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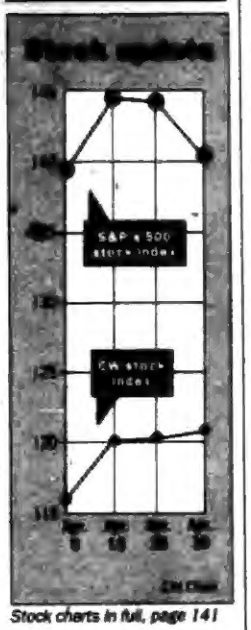
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THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

COMPUTERWORLD

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Computervision rolls out its new workstation-based system, while analysts press for a more open software system. **Page 5.**

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Dexpo South attracts 7,000 DEC users, while third-party vendors grumble about new policies preventing add-on devices. **Page 14.**

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Pan American's decision to use American Airlines' Sabre reservation system may foreshadow further links between the airlines' DP operations. **Page 2.**

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NCR users rave about the company's 9800 mainframe but question its speed and memory address space. **Page 6.**

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Thinking Machines rolls out a massively parallel processing system. **Page 4.**

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Telecommunications industry turmoil spells opportunity for venture capitalists. **Page 31.**

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Users rate the Data General MV/20000 and MV/2000 models. **Page 43.**

■

Users of Wang Laboratories equipment are objecting to a new Wang policy that they say charges for all software maintenance support and will begin on July 1. "When Wang gets its service to a level worth paying for, then we'll talk," one user said. Wang spokesmen were not able to comment by press time.

■

The troubled Federal DP & Communications Conference, scheduled for this week in Washington, D.C., was canceled last week by the Interface Group. A spokesman said budget cuts were keeping federal employees away. The 1986 show had been in big trouble since its inception; Interface postponed the show from its original March dates, dropped

See **NEWS** page 4

FCC tickets 2,500 units in Comdex raid

By Douglas Barney

ATLANTA — Six Federal Communications Commission employees swooped down onto the show floor of Comdex/Spring '86 last week, slapping labels on all computer products that failed to meet federal radio frequency emissions regulations.

An estimated 2,500 products were tagged by FCC investigators during the first three days of the popular trade show.

In addition to affixing the labels, which effectively bars the sale of uncertified equipment, FCC officials provided vendors and resellers in attendance at Comdex with information on FCC certification and labeling requirements.

"We encouraged those that have not done it to abide by the rules and regulations to bring them into compliance," said Dorothy Goodrich, a public service specialist involved in the Comdex operation. "There were quite a few surprised faces there."

The FCC's Comdex raid is but one chapter in the agency's recent assault on firms that manufacture or resell computers that do not meet FCC standards. So far, the FCC crackdown has focused mainly on mail-order firms such as PC's Limited, an Austin, Texas, mail-order firm that sells its own brand of machines in addition to other brands of hardware and software.

"We had a couple of products that had not been certified. The application process is somewhat lengthy," said Allen Baden, attorney and assistant to the president for PC's Limited, which has been fined $8,000.

Baden said PC's Limited has since had its product certified and that the experience will help the firm avoid problems in the future. "We have seen some problem serial and parallel ports, so what we are

See **FCC** page 8

Rolm voice linked to VM

IBM office users tied in to voice messaging system

By Elisabeth Horwitt

Phonemail/VM host link, representing the first step toward integrating IBM electronic mail and Rolm Corp. voice messaging systems, is scheduled to be announced jointly today by the two companies, according to a Rolm official.

Phonemail/VM is described as a software option to be offered with Rolm's Phonemail voice messaging systems and will reportedly notify users of messages sent through a VM-based IBM text messaging system such as the Professional Office System.

See **ROLM** page 4

Cincom facing relational test

By Charles Babcock

ORLANDO, Fla. — Users of Cincom Systems, Inc.'s large-system software expressed strong interest in the firm's claims about its latest relational data base management system, Supra, at the annual Cincom users conference last week.

Users were also informed of a new release of Cincom's development language, Mantis, due June 1.

Interest in Supra, announced last fall, was heightened by reports that relational DBMS pioneer E. F. Codd is evaluating the Cincom product at his Relational Institute in San Jose, Calif. Preliminary reports, Cincom officials said, indicated that Supra

See **CINCOM** page 6

CW EXCLUSIVE

McNetwork: Fast-food giant orders ISDN communications

By Elisabeth Horwitt

This December, $3.4 billion fast-food giant McDonald's Corp. will abandon its safe and secure Centrex service for a pilot communications system employing the still-evolving standard, Integrated Services Digital Network.

"The value of information as a strategic asset is increasing rapidly for us," notes McDonald's telecommunications director Patrick Krause. He was a member of the management team that two years ago evaluated the company's voice and data communications systems, assessed future needs and developed a proposal that led to the ISDN pilot test. "Ideally, ISDN will allow us to install one uniform wiring plan and switching vehicle for network access," Krause says.

The emerging ISDN telecommunications standard defines a single set of specifications that will enable digitized voice, data, image and text transmissions to be delivered to the same user terminal over the same channel.


Krause

In addition to uniformity, Krause says, McDonald's hopes to realize substantial savings in equipment, line and service costs by consolidating its transmission facilities under ISDN services supplied by Illinois Bell.

Currently, the company uses a wide variety of switches, controllers, modems and cables to connect data terminals to Wang Laboratories, Inc., IBM and Unix-based hosts; telephone sets to public and dedicated lines; and workstations to data transmission services such as value-added networks, Digital Dataphone Service and WATS.

"We were concerned with long-term viability," Krause says, explaining why McDonald's decided that its 10-year-old telecommunications system was overdue for an overhaul. Although Illinois Bell's Centrex had served them well in the past, he says, McDonald's had become aware of the

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NEWSPAPER

Pan Am exploring DP sharing with American Airlines group

By David A. Ludlum

NEW YORK — Pan American World Airways, Inc. is looking into expanding its cooperation with American Airlines, Inc. in data processing in the wake of Pan Am's agreement to use American's Sabre reservation system.

Pan Am is comparing American's data processing capabilities with its own in weighing further cooperation, according to Robert Wagner, Pan Am's general manager of data systems and communications.

The airlines limited the scope of the Sabre agreement in order to expedite it, Wagner said. The agreement calls for Sabre to provide Pan Am's seating reservations and departure control. It does not cover Pan Am's freight tracking or reservations that Pan Am manages for several Latin American airlines.

In announcing the Sabre agreement late last month, Pan Am Chairman C. Edward Acker said Pan Am will "review other areas in which American's data processing resources could augment Pan American's capability in . . . operational and analytical functions."

Reason for move

Wagner said the chief reason for the move to Sabre is its penetration in travel agents' offices. Terminals for Sabre, the largest of five major airline reservations systems in the U.S., sit on 48,000 travel agents' desks, generally under exclusive five-year contracts, he said. The system issues more than half the airline tickets sold in the country, Wagner said.

Pan Am spokeswoman Ann Whyte said the number of terminals for Pan Am's Panamac reservations system on agents' desks is "very, very small."

Sabre already carries listings for Pan Am and other major airlines. The new agreement provides for Pan Am's seating availability, fares and schedules to be reported in real-time, which is not now the case, Wagner said. "If one seat is available, you get it," he said.

Benefits for Pan Am

The move also will allow Pan Am to provide customers with boarding passes when they make reservations, automatically record mileage accumulated in frequent-flyer programs and offer other travel services, Acker said.

Panamac is 22 years old and was rewritten in 1973. It was derived from the Programmed Airlines Reservation System application software developed by IBM and uses the ACP/TPF operating system and an IBM 3083 Model BX host processor, Wagner said. He would not say how many workers are involved with the system.

Pan Am hardware and data processing personnel freed up by the move to Sabre will be used to solve other needs where capacity is lacking, including decision support, electronic mail, maintenance and engineering, Wagner said. Pan Am reservation agents will continue to use the Panamac terminals, according to Wagner.

Pan Am said no personnel will be laid off due to the move to Sabre, but a day after announcing the Sabre agreement it said it was laying off 212 of its 1,470 reservations agents because of a decline in business. That decline is because of concern with terrorism in Europe and the Middle East, Wagner said.

In announcing the Sabre agreement, Pan Am and American also said they will integrate their frequent-flyer programs, allowing mileage accumulated under one program to be credited to the other, effective June 1.

Tandem unveils workstations

PC AT compatibles emulate 6530 terminals

By Jeffry Beeler

CUPERTINO, Calif. — In a move to strengthen its distributed processing capabilities, Tandem Computers, Inc. today is set to introduce two IBM Personal Computer AT-compatible workstations that reportedly support Tandem's key communications software products.

Even though both the 6AT/20 and 6AT/40 can operate in a stand-alone mode, they are primarily intended to serve as system terminals and to be integrated into networks that incorporate Tandem's Nonstop mainframes.

In addition to being configured with a program that allows micros to emulate a Tandem Model 6530 terminal, the 6AT/20 and 40 support the vendor's Information Xchange Facility (IXF) software, according to John Gully, manager of product management at Tandem's Austin, Texas, site.

Together, 6530 emulation and IXF reportedly enable the workstations to connect to Tandem hosts through standard access methods and make the two 6ATs compatible with the firm's Pathway transaction processing system.

Distributed processing

One key to the workstations' distributed processing capabilities is their local intelligence and storage capacity. Both units use Intel Corp.'s 80286 microprocessor and support an array of operating systems, including Microsoft Corp. MS-DOS 3.1, Unix and its look-alike — Microsoft's Xenix. The units are expandable to 11M bytes of main memory and 80M bytes of external storage.

A basic 6AT/20 incorporates a 20M-byte disk system and costs $3,995, compared with $4,495 for a minimum 6AT/40, which provides 40M bytes of mass storage.

Both products are available for immediate delivery.

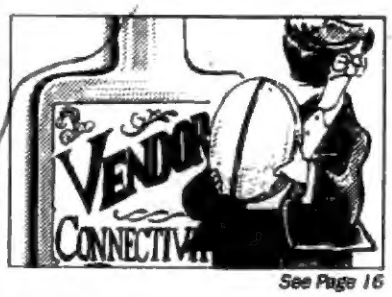
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Massively parallel processor introduced

Connection Machine concept represents a 'new technology'

By Eddy Goldberg

CAMBRIDGE, Mass. — The massively parallel processing Connection Machine introduced by Thinking Machines Corp. last week represents "a fundamentally new technology," according to company founder and President Sheryl Handler.

The Connection Machine incorporates 16,000 to 64,000 processors that reportedly process data at up to 1 billion instructions per second.

"I think it's a breakthrough, but I don't think it immediately makes other machines obsolete," said Vincent E. Giuliano, vice-president and chief scientist at Mirror Systems, Inc., which produces software systems for parent company Times Mirror Co.

"The important thing at this point is to prove the concept," said Martin Schultz, chairman of Yale University's computer science department. "We have to find out if massive parallelism is the answer to our needs," he said. Schultz is looking to simulate three-dimensional physical experiments, among other tasks.

The company, founded in June 1983, has sold six units, which cost $1 million in the 16,000-processor configuration and $3 million for the full 64,000-processor version.

The first sale was to the Defense Advanced Research Projects Agency (DARPA), which sponsored the project to develop a general-purpose massively parallel computer.

"Each of the architectures we're sponsoring represents a major architectural advance," said Stephen Squires, assistant director of DARPA's Information Processing Technology Office. "This is pushing things in the direction of fine-grained, massively parallel, fully connected computing," he added.

Fine-grained processing assigns each data element of a task to an individual processor, allowing thousands of processors to work simultaneously, the company said. It works best where the number of data elements is large, ranging from 10,000 to one million.

The front end is a conventional computer, such as a Digital Equipment Corp. VAX or a Symbolics, Inc. 3600, which contains the programs. Any single-data-element instructions are executed directly by the front end. Instructions that call for operations on the whole data set at once are passed to the Connection Machine for execution.

For problems with more than 16,000 or 64,000 data elements, the processors, which each have 4,096 bits of memory, act as virtual processors. The Connection Machine can support up to one million virtual processors.

Its communications technology, called the router, has an overall capacity of 3 billion bit/sec. and allows any processor to establish a link to any other processor in a maximum of 12 dynamically configurable steps. Though its future usefulness is yet to be fully determined, four applications were demonstrated: document retrieval, fluid dynamics modeling, creating contour maps from aerial photographs and the design of very large-scale integrated circuits.

Rolm voice linked to VM

From page 1

"This is the first link between voice messaging from Rolm and an IBM office system," said Jeff Crow, group product manager of Rolm's messaging products division. "We believe that voice and text mail are complementary; bringing them together benefits users."

One such benefit, Crow said, is that Profs users will receive notification of waiting Phonemail messages directly on their screens. They can also bring up a list of waiting calls that includes details such as caller name and time of day.

"The actual features being provided are less important than the fact that this announcement represents a first, small but important step toward true integration of Rolm voice and IBM data systems," said Susan Lehto, senior research analyst at Boston-based consulting firm the Yankee Group.

"You wouldn't want to rush out and buy this stuff unless you already had most of the necessary components," Lehto added. Those components, she said, include IBM's VM/SP Release 3; IBM's Voice Text Messaging System (VTMS), which is priced at approximately $10,000; a Phonemail system, which costs $40,000 or more; and Voicemail/VM, which is priced at $2,000 and up. VTMS can be used as a text messaging system or as part of the link between Phonemail and Profs.

"Dual message notification is a small feature," Lehto said. "The next step would be having voice messages delivered to the user's terminal, either on the screen or in printed form or even audibly."

Available now, Phonemail/VM is said to run on any private branch exchange or Centrex system supported by Phonemail. It costs $2,000 for a four-channel PBX, $4,000 for an eight-channel PBX, $6,000 for 16 channels and $2,000 for each additional add-on of 16 channels.

A second Rolm introduction was the latest release of Phonemail, which includes a number of new features, including the following:

- Name/extension identification, which enables users to identify a message recipient by last name instead of by extension.
- Multiple personal greetings, which allows users to set up two alternate messages for callers. For example, internal callers might hear one message, callers from outside, another. This feature is only available with Rolm CBXs.
- Personal distribution list, which sets up one number to send voice mail to a group of Phonemail boxes. Abbreviated prompts allow experienced users to use shorter versions of Phonemail commands.

The new version of Phonemail is automatically included with all new Rolm voice messaging systems, as of today. It also is available as an upgrade to currently installed systems. The upgrade is priced the same as Phonemail/VM.

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TOP OF THE NEWS

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the entire vendor exposition, and moved the remaining educational conference to a much smaller site.

■

A small computer platform and an office networking software system are due to be announced by Honeywell early next month. Top Honeywell executives are scheduled to be on hand in New York as the company emphasizes its commitment to the office market and outlines its strategy for the office and departmental systems arena.

■

Software Publishing Corp. will announce today it has signed a letter of intent to acquire a full-function desktop publishing product being developed by Best Info.

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Box 9171, 375 Cochituate Road,
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Computervision launches flagship CAD/CAE Caddstation

Firm has no plans to sell Cadd 4X software alone

By Rosemary Hamilton

BEDFORD, Mass. — Aiming for a new lease on life after a year of declining market share, Computervision Corp. last week rolled out a workstation-based computer-aided design (CAD) and computer-aided engineering (CAE) system slated to become the firm's flagship product.

But while the new Caddstation won positive initial reviews, some observers questioned the company's strategy of not making its proprietary software available on a wide range of other vendors' hardware.

Meanwhile, Computervision posted improved financial results for the first quarter ended March 31 that showed the company still operating at a loss. Computervision reported a net loss of $7 million, or 24 cents per share, on revenue of $112.9 million. In the first quarter last year, the company reported a net loss of $18.8 million, or 66 cents per share, on revenue of $105.9 million.

Caddstation will be sold as a complete system, and Computervision does not plan to sell unbundled Cadds 4X software to non-Computervision workstation users as some analysts have urged.

Furthermore, a company spokesman said that even if Cadds 4X were supplied to non-Computervision users, it would not work well without the Computervision-designed Graphics Processing Unit (GPU) that was incorporated into the Sun Microsystems, Inc. hardware used to build Caddstation.

" It wouldn't be as powerful or as integrated without the GPU," spokesman Thomas Charland said.

"This is a real sticky point," said Vicki Brown, a senior analyst at International Data Corp. in Framingham, Mass. "By not unbundling the software, they've yielded a product by which the software can only run on Computervision systems."

Large number of Cadds 4X devotees

However, Computervision has a large installed base of Cadds 4X devotees who are willing to buy complete systems, analysts predicted.

"A good portion of the installed base will buy Caddstation," said Laura Conigliaro, a vice-president at Prudential Bache Securities, Inc. in New York. "They continue to buy the older systems with Cadds on them."

Dana Lonn, CAE manager at lawn equipment manufacturer Toro Co. in Minneapolis, said his department was a beta site for Caddstation. "Generally, it's a very good system," he said. "It needs a little development work to get it where it should be, but I'm convinced they're committed to do that."

Lonn said the response time on his 8M-byte color workstation is not as quick as he expected, particularly when he is working with the accompanying tablet to input data.

Caddstation is based on a Sun 32-bit workstation operating under the University of California at Berkeley 4.2 version of the Unix operating system. It comes with either a Motorola, Inc. 68010 or 68020 microprocessor, a 68881 floating-point processor and the proprietary GPU graphics coprocessor.

The stand-alone version comes with 4M bytes of main memory, expandable to 12M bytes and 85M bytes of disk storage, with the option of adding another 85M-byte disk. Users can purchase either a monochrome monitor or 1,152- by 900-pixel, 19-in. color monitor.

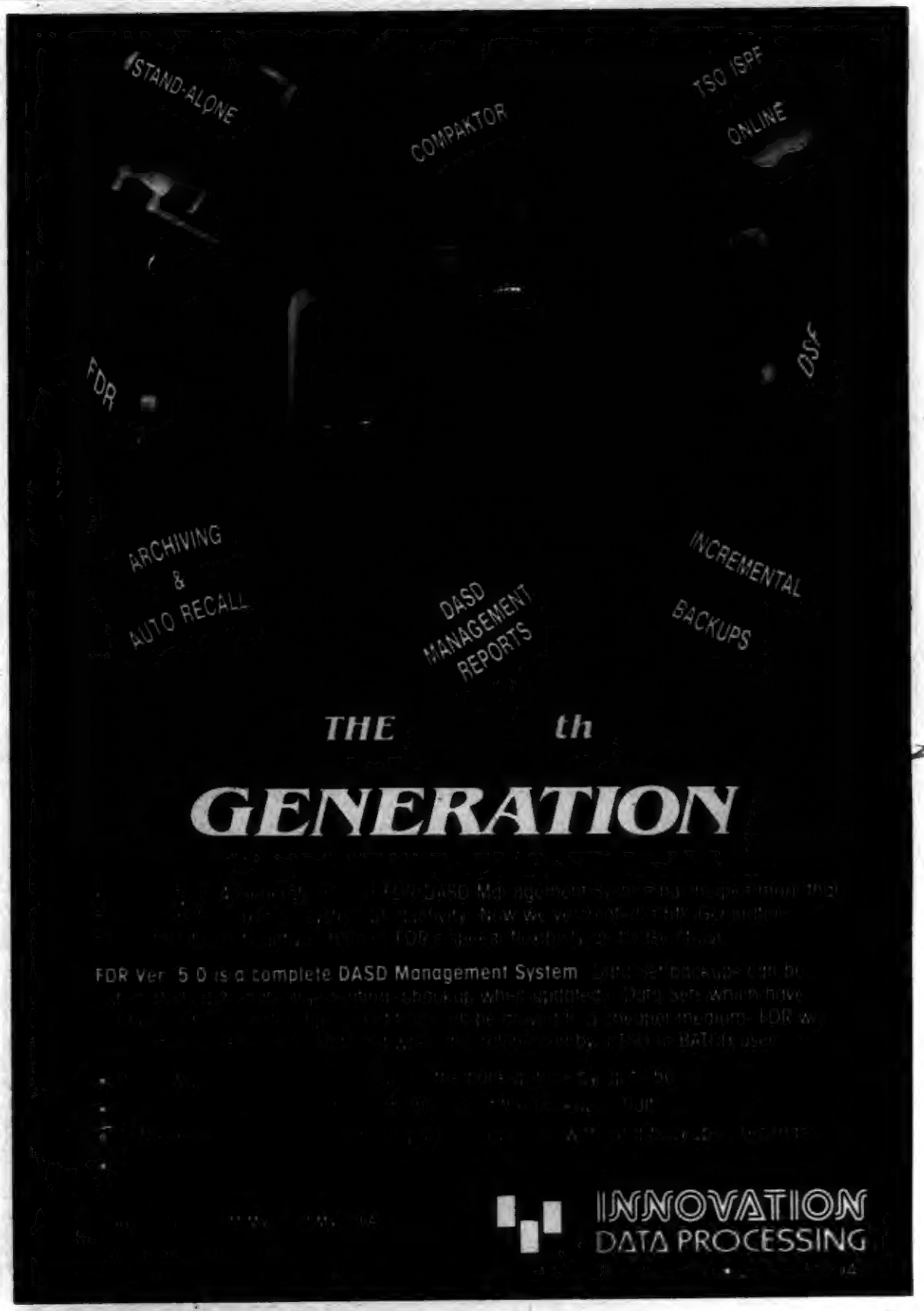
The system can also be used as either a diskless node or a file server on a network and can be configured as a host for up to six Caddstations. Computervision officials refused to release specific prices but estimated that a typical color Caddstation, running its mechanical CAD software, will cost approximately $65,000 and that a diskless node will sell for about $14,000.

Computervision also announced the Caddsnetwork, an Ethernet-based network supporting the Transmission Control Protocol/Internet Protocol (TCP/IP), that will provide Caddstation access to both Digital Equipment Corp. and IBM systems that support the protocol as well as older Computervision systems such as its CDS-4000.

The first portion of the Caddsnetwork will be a local-area network to link Caddstations with the Sun Microsystems Network File System, which allows users to transfer data among different systems. The company said a backbone network supporting the TCP/IP protocol will be available this summer.

Caddstation is the result of a three-year effort in which the company ported its Cadds 4X computer-aided design and manufacturing (CAD/CAM) software from its proprietary systems to one based on an industry standard platform. Some of the company's troubles last year resulted from its proprietary systems losing market appeal.

"It can't help but be a boost," said Charles Foundyller, president of Daratech, Inc., a CAD/CAM market research firm in Cambridge, Mass. "The installed base will be very happy with it. It's attractive-looking and has good user interfaces."



Speed, small memory among few criticisms of NCR 9800

Users generally pleased with fault-tolerant effort

By Jeffry Beeler

PHOENIX — Some potential buyers of NCR Corp.'s just-announced Model 9800 mainframe last week characterized the machine as too slow to satisfy even their current, much less their future, processing needs.

At least a few user complaints were also triggered by the 9800's failure to expand NCR's memory address space beyond its current 8M-byte limit.

Otherwise, though, NCR's first venture into fault tolerance and online transaction processing won generally rave reviews from members of the International Federation of NCR User Groups. The members were in town last week for the 16th annual NCR Users Conference (Nucon), which marked the 9800's first public demonstration since its introduction April 22.

"I'm quite excited about the product's fault-tolerant features, which are fantastic and signal a whole new direction for NCR," said Lawrence Staples, programming vice-president at Appleton, Wis.-based Valley Systems, Inc.

Although the 9800 uses a significantly enhanced version of the operating system that drives NCR's previous mainframes, most users foresee little hardship in porting their existing files and application code to the company's fault-tolerant architecture.

"Migration path engineering is one of NCR's traditional strengths," Staples said. "Users may not always get the performance they want when they move their software from one generation of NCR system to the next. But at least the programs always continue to run."

A similar faith in the vendor's migration prowess was voiced by Homer Schmitz, senior vice-president for management resources at St. Louis-based Deaconess Hospital. "Over the years, we've gone through several generations of NCR hardware," Schmitz recalled. "Every time we upgraded to a new processor model, we had a pure transport of software."

Baker Manufacturing Co. of Evansville, Wis., is also a seasoned veteran of NCR mainframe swapping. "In 1971, we started with a Century 100," explained Baker's MIS manager, Robert Richter. "Later, we became one of the first 50 users of NCR's Criterion 8550." In the end, Baker upgraded to an 8560 and then to an 8575 Group 2, which the company still uses.

His company's earlier successes in graduating to new, enhanced mainframes has convinced him that code residing on existing NCR systems can be ported to the 9800 with little rewriting. "But to get the full benefit of the machine's native performance, the software will have to be recompiled," he said.

User reaction not all upbeat

Reaction to the latest NCR mainframe announcement, however, was far from universally upbeat. Staples of Valley Systems, for example, found fault with the computing horsepower of the 9800's application processors, each of which roughly equals the performance of an NCR 8555 Group 2.

Staples expects the company to increase its fault-tolerant machine's processing speed through the addition of improved technology. But until then, the 9800's current throughput "simply won't be adequate for my work load," he said.

Cincom facing relational test

From page 1

matched or bested IBM's market-leading DB2 product on most of the 12 points in Codd's controversial relational quality scale [CW, October 14, 21, 1985].

The initial MVS version of Supra, announced last fall, has been available since Feb. 17. A DOS version will be available June 1. The new release of Mantis, 4.2, was announced and will also be available June 1.

Speaking at the Cincom meeting was Codd's associate C. J. Date, a partner in the Research Institute, who cited three specific points on which his group considered Supra to be superior to DB2. These were referential integrity, primary keys and foreign keys.

Date criticized the lack of referential integrity in DB2, while calling it "one of the strongest points about Supra."

Referential integrity is a relational property that allows the system to enforce rules on whether one set of data can be used with another. "We have a rule you cannot enroll a student who has not been admitted," noted J. Rich Burnett, data base administrator for Alabama's Auburn University. Auburn is one of a handful of early users of Supra, and Burnett said, "referential integrity is built into the system. It will enforce those rules."

Date said referential integrity can be added to DB2 on an application-by-application basis, but it is a job for a skilled programmer. The other points Date mentioned were primary keys, which identify records and represent fields within those records, and foreign keys, which tie one record to another through its primary key.

The full preliminary results of the Codd study were not made generally available, but were related to users. "Supra appeared higher on each count than DB2," recounted Ray Parham, data base administrator of Akzo America, Inc., an Asheville, N.C., holding company, who attended a closed-door briefing on the study by Cincom officials.

Other sources tempered claims that Supra was being rated higher on many counts, saying Supra's alleged superiority was limited to one or two areas. A McDonnell Douglas Corp. representative said, "It's the tools tied to Supra that make it look better. I don't think it's a lot better."

Nevertheless, Cincom customers were eager to see final results of the study. It is scheduled to be published sometime this summer, Cincom officials said.

"I think Supra has got a great architecture," said Neal Indermuhle, data base administrator for J. M. Smucker Co., the Orrville, Ohio, food processor, who said he would like to see his firm move from Supra's predecessor, Cincom's TIS data management system, to the new system.

A Frankfurt engineering firm, Lurgi, has installed Supra and conducted tests with it for four weeks to compare its performance with DB2 and IBM's IMS. Andreas Ohuserge, Lurgi director of data base implementation, said in one instance an application designed to take advantage of relational properties ran 1.7 times faster on Supra than on the IMS version. He cautioned that the test reflected "special circumstances" and was not a head-to-head comparison.

A powerful one-two punch

Conference attendees said a new release of Mantis, Cincom's fourth-generation development language, coming at the same time that Supra hits the marketplace, will give the firm a powerful one-two punch.

Release 4.2 features screens that are 255 col. by 255 rows, compared with the 80-col. by 24-row limitation in the previous release and that offer full screen editing, compared with single-line text editing in the previous release.

Many attendees worried over how much both new products would draw down their mainframe resources.

John F. McKeown, telecommunications programmer for Signode Industries, Inc. of Glenville, Ill., said he had been told by Cincom officials that the new release of Mantis increased CPU demand by 30% but the increase could be trimmed through high-performance options that would improve performance 24%.

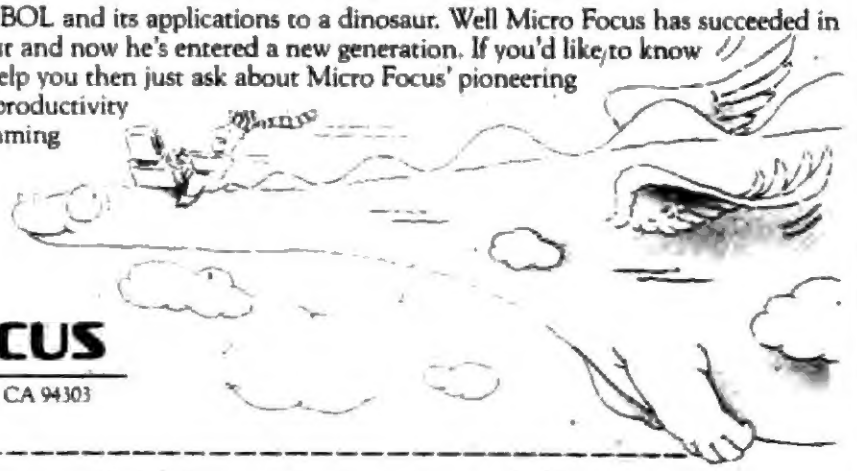
The options include binding and global pools. Binding allows a Mantis program to hold more information about what it has just done in the mainframe random-access memory (RAM), saving disk access time. Global pools is the name of a tracking system that watches what common routines are resident in memory at the same time. When a production application calls for a particular routine, the CPU retrieves it from another application in RAM rather than from the disk.

Without the high-performance options, Release 4.2 "will probably run a little slower," said Thomas McLean, Cincom's vice-president for marketing and product planning.

Mantis 4.2 will go to current users as a free upgrade and will be sold to new customers for $30,000 to $80,000. When purchased together, the DOS version of Supra and Mantis will sell for $193,000 and the MVS version for $274,000.

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Resellers strengthen ties with customers

Toshiba transportable, optimism of business chains highlight Comdex

By Eric Bender

ATLANTA — Despite tumult in the micro reseller channel and predictions of a vendor shift toward direct sales, major computer chains are solidifying their position among corporate customers. This was the consensus of both vendors and resellers interviewed at last week's Comdex/Spring '86 trade show.

While Lotus Development Corp. continues to beta-test various distribution options for large customers — including electronic distribution, on-site copying and others — "many of the reseller channels have rationalized to the point where they can handle that distribution more cost effectively, in many cases, than the customer or Lotus," Marketing Vice-President Michael Kolowich told *Computerworld*.

"Many large customers are sort of unraveling some of their PC support efforts," commented Alan Hald, chairman of Microage Computer Stores, Inc., a franchise operation with almost 170 outlets. "They only do those efforts from necessity."

"Customers say, 'We've been spending the last two years trying to get out of that business,' " Kolowich agreed.

Surviving dealer chains will be strengthened by their ability to draw on additional financing, suggested Rod Canion, president of Compaq Computer Corp., at a Comdex press conference. "The consolidation continues, but there are not any significant dealers shaking out," Canion said.

That was the good news for resellers and perhaps for their corporate customers at the annual spring edition of Comdex.

Decline in exuberance

The show exemplified the general decline in exuberance of micro-focused trade shows. While attendance held steady with previous years' spring gatherings at about 40,000, there were very few splashy receptions and no dramatic product announcements.

In software, desktop publishing and computer-aided design packages drew considerable attention. Among more general-purpose offerings, Satellite Software International introduced the Word Perfect Library, a $129 program manager for the firm's word processing software with built-in program editor and macro facilities. General Optimization, Inc. announced What's Best Personal Version, a $149 entry-level variant of its linear programming add-on package for Lotus' 1-2-3 and Symphony.

Local-area networks were a topic of much discussion, but few network-tailored applications debuted. One of the holdups, according to 3Com Corp. Chairman Robert Metcalfe, is difficulty in resolving pricing issues. 3Com and other vendors joined in a recent study of those issues. The study reached no overall conclusions but indicated that pricing on a per-network-server basis appeals most broadly, Metcalfe said.

If there was a hot system introduction at Comdex/Spring, it was Toshiba America, Inc.'s transportable micro, an IBM Personal Computer AT-compatible system that weighs 16 pounds and carries a starting price of $4,499. The externally powered T3100 features 640K bytes of internal storage, one 3½-in. floppy disk drive and a 10M-byte hard disk drive. Toshiba targets the machine against Compaq's new Portable II.

The expected flood of AT-compatible systems did arrive. So did dozens of add-in cards, "which can be noted here in their volume and perhaps in their lack of distinguishing characteristics," commented William Coggshall, industry analyst with Market Access International, Inc.

Among peripherals, about a dozen laser printers were unveiled (see story page 22), along with an offbeat package from Eastman Kodak Co.'s Sayett Technology subsidiary that permits PC screen images to be displayed with standard overhead projectors. The $1,200 system combines controller hardware and software with an LCD panel that sits on the projector's lens and produces a high-resolution monochrome image.

While there was much talk about future systems based on the Intel Corp. 80386 chip, the first significant product introductions are not expected before Comdex/Fall '86 in November, at the earliest.

Apple Computer, Inc. skipped the show again, and its Macintosh was almost as invisible as 80386-based hardware.

As usual, various conflicting trends showed up in hardware and software pricing. Corporate Software, Inc. Chairman Morton Rosenthal predicted that the street price of both Lotus and Ashton-Tate products will climb, as those vendors have boosted pricing to resellers. System costs showed steady slippage, with a prime example being one IBM-compatible system carrying a $345 price tag (with some lengthy footnotes).

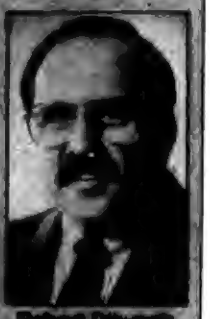
Consolidation trends also showed up in service firms, with the demise of McGraw-Hill, Inc.'s market researcher, Future Computing, Inc., the most spectacular case.

Contributing to this report were staff members Douglas Barney, David Bright, Stanley Gibson, James A. Martin, Peggy Watt and Clinton Wilder.

Problems delay 'Year of the local-area net'

By Peggy Watt

ATLANTA — Personal computers are still sneaking in corporate back doors, causing piecemeal configurations that help delay the "year of the local-area network" that industry watchers have predicted for the past several years, Zenith Data Systems Corp. President Robert Dilworth said last week during his keynote address at Comdex/Spring '86.


Robert Dilworth

The other major cause for local-area networks' delay is an innate childhood characteristic, Dilworth said in his opening address: "We do not like to share our toys.

"The user has had considerable flexibility up until now," he said in a later interview. "Maybe the only time we share our toys is when Dad says we have to. The MIS director is saying, 'yes, it's time to share.' "

That approach accompanies [illegible] being cut from the top, Dilworth added.

"Many times, before a company has time to establish a standard, there are dozens of PCs and computer people, scattered," he said. "Some of them are compatible with each other, and some of them are not."

Dilworth also said that the most battle in the battle market, one of Zenith's primary areas, will be this year, other IBM users, [illegible] of the Compaq PC Convertible with floppy disks.

"I doubt that even IBM could change this standard," he said.

The [illegible] Dilworth added, will only [illegible] for the IBM division. Dilworth added, "I am [illegible] it's easier to make a quantum [illegible] to move the changes in [illegible] to the knowledge that the [illegible] can grow."

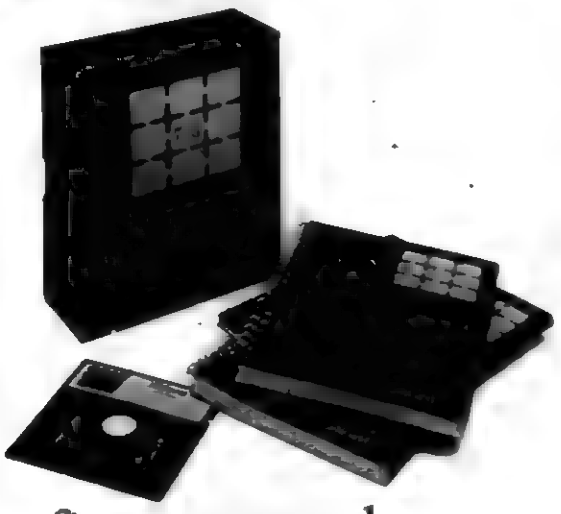
For example, he noted, [illegible] a product that [illegible] to all [illegible] users, [illegible] [illegible] without [illegible] [illegible] of the [illegible] [illegible] [illegible] from the other [illegible], [illegible] [illegible] [illegible]

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NEWS

NAS unveils 7380 models

Can be field-upgraded to double-density versions

By James Connolly

MOUNTAIN VIEW, Calif. — Responding to what the company said was user demand for a phased upgrade path, National Advanced Systems Corp. (NAS) last week introduced new versions of its single-density 7380 disk drive.

The two 2.5G-byte drives, the 7380 Models AD and BD, can be field-upgraded to the double-density 7380 Models AE and BE (see story page 43) and can be used on the same strings as those E model versions. The previous single-density versions, the 7380 Models A4 and B4, cannot be upgraded or used in a string of D or E models but can be used with the same 7880-3 and 7880-3C controllers as the new models.

An NAS executive said the company had chosen to announce the dual-density drives without an upgrade in March 1985 because officials felt that replacing entire strings of single-density drives with double-density drives provided customers with more financial benefits and assured data integrity.

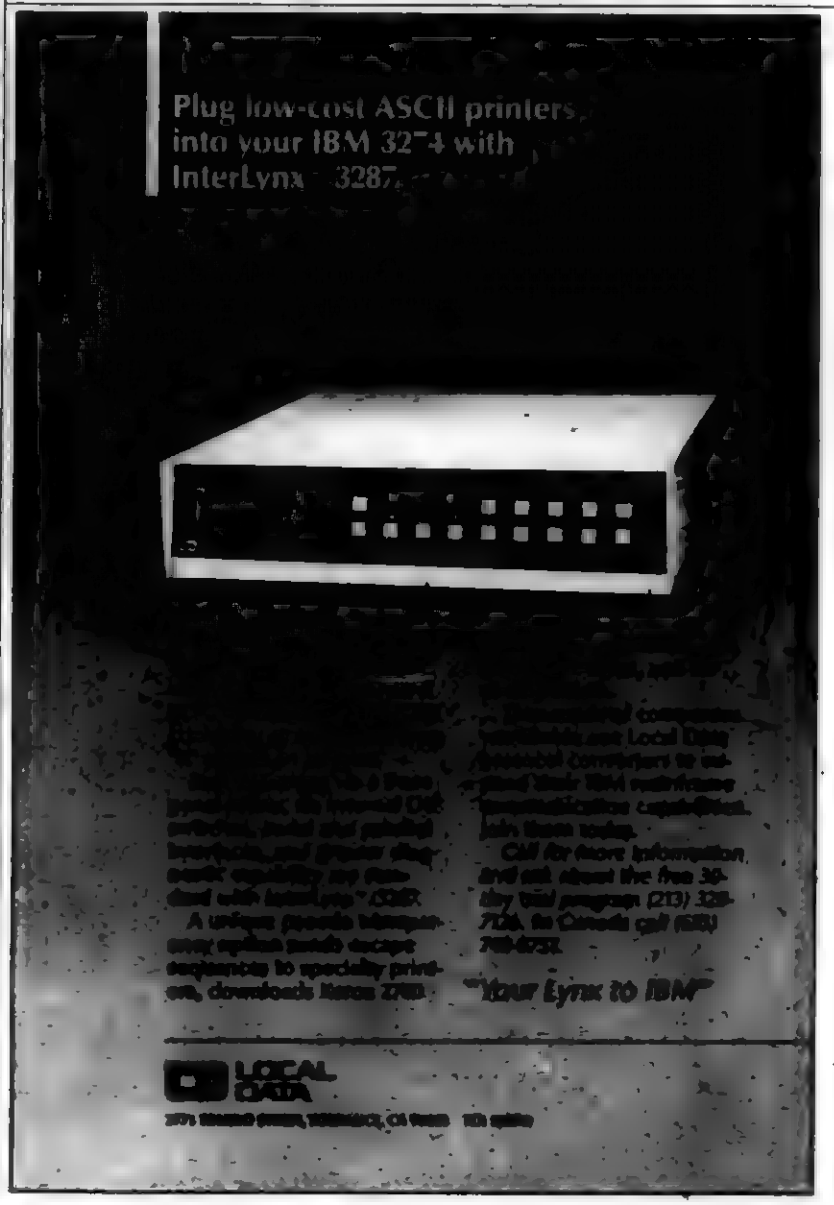
"But what the marketplace said it wanted was upgradable devices. In some cases it had to do with the Investment Tax Credit, and in some cases it had to do with the federal government saying that once they got a serial number on their books, they wanted to keep it," said Ken Page, director of peripherals marketing for NAS. He said NAS' large customers were the ones demanding upgradability.

Drives remain available

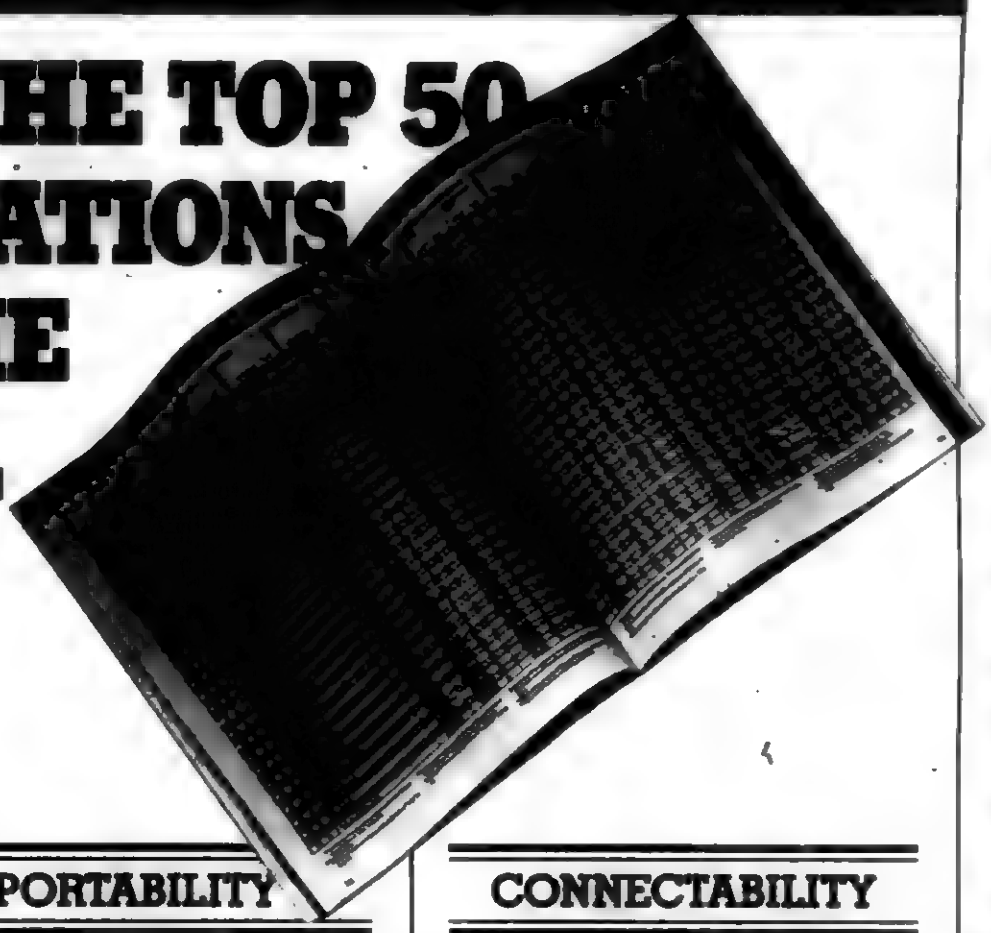
The standard A4 and B4 drives will remain available, particularly for users who want to fill out strings that already use those models and for customers who will not need a double-capacity drive during the next several years.

The AD and BD units contain dual-port electronics and four single-rotary actuator, head-disk assemblies, with each assembly accessing 630M bytes of storage. The AD costs $84,350, and the BD costs $61,225. A field upgrade from a D model to an E model drive costs $41,480. The D models, although formally announced last week, began shipments to customers in March and are available for volume deliveries now.

NAS also announced what it called its Gigabyte Discount Program, under which volume discounts for 7380 equipment will be based on the total storage capacity ordered. In the past, NAS assigned volume discount percentages to specific models. The Gigabyte Discount Program allows 8% discounts for orders of 20G to 49G bytes and 14% for orders in the 50G- to 99G-byte range.



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Jul 10, Aug 6
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Sacramento ..... May 13
San Diego ..... Jun 17, Aug 7
San Francisco ..... Jun 19, Aug 5
Sunnyvale ... Jun 10, Jul 8, Aug 7
CO Denver ..... Jun 17, Jul 17
CT Hartford ..... Jul 16
New Haven ..... Aug 20
FL Jacksonville ..... Aug 5
Tampa ..... Aug 6
GA Atlanta ..... Jul 15
IA Des Moines ..... Jun 25, Aug 27
ID Boise ..... Jul 31
IL Chicago ..... Jun 12, Jul 8, Aug 14
IN Indianapolis ..... Jun 17, Aug 19
KY Louisville ..... Aug 7
LA New Orleans ..... May 21, Jul 11
MA Boston ..... May 13, Jun 19, Jul 16
Burlington ..... Aug 12
MD Bethesda ..... May 7, Jun 12
Jul 9, 23, Aug 7
ME Bangor ..... Jul 3
MI Detroit ..... Jun 10
Grand Rapids ..... Jun 13
MN Minneapolis ..... Jun 26, Jul 22
MO St Louis ..... May 14, Jun 11, Jul 30
NE Omaha ..... Jul 9
NJ Convent Station ..... Jun 5
Aug 7, 28
Iselin ..... May 15, Jul 8, 23
NY Albany ..... Jul 23
New York City ... May 14, Jun 12, 25
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Rochester ..... May 18
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Syracuse ..... May 8, Aug 19
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TX Austin ..... May 27, Jul 10, Aug 19
Dallas ..... May 6, Jun 11, Jul 22
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Houston ..... May 15
TX Houston ... Jun 10, Aug 19
San Antonio ... Jul 8, Aug 27
UT Salt Lake City ... Jun 5, Aug 6
VA Norfolk ... Jun 4
VT Burlington ... Aug 6
WA Seattle ... Jun 12, Jul 15
WI Milwaukee ... May 21, Jul 17

Canadian Seminars

Halifax ..... Aug 20
Montreal ..... May 14, Jun 18
Ottawa May 8, Jun 12, Jul 10, Aug 14
Quebec ..... Jun 18
Toronto .... May 6, Jun 3, Jul 1, Aug 5
Vancouver ..... Jul 10
Winnipeg ..... Jun 3, Aug 6

Fast-food firm orders ISDN

From page 1

increasing cost of providing new terminal connections and moving equipment on Centrex. "And we wanted greater control and management of our communications system," he adds. "The phone company had been doing all of our reconfiguration and testing."

Consequently, two years ago, managers of McDonald's information systems, telecommunications and office automation came up with an 800-item manifesto describing current and future voice and data communications needs and sent out a request for a proposal embodying these details.

One of the nine companies to respond was McDonald's current Centrex-based service vendor, Illinois Bell, which offered a telecommunications solution based on the emerging ISDN networking standard.

ISDN proposal best bet

The McDonald's management team decided Illinois Bell's central office-based ISDN proposal best met the company's technical, support and financial criteria, Krause says.

"It was a perfect fit," recalls Paul Czaplewski, manager of marketing product management with Illinois Bell. "We had recently been designated by AT&T and Bell Communications Research, Inc. to be the first trial provider of ISDN on AT&T's Number 5 Electronic Switching System digital switch. We were looking for a business to be the first trial site when McDonald's called."

The team of managers "decided that we need integrated voice and data over uniform wiring, as well as store-and-forward information distribution and voice messaging," Krause says.

"McDonald's is a communications-intensive company; our people are rarely at their desks. We wanted a way to combat the telephone-tag problem by enabling our employees to access messages when they want to. And management stepped in and demanded a long-term, strategic telecommunications solution," Krause remarks.

"We chose ISDN because it offers us a blueprint for orderly evolution as new technologies become available; it doesn't limit us to one set of products," Krause says.

The company will be able to use 96% of its current wiring with the new ISDN communications system and replace the current analog system "one phone set at a time," Krause adds.

Illinois Bell currently estimates that the price of putting a terminal on the ISDN system will be "competitive with the $1,000 to $1,200 average cost of putting a terminal on a Rolm Corp. or Intecom, Inc. digital private branch exchange," according to Krause.

ISDN services provided by the telephone company will cost approximately twice the current price of Centrex lines, he says. "Those estimates incorporate savings based on shared use of interfaces," Krause notes.

Illinois Bell's ISDN services will be compatible with the old Centrex system, according to Czaplewski. "McDonald's will start with a small number of 2B + D ISDN lines initially and convert more Centrex analog lines to ISDN as needed." 2B + D is the basic ISDN rate defining two 64K bit/sec. "B" channels and one 16K bit/sec. "D" channel, which is used for packetized data and signaling.

The McDonald's trial tests only basic ISDN communications services, defined by layers one through three of the ISO model, Czaplewski notes.

For now, Illinois Bell and McDonald's are concentrating on setting up an ISDN system that can deliver voice, data, text or image transmissions to a user's desktop terminal over the same 64K bit/sec. channel.

Illinois Bell currently has out a request for proposal

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specifying a terminal adaptor that will enable a desktop device to be compatible with McDonald's current equipment base and with ISDN interface specifications.

The first step involves minimizing duplication of resources, administrative overhead and local distribution costs, Krause says. For example, coaxial-attached devices can be multiplexed over a circuit- or packet-switched connection over one or two aggregated 64K bit/sec. B channels. This would eliminate the need for coaxial cable connections.

Eventually, McDonald's plans to use Illinois Bell's digital switch to interface a wide variety of on-premises devices with a range of outside services, such as telephone sets with WATS, public dial-up and T1 lines; personal computers, 3270 terminals and integrated voice/data terminals with remote hosts; and long-distance network services.

The primary trial is scheduled to begin in October at McDonald's Oak Brook, Ill., headquarters. "We'll start with a limited number of ISDN lines, ramping up to 300 to 400 by early 1987," Krause says. A full trial at headquarters should be underway by mid-1987.

If all goes well, the company plans to implement ISDN at its 30 field offices as services become available from other telephone companies.

McDonald's could have installed ISDN switches on its own facilities, but the company chose Illinois Bell's central office-based solution because, "we preferred not to operate and maintain the telephone system on a daily basis, although we did want to manage it," Krause says.

Services not yet offered

Most of the ISDN services that McDonald's will be using during the trial are not yet offered commercially by Illinois Bell. McDonald's also will have to wait for some of the services, such as the option of aggregating 64K bit/sec. channels to provide higher transmission rates.

Currently, Illinois Bell's digital switch only handles 64K bit/sec. channels. "Right now, we would have to do the aggregation on our premises equipment and also provide synchronization," Krause says. This would involve more in-house resources than the corporation currently is willing to expend.

Krause recognizes, however, that "ISDN is not all here today, its issues are not all nailed down." Some issues relate to McDonald's need for a multivendor environment.

"We like to pick and choose our suppliers; the trial involves five or six at least. There has to be an end to finger pointing; vendors have to assume end-to-end responsibility beyond the line where their technical responsibility ends. And we still need multivendor conformance to the standard."

He also points to internal organizational issues that will arise at McDonald's and other companies converting to ISDN. "Most organizations have their voice and data groups separate; those have to be integrated to provide user support.

Multivendor network management products are "still on vendors' drawing boards, and I don't think a global network management interface will happen in the near future," Krause adds. McDonald's will probably implement two or three network control points, each utilizing a different vendor's product, he predicts.

"A lot of work needs to be done in the next year or two," Krause concludes.

McDonald's ISDN goals

McDonald's Corp.'s long-term goals for the Integrated Services Digital Network (ISDN) trial include the following:

- Reduction of costs associated with wiring changes and additions, network access and terminal equipment.
- Increase of productivity by providing employees with store-and-forward messaging and with integrated voice/data systems.
- Service-level improvement, by cutting lead times for new equipment and, through the higher speeds, increased accuracy and decreased downtime associated with an end-to-end digital network.

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Dexpo debuts draw users, but DEC policy draws grumbles

Components, software, Microvax II products highlight Dallas show

By Donna Raimondi

DALLAS — While third-party vendors grumbled about Digital Equipment Corp. decisions that cut many of them out of the new VAX products market, thousands of DEC users came to Dexpo South '86 last week looking for components and software.

Close to 7,000 attendees, many of them in town for the Spring Decus U.S. Symposium, pored over the products exhibited at Dexpo, where 200 companies showed more than 500 DEC-compatible products. About the only DEC-related company that was not there was DEC itself, which was running Decus simultaneously.

"DEC's shipment of most available Microvax II products to its very large system integrators is affecting our business in that the big companies that got the Microvax had to buy memory from DEC and not from the open market," said Jack Mueller, manager of memory products at Hamilton Standard Digital Systems, Inc., a memory board vendor. "It's a precondition in the DEC agreement that helps DEC control the market," he added.

Mueller said the difference in price to the customer can be significant — a $13,000 DEC-supplied Microvax II board would cost about $4,000 from a third-party vendor.

Vendors shut out

One Midwestern academic user, looking for add-on memory for his new VAX 8200, was out of luck. "DEC won't let vendors in any more. I will have to buy DEC add-on memory for three times more money and pay a maintenance fee for the rest of my life. DEC is playing hardball now. Field service said if I put foreign memory on, DEC would not maintain the computer," the user said.

But attendees were, for the most part, finding what they were looking for at the exhibition. "I am absolutely pleased with the show," said Ellen Robie, chief of the data systems branch, Department of the Army at Fort Huachuca, Ariz. Robie came looking for relational data base management systems for DEC's VAX machines and left with a shopping bag full of pertinent material.

"I'm at Decus and Dexpo to see what new products there are for the Decsystem-20," said Stan Baer of Harvard University's Business School. DEC relieved his concerns at Decus by announcing that support for the Decsystems would continue until 1994. For the first time, there were no Decsystem-10 or -20 systems exhibited at Decus, "but they do have new products to use on them," he said. "I'm looking for some communications products, too," Baer said. The Harvard Business School is tying 2,000 IBM Personal Computers into the Decsystem-20.

"I'm trying to determine if the software we want to use has been put up on the RSTS/E [PDP-11 operating system]," said attendee Robert Brandt of the Appraisal Group real estate consultants in Dallas. "From the folks I talked to so far, there have been no major improvements in the software for RSTS/E. DEC is pushing VMS so hard that in most applications, it's desirable to move to VAX machines, but for our applications, because of the file structures and other things, RSTS is still more desirable," he said.

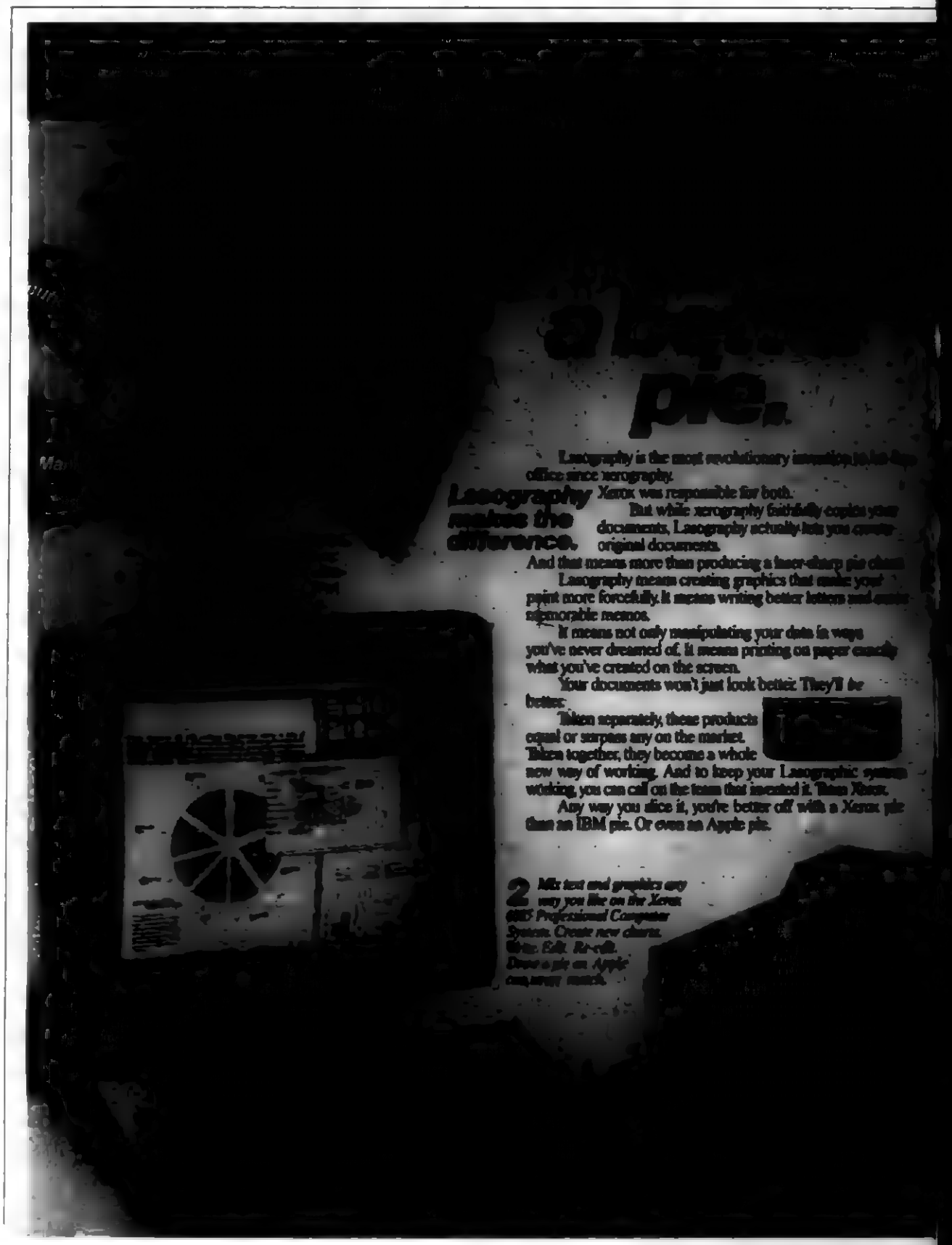
New products

Several new products were released at Dexpo. One of the most interesting ones, called a Unibus segment isolator/high-speed repeater, was designed by former DEC engineer Ernest DeFore, now vice-president of Setasi Research and Development in Fort Lauderdale, Fla. The unit, marketed by MRI Computers in Fort Lauderdale, replaces a DEC M920 or M9202 Unibus connector and is said to eliminate the need for additional $13,000 Unibuses as a configuration grows. One of the unit's beta-test site engineers said the $3,000 unit has been running in his installation for a month with no problems.

By far the largest number of products shown involved the DEC Microvax II supermicro. Roger Weidel, an Eastman Kodak Co. Microvax II systems manager, came to the show looking for Microvax II memory boards and for TK50 tape systems for the Microvax, which he said are in "real short supply." Weidel came to Dexpo from Decus, where he said that DEC was showing a model of clustered Microvax IIs.

The only DEC VAXBI-based product released at Dexpo was the ICP1632 intelligent communications processor from San Diego-based Simpact Computer Systems. The vendor said the processor will be generally available in September 1986.

Numerix Corp., based in Newton, Mass., announced that it signed an OEM agreement with DEC whereby Numerix will add its array processors to the Microvax II and VAX 8200 systems in order to create turnkey data acquisition systems for use in laboratory and workstation environments.



Strategic investments in automation add up, professors say

Accounting methods quantify potential gains

By David A. Ludlum

BOSTON — Conventional accounting fails to reflect all the benefits of automation and can discourage companies from making valuable investments, two business professors told a national gathering of accountants last week.

Accounting methods should be adapted to realize the gains automation can provide through manufacturing flexibility and product quality, said Grant W. Russell, professor of accounting at Canada's University of Waterloo, and David M. Dilts, professor of operations management at Michigan State University.

The two brought their message to a conference on "Cost Accounting for the '90s" sponsored by the National Association of Accountants. They discussed investments in factory automation, but Dilts told *Computerworld* that their approach also applies to analysis of office automation and information systems. "We need to look at the strategic implications of those investments, too," he said.

Traditional criteria for judging business investments — the rate of return, payback period and cash flow, for example — work for tactical moves, Dilts said. But in their current forms, which focus chiefly on cutting costs, they might fail to recognize all the benefits of strategic investments, he said. "We have not been equipped to handle major changes in our manufacturing process," Dilts said.

Many of the corporate investments in factory automation to date have been undertaken as experiments because of customers' requirements or from "a basic faith in automation," Dilts said. Such faith does not specify the best approach to automation or point out situations where it is not desirable, he said.

But accounting can be used to quantify the potential gains from investments in automation, the professors said. Taking turns at the podium in tag-team fashion, they outlined several general sources of gain that accountants must learn to account for more effectively. They include the following:

- Manufacturing flexibility, which can speed up changes in product design, production level, the manufacturing process, replacement of products and introduction of new products. "How much is that timing worth to us?" Dilts asked.
- Improvements in product quality through the elimination of random errors that crop up in labor-intensive manufacturing.
- Synergistic benefits to other operations, such as accounting and personnel, through information generated by automation systems.

Dilts said marketing executives have been the most successful in quantifying the impact of manufacturing flexibility and product quality on conventional accounting measures such as return on investment.



DEC unveils workstation

By Rosemary Hamilton

MAYNARD, Mass. — Digital Equipment Corp. last week added a low-cost, scaled-down monochrome model to its Vaxstation family of engineering workstations and cut the price of two other monochrome workstations.

The company also announced an upgrade package that moves its Microvax II or Vaxstation II systems to the Vaxstation II/GPX, the workstation line it introduced earlier this year.

The Vaxstation II/Restricted Configuration (RC), which is currently available, is based on the Microvax II processor and is offered as two, fixed-package, nonexpandable systems. A 3M-byte version costs $14,995, and a 5M-byte version costs $16,995.

DEC reduced the price of two monochrome Vaxstation II systems by an average of 15%. The $29,600 Vaxstation II now costs $26,000, and the $36,800 version now costs $30,500.

The Vaxstation II/RC was designed for such applications as technical publishing that require minimal memory, whereas other monochrome models in the Vaxstation family are suited for more sophisticated applications such as the development of artificial intelligence tools and systems, a spokesman said.

The Vaxstation II/RC operates under both Ultrix, the vendor's version of Unix, and MicroVMS. The system comes with a 19-in. monochrome monitor, a 71M-byte disk, disk controller, Ethernet interface, 95M-byte streaming tape drive, video subsystem, standard keyboard and mouse.

The upgrade package, scheduled for June release, would allow users of the Microvax II or Vaxstation II to upgrade to the GPX line. Prices will start at $7,050. The company said its VMS operating system for the GPX line will also be released at that time

VIEWPOINT

EDITORIAL

Hang the user: Vendor vs. pirate

Software piracy is back in the news, with all the drama of a segment of *Miami Vice*. In Hong Kong, police raided a shopping arcade notorious for its sales of pirated goods, netting 17 arrests and $130,000 in stolen software — all thanks to the investigative legwork of Lotus Development Corp. In Toronto an entrepreneur faces 10 counts of criminal behavior for boldly advertising and selling at bargain-basement rates software he copied from a variety of vendors. And, in sunny California, a computer reseller was accused by Ashton-Tate of copying software onto 20M-byte hard disks, which he then sold to users as add-on products.

Because these cases are dramatic, they may be pointed to by vendors and their lobbying groups as an argument for copy protection devices and other unwieldy restrictions on all those who buy and use software products. This would be unfortunate. There is simply no fair comparison between such examples of clear criminal conduct and the legitimate demands of corporate buyers for reasonable agreements on duplicating software within their organizations.

Along some fronts on the anticopying battleground, some software vendors are spending time, energy and legal fees tracking down those few criminals who deserve to be dubbed pirates. But it is far more productive for vendors to spend time, energy and dollars designing better software duplication agreements for that far larger and far more important body of software buyers who inhabit corporate offices.

Notes & observations

A recent thought from Chairman Malcolm (as in the editor in chief of *Forbes* magazine), titled "The Computer Age is Only at Dawn's Early Light":

"There's irony in the fact that early death has come to so many spectacular corporate denizens of America's silicon valleys. There's irony in the fact that malaise still plagues the huskier players plowing our silicon fields.

"We've really only opened the door to the Computer Age. Even the wildest or soundest or most soaring imaginations can't predict, foresee, conjure up the dimensions, the ramifications, the impact that lie ahead.

"The transfigurations (pardon the pun) to come from compacting research on computers in health, in mind, in body, in not-yet-born and the analysis and prescribing for the sick are far out — and some still far off.

"From weather to design, travel safety to embracing knowledge of space, for research in every area, computer use is only at the threshold.

"There is no aspect of your daily life and your doings or anyone else's that is not or won't be immensely more affected at a geometrically accelerating pace.

"While this unimaginable Tomorrow won't happen tomorrow, the current bleak pause in the computer field is just that — a pause whose duration will be as varying as the uses, users, makers and visionaries involved."



LETTERS TO THE EDITOR

Misapplying the principle of privacy

Underlying the statement quoted in the editorial, "Computers aren't the issue" [CW, April 14] by Jerry Berman of the American Civil Liberties Union, is the premise that whether or not a government action violates our privacy depends on the power of the technology used. Berman misses the point, as your editorial argues; and the premise, which appears to be a consensus in his milieu, seriously harms the privacy cause and consequently everybody.

I do not recall that the ACLU has challenged the right of government to know who is delinquent in repaying student loans, receives welfare benefits, has taxable income or even is old enough for draft registration. It seems even to concede the right of the government to correlate the information but only in manual, special-case, generally ineffective ways.

To invoke the principle of privacy only when enough technology is applied to inconvenience a substantial number of violators discredits both the principle and, however unjustly, the motives of those who invoke it. If Berman thinks that file matching erodes privacy, then his vocabulary has a gaping hole where "privacy" used to be, to the detriment of what the word used to protect.

To be credible, the privacy advocates need to draw the line where there is a clear qualitative difference between what they do and do not deplore rather than at a point that appears arbitrary, capricious and even frivolous. If the castle walls about our truly private affairs are actually under siege, it is hardly the time to try to expand these walls by declaring private our business affairs and even our financial dealings with the government. This is a matter not only of elementary strategy but of perceived sincerity.

The Internal Revenue Service's objection (to matching information on tax returns with that on welfare rolls and delinquent student loan accounts) also deserves scrutiny. The mandatory notice in the instructions that accompany the federal tax return form explicitly warns that the information you provide can be disclosed to other government agencies.

Is it possible that the IRS is concerned less about violating a privileged relationship (which does not appear to exist really) with the taxpayers and deterring honest reporting of income than about diverting its resources to the aid of other government agencies to the detriment of its own work?

Nothing discredits a noble principle as effectively as misapplying, trivializing and exploiting it for ignoble ends. In this, Berman and the IRS seem to be political bedfellows, but perhaps not so strange.

Daniel J. Lasser
Rockville, Md.

Bug only part of software story

As much as we might enjoy the discomfort of Computer Associates International, Inc. per your article, "Repair of bug in Computer Associates tool hikes CICS bills" [CW, March 17], concerning its CA-JARS/CICS reporting system, we cannot help but be appalled at your unwarranted treatment of this subject. For some reason, you have singled out a rather modest niche product and a rather understandable, if embarrassing, bug.

I can assure you that software development is a humbling experience. No matter how hard you try, no matter how skilled you are, you will fail in some fashion. Inevitably, there is that situation where you can only shake your head and do the best you can. I know that. Other software vendors know that. And I'm sure CICS users know that. Does *Computerworld*?

If one of your 1,000 users complained, would you treat it similarly? Would you even consider the other 999? In this particular case, it seems as if you thought it newsworthy not that the error was fixed, not that the vendor discovered the error, not that the vendor had the courage to fix it, but that the error existed in the past.

Patrick H. McGettigan
President
Landmark Systems Corp.
Springfield, Va.

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VIEWPOINT

Departmental computing: PCs and mainframes not enough

Frustrated by its lack of success with the System/36 as a "strategic office automation" product, IBM has apparently been suggesting to some of its large customers that the proper approach to office automation isn't a terminal on a System/36, isn't a Personal Computer attached to a 36 or a local-area network but is rather a PC directly communing with an IBM mainframe.

Customers claim that IBM argues that the superior capabilities of its microcomputers make a new architecture possible, one in which the PC takes over many functions that would otherwise need to be based in an intermediate or departmental processor — true.

In addition, IBM claims that Personal Services/Personal Computer on the IBM mainframe offers adequate functionality for system-level functions such as electronic mail and file sharing, that building large office automation systems with departmental processors is too expensive and that this solution fits the overall IBM Systems Network Architecture environment better.

Now, what is going on here? This was supposed to be the year that all those thousands of personal computers in companies of every size started to get interconnected, some by local-area networks, file servers and software and some by departmental processors and office automation software. In fact, some companies are pretty far along this track, with vendors selected, plans in place, pilots under way and early reports of considerable success.

And the notion of the intermediate or departmental processor is an important part of this game *if* the following are true:



By AMY D. WOHL

- The rush to personal computers was really (at least in part) a strong statement by end users that they wanted to control their own computing destiny.
- Departmental processors, departmentally controlled, are an extension of this perceived need for some end-user control.
- Those of us who struggle to provide a philosophical underpinning for what is going on are correct in identifying the inherent problems of trying to provide all of the systems-level functions, for every level of the organizational hierarchy, all at the mainframe level.

No vice-presidents

To me, an office automation solution that is based only on workstations and mainframes is rather like a company with a president and staff, but no vice-presidents in the middle.

Who will provide coordination and control, corporate memory and experience, management and recommendation? Companies without vice-presidents don't work very well because every time two clerks have a disagreement on how to proceed, the president has to decide what to do. It's an appropriate structure for a very small firm in which the president makes all the decisions anyway. It is a terrible bottleneck for anything larger.

An end-user computing solution that is entirely mainframe- and PC-based assumes that end users can be adequately served by mainframe computers and the support apparatus they offer. I don't think that's likely.

Imagine a normal mainframe environment. It's Friday afternoon. There were two major software upgrades scheduled for this week and a new department full of 3270 Personal Computers to bring up with a new data base application. Everything is behind schedule (as usual), and you're scheduled to be down for 24 hours over the weekend for normal hardware maintenance and some new communication hookups.

The marketing vice-president's secretary calls to say the two of them are working on a report for the chief executive officer, and when she mails the draft back to him (via the mainframe, of course), all the underlines are disappearing. Immediate action is required.

Just finding out what's going on will be difficult. Is it a workstation problem? A communications snafu? A mainframe software (operating system, application, or whatever) problem? And who's going to do the problem determination and resolution in an already overworked environment? Or find a temporary rubber-band-and-band-aid solution?

And who says this is cheaper? Computer resource has to cost something. And baby-sitting big iron can cost substantially more because the job requires more skills than those of a departmental-level analyst or troubleshooter.

Organizational solution

In fact, since most of the cost of end-user computing is really in the support and training — and not in the hardware at all — perhaps we should look at this as an organizational problem and find an organizational (people and management) solution rather than expect the selection of hardware itself to offer profound [illegible]

The answer is really in the numbers. IBM numbers. System/36 is not doing well in the marketplace — not in the office automation market. Performance, even the improved performance of the newest models, still makes the system expensive and difficult to configure for large-scale installations. And System/36 OA software has never really become competitive with the best solutions of other vendors.

The IBM local-area network-based solutions aren't a real substitute yet

See PCs page 18

Wohl is president of Wohl Associates in Bala-Cynwyd, Pa., and editor of "The Wohl Report on End-User Computing" newsletter.

AT&T rides accelerating mobile data communications market

AT&T is about to get into the mobile data communications business.

That may not sound like much at first (in fact, AT&T is not even the first to do it), but as a new and emerging market, the potential is tremendous for end users as well as for vendors.

With direct mobile data, field service people can automatically access a computer like their office coworkers. Mobile data could, during the next few years, launch a whole new category of products and services: special applications software, ruggedized portable computers and terminals, special modems and other communications products like mobile satellite antennas.

Studying the market

AT&T and Basking Ridge, N.J. based Bell Atlantic Mobile Systems have been studying the market for data and private voice transmission services over cellular phone systems for almost a year.

They started by equipping about 50 Washington, D.C.-Baltimore-area cellular customers with special modems for encrypted voice and data transmission. Portable computers were supplied from Hewlett-Packard Co. and Data General Corp. to customers who needed them.

Months later, Bell Atlantic Mobile decided it was pleased with the initial results, but the decision to proceed was left to AT&T, which would have to produce the modems and special central office hardware.



By RON SCHNEIDERMAN

AT&T decided to go ahead, despite the knowledge that, for the time being, the market is limited. Initially, AT&T and Bell Atlantic Mobile see mobile data as a very reliable voice encryption product. Ready markets are federal government agencies, government contractors and others that require secure mobile voice communications. Commercially, there are some niche markets but, so far, very few, which may explain why some very interested parties have delayed product and service announcements.

For example, IBM

IBM is the most prominent example. IBM has been equipping its National Service Division customer engineers with Motorola, Inc. KDT 800 portable data terminals. It now has about 20,000 of these terminals in use in 250 cities and expects to add another 50 or so cities by the end of this year.

IBM estimates it takes about 20 seconds to dispatch a service representative using the Motorola system. The same transaction, using a one-way pager and telephone (the system IBM is replacing), requires an average four to five minutes because the technician must find a phone to acknowledge receipt of a call and get additional information about the service call. In addition, it improves efficiency by eliminating the need to have someone read and relay information off a CRT.

The system works so well that IBM figured it could make a few extra bucks with it by reselling excess capacity. By using simultaneous transmission, up to 1,500 data users can be accommodated on a single KDT 800 channel.

Sell off frequencies

If IBM has, for example, 500 field people on a system, it would be able to sell off the remaining 1,000 frequencies in that market and obtain more than one channel per market.

But IBM has backed off the resale scheme, claiming it has more important things to think about. More likely, IBM discovered just what AT&T did — that board-based applications are hard to find.

Motorola may be wrestling with the same problem. In addition to the KDT 800, Motorola also makes the KDT 480, a mobile data terminal, and a cellular data link for accessing computer systems directly from vehicles. The data link is a 300 bit/sec. modem that plugs the modular connector on the mobile telephone handset into the data link. The portable computer or terminal is then connected to the data link via the RS-232C connector.

User interest

The data link has been available for about a year. Motorola started making it because some of its customers had expressed an interest in mobile data communications.

But very few data links have actually been sold, and some of those that have are being used on an experimental basis.

Motorola's data terminal contract with IBM alone is estimated at $100 million. And there's a lot more where that came from, which (as often happens) has created another problem, albeit an internal one. Obviously, Mo-

See AT&T page 18

Schneiderman has been covering the computer and electronics industries as a reporter and editor for more than 20 years.

AT&T rides mobile mart

From page 17

torola would like to rack up more data terminal sales. But which of its related but separate operations will get the business: the telephone marketing organization or the cellular side? Or both? And when? Discussions within Motorola are described by a company executive as "volatile."

Meanwhile, there are also technical problems. Assuming they're left in the car or truck, how well will terminals or computers continue to work in the hot, cold and humidity and in an environment wrought with voltage variations?

Transmission difficulties, resulting in lost data, can be another problem, particularly when customers are handed off from one cell or radio tower to another within the system's area of coverage. But Bell Atlantic Mobile insists this problem has been solved. The system has operated almost flawlessly in field experiments in the data mode, according to the cellular supplier.

Compatibility

Compatibility is another problem. Ameritech Mobile Communications, Inc. in Schaumburg, Ill., markets the Bridge, a modem-like device that allows error-free data transmission over a cellular network, and Span, which enables Bridge to retransmit data if it is lost in transmission. Both were developed by Spectrum Cellular Corp. of Dallas.

Despite interest in its mobile data service, Ameritech Mobile Communications discovered that before it can lock up a commercial account, it must be compatible with a customer's data base, and that can take months.

Who will use mobile data communications? Most large companies now have some form of portable data applications in field test. Rather than simply uploading and downloading information, sales reps could do interactive tasks and begin to develop applications. The AT&T/Bell Atlantic Mobile team sees immediate possibilities from manufacturers' reps and in real estate (as Ameritech has found), where financial programs and data bases are important.

It may take a little time for mobile data communications to develop, but it should be an important addition to existing data services.

PCs, mainframes are not enough

From page 17

(although they may be some day). The PC Network doesn't have enough software to be competitive with the supermicro- and supermini-based solutions from vendors like Digital Equipment Corp., Data General Corp., Hewlett-Packard Co. and Wang Laboratories, Inc.

And the Token-Ring won't attach anything but Personal Computers until early 1987, so it can't get at even the limited functionality of the PS/370 mainframe and PS/36 minicomputer solutions.

Waiting not good enough

Apparently (if we read the customer tea leaves correctly), IBM has decided that keeping customers waiting won't be quite good enough, so it has trotted out the PC-to-mainframe solution, which has the advantage of being available right now.

Whenever a trend moves too far

> ***Apparently, IBM has decided that keeping customers waiting won't be quite good enough, so it has trotted out the PC-to-mainframe solution, which has the advantage of being available now.***

out to the right we correct it by going too far to the left. So if PCs on their own have gotten out of control, the solution will be to overcentralize rather than to apply a more sensible mid-course correction and centralize a little bit, through centrally agreed-upon guidelines and intermediate-level, largely departmentally controlled, processors.

Guess what? That won't work.

Users won't give up the control they've so carefully grown and grown up to deserve. DP departments can't find mainframe software (IBM's or anyone else's) that is competitive with the systems-level features provided by good, departmentally based solutions, and users won't (and shouldn't) settle for less.

Not prepared to provide support

And even if data processing departments could find software, they are not prepared to provide and manage the numbers of support people who would be required to make it all run smoothly.

Besides, who should set marketing department computing priorities — the marketing department or a newly appointed guru in the data processing department who has never worked in the marketing department at all and isn't under its control or direction?

Note that this is not a diatribe against mainframes. We need them. They are just not now (and they may never be) adequate for more distributed solutions to the office computing problem.

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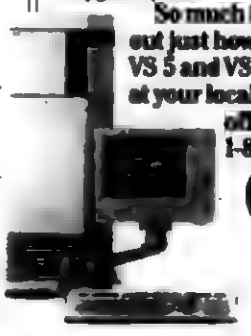
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*Costs based on total cost of ownership (list price and maintenance over 5 years). QC Wa

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WANG

MICROCOMPUTERS

SMALL TALK
Eric Bender

HAL: Not just another add-on

Under the original billing, Lotus Development Corp. was to showcase a new package, but nothing was ready for prime time. So last month's Boston Computer Society meeting saw a work-in-progress view of HAL, the Human Access Language add-on for 1-2-3.

Just as it did in a private demo last October, when we all joined the chorus telling Bill Gross to go talk to Lotus, HAL looked impressive. Gross — who comes across in person like Bill Gates on speed — and his brother Larry worked late into the Pasadena night on pizza and adrenaline and really created something useful.

While HAL offers an English-language interface for 1-2-3, that's not the main point. HAL's real benefit is that it tries to figure out what jobs you need to accomplish (like setting up ranges) and carries them out, as Gross said. He predicted that the greatest single payoff will be easier setup requirements.

Among HAL's services, some are new and some not. HAL automatically creates transcripts of work sessions. It offers an UNDO command for file retrieval, work-sheet Erase and other potentially catastrophic moves. HAL can highlight dependencies within a work sheet. It offers powerful Find and Replace features. There's a translation key that translates user requests into 1-2-3 commands and displays those.

Another jazzy (not Jazzy) feature is self-documenting English-language macros. "You're literally writing mac-

See HAL page 25

Bender is Computerworld's senior editor, microcomputers.

Dbase tracks crime on-line

Florida investigators keep files on suspects, associates

By Douglas Barney

If you are a narcotics trafficker in Florida, the biggest threat to your livelihood may be the long arm of Ashton-Tate's Dbase III Plus.

The Florida Department of Law Enforcement uses Dbase in criminal investigations to sort, analyze and track information on criminals and suspects. Now the department is working on upgrades of its applications using Dbase III Plus, which also is gathering positive reviews from other users with less dramatic jobs.

Running applications written in the Dbase programming language by special agent Robert Pennington, the department gets information on suspects in seconds instead of days.

"If I have a file of associates of some criminal elements or criminals, I can run comparisons and have the associates and everybody who has similar associates dumped out into a third file," Pennington says. "Then I can find out immediately if two criminals, or two bad guys, might know each other because they are talking to the same associates."

Pennington has written other applications in the same vein, such as a wire-intercept system.

"Every call has data elements associated with it: the number that was dialed, the time, the date, the time when he went on hook, off hook, that kind of thing," Pennington notes. "All that information used to be put on 3-by-5 cards and filed away in shoe boxes. If a supervisor walked in or an analyst asked, 'Did this number get called?' it was not uncommon to spend days sprawled out on a floor with shoe boxes full of 3-by-5 cards. We can now have that information literally in two to three seconds."

And because current wire-intercept devices are based on microprocessors, information from wire taps can be automatically dumped into Dbase files. "We have a separate data base file, which maintains a list of targets, or suspects, and their phone numbers. We can then compare those two

See DBASE page 26

Ashton-Tate sets DBMS pace

By Douglas Barney

Microcomputer data base management software is so dominated by Ashton-Tate's Dbase, which holds some 60% of the market, that Lotus Development Corp. will wait for a crop of machines with a newly upgraded operating system before entering the market. Neither has Microsoft Corp., the second largest independent microcomputer software vendor, tried its luck.

But many firms, some of them veterans, have not been scared away and are still vying for the slice of the pie Ashton-Tate has yet to consume. These firms argue that user dissatisfaction over Dbase's complexity, coupled with a growing market, leaves plenty of opportunity.

Some also argue that Dbase has the largest installed base only because it was one of the first commercial offerings. "They were out first with a high-end data base that did a lot if you knew how to program," says Steven Dow, president of Ansa Software Co., which markets Paradox data base software.

But pessimists point out that the data base market is marked by turmoil, with rampant price cutting, acquisitions and the recent entry of low-priced clones of Dbase.

One example of the fierce competition came last month from Microrim, Inc., the second biggest player with an estimated 10% to 15% share of the market. Microrim announced a promotion that runs until June 30 under which customers receive a free copy its R:Base 6000 package with every order. (According to industry scuttlebutt, a new version of R:Base will appear in the near future.)

See ASHTON-TATE page 24

INSIDE

Many laser printers debut at Comdex/Spring/22

AT&T releases Simul-Task, Unix/MS-DOS system software for the AT&T PC 6300 Plus/24

NEW THIS WEEK

- Insight Development offers emulation software for HP's Laserjet
- Summagraphics upgrades Mac-tablet and offers Summamouse

For more on these and other new products, see pp. 81-104.

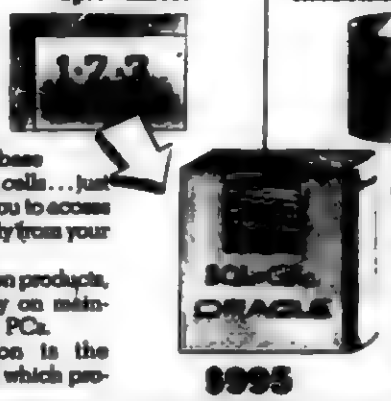
INSTANT ANALYSIS

"You're literally writing macros that are just straight documentation of what you're doing."

— Bill Gross, Lotus Development Corp., on the Human Access Language for 1-2-3

Oracle's SQL*Calc makes a relational DBMS as easy as 1-2-3.

Oracle Corporation has developed a Lotus 1-2-3 compatible spreadsheet and integrated it with its ORACLE® relational database management system (DBMS). The new product, SQL*Calc,® is the first to combine a mainframe-class relational DBMS with an easy-to-learn and familiar PC spreadsheet user interface.



SQL*Calc is designed for 1-2-3 users who've run out of memory, flexibility and patience. SQL*Calc allows you to put SQL database commands into spreadsheet cells... just like formulas. This permits you to access large amounts of data directly from your spreadsheet.

Like all Oracle Corporation products, SQL*Calc runs identically on mainframes, minicomputers and PCs.

SQL*Calc's foundation is the ORACLE relational DBMS, which provides users with a complete set of SQL commands through which they can create, retrieve, modify and otherwise control their data. SQL is the industry standard database command language for large computers. The SQL commands available in ORACLE are identical to the SQL commands in IBM's premier mainframe relational DBMS products, SQL/DS and DB2.

Built on this powerful DBMS foundation is a Lotus 1-2-3 compatible spreadsheet that allows users to put SQL commands into spreadsheet cells in the same way as they enter formulas. When a SQL command for data retrieval is entered into a spreadsheet cell, information is automatically retrieved from the database and placed into the spreadsheet. SQL*Calc also permits users to modify the database – and even create new database tables – directly from the spreadsheet.

SQL*Calc is easy to learn because its menu and command structure are compatible with those of Lotus 1-2-3. And SQL*Calc's ORACLE DBMS requires no supplement: It is vastly more powerful than the database components of 1-2-3, Symphony, Framework, dBase II, dBase III, or any other PC DBMS.

SQL*Calc is available immediately for IBM PC/XTs and ATs for $995.* SQL*Calc will soon be available on a wide variety of systems, including IBM mainframes, DEC, DG, and other superminis, and most UNIX systems.

For further information, or to order your copy of SQL*Calc, call 1-800-345-DBMS. Or write Oracle Corporation, Dept. CS, 20 Davis Drive, Belmont, CA 94002.

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Printer technology advances; price hikes get ink at Comdex

Strong yen forcing some prices up

By David Bright

ATLANTA — Last week's Comdex/Spring '86 saw the debut of a number of laser and other desktop printers that were said to mark advances in price/performance and functionality.

However, there was one negative note for customers: Several vendors of Japanese-made printers were preparing to increase prices because of the strong value of the yen. Some major suppliers, including Epson America, Inc. and Citizen America Corp., have already raised their prices. Epson's prices have risen 5% to 15% on selected models.

With its $1,895 Laserpro Express, Office Automation Systems, Inc. dropped price points slightly for laser printers. The Laserpro Express emulates Hewlett-Packard Co.'s Laserjet, Diablo Systems, Inc.'s 630, Qume Corp.'s Sprint 11 and Epson's FX-80 printers and reportedly has a duty cycle of 10,000 pages per month.

Available in July, the Laserpro Express provides 300 by 300 dot/in. resolution, 10 bit-mapped fonts and 384K bytes of memory. Office Automation Systems should continue to lower the prices of laser printers, marketing support manager Al Rocheleau predicted.

The Laserpro Express undercuts by $100 the price of QMS, Inc.'s 6 page/min Kiss laser printer introduced last fall. Art Hyzer, QMS executive vice-president, suggested that $1,500 is the next logical step in the price-cutting process.

QMS introduced the Big Kiss laser printer, a $2,995, 8 page/min unit that offers 17 resident fonts and ANSI X3.64 support as well as Diablo, Qume and Epson emulations, 640K bytes of random-access memory (RAM) and maximum graphics resolution of 300 by 300 dot/in. QMS rates the duty cycle at 5,000 pages per month.

Digital Equipment Corp. introduced the LN03 Plus, which offers 1M byte of full bit-map memory and Tektronix, Inc. 4010/4014 compatibility. The printer costs $4,995 and will begin delivery in June. DEC's original LN03 printer, now priced at $3,495, can be upgraded to the new model with a $1,595 kit.

AST Research, Inc. introduced its first laser printer, a $4,995, 8 page/min model intended for high-volume, multiuser environments. The Turbolaser can print 5,000 to 10,000 pages monthly, with a life expectancy of 600,000 pages, according to AST.

Available in July, the 300 by 300 dot/in. printer can emulate standard text printers and graphics plotters using HP's Graphics Language, and it supports HP's Lasergraphics Language desktop publishing package. A variety of bit-mapped fonts, including fixed-pitch and proportionally spaced text, are resident.

Ink-jet printer unveiled

While the laser printer competition intensified, start-up Howtek, Inc. took another tack with the Pixelmaster color ink-jet printer. "We expect our technology to do for office printing and desktop publishing what Technicolor did for movies and Kodachrome did for film," stated Howtek Chairman Robert Howard, who also founded Centronics Data Computer Corp.

Priced at $2,995, the Pixelmaster uses a crayon-like solid plastic ink to eliminate clogging and to provide sharper, raised, near-offset-quality print, according to Howard. The ink is heated and liquified, then shot through the rotary print head onto standard paper.

The unit offers 240 by 240 dot/in. resolution at 2 page/min for text and 4 page/min for graphics. Production shipments will not begin until sometime in the fall, and distribution will initially be through OEMs.

Hoping to continue the popularity of its 24-wire dot matrix printers, NEC Information Systems, Inc. introduced the Pinwriter CP6 and CP7 color models, with respective prices of $849 and $1,049. With their 360 by 360 dot/in. resolution, the seven-color printers eliminate the need for pen plotters, said Bruce Thatcher, director of peripherals marketing. The 80-col. CP6 and the 136-col. CP7 produce 216 char./sec. in high-speed mode, 180 char./sec. in draft and 65 char./sec. in letter quality.

At 100 char./sec., Star Micronics, Inc.'s new NB-15 dot matrix printer offers one of the highest letter-quality speeds on the market. The 24-wire NB-15 retails for $1,449 and prints at 300 char./sec. in draft-quality mode.

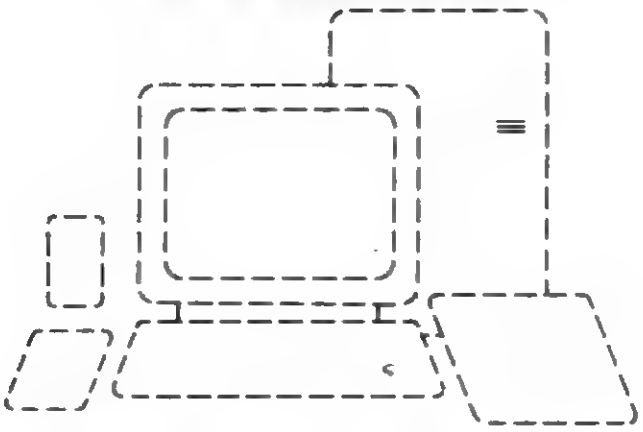
Star also announced the $379 NL-10 dot matrix printer, a nine-wire, 120 char./sec. model featuring plug-in interface cartridges that make it compatible with the IBM Personal Computer and most PCs.

Since Star's printers are made in Japan, the rising value of the yen may force Star to raise prices on existing models, said Tom Bongiorno, director of marketing.

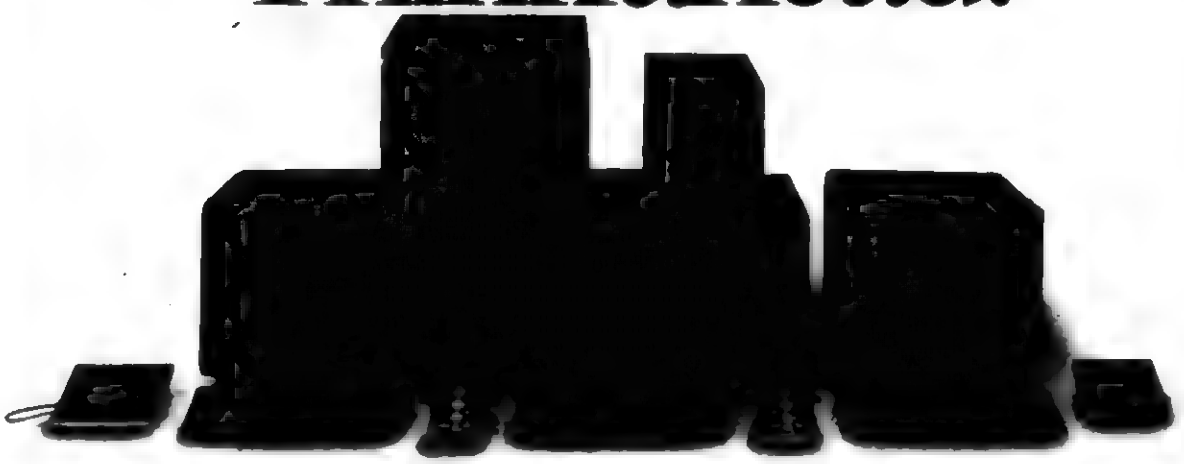
And at Okidata Corp., moderate price increases are inevitable, according to marketing director Jim Cullen. "The pressure is on," he said.

Senior writer Peggy Watt contributed to this report.

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Televideo uncages Personal Computer AT compatible

Desktop unit said to be faster, smaller than AT

By Peggy Watt

ATLANTA — Televideo Systems, Inc. last week celebrated the "Year of the Tiger" by introducing the Telecat-286, a $2,995 IBM Personal Computer AT-compatible microcomputer.

The new desktop system, which was unveiled with a real (and heavily sedated) tiger at a Comdex/Spring '86 press conference, is said to be both faster and smaller than both the IBM PC AT and an earlier Televideo AT clone, the Tele-286.

Available now, the Telecat-286 runs at 8 MHz, but can switch to the AT-standard 6 MHz for software requiring the slower speed. The system comes with a standard 512K bytes of random-access memory and sockets for a full megabyte of on-board memory; one 1.2M-byte floppy disk drive; five expansion slots; and one serial port and parallel port.

A 30M-byte hard disk drive is optional, and the system comes with Microsoft Corp.'s MS-DOS 3.1. Televideo said the Telecat-286 measures 16 in. by 16½ in., providing a footprint 28% smaller than the IBM PC AT.

Televideo envisions the Telecat-286 as a powerful single-user system for users of Intel Corp. 80286-based systems who want a stand-alone PC. The firm's older Tele-286 is positioned as an alternative AT-compatible file server, not as competition for the new micro, said K. Philip Hwang, Televideo Systems founder and chairman. Hwang said Televideo will step up dealer support, offer training programs and promote a trouble-shooting service.

According to Hwang, the Sunnyvale, Calif.-based company, which last year posted its first loss in 10 years, is already recovering from "too rapid growth."

Last year, the company dropped from 1,270 to 650 employees but has now rebuilt to about 700 employees, Hwang said. Televideo wrote off more than $80 million in inventory, which Hwang said remains steady at $20 million now.

Other Televideo announcements at Comdex included the Networkstation, a $995 diskless workstation intended for use with Televideo's Personal Mini multiuser PC networks.

It also introduced the PT100 terminal, a $499 system with Digital Equipment Corp. VT100 and VT52 compatibility, and PM-Link, an option to the PM/Netware 2 system software for Televideo's Personal Mini network product line that allows larger configurations up to eight groups of 16 workstations.

Televideo also showed two new earlier-announced graphics terminals, the 995 and 9220 Graphics for Tektronix, Inc. Plot 10 programs, both priced at $1,129.

Dest enhances optical scanner

MILPITAS, Calif. — Optical reader manufacturer Dest Corp. has enhanced its Text Pac software, which runs Dest's PC Scan hardware, to read dot matrix output and transfer written material into a greater variety of word processing programs.

Text Pac Version 2 can put scanned text into formats compatible with Microsoft Corp.'s Word, Satellite Software International's Wordperfect and Multimate Corp.'s Advantage word processing programs. The original version supported the IBM Displaywrite 3, Multimate's word processing programs and Micropro International Corp.'s Wordstar and Wordstar 2000 formats.

The new release also permits PC Scan to read, in a single pass, dot matrix output from the IBM Proprinter, Okidata Corp. Microline 92 and 192, Epson America, Inc. FX-85, 185 and LQ1500, Hewlett-Packard Co. Think Jet and Star Micronics, Inc. SQ10 printers. The system can read output printed in 10 pitch, 12 pitch and proportionally spaced type fonts.

Text Pac Version 2 is $595, the same price of the original version. Owners of Version 1 can upgrade through their dealers for $95.

"We have a continuing effort to add word processing programs," said Pat Groves, Dest marketing director. Dest also is refining graphics scanning and hopes to release additional enhancements in that area, he said.

Groves said corporate customers, who are keeping more records on-line but are slow to convert older materials that are still put into filing cabinets, are just becoming aware of the potential of scanners.

Dest's orders have been steady, and the company's officers are pleased with the projected fiscal year results, due out in May, Groves said. Last year's earnings were $2.6 million on revenue of $18.6 million.

In March, the company introduced four low-end scanners for dedicated word processing systems in addition to its Workless station document reader. Those machines also picked up some of the slack in OEM sales, which were once a mainstay of Workless marketing but slowed last summer, Groves said.

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fieldwatch™

Ashton-Tate sets DBMS pace

From page 19

Mail order firm Diamond Software Supply is currently offering R:Base 5000, which lists for $700, for only $349, with the free copy.

Other price cuts abound. Analytica Corp.'s Reflex sold for $495, but after being acquired by Borland International, Inc., its price was slashed to $99 and then raised to $149.95. Enrich from Migent Software, Inc. dropped to $395 from $595, and the price of Powerbase from Powerbase Systems, Inc. was cut from $595 to $349.

Bob Leff, cochairman of Software distributor Softsel Computer Products, Inc., calls this arena a no-man's-land. "They couldn't make it at $495 to $595." Leff, however, says he believes that the lower prices may help to boost sales.

Despite its pressures, microcomputer data base software is still one of the fastest growing software markets, vendors say. And it contains many niches.

Some firms attempt to face Ashton-Tate head-on by providing products with lower prices and more features or ease of use. Ansa's Dow, like many others, says there is room for his firm's package because users are dissatisfied with Dbase.

But others plan to coexist with Ashton-Tate. Wordtech Systems, Inc. of Orinda, Calif., gives the most recent example of this strategy with DBXL, introduced at Comdex/Spring '86. This $169 Dbase III Plus workalike uses Dbase III Plus data and index files, provides networking capability and supports Dbase III Plus syntax as well as its report and format files. It targets users interested in a powerful, Dbase-style package at a sharply reduced price.

Similarly, Alpha Software Corp. of Burlington, Mass., is set to introduce Data Base Manager III, a package that directly reads Dbase III disks but offers more menu-driven capabilities. Alpha's package, according to analysts, will sell mainly to users in large corporations that desire an easier-to-use data base that easily shares Dbase III data.

Jeffrey Tarter, publisher of the "Soft-Letter" industry newsletter, says that the only firms that will survive will be those with Dbase file-compatible products. "The question is whether they can really take a Dbase disk and read it," Tarter says.

Others, such as Migent's Enrich, the $600 Dataease from Software Solutions, Inc. and the recently introduced Simple, a $995 package from Los Angeles-based Software Merchants Unlimited, push ease of use and ease of generating applications.

All data base vendors, it seems, expect high growth in sales. Arun K. Gupta, president of Software Solutions, expects his firm's market to increase by a factor of five. The firm has already sold more than 70,000 copies, according to Gupta.

Kent Johnson, president and chief executive officer of Microrim, says the data base market is growing 30% to 35% per year, and Microrim has sold some 100,000 packages. The firm became profitable last July after 2½ years of operation. Sales doubled from $8 million for calendar 1984 to $16 million for 1985, and sales continue to increase, he says.

Microrim plans to continue to build a family of products around data base technology and charge for support, he added. "I think we can build a $100 million company on those strategies."

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Shell as a Command Language*	Jan 20-21 Mar 17-18 Jun 9-10 Aug 4-5 Sep 29-30	Apr 3-4 Jul 17-18 Sep 25-26	Mar 20-21 Jul 31-Aug 1	Feb 6-7 May 8-9 Oct 30-31	Mar 20-21 Jul 31 Aug 1	Feb 13-14 Apr 24-25 Sep 11-12	Feb 6-7 May 8-9 Oct 30-31	Jan 23-24 Mar 20-21 Jun 5-6 Jul 31-Aug 1 Oct 9-10 Dec 4-5	$490	
"C" Language Programming*	Feb 24-28 May 12-16 Jul 14-18 Sep 8-12 Nov 3-7	Apr 7-11 Jul 21-25 Sep 29-Oct 3	Mar 31-Apr 4 Aug 4-8	Feb 10-14 May 12-16 Nov 3-7	Mar 31-Apr 4 Aug 4-8	Feb 17-21 Apr 28-May 2 Sep 15-19	Feb 10-14 Apr 12-16 Nov 3-7	Jan 27-31 Mar 31 Apr 4 Jun 9-13 Aug 4-8 Oct 13-17 Dec 8-12	$1225	
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UNIX Internals	Feb 17-20 Apr 28-May 1 Jul 7-10 Sep 1-4 Oct 27-30	Apr 21-24 Aug 4-7 Oct 13-16	Apr 14-17 Aug 18-21	Feb 24-27 Jun 2-5 Nov 17-20	Apr 14-17 Aug 18-21	Mar 3-6 May 12-15 Sep 29-Oct 2	Feb 24-27 Jun 2-5 Nov 17-20	Feb 10-13 Apr 14-17 Jun 23-26 Aug 18-21 Oct 27-30	$1375	
UNIX Administration*	Feb 12-14 Apr 23-25 Jun 30-Jul 2 Aug 27-29 Oct 23-25 Dec 17-19	Apr 29-May 1 Aug 12-14 Oct 21-23	Apr 22-24 Aug 26-28	Mar 4-6 Jun 9-11 Dec 2-4	Apr 22-24 Aug 26-28	Mar 11-13 May 20-22 Oct 8-10	Mar 4-6 Jun 9-11 Dec 2-4	Feb 18-20 Apr 22-24 Jul 8-10 Aug 26-28 Nov 4-6	$735	
Advanced "C" Programming Workshop*	Mar 3-4 May 19-20 Jul 21-22 Sep 15-16 Nov 10-11	May 5-6 Aug 18-19 Oct 27-28	Apr 28-29 Sep 8-9	Mar 10-11 Jun 16-17 Dec 8-9	Apr 28-29 Sep 8-9	Mar 17-18 Jun 2-3 Oct 13-14	Mar 10-11 Jun 16-17 Dec 8-9	Feb 24-25 Apr 28-29 Jul 14-15 Sep 8-9 Nov 10-11	$490 $735	$1125
Advanced "C" Programming Under UNIX*	Mar 5-7 May 21-23 Jul 23-25 Sep 17-19 Nov 12-14	May 7-9 Aug 20-22 Oct 29-30	Apr 30-May 2 Sep 10-12	Mar 12-14 Jun 18-20 Dec 10-12	Apr 30-May 2 Sep 10-12	Mar 19-21 Jun 4-6 Oct 15-17	Mar 12-14 Jun 18-20 Dec 10-12	Feb 26-28 Apr 30-May 2 Jul 16-18 Sep 10-12 Nov 12-14	$735	
Berkeley Fundamentals and Sub-Shells*	Feb 3-7 Apr 14-18 Jun 23-27 Aug 18-22 Oct 13-17 Dec 8-12	May 12-16 Aug 25-29 Nov 3-7	May 5-9 Sep 15-19	Jun 23-27 Dec 15-19	Feb 3-7 May 5-9 Sep 15-19	Mar 31-Apr 4 Jun 9-13 Dec 15-19	Jun 23-27 Dec 15-19	Mar 3-7 May 5-9 Sep 15-19	$1225	

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AT&T tool runs MS-DOS, Unix simultaneously

By Douglas Barney

ATLANTA — AT&T Information Systems is scheduled to release Simul-Task this month, about six weeks behind the original shipping schedule. The system software, formerly called Unix/OS Merge, allows Microsoft Corp. MS-DOS applications to run simultaneously with Unix applications on AT&T microcomputers.

Simul-Task, demonstrated at Comdex/Spring '86 in Atlanta along with several other AT&T introductions, currently runs only on the AT&T PC 6300 Plus, a microcomputer based on the Intel Corp. 80286 microprocessor. AT&T maintains that the multitasking benefits of Simul-Task can greatly increase a user's productivity. A user could, for example, receive electronic mail while running a data base application and write a report.

In addition, AT&T claims that corporate developers can use Simul-Task to modify existing MS-DOS applications using Unix commands. Simul-Task also has features such as unattended job scheduling and software-based security that typically are unavailable within MS-DOS.

At Comdex/Spring, the firm also displayed the AT&T PC Image Director, an integrated graphics software and hardware package that allows users to scan, view, edit, store, send and print a variety of documents. It includes a document scanner, scanner interface board, high-resolution monitor, graphics board and PC Image Director Software. A complete system costs $2,836.

In addition, AT&T showed, and said it plans to introduce, an Enhanced Memory Expansion Board that provides 2M bytes of random-access memory for the AT&T PC 6300. The board supports expanded memory for MS-DOS applications and allows AT&T Unix System V applications to use the additional memory.

MICROCOMPUTERS

HAL: Easier than 1-2-3

From page 19

ros that are just straight documentation of what you're doing," Gross remarked.

Throughout all of this, HAL was designed to stay sensitive to a given context — you can say "copy this" and get an appropriate response. Help features keep this sensitivity and can "actually generate the words you can continue the sentence with," Gross said.

HAL will be sold as a stand-alone product for 1-2-3 releases 1A and 2 this fall. This is about a year after the previous version was scheduled to ship, leading those with suspicious minds to ask whether it's development or marketing that is causing all the delays.

Naturally, Lotus officials would not comment on pricing or on some technical details such as how much memory HAL requires. (The first version, which was weeks away from shipment when Lotus bought the Gross' firm, took up 120K bytes.)

> ***Dan Bricklin, developer of Lotus' Visicalc, raised the crucial question about HAL's add-on role: "Couldn't you provide the whole thing with one metaphor?"***

However, Dan Bricklin, developer of Lotus' Visicalc, raised the crucial question about HAL's add-on role: "Couldn't you provide the whole thing with one metaphor?"

Two answers

Why not make it part of 1-2-3? Lotus responded with two answers.

First, the company doesn't want to struggle through another major release of 1-2-3 this year. And second, some people just won't want to buy HAL. Trying to underline that point, one official said that it makes sense for users to learn 1-2-3 before moving to HAL.

But that's nonsense from a design point of view. (First, we'll teach you about simple commands like "/prlpo," and then we'll get to the difficult stuff like "print this.")

Selling HAL as an add-on would generate additional revenue, and Lotus is not in the business of continually revising its software and selling it as inexpensively as possible. Lotus shouldn't be; that's a role for riverboat gamblers like Borland International, Inc.

Lotus, instead, is grappling with the task of trying to get two million people to move roughly in step, without ever quite putting their wallets back in their pockets.

As 1-2-3 has become *the* environment for financial analysis software, competitors starting over from scratch (like Javelin Software Corp.) are bucking a riptide, however well-crafted their software.

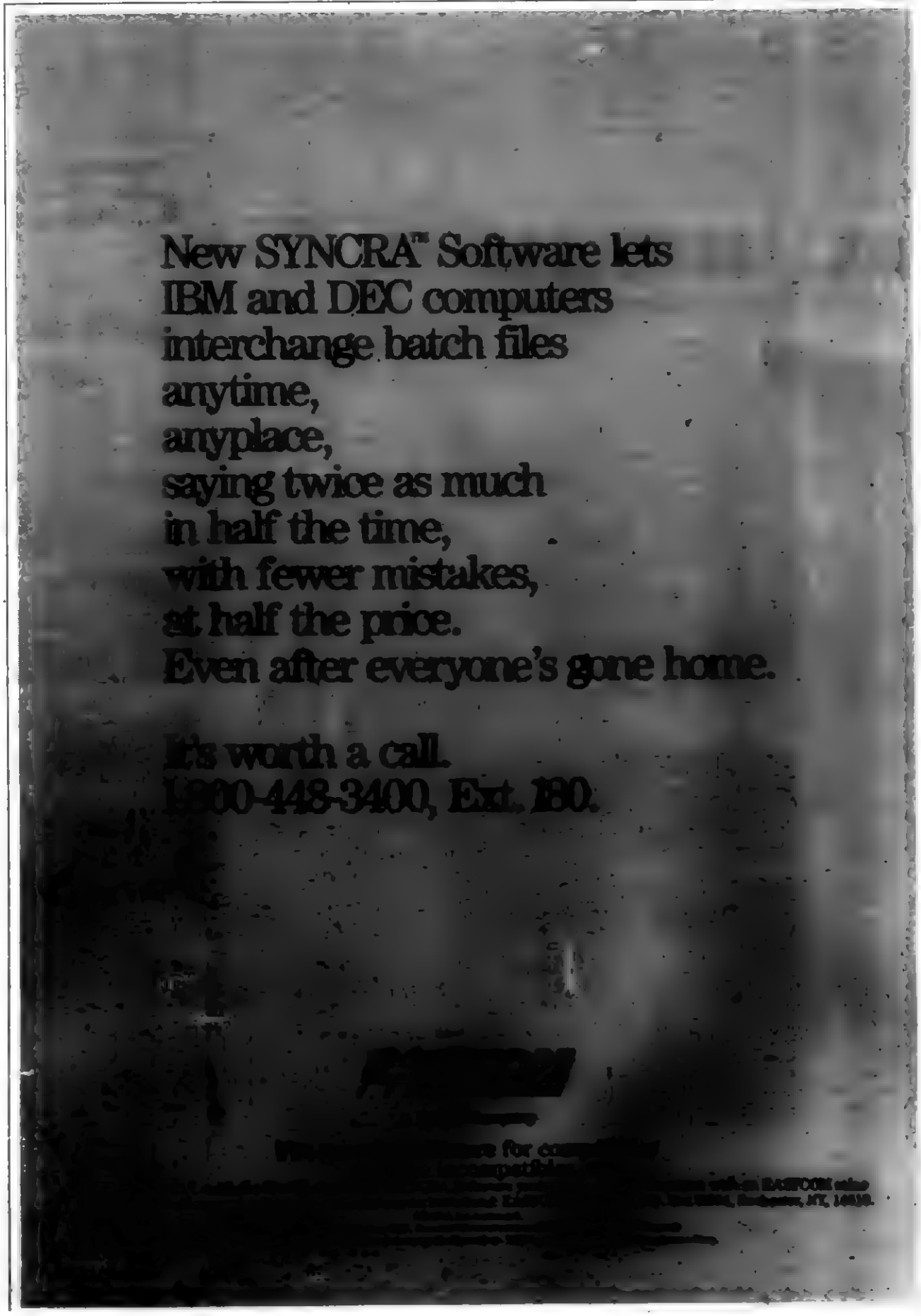
And there's a never-ending parade of 1-2-3 add-ons, ranging from the ridiculous (or at least humorous, like Solar Systems Software's Templates of Doom) to the potentially sublime (like General Optimization's What's Best programming software). In these cases, add-ons are the way to go.

But from a user's point of view, omitting HAL from the next major release of 1-2-3 makes no sense at all.

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Dbase tracks crime on-line

From page 19

files and see if they are calling anyone in our target or suspect file and, if so, immediately provide an identification on the number that the bad guy called."

Although the Florida Department of Law Enforcement has other computer systems, its agents rely most heavily upon Dbase for help in investigations. "From what we would call a tactical data processing level, the only thing we are really doing is Dbase," Pennington says.

Dbase III Plus, which shipped in January, has many features not found in Dbase III. These include the ability to run on local-area networks, new commands for programmers and the Assistant, a menu-driven interface with relational capabilities that was formerly available mainly as a teaching tool for Dbase, without relational ability. With the new Assistant, users can update, create and obtain information without using the Dbase programming language.

Enhanced programming

Pennington is most interested in the enhanced programming capabilities. "I moved up to Dbase Plus because I wanted to know what it would do," he says. "I upgraded as almost an automatic procedure to see what was new in Dbase."

The special agent says he found several new commands that make the upgrade worthwhile. "One command that is so simple that just jumped out at me immediately (that I thought Dbase needed years ago) was the On Error command, which allows you to write a routine to have something happen when the operator makes an error. In the past, a lot of times if you made an error, then the program would just bomb."

While not all Dbase applications are as exciting as chasing criminals, each serves an important function for users, such as First Bank System, Inc., a Minneapolis-based bank holding company.

"We do a lot of mass mailings where people will store customer files for a mailing," says Donna Staats, manager of the micro center for First Bank System. "And we use it here in the micro center. We have had about 1,800 students come to our training classes, so we maintain a large student data base where we keep information about what kind of classes students have gone to, when they have been scheduled and so on. We also produce our billing at the end of the month from that."

Networking needs

First Bank System is now upgrading to Dbase III Plus, in large part to meet future networking needs. "Since we are going onto the networks, we want to make sure that we don't have to rewrite all our programs, and yet we wanted a data base that would work in a local-area network environment. That didn't give us a whole lot of choices," Staat says.

Perhaps the biggest selling point for Dbase III Plus is the already widespread use of Dbase II and III. "We have set standards so we can say to our employees, 'This is the standard. This is the package that the micro center is going to support. This is the package you can get training for,' " Staat says.

Another Dbase III Plus fan is Les Helgeson, senior training specialist for Beatrice Food Co. of Chicago, who has only minor reservations about the product. "Dbase III Plus has some significant benefits over Dbase III that I am trying to get across to people." Helgeson particularly likes the View capability, under which up to 10 files can be viewed simultaneously.

Multiple relationships

However, Helgeson hopes that Ashton-Tate will improve the product's ability to handle multiple relationships so that he can compare data from more than two files simultaneously. "Multiple relationships are the key to most applications, and Dbase III doesn't handle them real well. Dbase III Plus doesn't do an excellent job either, but at least it is better," Helgeson says.

What Helgeson likes most about Dbase III Plus is the menu-driven interface and its ability to run on local-area networks. "We have one group right now that is implementing a network and is looking for software that will work on the network. I am sure they will be using Plus on their small system," Helgeson says.

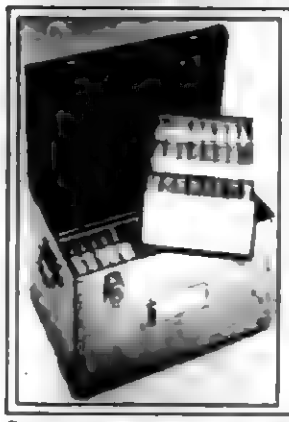
Ashton-Tate's upgrade policy makes it relatively painless for Beatrice to convert. Under this program, customers can upgrade a minimum of 25 copies of Dbase or 25 copies of Framework for $75 each, and the customer does not have to return the original disks or documentation as long as these are destroyed.

Dbase III Plus is a popular product. Ashton-Tate sold more than $20 million worth of Dbase III Plus in its first month in January, and more than 300,000 of the original Dbase III have been sold since that product debuted in June 1984. But corporate customers still have complaints.

"Get rid of copy protection; it is the most bothersome part of the whole thing," says Dave DeVries, senior systems analyst with First Bank System.

Ashton-Tate officials respond that they are seriously considering the removal of copy protection.

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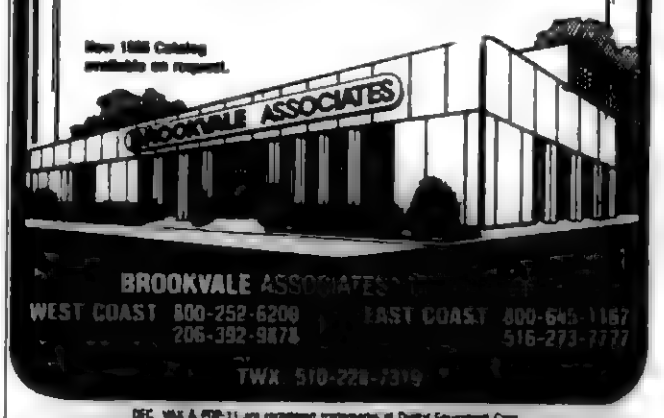
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Robert Silverstein

Mixing public data nets, SNA

More and more companies are supplementing their leased-line-based data communications networks with packet switching network services. Public data networks offer cost advantages over leased lines, particularly for companies in which terminals are scattered over a large geographic area, at sites that generate light data traffic.

However, users who are considering using public data networks in conjunction with a leased-line network should be aware of the protocol compatibility issues involved. While this column concentrates on considerations that apply to Systems Network Architecture (SNA) networks, the integration of other vendor network architectures with public data networks involves the same type of approach.

The basic problem is how to interface X.25 packet switching protocols with the asynchronous, bisynchronous, or Synchronous Data Link Control (SDLC) protocols used by the host and terminals.

Several approaches have been used. The most simple method, in terms of the changes required of the terminals and host, is to use packet assembler/disassemblers at terminal and host

See MIXING page 38

Silverstein is a senior consultant in the architectures and protocols group at Network Strategies, Inc. in Fairfax, Va.

Telecom firms lure investors

Start-ups with new ideas seen as hot prospects

By Stanley Gibson

"When you've got an industry in turmoil, you've got a great opportunity for investment," said Robert Morrill, a general partner with Hambrecht & Quist in Wellesley, Mass.

Morrill was referring to the telecommunications market, where divestiture has saddled users with new problems that require new kinds of products. Start-up companies are scrambling to fill those needs as well as to address specialty niches created by the convergence of computer and communications products, he said.

While the computer industry has at least temporarily lost its attraction for many venture capitalists, investment in the telecommunications arena continues to grow at a steady pace, according to an upcoming report, "Trends in Venture Capital," to be published by Venture Economics of Wellesley Hills, Mass.

"Venture capitalists are financing local-area network component companies. That's where the action is," a Venture Economics spokesman said. He added that the major players in the market have already been decided so that growth will center on companies that supply equipment that the market leaders will incorporate into their systems. The Venture Economics study also shows strong investment in fiber-optic companies, satellite companies, multiplexer makers and consulting firms.

"The divestiture of AT&T, coupled with deregulation of all customer-premise products and services and most common-carrier services, has created an environment of explosive growth. We're looking at a market that will be $150 billion to $200 billion by the early to mid-1990s," said Dixon Doll, a telecommunications consultant and manager of the Accel Telecommunications Fund.

According to Doll, the Accel fund has

See TELECOM page 34

TRW to resell Banyan products

By Elisabeth Horwitt

In a strategic alliance that meshes their complementary product and marketing strengths, Banyan Systems, Inc. and TRW, Inc.'s Information Networks Division recently signed an OEM agreement for TRW to resell Banyan products as part of TRW's networking product line.

"We both think it's a very compatible relationship," said Banyan President David Mahoney. The products have already been working together for several months, he noted. On a departmental or work group level, Banyan's server offers a choice of IBM Personal Computer networking options. PCs can be linked directly to the server or through one of several micro networks supported by Banyan.

On the corporate networking level, TRW's Concept 2000 boards, installed in the expansion slots of Banyan servers, provide a broadband backbone that links multiple departmental PC networks into one communications system, Mahoney said. Banyan also provides gateways to IBM and asynchronous hosts. "We are providing products that significantly extend TRW's range of network offerings," Mahoney claimed.

Banyan also benefits from the agreement by gaining access to TRW's customer base of large government organizations and corporations, Mahoney noted. Responding to such companies' requests for quotations requires "a large upfront and

See TRW page 32

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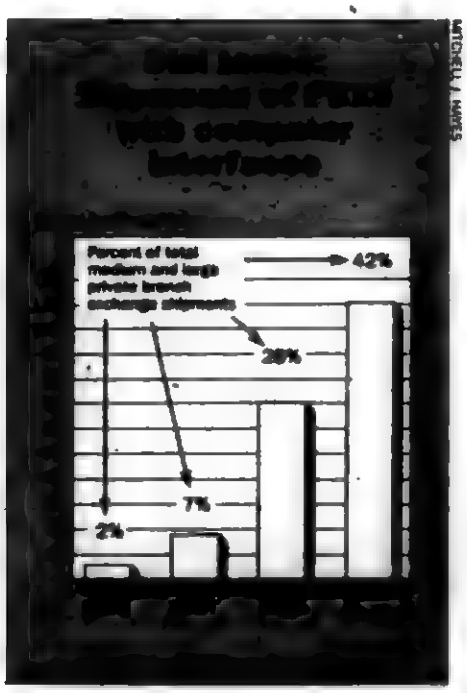
For more on this and other new products, see pp. 81-104.

INSTANT ANALYSIS

"For ISDN to work, there has to be an end to finger pointing; vendors have to assume end-to-end responsibility beyond the demarcation line where their technical responsibility ends."

— **Patrick Knaus, telecommunications director, McDonald's Corp., at Centrex Users Exchange meeting**

PABX-computer links on rise



T1 links earmarked for 200% growth rate

By Elisabeth Horwitt

NORWALK, Conn. — A growing demand for T1-based computer-to-private branch exchange interfaces should give the voice/data private automatic branch exchange (PABX) systems market a much-needed shot in the arm, according to a recently published report from Norwalk research firm International Research Development, Inc.

The report forecasts a 200% annual revenue growth rate for PABXs equipped with such interfaces; approximately the same growth rate that International Research Development predicts for T1 links, senior consultant Leslie Townsend said. She added that the demand for T1 links will continue to rise, "whether or not Integrated Services Digital Network

See PABX page 35

ETL to assume certification service for IBM Cabling System

By Elisabeth Horwitt

CORTLAND, N.Y. — The Network Cable Certification Program, a service that tests whether cable products meet IBM Cabling System specifications, is now being administered by ETL Testing Laboratories, Inc. of Cortland, an ETL spokesman said last week. The service will supercede IBM's own qualification program, with the two programs overlapping until May 31 to provide a smooth transition, ETL said.

Close supervision and quality assurance is important "because the high bandwidth requirements of IBM's Token-Ring network will stretch copper cable to its performance limits," said James Williams, vice-president of business operations at ETL. IBM has researched different types of copper cable construction that can carry large masses of data, including a foam-insulated, twisted-pair copper conductor that reportedly could support 20M bit/sec. data rates, he added.

Several different types of copper cable that IBM had specially designed for its Token-Ring network are "very closely rated for impedance, cross talk, signal attenuation, capacitive imbalance," Williams said. "We will be closely observing participating cable manufacturers for performance and quality to ensure that they meet those specifications."

The program is open to all manufacturers of network cable designed to meet IBM specifications, Williams said.

ETL employees will perform weekly factory inspections during which samples will be taken for laboratory testing. Cable that ETL inspectors find to be up to stan-

See ETL page 32

TRW to resell Banyan products

From page 31

long-term investment from the supplier in terms of network planning, development, training and support," according to Mahoney. "Banyan does not have the resources to target this market; TRW does. They're letting a little company play in a big field."

TRW chose Banyan products for their versatility, according to TRW's general manager of information networks, J. Edward Snyder. "The server uses an IBM PC backplane, so that it can link into 3Com Corp., Sytek, Inc., IBM's Token-Ring, any network that has an IBM PC interface. They just have to write the software driver. If the customer already has a 3Com network, we can protect his investment." Adding Banyan networking products to its own line should strengthen TRW's position in the systems integration arena, he explained.

He added that TRW estimates systems integration revenue will be $15 million this year. "As a turnkey supplier to large organizations that need a lot of PCs, data base and peripheral sharing, we need to offer a range of products — and we can't invent them all ourselves."

Paul McHugh, manager of network services at TRW customer Cleveland Clinic Foundation, Inc., agrees with McHugh's assessment. "The TRW-Banyan alliance gives TRW an edge in the networking market that their products formerly lacked, especially in the PC arena," he commented.

Approximately a year and a half ago, Cleveland Clinic installed a broadband network based on TRW's Concept 2000 boards. "We are in the process of switching" from a Burroughs Corp. to an IBM mainframe, McHugh said. "The network enables users to get used to accessing an IBM host while still retaining access to the Burroughs."

The network also supports the clinic's surveillance security system and may support voice communications in the future, McHugh noted.

Cleveland Clinic became a beta test for TRW's newly integrated Banyan product line because "many of our departments use IBM PCs a lot," McHugh said. The company has approximately 100 Personal Computers now and expects to have 400 to 500 by the end of the year. Banyan's server, connected to TRW's broadband network, enables IBM PC users to "maintain their own files and access mainframe files that have been downloaded to the server," McHugh said.

Eliminating the need for direct micro-to-mainframe connections saves Cleveland Clinic the cost of equipping each micro user with an IBM 3270 terminal emulation board and also avoids overloading the host with user data requests, he explained.

Download from a VAX

Departmental users also will be able to access medical diagnostic data that has been downloaded to Banyan servers from the clinic's Digital Equipment Corp. VAX, McHugh added. "This will eliminate the need to supply IBM PCs with asynchronous terminal emulation boards."

The clinic currently is testing one Banyan server in prototype mode, McHughs said, "to see if it does everything we want it to do. If it's cost-justifiable, as seems likely now, we will install 40 to 50 servers around July 1." The clinic is still unsure whether Personal Computers will be linked directly to Banyan servers or over Ethernet networks.

Integration of Banyan and TRW's product lines provides customers with a wider range of networking choices, Mahoney commented. "PCs can be clustered, or linked over an Arcnet or Corvus Omninet at the departmental level; then the various networks can be linked over a broadband backbone." Banyan also provides IBM mainframe gateways.

The contract with Banyan is the second of its kind for TRW. Late last year, the company agreed to sell Bridge Communications Corp.'s Ethernet-based communications servers and gateways. TRW and Bridge are also jointly working on gateway products.

"Some additional minor OEM agreements are in the works, but Bridge and Banyan are the main ones for now," Snyder said. The three companies' network offerings together should answer 80% to 90% of all customers' connectivity needs, he added. "The rest involves more specialized products like satellite links or laser bridges." TRW's next major agreement should be with a wide-area networking vendor, Snyder noted.

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ETL to assume service

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dard will be marked every few inches, "to assure users that their cable meets all IBM specifications for local-area network system performance," he added.

Among the types of IBM network cable certified by the program are Type 1, two twisted pairs designed to carry data only; Type 2, two twisted pairs for data and four twisted pairs for voice; Type 6, patch-panel data cable; Type 8, under-the-carpet data cable; and Type 9, two twisted pairs carrying data only.

"As far as we know, these cable types are what IBM is specifying to be used in its current network," Williams said. "As other cable is introduced into the net, we'll be certifying it. IBM won't say what type of cable that will be; you know IBM."



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Telecom firms lure investors

From page 31

raised some $65 million, which he said he believes is the largest source of capital solely for the telecommunications industry. Investors in the Accel fund include U.S. West, Northern Telecom, Inc., Hasler Ltd. and the pension funds of AT&T, Bell Atlantic Corp. and GTE Service Corp. as well as a number of financial institutions.

Doll said his strategy is to invest not only in start-up companies but in established companies that need follow-on financing. He said the Accel fund has concentrated its resources in the following areas: Integrated Services Digital Networks, network management, T1 multiplexers and switches, multivendor connectivity, advanced switching and communications software.

A similar project, based in San Francisco, is the Hambrecht & Quist Communications Ventures fund, which should raise $30 million to $40 million within a year, according to General Partner Cliff Higgerson.

Boston-based TA Associates has been looking for companies that sell products to divested Bell operating companies, according to Andy McLane, a TA Associates general partner. Before deregulation, the Bell operating companies purchased many products from AT&T that they now can buy from other suppliers, McLane explained.

"We're excited by the industry," McLane said, adding that TA Associates has invested in some 12 telecommunications companies in amounts ranging from $1 million to $10 million.

Some of the investors in start-ups are equipment manufacturers that desire to sell the young companies' products under their own label. Infotron Systems Corp., for example, already built low-end T1 multiplexers but desired to expand its line by adding a high-end system.

Rather than incur the cost of research and development, the company chose to invest in Network Switching Systems, Inc., an Andover, Mass., start-up that is developing a high-end T1 multiplexer. A combination circuit and packet switch, the product will handle voice, data, image and video transmissions.

Network Switching Systems has received two rounds of venture capital totaling $12 million from a variety of investors. Infotron purchased just under 20% of Network Switching Systems' stock and acquired the nonexclusive rights to market Network Switching Systems' equipment, according to Infotron President and Chief Executive Officer Jim Hahn.

Now a Network Switching Systems beta test site, Infotron has two Network Switching System units connected to T1 lines, Hahn said.

Anticipating two more beta tests this year, Network Switching Systems plans to ship products in the second quarter of 1987, according to Harry Ruda, Network Switching Systems vice-president of sales and marketing.

Variety of investment sources

Some other firms that have recently attracted investment from a variety of sources include the following:

• Netlink, Inc. The Accel fund has invested in Netlink, a Raleigh, N.C., maker of Systems Network Architecture (SNA) gateways. Netlink was founded in Australia in 1982 by several former IBM employees.

"There are lots of holes in SNA that need to be filled," said Netlink spokesman David R. McCormick. The company has so far produced an 3703 network processor and hub that links multiple Hewlett-Packard Co. devices to an SNA environment. With more than 1,000 boxes installed, Netlink had $2½ million in revenue last year and this year expects $6 million, according to McCormick.

• Advanced Business Comuunications, Inc. When Advanced Business Communications founder John Israel built a central office switch for the Italian telephone company Italtel, some private investors urged Israel to produce a similar switch for the U.S. market. The result, introduced in the spring of 1985, was the Multiple Applications Exchange. Aimed at long-distance carriers, the digital switch supports up to 24,000 ports.

The Dallas-based company recently signed an order for 10 tandem switches for the Telcore Digital Network in California, which plans to build a nationwide network to be used by long-distance carriers. Eventually, Advanced Business Communications plans to sell its equipment to corporate users.

• Quanta Communications Systems, Inc. Founded in 1982 and expecting $5 million in sales this year, Quanta of Anaheim, Calif., makes a 32-channel fiber-optic multplexer that transmits at a top speed of 64K bit/sec.

"We feel we have the top-of-the-line fiber-optic multiplexer," said Quanta founder and President Howard Rush, who also said he believes fiber-optic cable will increasingly be a medium of choice for building networks.

Quanta has OEM agreements with Racal Milgo Information Systems, Inc. of Florida and with Racal Milgo Ltd. in Great Britain. Racal Corp. owns a large percentage of Quanta stock.

One of the liveliest areas of innovation and start-up activity in the past few years has been the T1 multiplexer realm. But Doll of Accel offered the view that some of the large number of companies active in the T1 arena will not survive beyond the next few years. "The T1 mux area may not be able to go much further because it is fully populated now," he said. "There will probably be a shakeout."

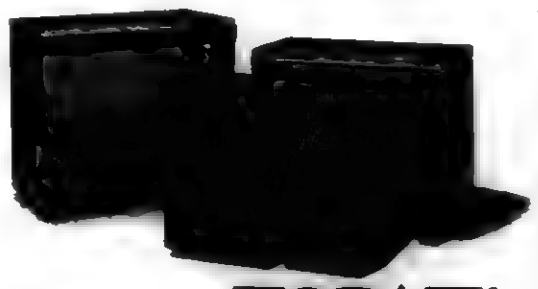
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Mixing public data nets, SNA

From page 31

sites. The packet assembler/disassembler takes data off a communications line from either a host or terminal, places it in an X.25 packet and sends the packet to the nearest public data network node over a dial-up or private line.

The double packet assembler/disassembler approach may be the easiest to implement, but it does have several drawbacks. The first is response time. This will not be a problem if a packet assembler/disassembler supports only asynchronous terminals sending short messages, but be careful with bisynchronous IBM 3270 terminals where transmissions average 1,000 characters or more. Each additional piece of equipment that the message must go through will add to response time.

Implementing packet assembler/disassembler functions in a separate box also prevents the user from extending X.25 time division multiplexing capabilities all the way to the front-end processor. Instead of having multiple devices share one communications link to the front-end processor, you must have one line and port per terminal.

This leads to the next alternative, which is to implement X.25 functionality in the front-end processor. In the IBM and IBM-compatible world, there are three software products that provide this capability: IBM's Network Control Program Packet Switching Interface (NPSI); Network Access System from Comm-Pro Associates, which runs on a communications processor such as an IBM 3705 or 3725 or plug-compatible front-end processor; and NCR Comten, Inc.'s X.25 Interface to Packet-Switched Networks, which requires an NCR Comten front-end processor.

IBM's NPSI will serve to exemplify the capabilities of implementing X.25 functionality in the front-end processor. NPSI takes care of converting X.25 packets to SNA protocols, and vice versa, at the host end. If asynchronous terminals are involved, no protocol conversion is necessary at the terminal end because all public data networks support asynchronous protocols. IBM mainframes do not, however. The NPSI thus takes on the additional job of setting up dummy sessions so that the host thinks it is communicating with an SNA device.

Dummy sessions are unnecessary if the X.25-based terminal-to-host connection involves a real SNA device such as an IBM 3274 controller.

However, protocol conversion is needed before synchronous terminals can transmit via a public data network. Three options are available: a converter can be built into the SNA controller; special High-Level Data Link Control packet assembler/disassemblers can perform conversion between X.25 and SDLC; or the Network Interface Adapter, available from IBM, can be used.

The last type of device commonly found in an SNA network is the bisynchronous 3274 controller. Unfortunately, messages from bisynchronous 3270 terminals must be processed by a special VTAM program before NPSI will allow them to pass through the front-end processor to the host.

More practical alternatives include implementing on the front-end processor Comm-Pro or NCR Comten software that includes the required conversion capabilities or using the double packet assembler/disassembler approach described earlier.

As can be seen, there are a number of issues to resolve when implementing an SNA network over public data network facilities. The decision to use them can clearly save money, but beware of taking a wrong turn along the way.

PABX-computer links on rise

From page 31

starts to displace private networks."

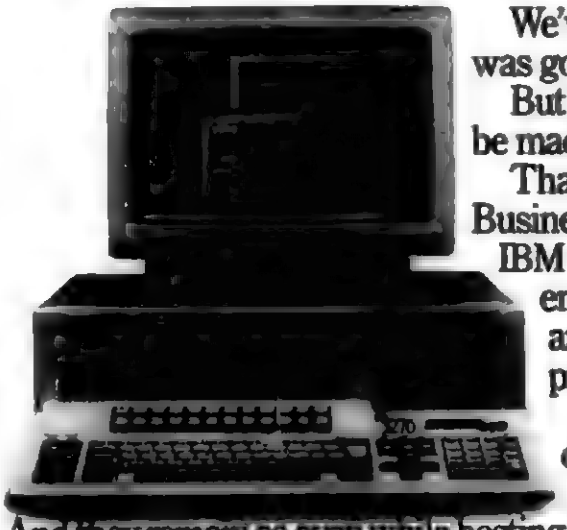
The computer-to-PBX interfaces themselves make up only a small portion of PBX vendors' total revenues, according to Townsend. International Research Development reported $3.17 million in interface sales for 1985 and predicts sales of $24.1 million in 1995.

T1-based computer-to-PBX interfaces enable users to connect multiple terminals and hosts over 1.54M bit/sec. links, either locally or over a distance, Townsend noted. The PBX connection provides flexible switching capabilities and also enables companies to "use excess T1 capacity for voice transmission, especially during off-peak periods," she added.

An important development in this market, the report stated, is industry support of a standard computer-to-PBX interface. At this time, there are two competing standards: Computer-PBX Interface (CPI), jointly developed by Northern Telecom, Inc. and Digital Equipment Corp., and AT&T Information Systems' Digital Multiplexed Interface (DMI). According to International Research Development, CPI is the current leader with 58 PBX interfaces shipped during 1985 and approximately 100 licensed vendors.

However, the research company concluded, CPI may lose ground over the long term because it is incompatible with Integrated Services Digital Network (ISDN) specifications for clear 64K bit/sec. transmission and a separate channel for signaling. DMI's closer conformance to ISDN will prove "a more likely long-term strategy," the report said.

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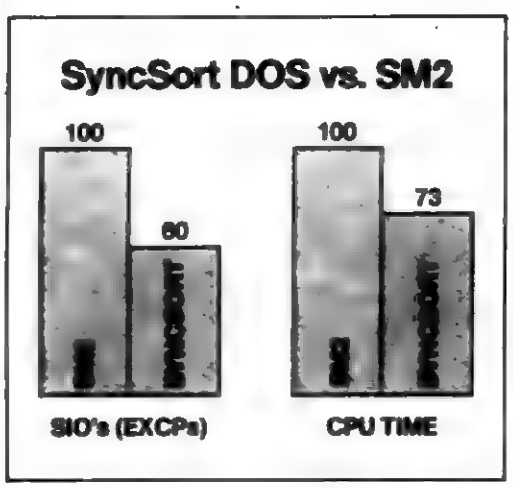
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SOFTWARE & SERVICES

SOFTLINE
Edward Warner

Ada goes civvy with SDI boost

The Strategic Defense Initiative (SDI), a multibillion-dollar research and development effort to shoot down enemy missiles with everything from lasers to high-speed projectiles, has been attacked as a threat to world peace — and to an already swollen federal deficit. But while the merits of the SDI program are debatable, one thing is certain: It will be a boon for the Ada programming language, a language that has so far been relegated to the backwaters of military applications and academic research.

SDI will rely heavily on computers, and those computers will be running software written in the Ada language, a Department of Defense requirement for all of its computer systems. A massive number of Ada programs will be needed to implement SDI, creating a demand for Ada programmers and spreading knowledge of the currently little-known benefits of this obscure language.

Like the Jeep and radar, Ada is likely to migrate eventually from military uses to a position in civilian life that many will appreciate. Business users, in fact, will find Ada quite attractive.

Ada, you see, offers some features that are available with no other language. For one thing, it is highly portable; that is, it will run on various vendors' hardware. All that is needed to transport it between different makes of mainframe computers is a compiler, and the number of compilers is growing as interest in developing software for SDI heats up.

One vendor, Verdix Corp. of Chantilly, Va., makes eight Ada compilers for use with the variants of just one operating system, Unix.

Portability is important because it permits users to switch to cheaper or

See ADA page 42

Warner is editor of the Computerworld News Service.

MSA chief leads charge

Builds firm to challenge mart leaders, gain top spot

By Charles Babcock

John P. Imlay Jr., chairman and chief executive officer of Management Science America, Inc. (MSA), has led the Atlanta-based applications company from a $2.7 million-a-year supplier in 1972 to what is projected to be a $175 million-a-year company in 1986.

If the company matches that projection from Wall Street security analysts, it will have bounced back from a slow 1985, when revenue advanced only $11 million to $152 million, or 7.8% over figures from the year before. At the $175 million mark, MSA's revenue will be up 15% over 1985, and the company will be challenging the industry leaders for a top spot in 1987. At the recent MSA users group meeting in Las Vegas, Imlay paused to tell *Computerworld* why he thinks his company will face continued strong demand for its products.

INTERVIEW



MSA's Imlay

CW: Customers like your new product, Information Expert (IE), as a report writing interface to your applications. But IE is being given to your customer base. You say you spent $20 million and five years to develop it. When do you see MSA getting a return on that investment?

IMLAY: Well, we aren't marketing it as a stand-alone competitor to Focus and Ramis [development languages and data base management systems from Information Builders, Inc. and Martin Marietta Data Systems, respectively]. We were using IE as a development tool over those years, . . . We have 125 users licensing it for use with non-MSA systems for $50,000 a license, and that's more than we anticipated. We will sell Screen Painting for $50,000. But the main thing is we sell applications with it. It makes applications more attractive.

CW: You said you attracted top MIS and corporate execs to a special session this year. Why are they coming?

IMLAY: It points toward the fact that the sale is bigger, that integration is a great concern and that the total solution for these corporations is a paramount concern to the top DP person or chief information officer. . . . It's interesting that where only IBM could draw this type of crowd before,

See MSA page 40

SOFTWARE NOTES

Pitts leaves DG, moves to Cullinet

An associate of **David L. Chapman** at **Data General Corp.** has been named to a top position at **Cullinet Software, Inc.**, where Chapman is now president and CEO. **James A. Pitts** has been named executive vice-president of finance, administration and strategic planning. Pitts now serves as DG's controller. Chapman is the former executive vice-president of manufacturing at DG, and his arrival at Cullinet March 12 prompted the resignation of then-President **Robert N. Goldman.** In a similar manner, the arrival of Pitts has resulted in the resignation of **Phyllis S.**

See NOTES page 40

Rabbit reports sales agreements

By Eddy Goldberg

MALVERN, Pa. — Rabbit Software Corp., in the space of eight days, announced four sales agreements for its IBM-compatible communications and connectivity software, including one with IBM. The other three contracts are with Burroughs Corp., Tolerant Systems, Inc. and SCI Systems, Inc.

Rabbit, founded in 1982, is among a growing number of third-party vendors supplying communications and connectivity software that provides links to IBM's Systems Network Architecture (SNA). The recent deals are indicative of stepped-up efforts by non-IBM computer vendors to provide their customers with access to IBM's SNA environment.

See RABBIT page 42

NEW THIS WEEK

- AGS Management ports PAC III project management system to Microvax II
- Applied Data Research enhances ADR/Roscoe on-line programming system for MVS

For more on these and other new products, see pp. 81-104.

INSTANT ANALYSIS

"A second-half 1986 capital spending upturn may be tempered by the depressed U.S. energy sector and a slowdown in foreign computer demand. Investment strategy should emphasize services companies and avoid the capital spending-sensitive software vendors."

— **Prudential-Bache Securities Research recommendation in "Software Snapshots."**



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MSA chief leads charge

From page 37

software is becoming a driving force. For the first time, clients are looking to packages more than they're looking to hardware.

CW: You have committed yourselves to interface your applications to IBM's DB2 and SQL. What would happen to a company that didn't?
IMLAY: They'd lose that potential market; in the long term, they won't have a market.

CW: With new players like Cullinet Software, Inc. in the applications market, do you find that your established products like general ledger are having trouble holding their own or that they're losing ground?
IMLAY: It's just the opposite. In the past six months, because of the acceptance of our technology, we seem to be more competitive than we have ever been. And the competition has lessened as many of the competitors have been acquired or dropped out of the foray. Uccel Corp. sold off their cross-industry accounting products to a company in Denver that we just don't hear of anymore. Walker Interactive Products, Inc. has reduced its staff to virtually nothing, and we don't hear from them anymore.

Cullinet has a very loyal customer base for its data base management system, but we see great activity on the applications side with IDMS. McCormack & Dodge Corp. is still a good competitor, but the marketplace has changed tremendously.

CW: Are you seeing an upturn in sales?
IMLAY: From October on, business has been excellent. Sales were up dramatically in the first quarter, $29 million vs. $25 million. It seemed like our business picked up as the Sierra machines were installed with that excess capacity.

CW: IBM has expressed interest in increasing software revenue. Why aren't you feeling the pressure of its presence?
IMLAY: At this stage of the game, they have gone to vertical markets, in health care, in decision support and in VM software. They have formed strategic alliances, but they have stayed away from the financial marketplace. They do compete with us in manufacturing, with COPICS and MAPICS.

CW: Aren't COPICS, or Communications-Oriented Production Information and Control System, and MAPICS, or Manufacturing, Accounting and Production Information Control System, aging products?
IMLAY: Absolutely. We love it when they compete with us there. That's the only area of a competitive nature at this time.

CW: Do the independents have an advantage over IBM in some areas?
IMLAY: The sale and installation of a sophisticated accounting product takes a great deal of service. To support applications is much more difficult than to support systems products. And at the moment, we don't see IBM coming for several years.

CW: Do you see competition coming from Japan?
IMLAY: I was just in Japan. There is no indication from either the independents or the vendors themselves, like Fujitsu, that there will be any applications software products, including manufacturing systems, coming out of Japan for many years. They have a natural resistance to packages. One of them told me, "Using someone else's code is like using someone else's underwear."

CW: Do you think Japanese companies might emerge as competitors?
IMLAY: Yes. It's logical that they would. When they grasp the concept, it is their type of business. The exacting nature of software is just like the exacting nature of the development of an electronics instrument.

CW: IBM has the technical capability today.
IMLAY: Our salvation against IBM is they don't have the business-specific knowledge. The ones that do could be potential competitors, but the ones we're making strategic alliances with are the Big Eight accounting firms. They have the business knowledge. All of our systems are involved with Arthur Andersen & Co., a joint arrangement where we provide all the systems and training for their consulting people, and jointly, we bid certain total-solution jobs.

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Notes: CCA buys software firm

From page 37

Swersky, former Cullinet senior vice-president and chief financial officer.

"It is with regret we accept her resignation," said John J. Cullinane, chairman.

■

In what company officials say is a strategic move, **Computer Corporation of America** (CCA) has acquired **Multiplications Software, Inc.** of Cambridge, Mass., and its products, Imagine and Accolade, for $3.5 million. Imagine is a forms-driven, information retrieval and reporting system; Accolade is a Cobol application generator. Both will be redesigned to work with CCA's Model 204 and IBM's DB2. They currently work with IBM's VSAM and IMS. CCA officials say they will be able to offer de-

See NOTES page 42

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Source: Luther Perry, D.P. Director, Santa Cruz County, CA

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Notes: Call IBM toll free

From page 40

velopment tools for Model 204 applications and will introduce a personal computer version of Accolade compatible with the mainframe version. The PC version is expected to be released sometime this summer.

■

IBM has established a toll-free number for software and service companies that want to comarket a product or pursue some other joint agreement. The number is **1-800-IBM-VARS**.

■

New data retrieval software will be released in November by **Pansophic Systems, Inc.**, for use in information centers. Called **Query**, the internally developed software will use English language commands to enable those not familiar with programming commands to extract data from data bases.

■

VM Software, Inc. next year will release utility software to provide for operatorless backup, monitoring and batch operations of IBM's SQL/DS.

■

Applied Data Research, Inc. (ADR) and **Ashton-Tate** have agreed to provide for **direct information exchange** between ADR's Datacom/DB mainframe data base management system and Ashton-Tate's Dbase and Framework micro products. ADR will adapt its ADR/PC Datacom and personal computer-based query and report-writing facility to allow the information exchange capability.

Rabbit reveals agreements

From page 37

IBM, too, is moving to provide connectivity among its family of computing products. The recent agreement with Rabbit gives IBM the right to market Rabbit's 3270-Plus intelligent micro-to-mainframe link for the IBM Personal Computer AT. It will be marketed as a licensed program under the IBM logo as Interactive Executive 3270-Plus.

The deal with Burroughs, announced last week, will give Burroughs direct communication links and system compatibility with IBM's SNA mainframe and minicomputer networks.

The agreement calls for Rabbit to supply Burroughs with its 3270-Plus Binary Synchronous Communications and 3270-Plus SNA terminal emulation packages, which run under Burroughs' proprietary operating system, BTOS, and Unix, and with Rabbit's RJE-Plus software for remote batch processing. The five-year deal reportedly is worth more than $5 million.

The Rabbit software will provide intelligent distributed processing capabilities for programs running on BTOS. Burroughs will install the 3270-Plus terminal emulation software on its B25 family of microcomputers and its XE 500 distributed processing systems. The RJE package will be available on the XE 550 only.

The deal with Tolerant Systems, announced a week earlier, is Rabbit's first major sale of its Peer-to-Peer Plus software, which implements IBM's LU6.2/PU2.1 Advanced Program-to-Program Communication facilities, part of IBM's SNA.

Rabbit also will supply 3270-Plus, RJE-Plus and Spooler-Plus print management software for Tolerant's Eternity series of fault-tolerant on-line transaction processing systems. The five-year deal is reportedly worth more than $3 million.

"The nature of transaction processing is that it has to link into and fit in with the customer's existing technological base," said Shirley Henry, marketing director at Tolerant.

"Since commercial data processing is dominated by IBM, and SNA is the preferred methodology, Rabbit software allows us to act as a fault-tolerant, on-line, transaction processing node within an IBM network," she said.

SCI Systems will install Rabbit's 3270-Plus package on its SCI Series 1000 and Series 2000 intelligent workstations and microcomputers, giving SCI IBM-compatible micro-to-mainframe links to SNA.

Ada gets boost from SDI

From page 37

faster hardware without a massive rewrite of their existing programs.

The DOD funded Ada's development in the 1970s because it was concerned with software life cycle costs.

A second plus for Ada is that it is designed to provide millisecond response times, something that mainframe computer users, pampered by personal computers, are now demanding.

Ada is notable, too, in that the rules for its use, while they may be many, are clearly spelled out, a quality that gives Ada the potential to eventually incorporate artificial intelligence. Those many rules, after all, may be learned by an AI program that, for example, could convert English language statements into Ada code.

With qualities such as these to recommend it and with the SDI effort to promote it, Ada is poised to take a significant share of the market in commercial programming languages, according to Verdix's director of marketing, Jack Crosby.

"The Fortune 500 companies have the same needs as the DOD," Crosby says. "As Ada begins to pay off for the government, the Fortune 500 will make Ada their language of choice."

The number of deals being made lately by Ada vendors is an indication that things may be heating up in that market. Verdix has announced a $1 million licensing agreement with Pyramid Technology Corp. under which Pyramid will gain the right to develop versions of the Verdix Ada development system for use on Pyramid Technology superminis.

Late last year, software vendor CRI, Inc. announced two packages, a data base management system and project management system, that it said were the first Ada applications for commercial use.

With the DOD gearing up for a spending effort comparable to the Manhattan Project — a program that will spend $4.8 billion on SDI research in fiscal 1987 alone — Ada use is bound to spread to the commercial sector.

After all, the last time the Pentagon sponsored the development of a computer language and then standardized on it, that language — Cobol — became the standard in the commercial sector.

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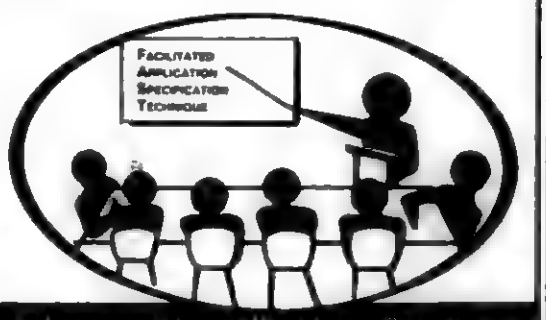
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SYSTEMS & PERIPHERALS

HARD TALK
James Connolly

Fault-tolerant mart matures

Once viewed as little more than an add-on peripheral — a front-end processor that made an IBM mainframe's job just a little easier — the transaction processor appears to be growing into maturity, establishing its own role in corporate computing.

Events are breaking rapidly in the transaction processing and fault-tolerant markets, and at least two traditional mainframe vendors appear to be paying heed. What vendors like IBM and NCR Corp. — as well as fault-tolerant systems manufacturers such as Tandem Computers, Inc. — seem to have noticed is that users are finding more ways to use fault-tolerant transaction processors. The market has surged beyond management of automated teller machine networks.

Among the more noteworthy recent occurences have been the following: Tandem's introduction of a new high-end system, its Nonstop VLX, which is designed to process several hundred transactions per second; NCR's commitment to transaction processing and fault-tolerant architecture in its 9800 series of systems; and IBM's positioning of its System/88 — built by Tandem's young competitor Stratus Computer, Inc. — as a host for banking and other financial terminals under IBM's Systems Network Architecture.

The on-line transaction processing market has grown steadily during the past decade, but the mart now seems positioned to soar by at least 15% per year. In conjunction with their recent announcements, Tandem and

See FAULT-TOLERANT page 44

Connolly is Computerworld's senior editor, systems & peripherals.

DG superminis make noise in business; Hutton listens

By Donna Raimondi

NEW YORK — The E. F. Hutton & Co. financial services firm has taken delivery of one of the first Data General Corp. MV/20000 superminicomputer systems. Both the MV/20000 and its little sister, the MV/2000DC, have started to find their way into the marketplace.

At E. F. Hutton, both systems — announced by DG in November 1985 — eventually will be added to a large number of MV/10000, MV/8000 and MV/4000 machines used for a branch information system in 400 offices around the world.

"We have a networked system tied together with a private telecom network," says Bernard A. Weinstein, vice-president responsible for communications, programming and systems.

The MV/20000, currently being tested in one of the main New York corporate data processing centers, will be joined by a number of other MV/20000s during the next year. "We are using multiple MV/10000s in some regional centers, where one MV/20000 will do," Weinstein says.

The MV/10000s will be handed down to sites where MV/8000s are straining to keep up. In turn, the 8000s will pass down to current 4000 sites, and the MV/4000s — along with some new MV/2000DCs — will go into small satellite offices or new offices.

Both of the newest DG machines have also been received by McDonnell Douglas Corp.'s Manufacturing Industry Systems Co., says Richard Rothfuss, director of marketing communications. The systems will be bundled with McDonnell Douglas Manufacturing's mechanical computer-aided design and manufacturing system, Unigraphics II, and resold. "The changes to port the software onto these new systems were negligible — we did it overnight," Rothfuss says.

Weinstein is putting the new system through its paces and likes what he finds. "We are running our normal applications on it, and it hums. We have not quantified it through performance parameters, but it is amazing how fast it goes," he says.

E. F. Hutton will not need something as big as the MV/20000 in any of its

See DG page 48

Upgrade board revs up IDM 500

Enhancements earn 38% average throughput gain

By Charles Babcock

LOS GATOS, Calif. — Britton Lee, Inc., manufacturer of hardware-based relational data base management systems, last week announced a processor board that speeds up the performance of its IDM 500 series.

Company President David L. Britton said an average of internal benchmarks indicated the new board "executes instructions up to 60% faster than our standard data base processor board."

The faster execution speed, combined with other enhancements, results in an average throughput gain of 38%, Britton said. The enhancements include the addition of cache memory, more random-access memory (RAM) and an upgraded disk channel.

"In other words, the same number of concurrent users can experience a 38% increase in performance, or you can achieve the same performance levels and add 38% more users to the network," said Britton.

The processor board and other enhancements are available for $25,000 to $35,000, depending on system configuration.

Also available as a standard feature on the IDM 500 is a mirrored disk system, which duplicates critical data bases on a redundant set of drives. The mirrored disk

See UPGRADE page 48

NAS ships double-density 3380-class plug compatibles

Beats other vendors to disk system punch

By Jeffry Beeler

MOUNTAIN VIEW, Calif. — A New York-based investment banking firm recently became one of the first customers to receive plug-compatible equivalents of IBM's double-density, 3380-class disk systems.

Part of the shipment of National Advanced Systems Corp. (NAS) Model 7380-AE and -BE storage units went to Morgan Stanley, Inc., where the machines are currently being tested for reliability. Morgan Stanley officials said the drives have passed their tests thus far and that the testing is continuing.

Other disks were delivered to five user organizations representing federal and state governments, the manufacturing sector and the pharmaceuticals industry, according to Ken Page, NAS' director of peripherals marketing. NAS declined to identify specifically the 7380-AE and -BE recipients except for Morgan Stanley.

Thus far, Page said, the vendor has delivered about 40 of the units, which correspond to IBM's dual-density 3380-AE4 and -BE4.

NAS is not the industry's first supplier of double-capacity, 3380-class disk subsystems. That distinction belongs to IBM, which started shipping its AE4s and BE4s last August. But NAS does appear to be the first double-capacity disk system supplier among the plug-compatible vendors. None of the other plug-compatible manufacturers — including Amdahl Corp., Memorex Corp. and Storage Technology Corp. — is expected to deliver similar products for another three to 12 months.

NAS also succeeded in shipping its dual-density storage modules on time. When the 7380-AE and -BE were announced back in March 1985, the company promised to make the products commercially available by the end of the second quarter of this year. On April 11, the first of NAS' double-capacity disk units were delivered to Morgan Stanley, Page said.

Since then, the investment banking firm has been testing the machines extensively off-line. "We've been driving the products pretty hard, thus far without a failure," said Morgan Stanley partner Earl Kidd, who heads the firm's technical services activities. "We've put them through a couple of million I/Os a day and have wrapped them in plastic curtains to see how they would perform under high temperatures."

Kidd declined to speculate about how long the tests at Morgan Stanley would continue.

Unlike IBM's double-density 3380s, which incorporate thin-film technology, the 7380-AE and -BE use a ferrite head design that NAS claims gives them better reliability and a 27% lower cost per megabyte than their Big Blue counterparts. These claims played a key role in Morgan Stanley's decision to buy its latest external storage units from NAS rather than IBM, Kidd said.

INSIDE

Honeywell adds a model and cuts prices of other systems in its DPS 7 lineup/44

Memorex introduces a disk cache unit and an IBM-compatible terminal/48

NEW THIS WEEK

- Hewlett-Packard adds memory cache to the controller of its 404M-byte drives

For more on this and other new products, see pp. 81-104.

INSTANT ANALYSIS

"Judging from the public statements of some other executives in our industry, our very substantial gains in orders were not characteristic of the industry as a whole and therefore may not be sustained."

— NCR Corp. Chairman and President Charles E. Exley Jr.

Fault-tolerant mart matures

From page 43

NCR cited a variety of market research firms' forecasts. NCR cited the Gartner Group, Inc.'s prediction that the worldwide on-line transaction processing market will grow from $34 billion in 1986 to $53 billion in 1989. Tandem quoted Frost and Sullivan, Inc. as predicting a jump in sales from the $15.8 billion level of 1984 to $47.7 billion in 1990 and cited Dataquest, Inc. numbers showing the market as being $13 billion today but growing to $36 billion in 1990.

Tandem also quoted Frost and Sullivan as saying that while on-line transaction processing applications took up 50% of mainframe expenditures in 1984, they will use 75% of those funds in 1990. That seems to signal a shift in the market, not only with the addition of new applications but with the migration of existing applications into the on-line transaction processing environment.

Another market research group, International Data Corp. (IDC), Framingham, Mass., in conducting its annual migration study, asked DP managers about the criticality of features in system selection. More than 80% of the respondents cited 99.9% uptime as being crucial, which made it the most demanded feature, while transaction processing finished third. IDC also attributed the high demand for data base management and multiprocessing to their association with transaction processing and high availability.

On-line transaction processing has gone beyond the automated teller machine and electronic funds transfer stage. Some markets being cited by the vendors are still in that financial arena — point-of-sale support, bank branch automation support, home banking, credit authorization and securities trading.

But other applications being targeted include retail and warehouse inventory management, order processing, manufacturing shop floor, material resource planning, reservation systems and videotext.

However, a familiar ghost arose during the NCR and Tandem announcements, the haunting performance measurement question. Tandem, which long has complained about the use of millions of instructions per second (MIPS) to measure performance of transaction systems, reportedly relied on the debit and credit benchmark to establish a 40 transaction/sec. minimum rating for its basic VLX and cited an average response time of 1.5 sec.

NCR quoted a figure of 52 transaction/sec. for its current high-end 9884 model, but the company confused matters by tossing around statistics such as "4 batch MIPS" and "8 transaction MIPS." NCR also drew comparisons between its 9800 family and IBM's high-end 3090 mainframe line, a comparison that can be justified only by NCR's caveat that they were discussing transaction capabilities and not overall power.

So the on-line transaction processing market is there, and the vendors appear to be ready to address it. But the question remains whether the buyer will be able to judge one system against another.

Honeywell extends DPS 7 line, cuts prices

Entry-level mainframe user market targeted

By James Connolly

PHOENIX — Setting its sights on the entry-level mainframe user and the IBM System/38 market, Honeywell, Inc. has introduced a new model and cut prices for its DPS 7 line of medium-scale systems.

The new model is the DPS 7/40E, which the company claims will provide 25% more performance power and twice the memory at about the same cost of the previous entry-level DPS 7/35E. The DPS 7/40E replaces both the DPS 7/35E and the second-tier model DPS 7/45E. The remaining DPS 7 models, the DPS 7/55E and DPS 7/65E, received 25% price cuts.

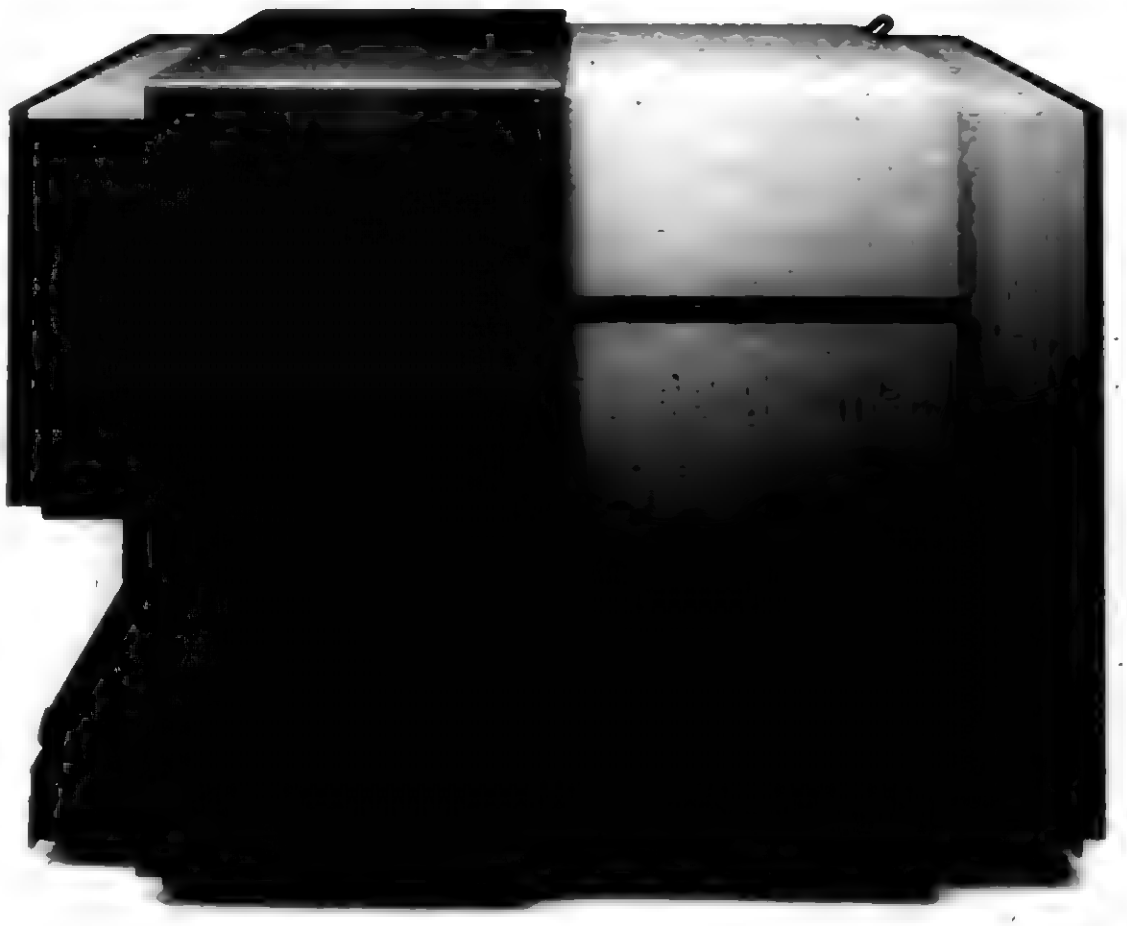
The DPS 7/40E costs $89,000 or can be rented for $3,177 per month on a five-year lease and is available immediately. The price for the DPS 7/55E was cut from $158,800 to $120,000. The DPS 7/65E was reduced from $215,700 to $160,000. In addition, the prices of upgrades within the DPS 7 line have been cut by an average of 42%, and the price for additional 2M-byte memory modules was cut by $5,000 to $15,000.

Andre Kasberger, marketing director for the DPS 7 line, said the DPS 7/40E is targeted at new business as well as providing an upgrade path for current Honeywell Level 62 and Level 64 users. "The price and performance levels of the DPS 7/40E make it attractive in high-uptime environments, end-user solution centers and DPS 7 shops requiring the added power of a second system," Kasberger said.

Honeywell also announced its MSP4370 mass storage processor and MSU1007 for the DPS 7 line. Each MSP4370 can handle 8G bytes of data, with 1G byte stored on each MSU1007. The fixed-media subsystems operate at 1.8G byte/sec.

The subsystems will be available in the third quarter of this year at a cost of $27,000 for the MSP4370 and $34,275 for the MSU1007.

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SYSTEMS & PERIPHERALS

Memorex storage unit boasts greater control over cache

IBM 3270-compatible compact color display station also unveiled

By James Connolly

SANTA CLARA, Calif. — Claiming that it can provide the user with greater control over what information should be staged in cache, Memorex Corp. has announced a disk cache storage control unit for its 3680 and 6240 High Density Package (HDP) disk drives.

A Memorex spokesman said the 3888-23 cache unit lets the user select what information should be staged in cache, thus avoiding the waste in time created when other cache subsystems load cache with unnecessary records that are never referenced.

'Access time has not kept pace'

"The power of mainframe computers has increased, but the access time to on-line data sets has not kept pace. Inherent mechanical motion and rotational delays of disk drives have inhibited the increase in performance. Disk cache solves this problem," noted Memorex Vice-President for Marketing Bill Etheredge.

The 3888-23 is said to be a plug-compatible replacement for IBM's 3380 Model 23 controller and to provide an independent processor for cache management.

The Memorex unit offers from 8M to 64M bytes of cache storage using 256K-bit dynamic random-access memories. Memorex officials said that if any portion of memory fails, the 3888-23 can automatically bypass unusable memory in 48K-byte sections, allowing the cache to remain functional.

Will attach to future 3680-family drives

The 3888-23 attaches to the 3680 and 6240 HDP drives and will attach to future 3680-family drives. The 3888-23 will also attach to the double-capacity drives that the company said it will introduce later this year.

According to the company, the cache unit operates with the IBM 3090, 3080, 3030 and 4381 and with compatible mainframes.

An 8M-byte 3888-23 costs $129,400. Production shipments are scheduled for the fourth quarter of this year.

Color display station

Memorex also announced a compact, color display station for the IBM 3270 environment.

The 14-in. 2179 Display Station reportedly can display two, four or seven colors and was designed as a plug-compatible replacement for the IBM 3179 or IBM 3279 terminals.

Its modular design includes a logic module that snaps on the back of the monitor for easier maintenance and installation of enhancements. Its features include the ability to set the display's brightness, contrast, cursor and other screen functions through the keyboard.

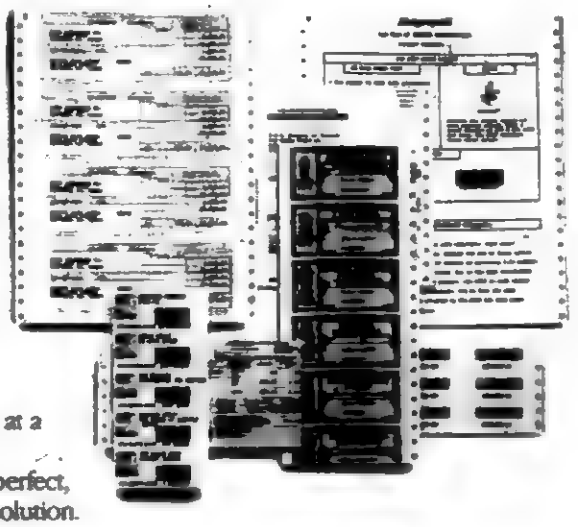
Other features are said to include a record and playback ability for frequently used character strings, light pen support, extended highlighting and reverse video.

The 2179 costs $2,095.

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MAI/Basic Four adds two series to MPX systems

By Rosemary Hamilton

TUSTIN, Calif. — MAI/Basic Four has added two high-end series to its MPX line of multiuser business systems. The systems began shipping this month.

The MPX Series 9000 and MPX Series 9500 run under the firm's Boss/VS operating system and are based on the company's proprietary CPU.

The Series 9000 is made up of two models, the 9010, which is based on one CPU, and the 9020, based on two processors.

Similarly, the Series 9500 is made up of three models that are differentiated by the number of processors. The low-end 9500 has one processor, and the high-end 9530 has three processors.

The Series 9000 supports up to 116 users and has a starting price of $135,000. The models come with 4M bytes of main memory, expandable to 12M bytes; 300M bytes of disk storage, expandable to 3.7G bytes; a 200 line/min printer; and one terminal.

The Series 9500 can physically support up to 255 terminals, but a more typical configuration would be 164 users. The models come with the same minimum main memory and disk storage configuration as the 9000 models. However, the 9500 models can support 5G bytes of disk storage. A typical configuration with 6M bytes of main memory; 1G byte of disk storage; two printers; five controllers, which can each support up to 16 disk drives; and 75 terminals would sell for $342,000.

Upgrades from the company's Series 7000 and 8000 to the 9000 typically involve a CPU and controller swap and cost $65,000.

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NBI supplements 500 series

Unix-based NBI 570 supports more users

By James Connolly

BOULDER, Colo. — NBI, Inc. has added another member to its 500 series family of Unix-based computers, the NBI 570, which was designed to support more users while handling larger files.

The NBI 570, based on a 16.7-MHz Motorola, Inc. 68020 microprocessor, reportedly supports four times as many users as does the NBI 510. For example, the company said it would support 100 timekeepers while providing data base and text search functionality in a typical large law firm.

NBI officials said the NBI 570 supplements NBI's Oasys cluster controllers and the company's Integrated Workstation electronic publishing system.

The NBI 570 supports from 269M to 1G bytes of disk storage and from 2M to 14M bytes of main memory. The NBI 570 will begin shipments in August with a base price of $46,990.

The company also announced its BRS/Search Full-Text Keyword Search System, an information storage and retrieval system designed for text. Also due for August shipment, it runs on the 500 series and is priced from $18,000.

DG units make noise in business

From page 43

branches, only in the regional data centers, Weinstein says. DG systems with the company's Comprehensive Electronic Office (CEO) have been installed since E. F. Hutton picked that vendor two years ago to give employees a worldwide office automation system.

"I am not an engineer, but I do know that the 20000 uses emitter-coupled logic technology, and that makes for a lot of efficiency in price/performance, which I do understand," Weinstein says. The MV/20000 has three boards, as opposed to 11 boards on the MV/10000 version that E. F. Hutton already had, so it should be more reliable, he adds. "And the operating system has been expanded to allow up to 275 CEO users, so that really raises the ceiling." In terms of size, the MV/20000 seems to be about the same size as the MV/10000 while offering twice the power for half of the cost, according to Weinstein.

All of these factors are important, Weinstein says, because E. F. Hutton has a very ambitious office automation program in progress. It is hooking together 12,000 users, or two-thirds of its employees, on-line. All use will be interactive during the daytime hours, and all systems will be integrated on the same network. In addition to OA requirements, the system provides information management such as data bases and models, support for personal computing and communications functions.

One feature Weinstein is still waiting for is DG's announced AOS/DVS operating system, which would enable interconnection of various processors in a global system. The AOS/DVS, an addition to DG's 5-year-old AOS/VS, will allow transparent access of information on different processors across an entire network, says DG spokesman Greg Jarboe. The operating system is in beta test sites now and should be released generally in early June, he says.

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Upgrade board revs up IDM 500

From page 43

system was previously an option on the 500 series, Britton Lee spokesmen said.

The high-end relational machine, the IDM 500XL, has been equipped with a new SMD/E disk controller that supports transfer rates as high as 3M byte/sec., more than double the current SMD controller's current 1.2M byte/sec. rate, spokesmen said. The price of the 500XL is $139,950.

Britton Lee is offering an addition to its high-end line, the 500XLE, which includes the SMD/E disk controllers, a high-speed tape controller and Britton Lee's previously announced data base accelerator. Together, this 500XLE configuration offers a 40% improvement in average performance over the 500XL. The 500XLE comes with 2.06G bytes of mirrored disk, four 515M-byte Winchester disk drives, a 340M-byte cartridge tape drive for file archiving and 4M bytes of RAM. It sells for $199,950, company spokesmen said.

The 500XLE can be equipped with a maximum of 6M bytes of RAM, the same limit that has been in effect on the earlier models.

The 500 series machines come equipped with expansion slots that allow a user to configure them with RS-232, IEEE 488, IBM block multiplexer or Ethernet local-area network interfaces. They are designed to operate simultaneously with computers from different manufacturers, and Britton said 600 have been installed.

The repackaged low end of the line, the 500X, is equipped with 680M bytes of mirrored disk, 2M bytes of RAM, a 340M-byte cartridge tape drive for data backup and a tape controller.

Executive Report

Edited by Janet Fiderio and Becky Batcha

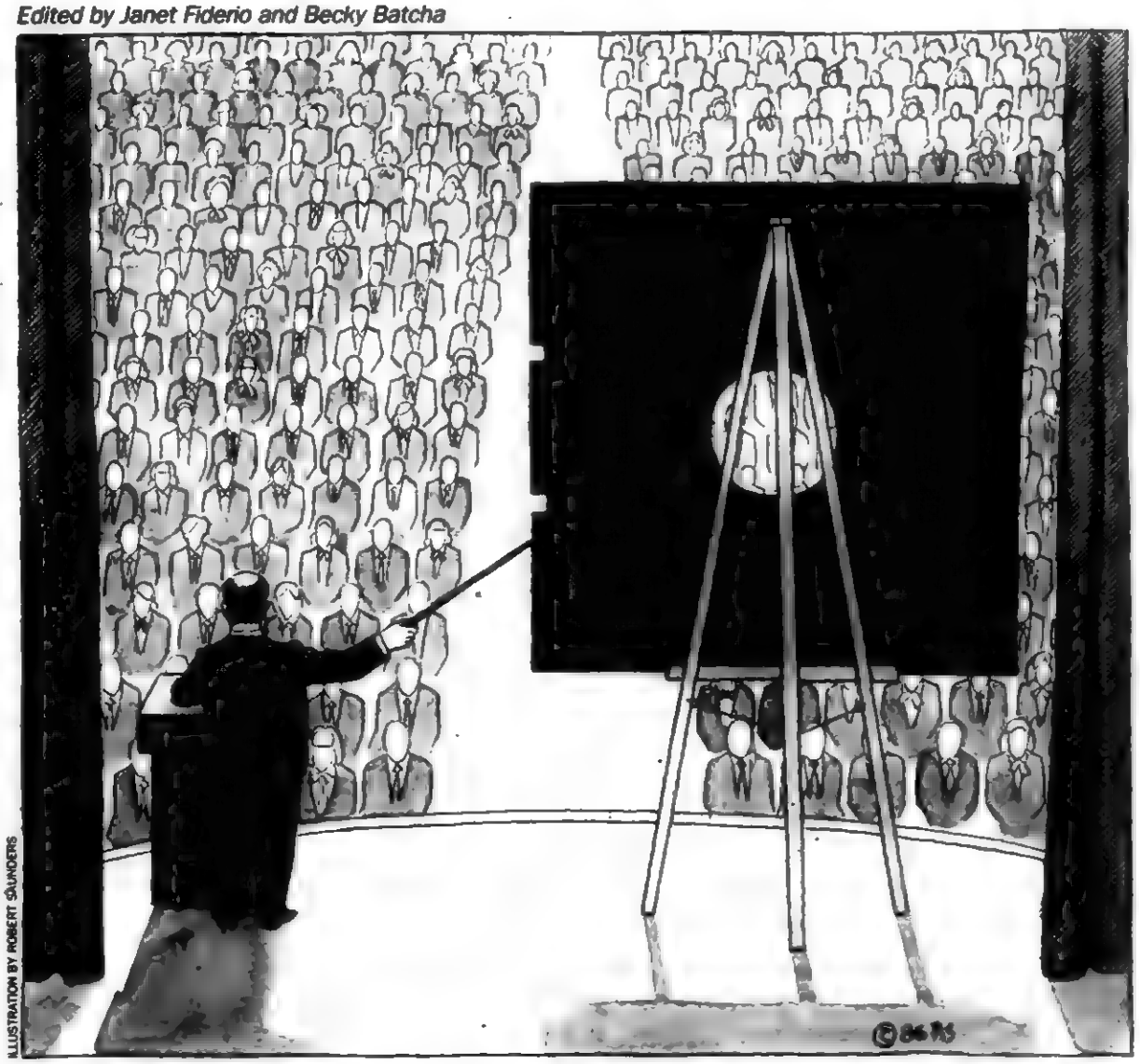


ILLUSTRATION BY ROBERT SAUNDERS

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Interactive designs, humor, game techniques — elements of interesting CBT/60

Managing end-user training

Dedicated staff, proper tools solve instruction snags

By SHARON EFROYMSON

Training end users is a pursuit without much precedent in data processing, in that it trys to bring technical information to nontechnical people. Given the job's novelty, it comes as no surprise that most companies' training programs are currently in a phase of experimentation and change.

At this early stage of the game, every manager who is responsible for an end-user training program faces a slew of problems, each bearing on the eventual success of the program:

- Training managers need to promote their programs so as to attract potential students.
- They need to decide what types of training are most effective: classes led by instructors or those guided by computer-based training (CBT) or interactive video programs.
- They have to figure out where training should take place and how outside vendors might aid the company's program.
- As their company's program matures, these managers need to follow up on early endeavors, measure the success of various courses and export successful programs to additional corporate sites.

Of course, before individual training managers can make any decisions, companies need to decide who should manage end-user training. Top management should make sure responsibility falls on a group of people dedicated entirely to training. Dedicated trainers manage better than part-time workers in keeping courses and manuals up to date and in developing new courses that meet end users' demands.

In some cases, training becomes the responsibility of a few workers in the information center — the hub of end-user services in many corporations. When training, applications development and end-user support all take place under the same roof, the quality of training stands to gain. Consultants who work in the information center can tell trainers about quirks they discover in new releases of software packages, for example, and the trainers can pass the word on to users.

When training, applications development and end-user support all take place under the same roof, the quality of training stands to gain.

Often, however, information centers are understaffed and overloaded. Staff members cannot dedicate themselves entirely to training because they feel swamped with other responsibilities.

Fidelity Investments, a financial services

Efroymson teaches personal computer communications to corporate clients at the Center for Advanced Data Processing, Inc. in New York.

Staff, tools solve instruction snags

Continued from previous page

company in Boston, faced this problem and found a solution. Fidelity maintains more than 650 microcomputers and runs 10 internal training courses every week. Topics for the courses range from an introduction to Lotus Development Corp.'s 1-2-3 to a hands-on workshop on how to use a Cobol generator.

At first, Fidelity's information center handled all training needs, but the load became too great, according to Jim Stoudard, the firm's information center manager. "My consultants needed time to work on applications with the end user," Stoudard says, "and they didn't have the time to spend on course development."

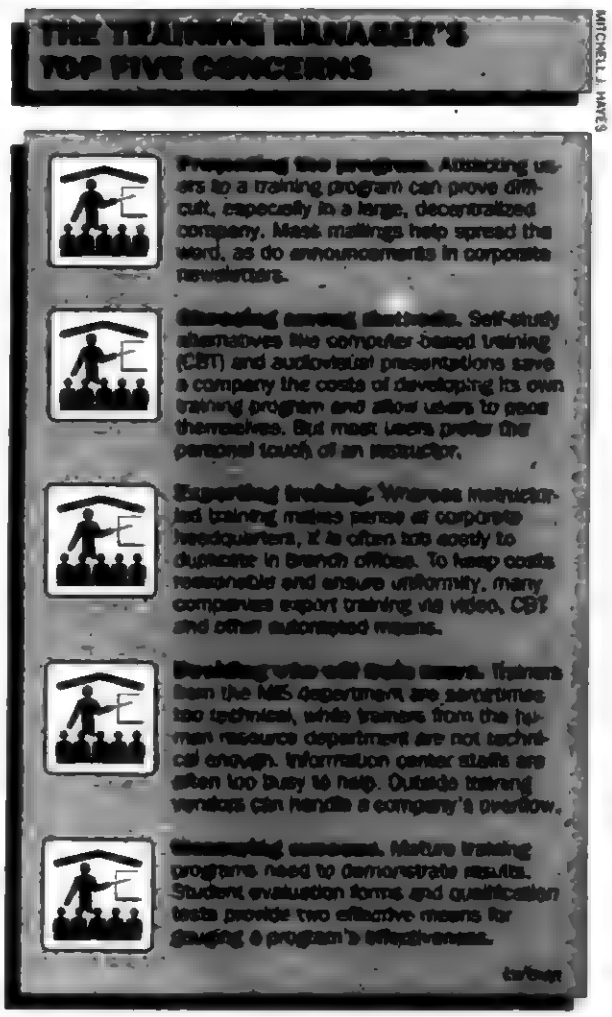
Fidelity solved the problem by dividing responsibilities between the information center and a dedicated training department. The information center took charge of all advanced courses, such as advanced macros and most data base topics, and the training group took over more basic classes.

One condition of the split was that responsibility for classes would change hands as users' sophistication increased. Whenever an advanced class became standard fare, responsibility for that class would pass over to the training department. Since the plan's inception, some fairly sophisticated classes, including an introduction to Microrim, Inc.'s R:Base, have moved under the department's jurisdiction.

Responsibility for training need not rest in an information center or a training department. Data processing and human resource departments often train users. When training comes out of MIS, however, users sometimes complain that their instructors are too technical; when it comes from the human resource department, they find that course material is not technical enough.

Because of the uncertainty about end-user training's rightful place, turf battles break out often. A financial institution that prefers to remain unnamed provides a case in point. The institution's training department has operated for a few years, yet it continues to report to both human resources and MIS. Beyond presenting political difficulties, the setup slows the training department's growth and limits its effectiveness.

Companies that want to avoid a similar snag should attempt to position their training programs under one department from the very start. If human resources and MIS both assume responsibility, neither department will abandon power without a struggle.



After a company places responsibility for training on a particular manager's shoulders, one of that person's first objectives is to entice users to register for classes. Getting the word out about new in-house training programs takes some effort, especially in a large, decentralized corporation.

At CBS Magazines, the consumer publishing division of CBS in New York, trainers generated publicity by mailing course announcements to just over 1,000 people at three locations. "We sent out a mass mailing to our entire company," says Louis Lisko, director of end-user computing for the division.

The announcement listed courses and requirements. Any user could attend, so long as he obtained his manager's approval and had a personal computer on which to practice what he would learn. As a follow-up to the mailing, Lisko placed a notice in CBS' company newsletter.

Lisko's efforts proved successful in piquing end users' interest. Of the 450 to 500 computer users at CBS Magazines, more than 100 signed on for some type of course.

In addition, the mailing provided a means of screening users before assigning them to a class. With each course announcement, Lisko's department enclosed a questionnaire that asked users to gauge their computer literacy and list their department name and other administrative information.

From users' answers, trainers could judge whether there were enough individuals in the same department or at the same literacy level to merit creating a separate class.

Lisko turned to the mass mailing and the newsletter announcement to generate interest when CBS' training program was only a few months old. Established training programs rarely require so much publicity; users tend to know computer courses exist.

In just about every company where training is voluntary, however, a block of users refuses to enroll. Ignorant users can burden an information center with their support needs, according to Fidelity Investment's Stoudard, so training managers should do all they can to keep this block as small as possible.

"The guy who says, 'I'm not going to go to class,' is the guy who calls us and says, 'I can't get my printer to work,' " Stoudard explains. He offers a handy solution for dealing with these bothersome users: "Refuse to help them until they go through class."

The training manager must also decide among competing forms of instruction. Most trainers feel that courses led by human instructors are more effective than any other type, but self-study methods like computer-based training and audiovisual presentations offer sound alternatives in specific situations.

April Allridge, a senior systems analyst at Manufacturers Hanover Trust Co. in New York, is a strong advocate of instructor-led training. When her company offered a CBT course in a fourth-generation language, people shied away, she says. "Many people have computer phobia."

Allridge currently leads a course in computer basics where five to 10 students at a time can get the initial hand-holding they need. She uses CBT materials as a supplement. "You have to start with a personal approach, so that people have a familiar face they can call with their questions," she says.

This personal approach also encourages users to take advantage of a walk-in support center that Manufacturers Hanover's training department runs. "As soon as they get to know an instructor, they'll come to the walk-in center," Allridge says.

Instructor-led courses offer another advantage over CBT in that some organizations find them easier to customize. At Fidelity Investments, for example, instructors rely heavily on real-world examples, which they use to reinforce company standards.

The company offers CBT in addition to live classes, but Stoudard sees little demand for it. "We have a dozen CBT packages in each major software package," he says, "but we always have some on the shelf." He

Continued on page 54

Expert's Opinion



Management consultant Quick

Trainers deserve leadership role

By THOMAS QUICK

Recently, a well-known management consultant angered a group of senior corporate trainers when he reminded them that they sit in leadership positions and should feel obligated to influence their organizations' strategic plans. His message was a complimentary one, but they did not want to hear it.

Many training professionals, even at high organizational levels, prefer to follow rather than lead.

These experts' reluctance causes much training and development to fall short of its potential. At the least, the training is not cost-effective; at most, it is ineffectual.

When professional trainers shy away from initiating programs, managers in MIS and other departments often determine what type of training their department will sponsor and who will receive it.

Most managers lack the professional trainer's expertise in human resource development, however. They can easily choose inappropriate kinds of training or select the wrong trainees. Of course, department managers need to assume responsibility for their employees' training. But they also need help in identifying training needs and fulfilling them.

If they choose programs without trainers' guidance and choose poorly, their organizations' products will not get made as well as they might, services will not get delivered as efficiently as they should, and costs will escalate.

With the stakes so high, managers in MIS and other divisions should insist that trainers get involved in strategic planning, yet often they do not. The reasons — or the faults — lie both with managers and with training professionals.

On the managers' side, the faults

See Quick, page 54

Quick is executive director of the Resource Strategies Institute, a training and development firm based in New York. He produces two monthly newsletters, "Professional Managing" and "Professional Selling," for the institute.

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Continued from page 50

does not know why, exactly, but says, "They do tend to be a little boring."

Fidelity's information center provides computer-based introductions to 1-2-3, DOS and Ashton-Tate Multimate, and instructors encourage students to use the programs to reinforce class work. The firm's most popular CBT course, however, is an application that teaches touch typing.

Many training managers feel that CBT deserves a more prominent place in training programs for three main reasons:

- It offers flexibility, because users can learn at their own convenience.
- It comes prepackaged and does not need to be developed in-house.

> ***Because of the uncertainty about end-user training's rightful place, turf battles break out often.***

- It is less expensive than other training media.

Managers find the last bonus especially tempting, but before they invest in CBT, they want to test its effectiveness. CBS Magazines' Lisko got the chance to do so recently, when a vendor offered to let the division work with a CBT course free for 60 days. Only members of Lisko's staff are participating in the pilot, which began in early April.

Some managers determine which training method to use primarily by comparing direct costs for classes and materials. According to this criterion, self-study programs seem inexpensive. But training itself rarely represents the most significant cost of a complete program. Students' time often costs much more. With employees' time factored in, the price of self-study rises.

Self-study methods like video and CBT are most useful in three situations:

- When people require immediate training in a new subject and the company's training staff cannot develop and deliver a course on time.

Continued on page 54

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QUICK from page 50

arise from a negative view of training that becomes a self-fulfilling prophecy.

Most managers feel skeptical about the effectiveness of training, especially in "soft" areas — topics like management training where trainers claim to teach vague skills such as decision making, problem solving, planning and innovation.

Because of this skepticism, managers frequently commit themselves only partially. They approach training almost the way they might order eggs: once over lightly, and the complex training that employees require gets reduced to short classroom sessions — far too short for employees to practice their new skills.

This training accomplishes so little that it might as well have never taken place. The managers who sponsored it feel that they should have saved their money. Naturally, they had set themselves up for exactly this result.

Skepticism and halfhearted commitments often set a fad trap, in which managers fall prey to any training program that promises a quick and easy fix. When the program fails — as, of course, it will — the failure reinforces the skepticism.

Trainers themselves further bolster management's skepticism with their reluctance to take charge of strategic planning. This reluctance, which serves as a major impediment to successful training projects, comes from three sources:

Tradition. Over the years, both trainers and managers have regarded training and development as low-priority functions — a fact demonstrated in virtually every recession.

Furthermore, the training department's reporting relationships are not strong. In many hierarchies, trainers report to a director or vice-president of human resources. It is not a power track.

Credentials. The exponential growth of the training field has opened doors to many people with little background or experience.

These neophytes receive in-house training to bring them up to speed in training others. But the training is typically so highly specialized and narrowly focused that it cannot prepare the new employee to take part in top management planning.

Business competence. Many of today's entrants to the training field come from the public sector, chiefly public education. They lack a knowledge of corporate life.

After training, they may know something of their product, but they do not understand their clients' needs sufficiently. In the clients' eyes, these trainers lack credibility. They cannot talk the language, and they have trouble diagnosing problems and prescribing solutions.

At the risk of sounding simplistic, then, the situation in many organizations involves two groups — trainers and their clients — who need each other but find it difficult to communicate. To get satisfactory results out of training programs, both camps will need to move forward.

Certainly, the situation calls for an increase in professionalism among trainers and human resource developers. It also calls for a realization among managers that unless they make a genuine commitment to training they will not be as effective as they want and need to be. ■

Executive seminars draw top managers, rally support for PCs

When the president of a major corporation requests training in an end-user application, the wise training manager does not place him in a class full of secretaries and middle managers. Most upper level executives have special training needs and want to learn with their peers.

If an MIS or information center manager satisfies executives' desires by providing special training sessions, he may derive a windfall for his own department. Executive-level seminars can alter top managers' perception of the personal computer and lay foundations for the future expansion of information systems.

Executive seminars played a large role in a plan for encouraging companywide PC use at Continental Grain Co., a multibillion-dollar international firm based in New York. Before the plan took effect, only clerical employees had used personal computers. And, according to Hilly Fuchs, director of Continental Grain's information center, middle managers were reluctant to join the ranks.

"Their reaction to the idea of using the PC was, 'What, should I become a typist?' " Fuchs says. "On the other hand, they were in a position where they didn't understand the technology used by their own staff."

The information center staff decided to skip over middle managers and target top executives, expecting acceptance to trickle down. If the plan worked, middle managers would come to feel pressure on two fronts: Both their bosses and their employees would expect them to learn about the personal computer.

The Continental Grain executive training program was conducted by an outside training firm and consisted of four half days of instruction. Classes covered minimal basic hardware considerations and introduced Lotus Development Corp.'s Symphony software package, a standard at the firm.

Other firms that offer executive training follow similar formats, although some lean more heavily toward a management slant, addressing topics like the integrity and security of data. Classroom examples tend to emphasize the personal computer's utility in "what-if" analyses and budget projections.

The general curriculum of executive seminars, however, resembles that of standard employee training programs. The main difference — and the chief reason behind the seminars' success — is the homogeneous audience.

According to Louis Lisko, director of end-user computing at CBS Magazines, the consumer publishing division of CBS in New York, "There's a comfort factor in having directors grouped with each other for training." At CBS, all employees at or above a specified rank are automatically placed into an executive class. The curriculum for the class is the same one the company uses for its introductory personal computing course.

"While executives are probably not going to utilize the product, they will need to know what the people who report to them do," Lisko says.

Grouping executives together also allows them to benefit from each other's ideas. Questions that one top manager asks tend to pertain to other top managers as well. They raise such questions more readily when they are among their peers.

If a class consists of executives exclusively, the arrangement provides a benefit for teachers as well as students. According to Colin Cuskley, director of training with the Productivity Center, a New York training firm, "The instructor can guide the discussion with questions like, 'How do you think your people will react to the program you just learned about?' " Cuskley taught the executive training seminars at Continental Grain, which met with great success.

One of Continental Grain's true achievements was its ability to attract executives to executive seminars, a difficult feat in personal computer training.

For political reasons, executives need to receive an invitation to participate from someone they consider a peer. At Continental Grain, the arrangements went smoothly because the idea for the training had originated with an executive.

Paul Cantor, vice-president of financial and administrative systems, not only initiated the seminars but also hand-chose the first participants, knowing they could make or break the effort.

Cantor also joined the class himself, thereby cementing support for the effort. Personal computer use caught on quickly. In their enthusiasm, a number of executives purchased machines without even waiting for the course to conclude.

Right now, Continental Grain's executive training program is logging yet another achievement. As planned, middle managers are beginning to call for training, citing recommendations from a boss or an assistant.

— SHARON EFROYMSON

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Survey

View from across the desk: Trainees offer tips on courses

By DAVID NEEDLE

Business users rarely agree on the merits and drawbacks of a particular micro training course, but they do hold similar opinions of classes in general. ComputerworlAl uncovered three common views when it interviewed recent trainees:

• View 1: Finding the right training facility and the proper class structure is essential to success.

After three years of using an IBM Personal Computer, Marina Von Bothmer decided to take a course in advanced DOS. Von Bothmer, conference manager in the public affairs department at Citibank NA in New York, wanted to explore batch files, subdirectories and other mysteries of the PC.

Because Citibank did not offer the type of course she needed, Von Bothmer went looking on her own. After a phone call, she chose the PC Executive Training Center in New York as her school.

"I called them up and asked them to read a description of the course," she says. The description listed the commands and tasks the course would cover, and the list matched Von Bothmer's needs.

Courses at the center are a mix of lectures and hands-on training exercises, with emphasis on the latter. Von Bothmer says the approach suits her well. "I'm one of those people that if I'm not doing it, I don't understand," she says.

She also likes the ratio of students to instructor (7:1) in her class and her instructor's attitude. "I can't say I've been to a lot of different courses, but we've had in-house consultants who made me feel stupid." In contrast, instructors at the center evaluate their classes and adjust courses to their pupils' level, she says.

Von Bothmer has enrolled with the center for a number of one-day classes on different topics. She says she appreciates the short duration, noting that she typically cannot spare the time to take longer courses.

• View 2: Picking appropriate training courses is crucial because poor choices can lead to discouragement.

Christina Bonilla, a manager at Pacific Bell in San Francisco, got off to a bad start in her first computer course, an introduction to Lotus Development Corp.'s 1-2-3, because she had never used a personal computer before. "I didn't even know how to put the disk in the drive," she says, "and the course assumed you knew the basics."

Nevertheless, she persevered.

After the one-day Lotus class, she tried again with a half-day introduction to the Microsoft Corp. MS-DOS operating system, which helped her feel comfortable using the IBM Personal Computer in her office. She went on to a more advanced MS-DOS class and finally to three one-day courses in 1-2-3.

The class schedule gave Bonilla a chance to work out the basics before moving on. "When I got stuck on something, I'd bring it to the next course and figure out how to do it," she says.

Two instructors taught the Lotus courses to 12 students using a combination of lectures and hands-on training, at an easygoing pace with which Bonilla felt comfortable. "It was done in a very organized way, so I was not overwhelmed," she says.

Bonilla took all of her classes from the same training company, Know How, Inc. of San Francisco, and found them all helpful. The Pacific Bell office had been disappointed with other courses from another training company whose instructors lectured too much and did not provide enough hands-on experience, according to Bonilla.

• View 3: Learning personal limitations can be as valuable as learning a specific software package.

Ronald Kilbaugh needed to learn how to program in Ashton-Tate's Dbase III — at least he thought he did.

In his job as regional production manager in charge of eight plants for W. R. Grace & Co. in West Chicago, Ill., Kilbaugh had long realized the benefits of using a personal computer. He had learned Lotus' 1-2-3 on his own and used the package regularly to help with some of his financial analysis and planning responsibilities.

But he knew he would have to spend long hours pouring over books and documentation to figure out the best way to use Dbase III, an advanced data base management program. Instead, he decided to take a one-week seminar at a summer computer institute at the University of New Hampshire.

Before long, Kilbaugh realized the topic was too advanced for him. "I was just starting in with Dbase, so the course was over my head; it was structured on a higher level. The people who had already worked with Dbase probably got a lot more out of it," he recalls.

He did learn one important lesson, however. "The course taught me I didn't have the time to take all the necessary training." Had he skipped the class and set out to explore Dbase III on his own, he says, he might have spent many months rather than a single week coming to the the conclusion that he would never master the product.

Kilbaugh took something else away from the experience. He ended up hiring the instructors from the course to do programming for his company. ■

Needle is a Menlo Park, Calif.-based free-lance writer specializing in computers and technology.

Continued from page 84

• When employees cannot spend an entire day in training.

• When the company wants to export training to remote sites that instructors cannot reach.

Whenever budgets allow, managers like to offer a variety of training media to suit users' varied needs. Bill Shannon, information center manager at Pitney Bowes, Inc. in Stamford, Conn., for example, says a mixture of instructor-led training and CBT classes provides ideal end-user education. "I think people learn in different ways," he says, and he would like to accommodate them.

Whatever medium a company chooses, its training manager and his staff will sometimes need help getting through a difficult stretch. At such times, outside training vendors offer relief.

An outside training vendor can handle overflow during heavy periods, for example, thereby easing the burden of erratic course registration patterns. A vendor can also step in and supply up-to-date instruction whenever the in-house training staff falls behind in new course development. If a training staff's time is severely limited, an outside vendor can even provide regular supplements to existing courses.

> ***"In every company where training is voluntary, a block of users refuses to enroll. Ignorant users can burden an information center with their support needs so training managers should do all they can to keep this block small."***

Pitney Bowes' information center turned to an outside vendor for yet another reason — to help it survive growing pains early on, when the center's limited staff was faced with heavy demands for training.

When the personal computer population at the firm grew past 150 a year and a half ago, Pitney Bowes assigned responsibility for support and training to Joyce Woodard, a staff PC coordinator.

When she took the job, Woodard faced more than 300 outstanding applications for training. Needs seemed likely to soar even higher, because the number of personal computers in the firm continued increasing.

To cope with PC training needs, Woodard turned to an outside vendor — the company that had sold Pitney Bowes its personal computers in the first place.

To cover costs, the information center instituted a chargeback policy. Operating departments paid $65 for each student's training.

By unloading training responsibilities on an outside group, information center staff members gained time to work on user support, which Shannon considers their primary activity.

The information center is now safely past the initial crunch, having educated more than 550 end users, but Pitney Bowes continues to rely on the outside training vendor for all of the firm's PC training. Woodard has been promoted to manager of MIS education.

In-house training departments that cannot use outside training programs often have trouble juggling their teaching and course development responsibilities. In a crunch, they tend to emphasize teaching, mainly because top management measures success by the number of users trained. But this trade-off brings trouble down the line: If trainers do not allocate time to developing courses, quality will suffer.

The 3-year-old information center at the Philadelphia Savings Fund Society (PSFS), a financial institution with headquarters in Philadelphia, is currently bearing the brunt of such a trade-off.

Trainers at PSFS function as trainer/analysts: Besides teaching end users, they need to test new releases, research new technology and carry out other duties. The results are predictable.

"We're a little behind in developing courses due to the conflict in priorities in our job functions," says Susan Derrickson, one of four trainer/analysts. "If we had more time, we'd be updating our current courses, becoming more knowledgeable about the products we teach and developing more courses."

Derrickson says she would like to develop, for example, separate word processing courses for professional and clerical staff members who are currently lumped into the same class.

The information center tried to make time for course development work when it scheduled a blackout on micro training courses last September, a move intended to allow trainer Gail Heinzeroth to research and write much-needed courses in Ashton-Tate's Dbase and On-Line Software International, Inc.'s Omnilink. The month-long break proved insufficient, however. Heinzeroth finished the Omnilink course afterward, but the Dbase course remains under development.

In a more promising development, PSFS recently doubled its training staff from two trainers to four.

Office automation training includes courses in file creation, electronic mail and calendaring. Microcomputer training covers general PC literacy as well as introductory and advanced courses in 1-2-3, DOS, Multimate, Omnilink and Ashton-Tate's Dbase III.

With two trainers assigned to either area, one trainer can drop out to develop courses for a month or so while the other keeps up with training needs. Heinzeroth says quality has improved as a result.

Still, the Dbase course remains incomplete. To tide users over, Heinzeroth hands out interactive diskette tutorials. End users at PSFS can also borrow books and video courses from the information center.

Even as work continues on the Dbase course, the training staff at PSFS is forging ahead with a bold project to move successful courses

Continued on page 92

Selective shopping yields greatest training payback

'Real-world' instruction key to user satisfaction

Ideally, computer training courses should dovetail computer manuals, providing complementary information that helps users learn.

But, warns consultant Richard Riddington, "There can be a real gap between the learning environment and the real world."

Riddington, a principal with the consulting firm Soft Industries Corp. in Southington, Conn., recalls attending a microcomputer software training session in which the instructor used a great number of creative terms to help explain certain procedures.

It would have been a nice addition to the training session, but the terms appeared nowhere in the product manual, he adds.

Trainers should never "create a separate frame of reference in the training environment that you won't have when you're back at your computer," Riddington stresses.

And potential students should check to see that their instructors plan to go by the book before signing up for a class.

After taking more courses than most users and [illegible] number of courses up well, Riddington feels qualified to dispense that and other tips for users who want to spend their time and training money wisely.



Richard Riddington

> "The very first thing you have to ask yourself before you sign up for a course is, 'What do I expect to get out of it?' "

"The very first thing you have to ask yourself before you sign up for a course is, 'What do I expect to get out of it?' " he says.

Course requirements differ for a person who wants to explore a field before he buys a microcomputer product and a person who has bought a product and now wants to learn to use it.

Riddington says that potential students can look for obvious clues that tip them off about a course's focus.

Students who want to learn to use a specific program, for example, should steer clear of any course that promises to cover 10 different programs.

"The course won't go into depth in any one program," Riddington explains. "If you go to learn one program, then you probably will not be satisfied."

Even courses that focus on a specific program do not always supply the in-depth or hands-on instruction and experience that students expect.

Riddington once took a [illegible] class in Ashton-Tate Framework II, a lecture and discussion he describes as a hands-off seminar. The course was a disappointment to him because he had wanted to learn how to use the program.

"The hands-off course can be like an in-depth magazine review," he says. "You still don't get skills, and people don't want to pay [high course fees] for what they can get from a magazine."

Riddington also suggests that potential students check to see that the course they plan to take uses real-world examples — not just exercises — to help students memorize [illegible].

"We don't tend to retain info from memorization," he says, "but from such things as 'We will set up a budget' or 'We will do a P and L' that sound similar to what we do in the office."

— DAVID NEEDLE

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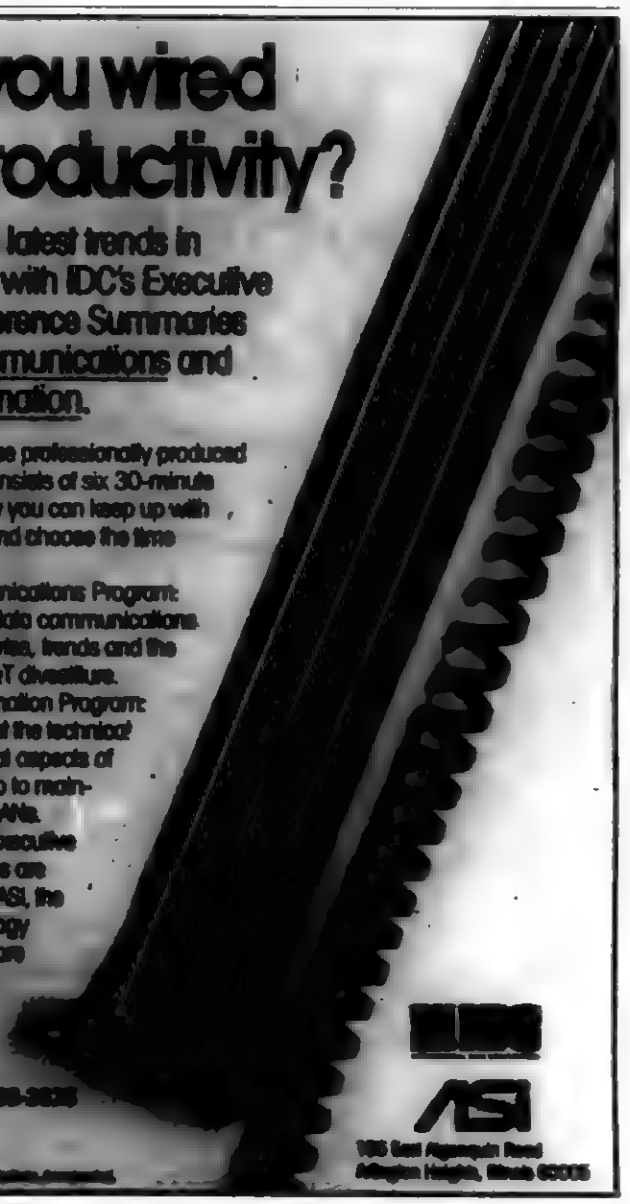
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Build or buy? Managers must weigh CBT tool options

By LARRY BRINK

End-user expectations have forced many companies to reposition training from a low- to a high-priority item.

Due to this shift, managers are paying more attention to a particular set of competing solutions — in-house development of training products vs. vendor development of training products. Both options can be appropriate solutions to training needs.

When it comes to the design and development of computer-based training (CBT) tools, however, there are several key questions managers should consider before making a decision.

CBT is a complex instructional medium — even seasoned instructional designers may have an insufficient background for dealing with it effectively. Therefore, CBT development should be approached with respect.

Whether it is done inside or outside, time, money and effort are required to create an effective training product.

The following list of considerations can help managers clarify their CBT development options:

• **Company business needs and goals.** The decision of how and where to develop CBT projects may be dependent on corporate strategies.

A corporation that plans to use a CBT program as a critical part of a major new product or service may be smarter to go outside and have the CBT training program developed rather than risk a less-than-professional first attempt at CBT.

This strategy was used by one well-known software company when it introduced its first business application.

Having spent millions of dollars on research and development and with knowledge of what it takes to compete in today's marketplace, the company decided to spend a quarter of a million more to buy a professionally designed and developed CBT tutorial.

> ***A corporation that plans to use a CBT program as a critical part of a major new product or service may be smarter to go outside and have the CBT training program developed rather than risk a less-than-professional first attempt at CBT.***

Since the stakes were so high, and since the company had little need for full-time CBT developers, the decision to go outside was smart.

On the other hand, any company that has a corporate mandate to generate significant numbers of CBT courses should consider in-house development.

Another option these companies have is to work with a vendor or a consultant initially to learn CBT basics and move gradually to create an in-house CBT development group.

Once the group is functional, outside vendors can always be used for difficult, high-visibility jobs that would stretch resources.

Companies that want to run a pilot project to examine the feasibility of the medium may also want to use the option of working cooperatively with an outside vendor.

• **CBT project schedules and budget status.** Schedules and budgets are two more elements that should be considered when making CBT development decisions.

Those companies that are inexperienced in the development of CBT projects and yet are faced with short time lines for building a major CBT program have no choice but to go outside for development.

Training vendors can staff up and get the job done quickly — although they will charge extra because of the tight schedule.

When time lines are more reasonable and controlled, however, companies can take the opportunity to hire an in-house staff to handle further CBT development.

Companies that are responsible

See BRINK page 60

Brink is a principal of Apogee Training and Development, Inc. in Newton, Mass. He has developed instruction programs using a wide variety of media, including the computer-based training format.

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for multiple projects — those that run in parallel and require significant numbers of developers, support staff (data entry, quality assurance, word processing) and management control — may want to split the work load between a vendor and an in-house development staff.

In this case, it is reasonable to contract out the toughest pieces of the project and use the designs and outlines provided by the vendor to save internal design time and effort in the future.

CBT budgets often reflect corporate commitment. In effect, if a company has a short-term commitment to CBT, it is often cost-effective to use outside vendors where hardware, software (authoring tools), start-up time and hiring fees have to be considered.

For a company with a long-term commitment to CBT, it is feasible to establish an in-house group that can meet most, if not all, corporate needs.

• **Project resources.** The availability of experienced CBT developers and project managers is another consideration that should weigh heavily in in-house vs. out-of-house development decisions.

If the time and budget for an employee search is available, knowledgeable vendors, consultants and other training managers with CBT development experience can be sources of information concerning the job descriptions, requirements and competitive salaries offered to qualified candidates.

Unfortunately, due to the newness and complexity of CBT, qualified candidates for in-house positions are sometimes hard to find.

CBT development also demands that investments be made in hardware and special authoring software.

While people resources are vitally imporant for good program development, the technology and tools that designers need must be factored into the decision process.

The dollars for such resources are easily cost-justified when a substantial commitment to CBT development has been made by senior management.

Although there is no simple answer to the issue of in-house vs. vendor development of training materials, when managers consider immediate and long-term business plans, a sound decision can be made. ■

> ***CBT budgets often reflect corporate commitment. If a company has a short-term commitment to CBT, it is cost-effective to use outside vendors. For a company with a long-term commitment an in-house group can meet most, if not all, corporate needs.***

Humor, interactivity enhance CBT training

Student participation key to learning process

By JANET FIDERIO

Computer-based training (CBT) programs might benefit from a little fun and games. In fact, some consultants are saying that the judicious use of humor or appropriate game techniques, when combined with interactive designs, may be the deciding factor in a student's decision to stick with a training program and finish it.

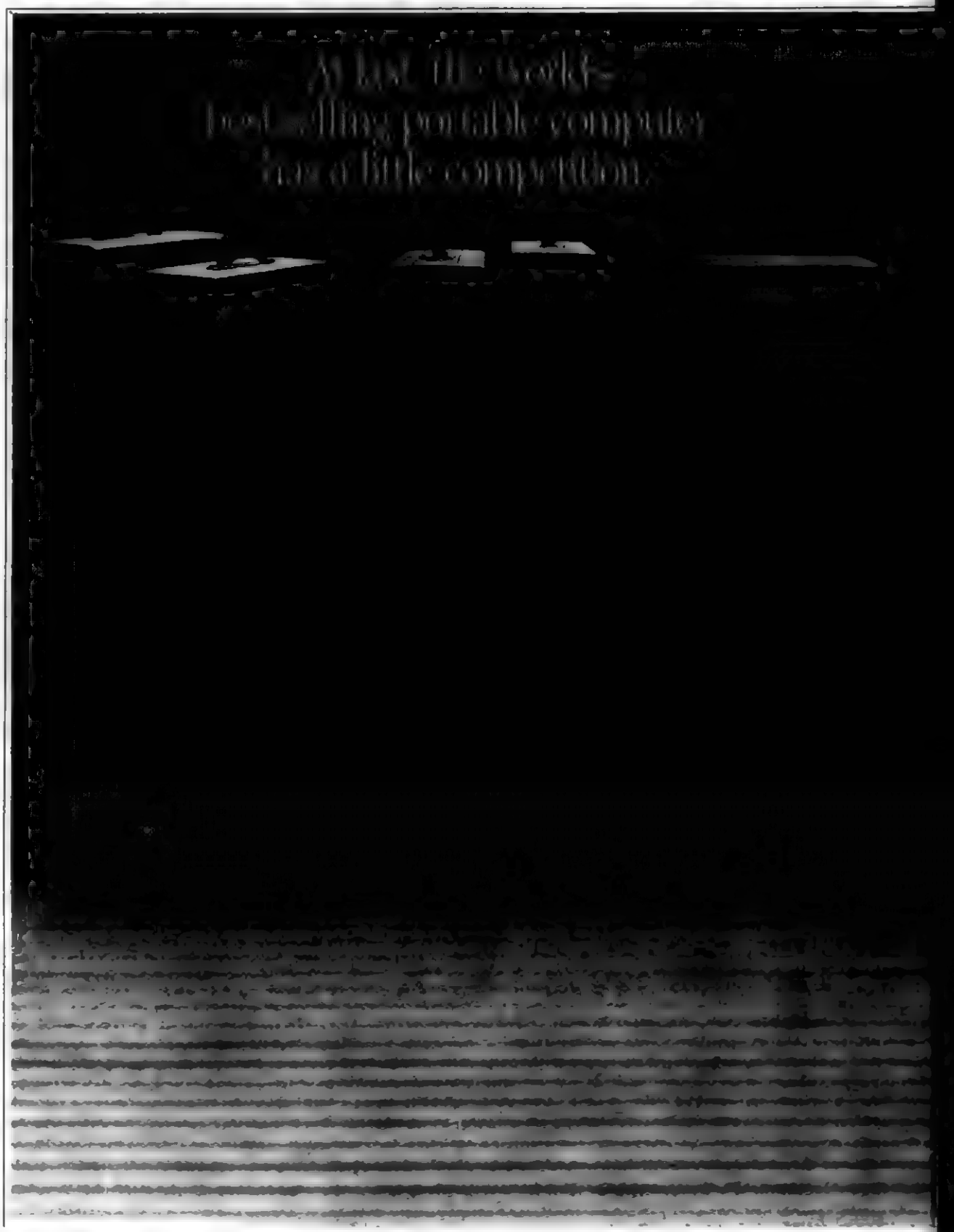
Fiderio is a Computerworld *senior editor.*

Student acceptance of CBT should be of more than academic interest to MIS and training managers because the number of CBT programs in corporate training arsenals is growing. These programs — used either as primary training techniques or as backup techniques for live or video training courses — are purchased with increased frequency because of their low price, wide availability and ease of use.

What MIS and training managers should understand before purchasing or developing CBT products in-house is what makes good CBT, or more important, what makes interesting CBT in the eyes of the student.

Consultants and training vendors are quick to emphasize the importance of interactivity in CBT designs.

They strongly discourage the use of static techniques such as simple page-turning programs, in which students are required to read page after page of electronic text. The training experts encourage the use of techniques that require the student to control or participate in the learning process, such as moving forward or backward, answering questions in a simulation or completing exercises.



Harris Sussman, a manager of special projects at Digital Equipment Corp. in Bedford, Mass., and designer of DEC's "Decision Point," a highly interactive videodisk program for management training, takes the concept of interactivity one step further.

Sussman's comments at the recent Computer Based Training Conference in San Diego reflect his philosophy that electronic-based training should be more social in nature. "A program is interactive if it gets the people who are working on it to interact with each other" he says. "But a program is very successful if it generates discussion, argument, exchange of any kind, between those people who have been exposed to it," he adds.

Sussman also advocates the use of humor in electronic learning environments. When other CBT professionals commented on humor and its importance as an ingredient in interesting CBT courseware, a variety of opinions emerged.

Consultants and training vendors are quick to emphasize the importance of interactivity in CBT designs. They strongly discourage the use of static techniques such as simple page-turning programs, in which students are required to read page after page of electronic text.

David Lichtman, president of ECA, Inc., an Arleta, Calif., CBT vendor, says humor is wonderful if it aids the training process, but that it should never detract from it.

Lichtman states, "The ideal training program is one in which the students are not aware they are being trained because they are so focused on the application or the task they are learning. In that sense, the use of humor has to be very judicious, because if they are really into performing the skill, tricks are not needed to keep them involved." Lichtman feels humor might actually upset their concentration.

Marilyn Albin, principal and creative director at Micro Training Associates, Inc., a Canton, Conn.-based custom CBT development firm, concurs with Lichtman's position that humor be used judiciously, but for slightly different reasons. According to Albin, humor should be used carefully because it can trivialize the student's training experience.

She also thinks students may find some types of humor offensive. "Humor is often very regional in nature, or specific to a particular cultural or organizational group. For that reason, it is difficult to use well and in a way that is appropriate for all members of the student audience."

For Albin, games can be an effective tool in CBT design not only because they are fun for the student, but also because they can be used to demonstrate increased proficiency.

"The reason why students enjoy CBT games so much is the element of competition" she says. "The problem that holds us back from developing more games is that their design is very time consuming."

Catherine Mambretti, president of Icon Associates, Inc. an Oak Brook, Ill., computer-based training company, feels that in the ideal situation most students would prefer a little humor, and "if the subject matter lends itself to a game, it's a good way to get people to stick with the training and finish it."

She thinks that although games can be used effectively in CBT, vendors of generic off-the-shelf courseware have been hesitant to present packages that might be interpreted as frivolous to training managers who are responsible for very large budgets.

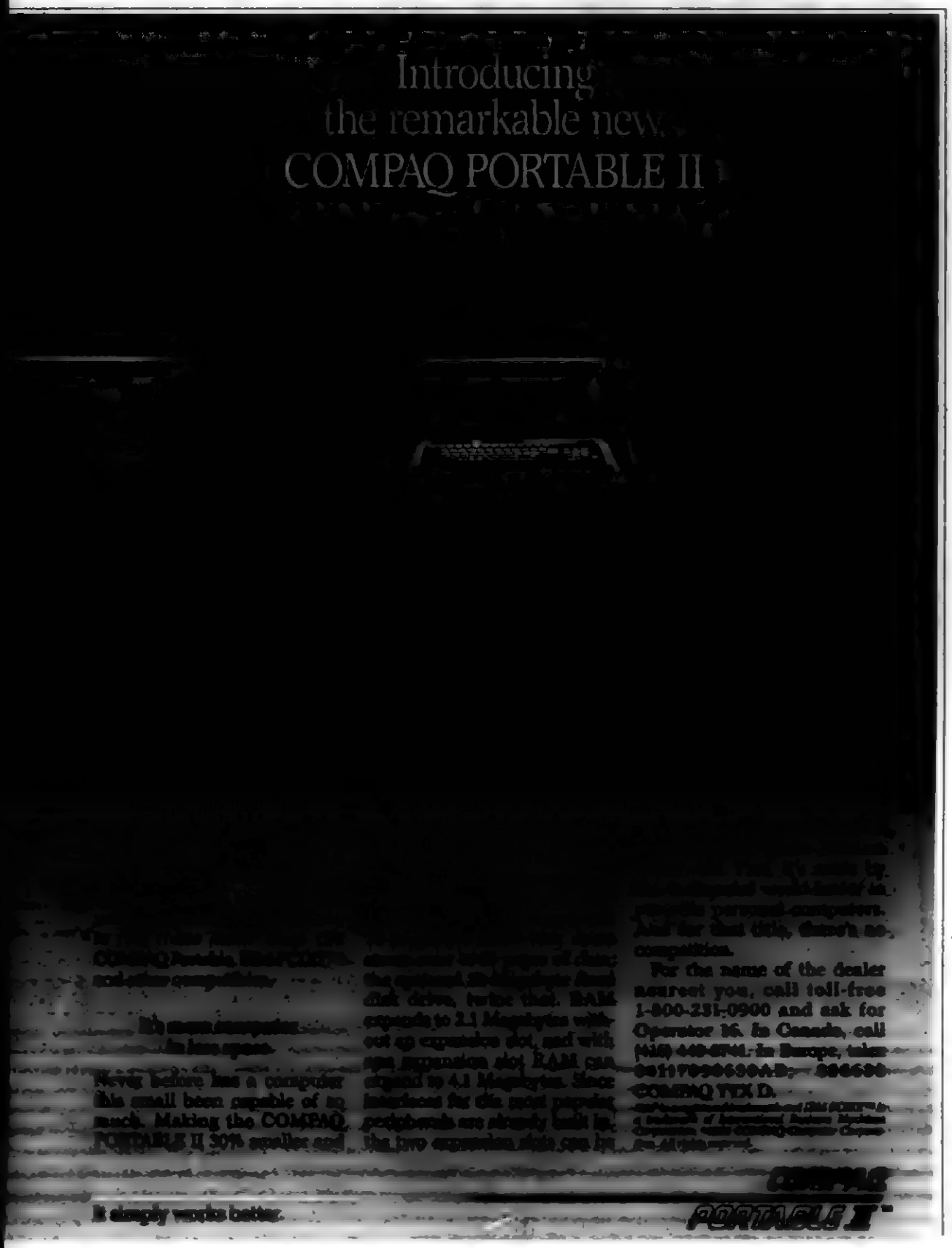
As a result, these vendors go with straight, plain vanilla instruction, because it is easier for training managers to justify to management a CBT budget that does not look like it is filled with sophisticated games — regardless of student tastes.

Mambretti suggests that managers watch for the use of voice I/O and interactive videodisk technologies in CBT.

"Traditionally, training managers have stayed away from noisy CBT — that is, courses that play music or beep and honk — because it can be disturbing to other students in a classroom situation. But there is always the use of headphones, and this kind of option humanizes CBT," Mambretti says. She feels that voice I/O could cut back on the use of static page-turning techniques.

She also thinks that interactive videodisk technology and CBT technology are destined to play an important role in electronic learning design. "When the hardware becomes more affordable, CBT is going to become interactive videodisk. They are really the same thing. The programs that drive CBT are the same programs that drive interactive videodisk."

According to Mambretti, "When people can use videotape and videodisk interactively, a great deal of interest is going to grow in the medium because we are all children of the TV." And last, but not least, the "boring screen that people sometimes get in CBT will vanish." ■



Continued from page 56
beyond the walls of the bank's Philadelphia headquarters and into about 50 branch offices throughout the country. Derrickson knows the expansion will not work without a good deal of effort.

Exporting training always presents a challenge. Because most companies cannot afford the time and expense of shipping instructors from site to site, quality control becomes difficult.

To circumvent this problem, PSFS is considering a number of options:

• One plan is to enlist a system administrator at each bank to serve as a front-line trainer and liaison to the central information center. But the branches are too small to support a dedicated trainer, and Derrickson worries that training will get lost in the administrators' other responsibilities.

• Another possibility is to send trainers from corporate headquarters to the branch offices, but Derrickson views this option as a last resort.

• A third option is to export training via CBT courses, a move that would consume little of the information center's time.

Video provides yet another option for companies that want to export their training programs outside of corporate headquarters, according to Allridge of Manufacturers Hanover.

Manufacturers Hanover exports training to extremely remote sites, usually in response to pleas for assistance from trained employees who got shipped overseas. "Whether our users are in Singapore, Hong Kong or Bombay, they want to be able to use their own terminals to access our data," Allridge says.

Because the firm cannot justify the cost of shipping its instructors around the world, it sends videotapes of those instructors, which Allridge considers the next best thing. While video is not as interactive as instructor-led training, it does supply the personal contact of a human face and voice, both lacking from CBT.

CBT courses, however, are generally less expensive than video. Moreover, they provide the opportunity to track students' performance. Metro-North Commuter Railroad in New York plans to rely on the medium to export training to mainframe users in New Haven, Conn., and Harmon, N.Y.

The firm cannot possibly provide instructor-led training at the two installations, according to Phyllis Aniello, Metro-North's training director. "There's no facility to train in, and the cities are too far away and spread out," she notes. "Plus, there is a lot of turnover, which creates a constant demand for training."

The training the railroad exports will primarily teach data entry to people who input maintenance information, recording which parts of a train need repair and when. The railroad's information center is customizing its CBT courses so trainees will learn only what they need to know. Aniello plans to track performance by compiling reports that list students and their scores.

Every training manager needs to find ways to evaluate his program. If a training program is new, evaluations help it improve; if the program is mature, they demonstrate success and keep management happy. But it is hard to isolate training from other factors that affect productivity. Evaluations require a lot of time and money.

Student evaluation forms and qualification tests provide the most practical account of a training program's success, but the popularity of a course can serve as a barometer as well.

A manager can measure the success of mainframe training courses by auditing the way employees use the system. If underutilization shows up as a trend, the training center can offer a refresher course.

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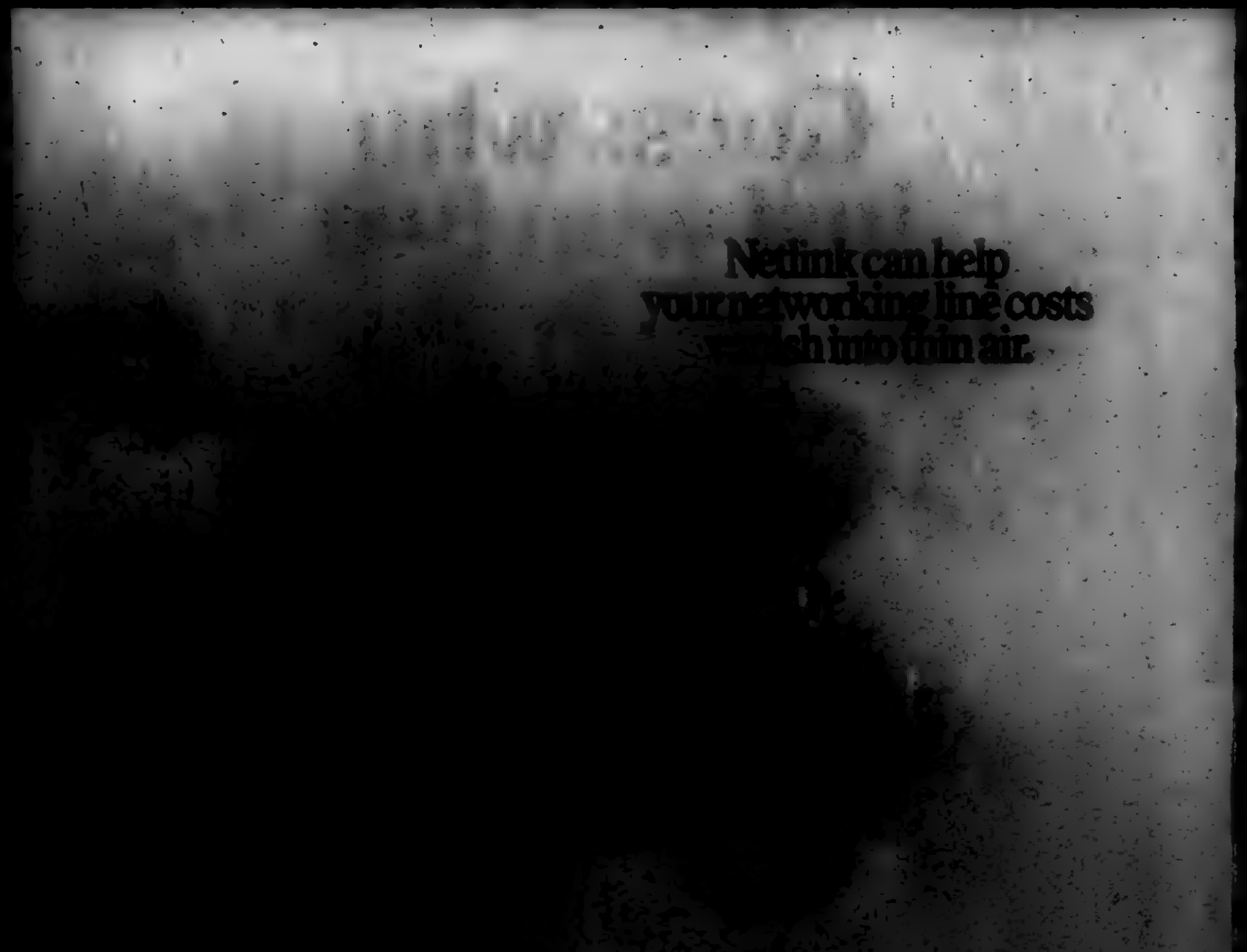
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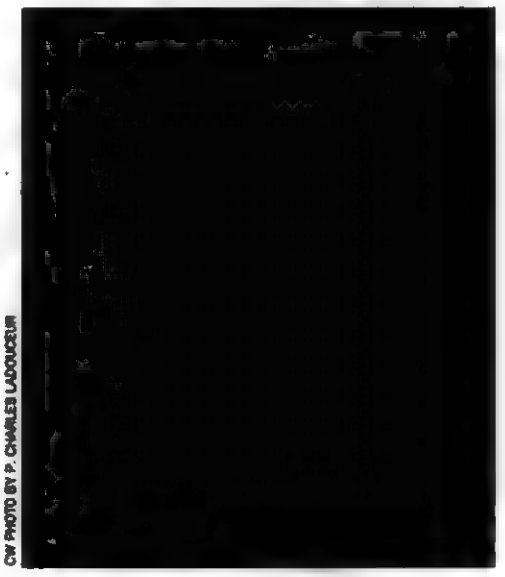
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In Depth

Upgrading proves cost-effective for immediate PC expansion



CW PHOTO BY P. CHARLES LADOUCEUR

The new AT clones tempt many users with claims of productivity increases. But upgrading installed PCs — via a broad range of upgrade options — can deliver superior compatibility and speed at much lower cost.

By T. A. ELKINS

Purchasing new IBM Personal Computer ATs or clones is one way for a company to update its personal computer equipment. This alternative yields a good degree of software compatibility, produces both real and perceived productivity increases — and expends a noteworthy amount of money. I believe that generally equal and sometimes superior compatibility and performance can be acquired at much lower cost by upgrading existing computers instead.

For one thing, the purchase-upgrade-replace sequence that many managers expect with the AT and its clones is not a likely pattern for the near future. Some history (of the Intel Corp. 80286 chip development) and some theory (about the Intel 80386) go a long way toward justifying this position.

A few naysayers will always argue against undertaking any changes to installed computers for reasons of expense or politics, but let's assume that the wide-ranging counterarguments and an appropriate management investigation have established the clear need for improvements in speed, power and efficiency. A less commonly recognized benefit is the double psychological return on investment achieved by upgrading personal computers: It prevents productive employees from feeling their work only rates outdated equipment, and it encourages these employees to believe their work is truly valued.

Unfortunately, there is no universal upgrade path, and several of the prospective paths are incompatible or wasteful if taken together. Still, much improvement can be achieved through the products marketed today.

An intrinsic side effect of upgrading existing equipment, however, will be to place new burdens upon the data processing department of the upgrading organization and to increase such organizations' necessary level of centralization.

Specific upgrades

Where cost/performance is the controlling parameter in an upgrade decision, several simple paths are available. First, in operations where in-house programs are most commonly run in interpreted Basic, truly enormous gains can come from a software upgrade: a switch to runtime programs generated by an optimizing compiler. These compilers are often fairly costly, but only one is normally needed for every IBM Personal Computer in use to demonstrate effective speed increases of a factor of eight to perhaps 15.

For some time, Microway, Inc. of Kingston, Mass., has offered a series of Basic compilers that produce fast and nearly optimum code. In published tests, Microway claims performance improvements consistent with those given above.

Where floating-point math is a major bottleneck and where compatible or modifiable software is used, an Intel 8087 math coprocessor can yield genuine speed increases of a factor of 10 to 30. In the most fortunate circumstances, where an optimizing compiler can be combined with 8087 math coprocessors, program execution times might be reduced from 600 or 700 seconds to 4 or 5 seconds. Hardware costs for this upgrade path run between $120 and $150 per computer, even without considering the inevitable commercial discounts. Costs for optimizing compilers should be well under $1,000.

Existing Personal Computer XTs can be made slightly more productive and much more convenient with the addition of a battery-backed clock/calendar like the Dclock by Microsync, Inc. of Carrollton, Texas. This product consists of a tiny clock daughterboard that holds an Intel 8088 chip and itself plugs into the 8088's socket, giving DOS an automatic time/date setting without the loss of a slot. As a major bonus, an appendix in the Dclock manual describes an easy plug-in method of extending the XT motherboard memory to the full 640K-byte DOS limit, which saves considerable cost and of course an expansion slot. (Unfortunately, this excellent daughterboard is

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Professor Elkins is a scholar with an ongoing research interest in advanced data encryption systems. He does management consulting in strategy and policy matters.

not currently compatible with any of the processor replacement accelerator boards to be discussed.)

With full memory now reduced to a minor cost, it is reasonable and most productive to run XTs with disk-caching software. These programs, like Personal Computer Support Group's Lightning and Intelligent Research Ltd.'s Cache System, improve disk-access performance to an amazing degree. Not incidently, they reduce the demands on hard-disk read/write arms, perhaps extending hard-disk life expectancies. Some form of disk-caching software is highly recommended.

In conclusion, then, several low-level and inexpensive processor enhancements are commercially available. For example, the 8088 chip can be replaced with a NEC Corp. V20 for about $25. But in this case, the 8% to 15% improvement in throughput yields a poor effort/benefit payout. Unfortunately, a test of the NEC V30, the Intel 8086 replacement chip, was not possible before press time. Several replacement processors, also offering low cost but yielding low performance increases, offer one particular advantage (mentioned below) but seem unattractive in general for the demanding commercial-use environment.

> ***Where minimum system change is more important than initial expense, a plug-in hard-disk card may be desirable.***

Minimal system change

Beyond the minimum-expense additions, the IBM Personal Computer can profit most from a hard disk. In those circumstances where minimum system change is more important than initial expense, a plug-in hard-disk card may be desirable. This category of boards includes a hard disk along with its controller circuitry on the card. They need only one or 1½ expansion slots and retain both of the floppy disk drives the system usually has installed.

For example, the Hardcard from Plus Development Corp. of Milpitas, Calif., offers several advantages over hard disks. They include automatic parking, which protects the disk in the event of a nonstandard stop sequence; extremely high shock resistance, claimed to be 100Gs nonworking and 10Gs running — much higher values than most standard disks can boast; and a mean time between failures rated at 25,000 hours — more than double the industry norm.

The Hardcard is advertised as completely IBM PC compatible, and when used with the appropriate read-only memory, is fully able to boot the system if desired. This latter property is most important if convenience of operation is to be maximized. Finally, the Hardcard is rated at only about 11W, leaving open the possibility of upgrading existing PCs without installing a new power supply — a mixed blessing but a real convenience.

Express Systems, Inc. of Schaumburg, Ill., offers two hard-disk cards of its own with claimed shock resistance of 50 to 60Gs stopped and 6 to 10Gs running, a mean time between failures rated at 14,000 hours and an excellent price. One of these cards is also self-parking; both have a 20M-byte capacity. The Express System card, among others, requires a 12V connection, which is not particularly a hardship but does complicate installation.

Of more consequence, none of these cards can coexist with another hard-disk controller. Either the card must be able to run existing disks, with the expected loss of all existing data, or any existing disk must be removed from the system. In systems with existing hard disks, check carefully for this limitation; be certain to specify any existing disks when ordering.

Where cost continues to be a factor and the loss of a floppy is not viewed with alarm, a number of suppliers can provide excellent add-on hard disks. Express Systems' array of disks and controllers seems fairly complete and is attractively priced. The firm actively promotes replacing PC power supplies when the system is expanded, although the firm claims its smaller disks have sufficiently low power requirements to work with a PC



that is not loaded. (In general, I recommend against a noncard internal hard disk without a PC power supply upgrade.) Express Systems also offers a dual-floppy/dual-hard-disk, single-slot disk controller to save a slot. There are many other suppliers of good hard-disk equipment as well.

A good rule for system upgrades, unless a warranty is still in effect, would require companies to add a new, low-noise, 130W power supply with the addition of any ordinary internal hard-disk controller. With retail prices for disk, controller and power supply of less than $500 now available, a PC upgrade to hard disk should get careful consideration.

Two logical drives

Two last hard-disk points: Some disk controllers, like the DTC-5150BX from Data Technology Corp. in Santa Clara, Calif., can split one physical hard disk into two logical disk drives. This feature is both convenient and useful. It offers protection for data on one part of the disk, designated as one drive, from runaway programs writing to another part of the disk with the other drive designation. Where other features seem about equal, I strongly recommend disk-splitting controllers. For systems with disks with more than the DOS limit of 32M bytes of capacity, a disk-splitting drive or a DOS driver are a necessity.

Unfortunately, the Data Technology unit's claimed "drive-to-drive" independence is open to some question, so again, obtain a demo unit and check your specific software before you buy. And at the other end of the spectrum, some disk systems now come with software to combine two physical drives into one large logical disk if this should be needed.

Finally, hard disks that require a DOS device driver were often incompatible with commonly used software in the past and still are sometimes. Further, they can be expected to remain incompatible with many disk-caching software programs. Care in selecting such systems is strongly recommended.

Glamour upgrades

The glamour and payoff for upgrading Personal Computers and XTs come in the areas of memory and CPUs. There are currently three CPU upgrade paths I can recommend. A number of firms sell boards with a 9.54-MHz 8086 chip. The Persyst division of Emulex Corp., Costa Mesa, Calif., sells the Supercharger board. Univation, Inc. of Sunnyvale, Calif., sells the PC Turbocharger. Microway offers the original board, its Number Smasher. And naturally there are others. Each of these board designs incorporates a frequency doubler that increases the Personal Computer's clock from 4.77 MHz to 9.54 MHz. In addition, all carry at least 512K bytes of 16-bit bus memory on the board, and all offer an optional 9.54-MHz 8087 math coprocessor.

All of these products depend for their speed increases on two multiplicative factors. First, each board doubles the usual system clock, thereby effectively doubling the processor's throughput. Second, each board uses an 8086 2-byte-bus processor to replace the PC XT's single-byte-bus 8088 processor. With the processor speed doubled and with the bus bandwidth also doubled, these boards can realise a fourfold increase in a few system activities.

Because the math coprocessor only achieves a single doubling from the faster clock, the final board speed is an average of the two increases. Each of the boards listed can offer a realistic speed increase over a standard PC XT of between 150% and 180% (performance increase factors of 2.5 to 2.8). Additionally, these boards, even though dependent on the same chips and technology, offer considerable differences.

To keep costs down, the Persyst Supercharger includes only 512K bytes of memory on board — a potential shortcoming, since neither it nor any of the other boards offers much of a speed increase when working from ordinary system memory. Users will notice the speed benefits when the boards can use their own onboard memory. This limitation puts the Supercharger at a disadvantage in the moderately rare individual applications and increasingly common situations where there are multiple memory-resident applications, in which processing requires frequent access to memory

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above 512K bytes.

Nonetheless, there is a circumstance in which less than full board memory offers advantages (see below), and the cost saving realized by Persyst could be passed on to big buyers in a nicely reduced initial cost. The Persyst board also comes with no bundled software except for fast and slow software switches that the customer must program — another potential cost saving.

The Persyst board uses an unusual (if not unique) three-position speed switch. In the up position, this switch forces full processor speed; in the down position, it forces slow speed; in the middle position, the computer's speed is software controlled. Most other boards have two-position switches, fast and slow, but these speeds are affected by software routines. Finally, the Persyst board uses a daughterboard that plugs into the 8086 socket and holds the 8086 and the 8087. The heat-producing 8087 rests in the upper position on this daughterboard, so overheating of either chip seems unlikely.

Memory up to 640K-byte DOS limit

Univation and Microway both offer 128K-byte daughterboards to bring their 2-byte-bus memories up to the 640K-byte DOS limit.

Univation offers several productivity programs on disk, including a random-access memory (RAM) disk, print spooling, fast and slow software switches, several test programs and the excellent disk cache from Intelligent Research.

Microway offers all of this sort of software (either the cache program is the same or someone is guilty of copyright violation in one of the handbooks) and has a number of further test programs of considerable value.

Regrettably, the Univation board contains or can quickly develop a flaw when it accesses disks. With Satellite Software International's Word Perfect 4.1, it would not save a file, except as trash, unless the cache program was active. The board also had problems running Softlogic Solutions, Inc. Disk Optimizer, a program that organizes files on a disk such that physical and logical locations are consistent and file access is as fast as possible. The Turbocharger trashed a 10.6M-byte hard drive all the way back to the DOS format command Fdisk.

Technical support people at a Univation dealer and at Univation itself are aware of the problem, but I cannot recommend the present Univation Turbocharger.

Although the Turbocharger proved a fine product in the other respects I tested, without a firm fix for this direct memory access trouble, I cannot recommend the present model. I also fear that the 8087 is badly placed to avoid overheating problems with this board.

Smashing

Microway's established reputation in this field precedes it, but as it happened, I did have a small problem with its board. The Number Smasher has a metal end-plate that was incorrectly positioned, making the board too long to fit into the PC XT. Were the board mine, I would just bend the plate's support arms — I did try this a bit, but the distance to correct was several thirty-seconds of an inch, and a bit of bending was not enough.

I ran a quick and necessarily limited check on the board without its end-plate and it performed perfectly. Microway's board has both processor chips mounted vertically in special sockets that form two small chim-

> ***With retail prices for disk, controller and power supply of less than $500 now available, a PC upgrade to hard disk should get careful consideration.***

neys. It is quite clear that they have devoted considerable attention to the rather important cooling issues.

Of the four boards of this kind I tested, the Persyst offering seemed to have a tiny edge (a fraction of a second) in the system memory test, while the Microway board might have been an eighth of a second faster in the multiplication benchmark test. I recommend either, with the individual choice depending on the cost difference and the value to the customer of the fine Microway software and extra memory option. I do recommend that the cost of a site license for a good cache program, if one is not otherwise available, be included when considering the Persyst board. It would be silly to omit this aid.

The second accelerator type includes the Tiny Turbo by Orchid Technology of Fremont, Calif., and the Speedpac 286 from Victor Technologies, Inc. of Scotts Valley, Calif., among others. (The Victor board is available under several names.) These half-slot cards include an 8-MHz 80286 with an optional Intel 80287 and an 8K-byte, 16-bit-wide hardware memory cache. The 80286-based products are a bit less compatible with the existing software base than are the 8086-based systems, but I found no business software that they would not run.

These boards, using their 80286s, will generally not do an interweave or low-level format, for example. I am strongly opposed to software protection for line business production programs and did not test protected programs (except for Disk Optimizer) with any accelerator system. I would expect some difficulties with

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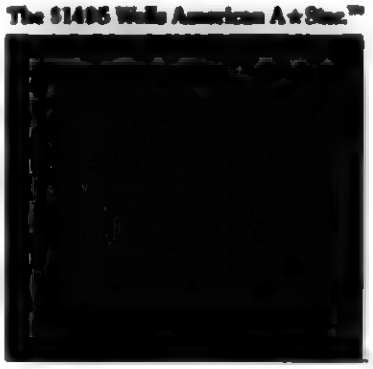
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certain protection techniques.

The Orchid board has a sizable advantage over the competing boards that I know about in that it retains the original system's 8088 chip and can switch back to it at any time. This feature should provide nearly complete software compatibility, albeit with the loss of the board's performance advantage when the 8088 is active.

The Victor board has a considerable advantage of its own in that it has a jumper that can disable the on-board 8K-byte cache, increasing the board's compatibility. Disabling the cache costs dearly in lost performance, although the throughput should still be perhaps twice the original system's level and twice the level Orchid achieves when its board is switched to the 8088 mode. But while the disabled cache should substantially increase the Victor board's compatibility with general software, it would be unrealistic to expect it to equal the capability of the Orchid board in 8088 mode.

These half-slot accelerators with only cache memory offer a potential advantage in that they are surprisingly fast and they use very little power — a matter of importance in a PC without an enlarged power supply. In a very cost-conscious organization, the Victor price advantage (about $100 at retail) might outweigh the greater general software compatibility of the Orchid. But for a large organization where compatibility surfaces as the primary concern, I would expect the Tiny Turbo's extreme compatibility to earn the more common nod.

Some half-slot cards like the ones described may be available without the on-board cache memory. These boards would be significantly slower than the cards mentioned and are recommended only when they have a great cost advantage and when certain multitasking software is to be run.

Full-memory processors

The last CPU product type to be reviewed concerns the full-memory 80286 coprocessors such as Orchid's PCturbo 286E and the Pfaster286 from Phoenix Computer Products Corp. in Norwood, Mass. Both of these boards, along with others in their class, use 8-MHz 80286 processors with between 1M and 2M bytes of 16-bit-bus memory without wait states on the card. Both of these boards offer optional 80287 math coprocessors. With the intrinsically fast 80286 processors operating at 8 MHz and using a 2-byte-wide memory bus, these boards blaze!

Literature from both Phoenix and Orchid show the Pfaster286 to be about equal in speed to the PCturbo 286E. Using public information, I would expect Phoenix's board to be a good product with one particularly nice feature — it can hold two full megabytes of memory on board without a daughtercard.

The Orchid card is a truly wonderful product. Besides impressive speed at an attractive price, this board offers some striking screen updates. It would be overly dramatic to say that the first time I saw it work I thought the computer had blown up, but the fact is that the first time I watched this board perform, I thought for a fraction of a second that something inside the monitor had let go; it is truly that fast. If your need in a PC is speed, look into this Orchid board.

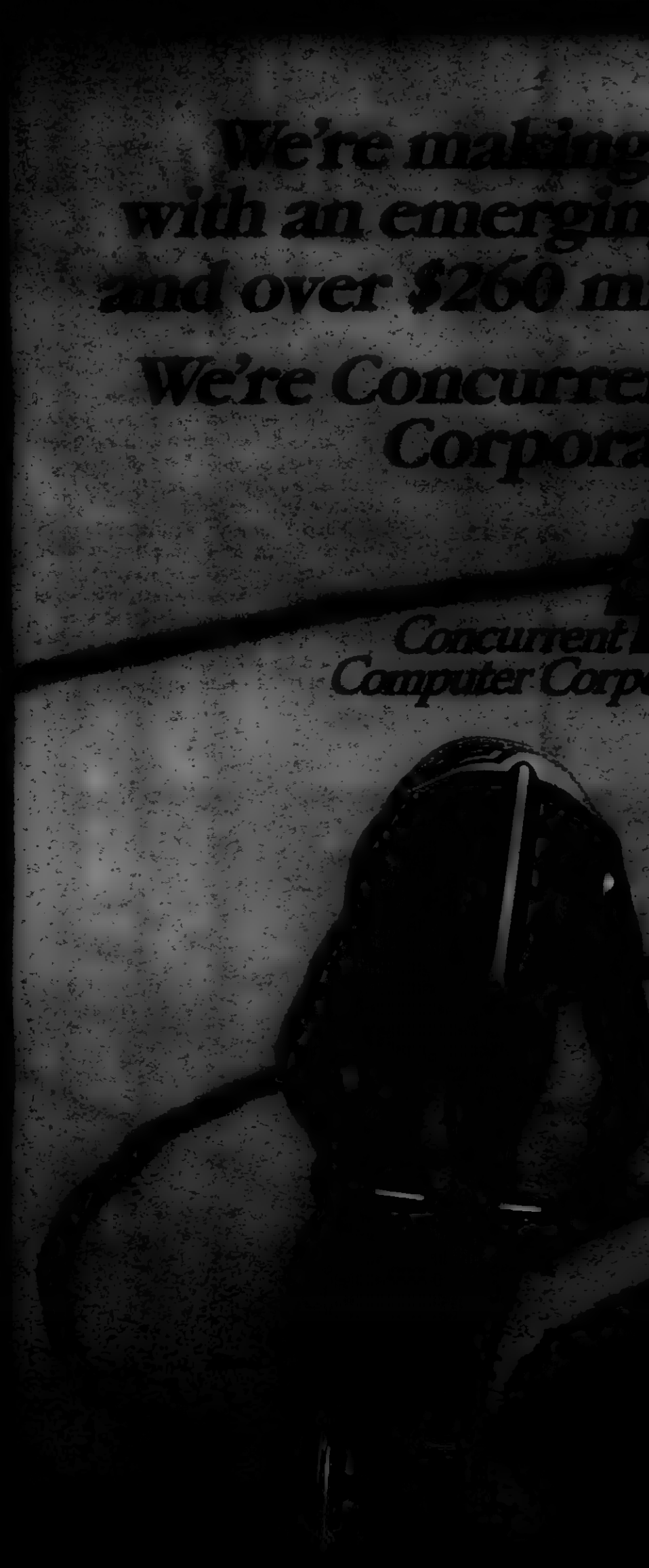
As is becoming common, the software for this board is transferred to hard disk or boot disk by a user-friendly install program. I hate these programs because they never do things my way, but I grudgingly admit that the Orchid install program is not just friendly, it's obsequious. I mean to coin a new term of acceptability here. This program says in plain language just what it is about and then reviews just what it has done.

These products offer some direct, concurrent operation. For example, both boards retain the original 8088 to maintain complete software compatibility. Orchid uses this chip to run a disk cache program, a RAM disk and/or a print spooler while the 80286 is doing something entirely separate. Several boards installed in

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the same computer are able, the vendor claims, to run different copies of DOS and different application programs concurrently, although I did not test this feature.

Unturbo

Orchid includes a disk cache program with the PCturbo 286E that offers two valuable advantages compared with other such programs I have examined. First, it is easily removed from memory when necessary, an ability none of the other cache programs I have seen share and a useful feature when copying programs needing verification.

Second, this disk cache program may be loaded into DOS memory, expanded memory or protected memory, when the latter two are available, at the user's option. With 1.2M bytes of disk cache, my system needs to do very few disk reads indeed. Unfortunately, this cache is not recommended with floppies, which is where the Intelligent Research cache really shines. A new version of the Intelligent Research cache can run in expanded memory, which makes it especially attractive in its own way. But take note — with some cache programs, particularly if floppies are cached, the verify program with the DOS copy function may be compromised. Unloading the cache or disabling it when copying important new software is a good idea.

> ***The first time I watched this board perform, I thought for a fraction of a second that something inside the monitor had let go; it is truly that fast.***

When the original system is needed with these boards, the command Unturbo or some equivalent returns users to DOS and the original 8088. The board loads its own copy of DOS, clean of any customized features. In this mode, the micro can run any program it had run originally, but without the accelerator's enormous speed, which I emphasize is addictive. The board's high-speed compatibility is slightly less precise than the half-slot units just discussed.

These systems are so advanced that they will violate some of the pickier software license agreements specifying single CPUs, a not insignificant concern for DP managers.

Classic Technology of San Jose, Calif., offers its 286 Speed Pak, a board that is much like the ones just discussed but that has a wait state for its memory. This board would accordingly run slower with on-board processing than the Orchid or Phoenix products. On the other hand, Classic claims to have a special BIOS implemented that accelerates disk I/O, and the company advertises a very high degree of software compatibility.

For speed demons

Once a user becomes accustomed to these boards' remarkable speeds, they do not really offer him anything more. In fact, doing nothing but increasing speed is the major design goal of these products. Except where concurrent processing is possible, compatibility with existing software and speed are the properties you pay for when you buy one of these boards.

Naturally the question must arise: Is speed enough to justify the cost? From my own experience I can answer with a rather emphatic yes. Programs like Word Perfect 4.1 too often are a bit more sophisticated and demand a bit more power than the PC environment supplies. With any of these accelerator boards, the Word Perfect screen scrolls as fast as scroll commands enter the input buffer. The system "beep" at buffer full is never heard, as it is all too frequently with a 4.77-MHz 8088. Computational programs process so much faster that I check (that is, rerun) jobs I would just accept as correct with an ordinary PC.

Several firms offer replacement motherboards that should show a nice improvement in speed, and there are at least two non-Intel coprocessor boards on the market with very fast floating-point performance figures.

Expanding memory

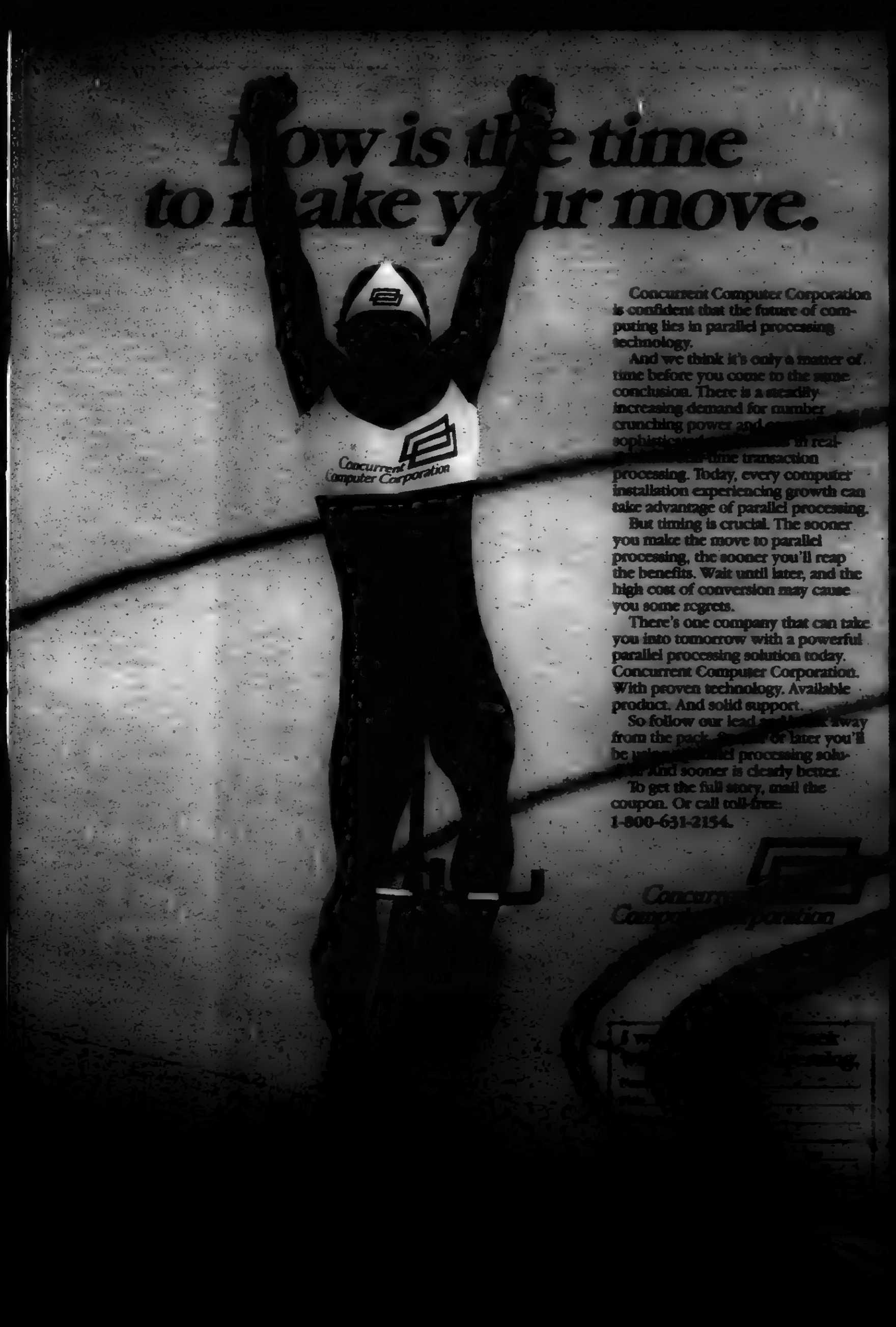
Memory beyond what is on the motherboard comes in three varieties. Conventional memory expansion boards are obsolete and not really recommended. The first step beyond conventional expansion lies in products like Maxit, a 256K-byte board from McGraw-Hill CCIG Software of Dallas. This board can add one or more segments to DOS, raising the system applications' limit to 704K bytes or more. In addition, it can switch-select unused space in the upper address range of the 8088 or 8086 (provided IBM's Enhanced Graphics Adapter [EGA] or other controllers have not preempted it all) yielding up to 256K bytes for memory-resident programs like Borland International, Inc.'s Sidekick, Central Point Software, Inc. PC Tools, and various vendors' Ramdisk and disk cache.

Special software can force certain of these programs into this otherwise wasted memory address range even when they are not designed to use it, leaving DOS free for applications — just as is most desirable. This board will be the answer to the prayers of a great many memory-resident program lovers and offers anyone not using expanded memory some real benefits.

The Lotus/Intel/Microsoft



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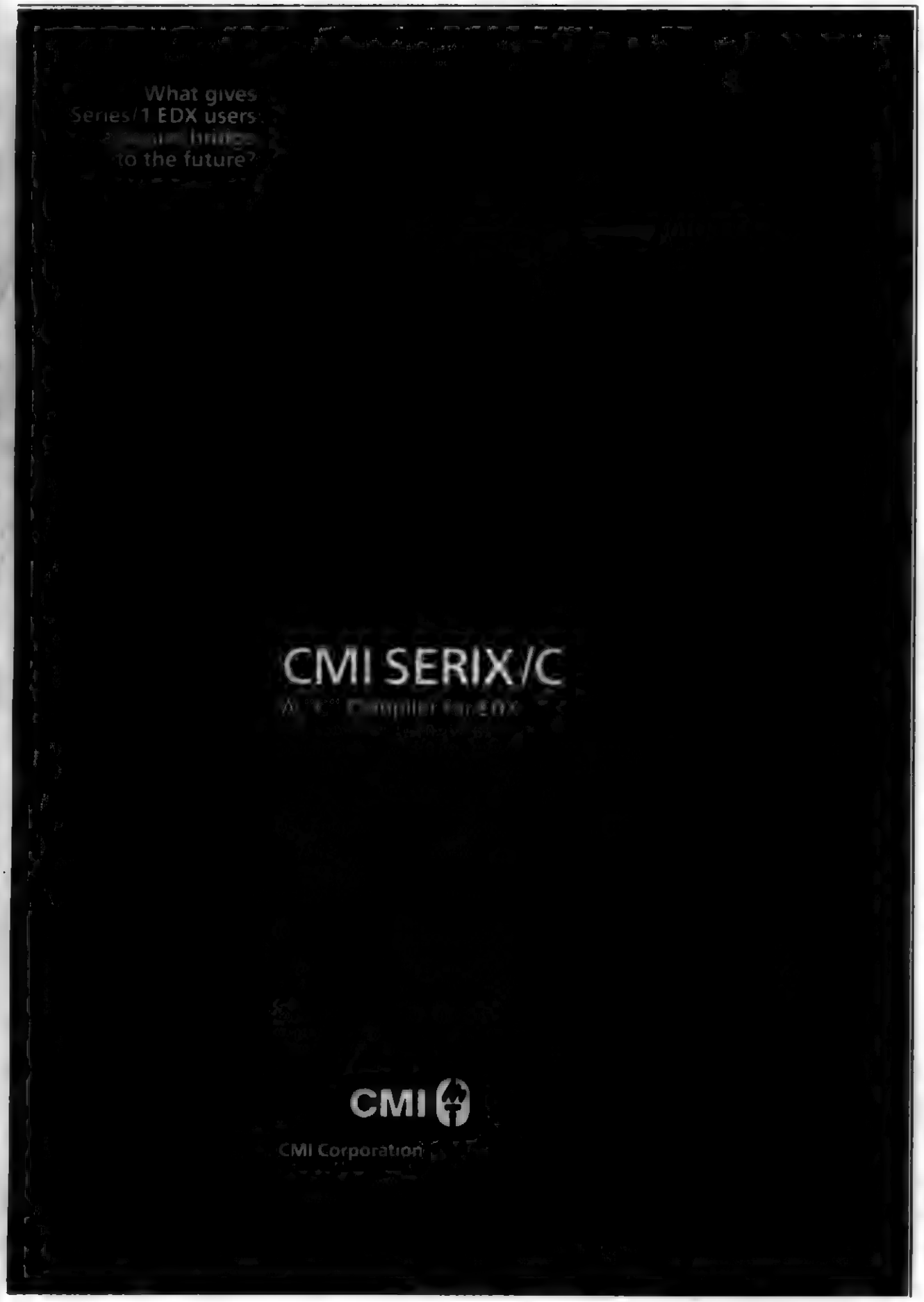
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'Expanded Memory Specification (EMS) changed the rules of the game where memory is concerned. It also, a bit more than incidently, introduced some of the worst and most confusing terminology imaginable into a discipline that does not need further confusion.

As a mnemonic — which you will most likely need — it is a good idea to associate expanded and paged with one another. Under the control of special programs that can use its device drivers, an EMS system pages blocks of memory larger than the 8088 and 8086 address capability — 1M byte — into this accessible range. And just to add to the fun, there is an Enhanced Expanded Memory Specification from AST/Quadram/Ashton-Tate that uses a superset of the Lotus/Intel/Microsoft specification. If this is beginning to sound like more than you really want to know about memory, skim the next paragraph.

In operation, the EMS deals in 16K-byte pages, which it switches up and down in memory from the accessible range to above it and back down into it. In the Lotus/Intel/Microsoft version, these pages are all moved through a 64K-byte window or frame located above the 640K-byte DOS limit. The AST/Quadram/Ashton-Tate version moves the pages in a much freer manner through all available even-boundary 16K-byte windows in high memory and, under the control of certain programs with certain hardware setups, through DOS memory as well.

In addition to these capabilities, a second type of device driver allows programs written to use the extended memory of an AT, not otherwise available on PCs, to run in expanded memory. You might try associating extended memory with *ten* twenty-four kilobytes (1,024K bytes), the address limit of the 8088 and 8086. The AST/Quadram/Ashton-Tate standard with 64 page registers is clearly superior to the Lotus/Intel/Microsoft standard of only four, but Intel makes the chips and Microsoft Corp. writes both DOS and Windows. How much hope can be held out for the new version's success on the basis of mere technical advantage?



Using more memory

So much for confusing nomenclature. In operation, an EMS board adds a few dozen seconds to the boot process as it checks itself. One or more of these boards then allows specially written programs to run in up to 8M bytes of space at 1M to 2M bytes per board. There is a four-board limit at present.

Ready, an outline processor from Living Videotext, Inc. in Mountain View, Calif., is one of the earlier programs to use the expanded memory space. Normally, this memory-resident program uses 128K bytes of DOS memory. However, if it finds an acceptable expanded memory board, it uses only 4K bytes of applications memory — the remainder of the program is stored in expanded memory. The load process is a good bit slower when expanded memory is used, and Ready's response is further slowed. But both effects are mentioned in the documentation, and for memory-resident programs neither of these two limitations is of any great importance, while the savings to DOS memory can be most important indeed.

> ***Is speed enough to justify the cost? From my own experience I can answer with a rather emphatic yes.***

Orchid's cache program will also go into expanded memory, and running a 1.2M-byte cache, as I usually do, is a joy not to be dismissed lightly.

Even when switching between three or four application programs, one disk access for each is almost always enough. When I return to a program I ran a little while before, there it is in the cache.

Microway's cache will go into expanded memory as was mentioned; unfortunately, it interferes with my hard-disk park routine, while offering only 960K bytes of storage, and is consequently less useful. With floppies, Microway's cache would be the hands-down winner.

Generally, I would say

that these boards are currently worth their price and that their convenience and utility will grow quickly over time. Programs written to make use of their abilities are constantly being released.

Variety of memory

Again, there is a surprising difference between the available boards in this EMS category. Microway's Megapage holds up to 2M bytes of CMOS memory chips and offers low power usage. It comes bundled with the expanded memory version of the good Intelligent Research cache program. A bit surprising, however, is that Ready failed to load into expanded memory with this board. The cause of this problem could have been some action of mine — the test was necessarily short — or I suppose that a small driver difference might have introduced an incompatibility. But a clear lesson can be found here: Confirm compatibility between hardware and software before you commit to an expansion memory board.

Of perhaps more concern, when I was testing this board, the file allocation table on my E hard drive was destroyed, killing it back through Fdisk and beyond. For obvious reasons, I was reluctant to try to recreate this problem, but one possible cause of the problem occurred to me. Two attempts had been made to load a hard Ramdisk (H-Ramdisk) into extended memory on this board. If an H-Ramdisk utility failed to recognize an E drive and wrote to the file allocation tables of both the H-Ramdisk and the E drive, the observed results could easily have occurred. Another matter for careful checking in each installation. (Note: This problem was not caused by Microway's Megapage.)

Intel offers two Lotus/Intel/Microsoft extended memory boards. Its Above Board PC contains up to 2M bytes of memory. Above Board PS has a maximum of only 1.5M bytes of memory but includes a clock and two ports — much like the well-known AST Research, Inc. Six Pack. These boards must be viewed as the industry standard, and compatibility problems should be minimal.

Orchid offers two boards as well. The full-size Conquest comes with 1M byte of memory on board, a 1M-byte optional daughterboard and a networking daughterboard as an additional option. The Orchid Cramram uses special chip carriers to provide 2M bytes of pure memory in a half-slot space drawing less than 4.5W. Of importance to some, Orchid's boards are switchless and install with software that tests the current personal computer configuration, asks a few questions and does all the calculations needed to set up the boards in operation.

These boards also come with Orchid's fine expanded memory disk cache program. All of these manufacturers' boards come with Ramdisk and print spooler utilities. Note my previous caution here, however, about loading H-Ramdisks.

The AST Rampage board has a 2M-byte capacity on board, and a daughtercard can add a clock and two ports without the loss of other expansion space. It naturally conforms to the AST/Quadram/Ashton-Tate Enhanced EMS and runs Ready perfectly well. The extra value of the AST/Quadram/Ashton-Tate specification is hard to measure, but one matter will arise shortly. As is

Emulation optimizes desktop computing

By R. C. FISHER

***Terminal emulator** — something that emulates (or strives to imitate, equal or outdistance) a terminal or any device by which data can enter or leave a communications network.*

Question: Why take an intelligent, powerful, IBM Personal Computer-compatible machine and ask it to act like a stupid terminal? Answer: increased efficiency.

What if you could train your average idiotic CRT to behave like a microprocessor? That is the kind of transformation possible if one uses a PC terminal emulator in place of a traditional VDT. The PC acts like a termin... during interactive hours and otherwise performs independently as a fully functioning microprocessor. As the dropping cost of baseline Personal Computer machines infiltrates the realm of CRT prices, a PC purchase will yield more computing power per square foot of office space.

Thus, terminal emulators optimize the use of the most valuable form of corporate real estate: the desktops of the professionals and executives who use them.

Emulator features

Terminal emulation add-on software products that tie a stand-alone microprocessor into a central data base by making the microprocessor act like an interactive VDT.

The first characteristic of any emulator belongs to the terminal that the product is trying to mimic. Emulations of the IBM 3270 series terminal and the very popular Digital Equipment Corp. VT100 class are the most common. Thus, prevalent computer jargon speaks of a VT100 emulator package. Once the role model has been chosen, a microcomputer running the emulator software — with many features that can be tailored to individual needs — can often do a better job working with the user than the terminal being impersonated can.

Because an emulator has the advantage of a smart CPU sitting between the user's CRT and the host computer, keyboard characters may be translated by the PC into specific user-defined sequences, which are then sent to the host.

For example, a user might instruct his Personal Computer CPU to translate the typed input sequence CTRL P into a Purge command, sent to the host to purge all multiple versions of data residing in his file directory. Much like a single math function, the keyboard input CTRL P results in an output of Purge * — purge all. This process of redefining keystrokes is known as keyboard programmability.

Vterm II from Coefficient Systems Corp. is a VT100 emulator designed to run on IBM PC-compatible equipment. It allows users to redefine all but two of the Personal Computer function keys. When used with the control character and shift key, this ability establishes 28 local commands that can be programmed into one key. This command power is available without using any resources of the host CPU. Clearly, the workstation has become more productive without taxing the entire DP network.

Zenith Data Systems Corp.'s Zstem PC is another VT100 emulator. Zstem gives the user the ability to redefine almost the entire keyboard. Thus, in ASCII, if the host recognizes the Backspace character rather than the Delete character as the rub-out command, this will allow the Delete key to be redefined locally in the emulator. Although the letters will rarely be redefined because they are essential to meaningful communication, the keyboard, in combination with the control character, will give more than 60 reprogramming options.

Because the emulator itself must be loaded before the Personal Computer can act like a terminal, keyboard programmability allows users to tailor the hardware they use to their specific needs. For example, Teasy, from ID Systems Corp., provides a highly friendly menu function to define its alphanumeric keys as well as its control characters.

Many emulators require a control code sequence to redefine a key; Teasy provides a simple display of every available programmable key. Teasy allows users to walk through the display and simply type the new translation for that key interactively rather than send a batch-like control sequence.

Although this tailoring procedure is helpful, the start-up time can be lengthy. To circumvent this, emulators allow users to save their current keyboard configurations. Some products — again, the Teasy system is notable here — offer a menu service that can save and recall up to 10 different keyboard configurations. Hence, a Personal Computer sitting in a public terminal pool can still be made into one's own personal machine and thereby increase overall productivity.

Remote processing

Micro-to-mainframe local-area networks allow a significant portion of processing to be shared with the remote microprocessors. Thus, printing and data storage for a word processing system can be done centrally, but the actual editing can be done off-line on the local microprocessor.

All terminal emulators provide the ability to transfer files. Data can be downloaded through the emulator to the local Personal Computer for editing, and then the final product can be uploaded and stored on the host mainframe. Two important features sometimes supplement the transfer process: memory residency and preset file-transfer menus.

Memory-resident Vterm II can remain connected to the host while also granting access to the local Microsoft Corp. MS-DOS environment. Because file transfers usually travel over telephone lines, it is not uncommon for line noise to create intermittent garbage in the transmission. The memory-resident feature allows users to transfer the file and check its integrity before logging off the host. Hence, with Vterm II one can do the transfer, hit both Shift keys simultaneously to land in MS-DOS, check the file, hit the Shift keys again to bounce back to the host and then log off.

Vterm II does not require a reload when a user plans only on editing or just scanning the file for five minutes and then replacing it. It allows users to bounce back and forth between environments at their convenience, rather than the machine's.

The second important feature involves file transfer menus. Some emulators do not have any — they prompt for the file name each time a transfer is requested. A better scheme is a menu that can be preset to the file name with which a user knows he will be working. With this feature, the Personal Computer can help by knowing what is being worked on without incessantly requesting its name.

Graphics and other idiosyncrasies

Care must be taken to find an emulator that understands standard graphics protocol. One cannot assume a graphics-oriented PC will act like a graphics terminal. Microsystems Co.'s Cali implements an emulator that provides Regis protocol compatibility to the mainframe host. Also, ID Systems' Teasy can double as a Tektronix, Inc. 4010 graphics emulator.

All of these packages — be they graphics or not — have idiosyncracies that should be examined prior to their selection for product development. Most vendors will gladly send a demonstration kit to a user facility if that facility agrees to pay return postage. This is the best advice: Users should try out the product to explore whether it has the required functionality.

Finally, for those facilities that house hardware products from more than one manufacturer, the terminal emulator option offers additional advantages. Some emulators, such as Communications Research Group's Blast, will standardize communications protocols for about 100 micro-mainframe combinations. Thus, one product can coordinate and organize access to a variety of hardware environments.

Terminal emulators provide management with greater flexibility for making hardware procurement decisions. The only systems for which they are inappropriate are critical real-time applications because users lose the speed of a terminal's firmware; it has been replaced by the portability of software. With a small cost increase, so much more computing power can be obtained with a micro network that terminal emulators can easily be said to outdistance the components they were designed to imitate. ■

Fisher is a systems security manager for a U.S. Air Force contractor at the Western Space and Missile Center.

standard with this version, Ramdisk, H-Ramdisk and print spooler are included. This board would be my choice for the industry standard.

If the Ready compatibility problem with Microway's Megapage proves to be a minor exception, I would wager that the combined matters of purchase price, warranty and power consumption would sway choice for a specific application. For memory pure and simple, the Cramram with its half slot and 4.35W power consumption would look very good; however, its replacement memory chips are special and could take time to obtain even if there is no premium on their price, whereas a growing list of fine additional boards can use the half slot.

In summary, then, the Cramram has major advantages in certain applications only. If a company requires the networking that the Orchid Conquest offers, the choice is easy. But if the clock and ports are more important, price and warranty matters may offer the only justification, within the expanded memory specification, for choosing one manufacturer over another.

AST Research's long experience with memory additions and its participation in the one expanded memory specification version are matters to keep in mind as well.

Finally, if a board like the Orchid 286E is used, it is most important that zero-wait state 2-byte-bus memory be added. Some of these products may be able to use EMS boards, but they will run many times faster from their own extended or expanded memories.

EMS software issues

Two programs must receive mention in the context of an expanded memory review. Windows from Microsoft and Desqview from Quarterdeck Office Systems of Santa Monica, Calif., will become ongoing facts of life for software writers and a great many users.

Because it is from Microsoft, Windows is quite likely to become a standard. This program does not use expanded memory to hold several programs in memory at the same time, as is widely believed. What it does do is provide the option of loading H-Ramdisk in expanded memory and setting Windows to swap programs from DOS memory to this virtual disk.

Also, it runs only one program at a time and requires a graphics capability on the computer for full performance.

Desqview, in contrast, needs the AST/Quadram/Ashton-Tate memory to shine. This program uses no graphics or print drivers of its own but is designed for concurrent processing.

Specific processor and memory advantages arise from the Rampage board's ability both to extend DOS memory and then to switch this extended memory with expanded memory under Desqview's control. The critical hardware issue is installed memory.

Finally, Desqview does actually switch programs up and down in expanded memory without the need of an H-Ramdisk. Under Desqview, the Persyst Supercharger leaves a 128K-byte block open for switched operation. Several sizable programs can run at once with this combination, but the programs in the upper 128K bytes of space will run at normal IBM Personal Computer speed, no faster.

Using the Victor board with its hardware cache disabled, a small motherboard memory would allow several large programs or up to nine small ones to run with one Rampage, while several Rampage boards could allow up to nine large concurrent program to run together. But beware: The processor speed, about double that of the Personal Computer, would be divided among all of these programs.

Softlogic offers an independent, low-cost program that simply switches up to 10 other active programs into and out of expanded memory space for memory-resident lovers.

Processor memory choices

Based on either the tested or claimed properties of the equipment involved, these are my choices:

If floating point were the controlling application undertaken, I would expect Microway's Number Smasher with McGraw-Hill's Maxit expansion board to offer the best speed and the highest compatibility available. I



> ***When IBM's managers set the personal computer standard with the selection of the Intel 8088 CPU chip, they proved they had learned a lesson. While Detroit must virtually reinvent the car every three years, IBM over many years has shown a commitment to upward compatibility.***

would install a 256K-byte cache in the high memory, where speed is not critical, and use the 640K-byte option on the Number Smasher board for the number crunching. But I would not quarrel with the use of any EMS board in place of the Maxit, and if the programs were modest in size, I would not argue against using the Persyst board.

If overall speed in differing applications were most important, I would recommend the Orchid 286E with its 1M-byte daughterboard and a 512M-byte cache in old system memory. For frequent floating-point operations, I would add the 8-MHz Intel 80287.

For conditions that call for one large and several small concurrent programs to be run, I recommend the Persyst Supercharger and the AST Rampage with its bundled Desqview, but I would not object to the Number Smasher used without daughter memory.

If several large programs were to be run concurrently and if a lower level of overall performance could be tolerated, I would substitute the Victor Speedpac with its hardware cache disabled. (The nature of these hardware caches is generally incompatible with Desqview.) I would look more highly on this Victor combination if only the cache would function with Desqview. For floating-point operations in either case, I would add the 8087 or 80287. In both of these cases, I would recommend an expanded memory cache program even though it will reduce memory available to swap applications.

Unlike Detroit

When IBM's managers set the personal computer standard with the selection of the 8088, they proved they had learned a lesson. While I am told that Detroit must virtually reinvent the car every three years, IBM has shown a commitment to upward compatibility.

In the microprocessor world, from its beginning throughout the 1970s, Intel demonstrated a similar commitment. For more than a decade, Intel produced a series of microprocessors whose instruction sets were each a superset of the others. Anyone, with the wisdom of hindsight, can see the importance of this pattern. But Intel broke this pattern with the 80286 CPU chip.

The 80286 chip runs two modes. The first, which Intel calls "real," *almost* perfectly copies the functions of the 8088 and 8086 parent chips. Even with this high degree of similarity, however, incompatibilities still appear between the processors, as virtually all AT users will attest. In its second, "protected" mode, the 80286 no longer operates with an absolute instruction superset of the 8088 and 8086, and compatibility issues can become quite complex. Unfortunately, it is in the protected mode that the 80286 chip exhibits most of its advanced features. Owing heavily to this incompatibility issue, the 80286 is often an underutilized processor.

Creating the 80286 was also a hard-luck project. Perhaps Intel attempted to do too much, but the original 80286 and several subsequent modifications came into being replete with bugs in theory and in operation. Design bottlenecks restricted the chip's original performance levels, and a long series of problems severely impaired its usefulness in the protected mode.

And just now the 80386 is seeing its first silicon. I believe that Intel learned a very important set of lessons from its 80286 setbacks and failures. I also believe that

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> ***The next generation of workstations will probably not call managers in the morning to bring them up to date on overnight developments, but the generation after that just might.***

some of the people on the 80386 project have proved to be unusually gifted. The result is that the 80386 chip promises to become in reality very nearly what it has been in prospect: a giant advance in microprocessor design that still retains access to our huge existing software base.

For illustration, Intel claims 3 million to 4 million instructions per second and 1.8 million Whetstones for boards using the fastest 80386 system — performance levels from several times to scores of times better than the best that the upgraded Personal Computers can be expected to manage. While other producers of microprocessors may claim similar or superior results, none of these alternative designs are compatible with the IBM PC standard. Without compatibility, a new design is generally barred from the current software base and from practical consideration as an IBM PC replacement.

If, as I predict, Intel's design efforts are successful, the full power of the 80386 will be available in a very special "Virtual 86" mode, where most of our current software base will be able to run independently under its own copy of DOS. Using this mode, the 80386-based computer promises to act as if it had a very fast 8086 imbedded within it.

In this environment, virtual memory and concurrent system functions would lie under the control of the 80386-based hardware and its separate operating system, while the pseudoembedded 8086 would run application programs at a very high effective clock rate. Expected performance levels might generally equal that of several of our current Personal Computers running together; for numeric operations, the levels might equal those achieved by dozens of simultaneously operating contemporary PCs.

Actual compatibility in this environment will depend upon both the original programs and the new operating system for the 80386, but users might expect to see — in the next 20 to 40 months — a new personal workstation that will run most of our present software base concurrently, will yield the processor power of a minicomputer and will make obsolete just about anything in the PC field that has come before it. If the next decade's promises of large, reliable electrically erasable programmable read-only memories and read/write compact disks are fulfilled, these personal workstations will come to have megabytes and perhaps tens of megabytes of electronic nonvolatile memory and hundreds of megabytes of disk memory.

The next generation of workstations will probably not call managers on the phone in the morning to bring them up to date on overnight developments, nor will it read them the six- and 12-hour weather forecasts, but with certain software advances now brewing, the generation after that just might.

Dangerously little of this upgrade capability will be suitable for retrofitting to existing PC ATs or clones. With this limitation as a prospect, I strongly recommend upgrading existing Personal Computers and replacing them only when the next generation of equipment becomes cost-effective — possibly two years from now. I also most strongly recommend against acquisitions that cannot be amortized over the next 20 to 40 months. ■



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NEW PRODUCTS

Data Group field service tool debuts

The Small Systems Group of The Data Group Corp. located in Burlington, Mass., has announced the release of Microfieldwatch, a microcomputer-based software package designed for field service management applications.

Developed for the IBM Personal Computer AT and compatibles, Microfieldwatch is composed of two modules: Dispatch-Plus, a stand-alone module for tracking and controlling service calls of all types, and Logistics-Plus, an integrated module for tracking and controlling parts inventory.

According to a company spokesman, Microfieldwatch offers an on-line fully integrated management capability. It can be used as a stand-alone software program or packaged with a specific hardware configuration to provide a complete turnkey system.

The modules are menu driven and feature extensive on-line Help screens as well as documentation. Specifically, the Dispatch-Plus module was designed to guide the service dispatcher through all phases of the service call, including on-line call handling, assignment dispatching and real-time incident tracking.

Logistics-Plus is a closed-loop system that is said to control a company's inventory from its central warehouse to service representatives. It was designed to track parts within a spare-parts network and accommodates both internal parts movement and external parts tracking through outside sources. Logistics-Plus must be used in conjunction with Dispatch-Plus.

Microfieldwatch is priced at $4,000 for a single-user module and $7,500 per multiuser module. It comes with a service and support program that includes preinstallation consultation, hardware and software requirements evaluation and intial as well as on-going training and technical support.

Microfieldwatch is based on the same concepts as the company's Fieldwatch field service management software product for mainframe and minicomputer systems, introduced in 1980.

Lasercontrol 100 bows

Allows HP's Laserjet to emulate seven printers

Hewlett-Packard Co.'s Laserjet printer now can emulate seven other printers with Lasercontrol 100, a $150 software program introduced last month by Insight Development Corp. of Moraga, Calif.

Currently distributed by HP's Direct Marketing Division, Lasercontrol's printer emulation facility provides compatibility between the Laserjet and all IBM Personal Computer software applications programs, according to Insight. These software packages need not specifically support the Laserjet.

Lasercontrol emulates Qume Corp.'s Sprint, NEC Information Systems, Inc.'s 3550, 5510 and 7710, Xerox Corp.'s Diablo 630, Epson America Corp.'s MX-80 and IBM Graphics printers.

Besides printer emulation, Lasercontrol provides menu-driven control of the Laserjet, replacing the need to use complex escape code sequences, the vendor said.

The menu is provided as both a standard IBM PC-DOS application or as a memory-resident program that can be accessed by pressing Shift-Prsc. Both versions of Lasercontrol are provided on the disk.

The menus allow the Laserjet user to set character spacing, margins, number of lines and pages, font cartridge, page orientation (horizontal or vertical) and type style (point, font and pitch).

In addition, the menus let users redirect printer output to another printer or turn the Laserjet into a copy machine that can print up to 99 copies of each page.

Lasercontrol runs on IBM PC, Personal Computer XT, AT and compatible machines with a minimum of 128K bytes of random-access memory and is not copy protected.

The program supports both the Laserjet and Laserjet Plus printers.

Borland unveils Reflex upgrade, Sidekick version for Mac Plus

Borland International, Inc. of Scotts Valley, Calif., has enhanced its Sidekick for the Macintosh to support Apple Computer, Inc.'s Macintosh Plus.

The new version supports the Macintosh Plus' expanded read-only memory and Finder 5.1 system software.

New features include an enlarged and field-sortable Phonebook, autodialing through a modem with either tone or pulse dialing and data transfer from the Phonebook feature to the Macintosh Clipboard.

It also includes an option for a column for dollars and cents in the Quiksheets feature and support for the Epson Corp. family of dot matrix printers and the Thinkjet from Hewlett-Packard Co.

Borland also recently announced an upgrade of Reflex, the Analyst, a relational data base management program that runs on IBM Personal Computers and compatible systems.

The upgrade reportedly includes support for expanded memory under the Lotus/Intel/Microsoft Expanded Memory Specification or AST/Quadram/Ashton-Tate Enhanced Expanded Memory Specification.

Version 1.1 also supports as many as 32,500 records in memory and 250 fields, compared with the 16,000 records and 128 fields permitted under Version 1.

Updates are available from Borland for $10.

The update is available for $19.95 for registered Sidekick owners who bought the product before Dec. 15, 1985.

Registered owners who bought after that date will receive the upgrade and new documentation free of charge.

Registered users who have not purchased Borland's Phonelink communications accessory can get the update with Phonelink for $29.95.

Sidekick for the Macintosh with Phonelink is priced at $99.95.

Concerto line enhanced

Leblond products tune up Symphony

Adding to its Concerto family of products designed to allow users to create add-ins for Lotus Development Corp.'s Symphony software, Leblond Software, Inc. of Indianapolis recently introduced $99 versions of Concerto for IBM's Compiled Basic and Borland International, Inc.'s Turbo Pascal.

Symphony add-ins are programs that attach to Symphony and become an integral part of it. They can either enhance Symphony's current functionality or provide links to other programs or computer systems. Concerto products allow developers to design add-ins using high-level programming languages rather than assembly language.

According to a company spokesman, Concerto's high-level language allows users to take advantage of Symphony's built-in hooks.

Basic Concerto, released last September, allows developers to use interpreted Basic to design Symphony add-ins. Compiled Basic Concerto lets developers use Microsoft Corp.'s Quickbasic Compiler or IBM's Basic Compiler Version 2. Pascal Concerto works with Borland's Turbo Pascal.

Leblond also is designing software to run with Lotus' 1-2-3. Leblond will offer Concerto versions for 1-2-3 in the same languages offered for Symphony, with products expected later this year.

General Parametrics' Videoshow gets presentation software, printer

General Parametrics Corp. of Berkeley, Calif., has announced two products designed to enhance the capabilities of Videoshow, its microcomputer-based presentation system.

The first product is a version of Freelance, a presentation software product from Graphic Communications, Inc., and the second is the Xerox 4020 Color Ink Jet Printer from Xerox Corp.

Freelance for Videoshow features a symbol library with almost 400 symbols and images as well as draw capability. According to a company spokesman, Freelance allows the presenter to produce not only professional-quality business graphics but custom images such as logos as well.

The Xerox 4020 Color Ink Jet Printer provides Videoshow users with color output for reprints, handouts and color transparencies.

Freelance for Videoshow is priced at $395. The Xerox 4020 Color Ink Jet Printer costs $1,495.

According to the vendor, the Videoshow product line of hardware and software is a complete business presentation system, offering output options in different media from video to slides to hard copy.

Videoshow products utilize a proprietary technology developed by General Parametrics, said to enable them to use 1,000 colors on the screen and to display high-resolution images.

INSIDE

Software & Services/82
Microcomputers/82
Communications/102
Systems & Peripherals/104
Price Reductions/104

SOFTWARE & SERVICES

Systems software

Applied Data Research, Inc. has enhanced its **ADR/Roscoe** on-line programming system to be used in MVS environments.

New features in the Roscoe Programming Facility (RPF) permit internal subroutines and allow direct reading of Roscoe library members into RPF variables. Multiple Roscoe commands can now be saved as they are executed, listed and recalled to allow changes and re-execution.

Other features include extensions to the Response Time Monitor and enhanced capabilities in the communications facility. Also the Extended Time Sharing option has been enhanced.

Roscoe costs $60,400.

Applied Data Research, CN-8, Rt. 206 & Orchard Road, Princeton, N.J. 08540.

Applications packages

The Acme Computer Co. has ported its **Linear Optimizer** general-purpose linear programming package for personal computers to the Plexus Computers, Inc. family of supermicros under Unix System V.

The package consists of an integrated matrix generator said to accept a formula-oriented matrix generation language, including features such as read and write statements and conditional expressions; a solution procedure, which is a primal or dual simplex algorithm operating on a sparse matrix representation; and a report writer.

Linear Optimizer is priced at $1,000.

Acme Computer, P.O. Box 51193, Seattle, Wash. 98115.

■

AGS Management Systems, Inc. has ported its **PAC III** project management system to the Digital Equipment Corp. Microvax II.

PAC III is said to be capable of handling projects with many thousands of activities, resources and network relationships, including software engineering, the design of electronic components and development of drug compounds.

Previously PAC III was available on large mainframes from IBM and DEC.

PAC III is priced at $30,000. Plotter software for drawing wall-size network and bar charts and color graphics software are available for $4,000 each.

AGS Management Systems, 880 First Ave., King of Prussia, Pa. 19406.

■

Gateway Design Automation Corp. has introduced **Stafsim**, a statistical fault analysis software package said to provide digital circuit coverage as well as a logic simulator.

Stafsim covers potential circuit faults, including those that occur at the inputs of circuit elements. It offers interactive logic simulation and primitives for functional, gate and switch-level simulation.

Stafsim was designed to be machine independent. Versions are currently available for Digital Equipment Corp. VAX, Apollo Computer, Inc., Sun Microsystems, Inc. and IBM mainframes. Price ranges from $5,000 to $20,000 per machine.

Gateway Design Automation, P.O. Box 1545, 235 Great Road, Littleton, Mass. 01460.

Training software

Computer Systems Research, Inc. has introduced a new version of its **self-study, computer-aided instruction courseware** package, designed to teach the fundamentals and use of IBM's JES3 operating system.

According to a company spokesman, the package has been expanded from 39 to 42 lessons and includes more examples and questions as well as expanded information.

It runs on either an IBM Personal Computer equipped with the vendor's Trainer 4000 Presentation System or on a mainframe that utilizes IBM's Interactive Instructional System.

The package is priced at $1,500 per course.

Computer Systems Research, P.O. Box 45, Avon Park S., Avon, Conn. 06001.

Services

Compuserve, Inc. has added access to an additional 700 data bases through its **Compuserve Information Service.**

The data bases are made available to subscribers through Iquest, a gateway service developed by Compuserve and Telebase Systems, Inc. Subjects range from business and technology to humanities and social sciences.

The data bases fall into two categories: full text and bibliographic. Searching a full-text data base provides up to 15 titles per search. Bibliographic data bases show up to 10 citations per search.

Subscribers pay $7 per search in addition to connect charges of $12.50 per hour during business hours and $6 per hour during nonbusiness hours.

Compuserve, P.O. Box 20212, 5000 Arlington Centre Blvd., Columbus, Ohio 43220.

MICROCOMPUTERS

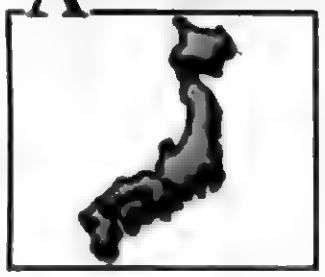
Software applications packages

McDonnell Douglas Information Systems Group has unveiled **FM/PC**, a facility management software system for the IBM Personal Computer.

The system, developed by Re-

Continued on page 84

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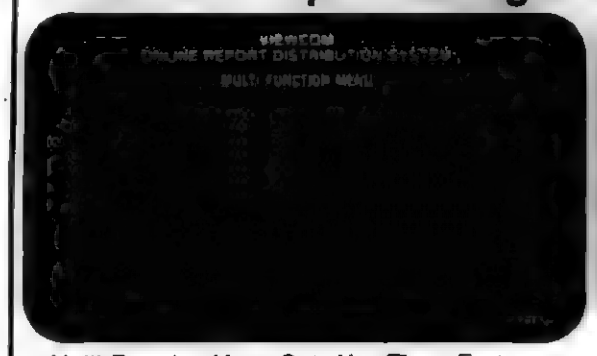


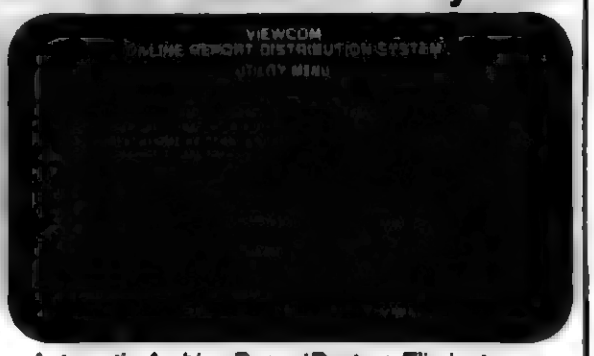
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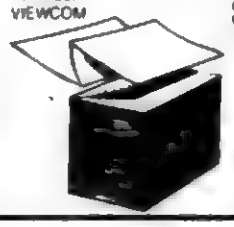
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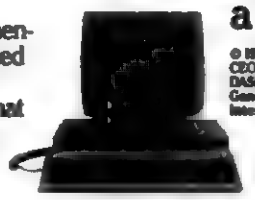
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NEW PRODUCTS/MICROCOMPUTERS

Continued from page 82

source Dynamics, Inc., operates in conjunction with the McDonnell Douglas computer-aided design product, Graphics Design System. It includes a relational data base and five facility planning functions: inventory, forecasting, affinity optimization, stack planning and lease management.

FM/PC is priced at $19,000.

McDonnell Douglas, P.O. Box 516, St. Louis, Mo. 63166.

■

McDonnell Douglas Communications Industry Systems Co. has announced **Microcube**, personal computer software for financial planning.

Designed for use on IBM PC-DOS- and Microsoft Corp. MS-DOS-compatible systems, Microcube is a fully integrated system for organizational modeling and business planning.

It offers a spreadsheet that organizes data into rows, columns and pages. The product can spread a year-end forecast over the months of a given year. It color codes values that have been input, locked, recalculated or left unchanged.

Microcube costs $1,200.

McDonnell Douglas, Suite 200, 7535 E. Hampden Ave., Denver, Colo. 80231.

■

American Business Computer Development Systems, Inc. has ported its **Workstation Basic** programming environment to the Santa Cruz Operation, Inc. Xenix operating system.

The Xenix version provides a consistent DOS-like format. It allows program changes and debugging while in execution, according to the vendor.

All Workstation Basic versions feature full screen entry with color support, unlimited file size, integrated index support and file sharing with record locking.

Prices for the programming environment range from $600 for a one- to four-user run version to $2,000 for a 14- to 19-user full version.

American Business Computer Development Systems, Suite 40, 2489 Rice St., Saint Paul, Minn. 55113.

Jandel Scientific has announced **Sigma Plot**, a software package designed to create publication-quality graphs and charts for scientists.

Sigma Plot features the ability to produce scatter, line, histogram, bar and grouped-bar charts with one- or two-way standard deviation, standard error of the mean and 95% or 99% confidence interval error bars.

Sigma Plot runs on the IBM Personal Computer, Personal Computer AT, XT or compatibles and Hewlett-Packard Co. or compatible plotters. It costs $350.

Jandel Scientific, 2656 Bridgeway, Sausalito, Calif. 94965

■

Tominy, Inc. has introduced the **Mach 1 Professional Application Developer** (PAD) for IBM PC-DOS and compatible computers.

Mach 1 Pad is a single-user system generation facility. It includes a relational/network/hierarchical data base management system, fourth-generation programming language, application program generator, automatic screen editor, report generator, system utilities and flexible query.

Other features include data base definition and creation utilities, menu and screen painting, interactive testing facilities and global directories.

Mach 1 PAD costs $129.95.

Tominy, 4221 Malsbary Road, Cincinnati, Ohio 45242.

■

Graham Software Corp. has announced **Sclaserplus**, a publishing software package for use with IBM Personal Computers or compatibles and Hewlett-Packard Co.'s Laserjet or Laserjet Plus printers.

According to the vendor,

MANAGEMENT
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for THE IBM S/38
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Contact Charles White at:
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NEW PRODUCTS/MICROCOMPUTERS

Sclaserplus integrates formatted text with business graphics and prints them together. The program includes a full-featured text editor, called Scwriterplus, as well as a user-defined icon or symbol editor, a random-access-memory-resident screen snapshot facility and a text formatter.

Sclaserplus is priced at $495.

Graham Software, 212 King St. W., Toronto, Ont., Canada, M5H 1K5.

Electronic Cottage, Inc. has announced **Image Management System Release 4.3**.

Image Management System is a graphics-presentation program for IBM Personal Computers.

The product combines business graphics with computer-aided design and free-form drawing capabilities. It allows images to be modified, combined, moved, copied, scaled and zoomed. Output can be to color monitors, slide cameras, color printers and plotters.

New features include raster-to-vector conversion, Lotus Development Corp. graphic file input, automatic charting of text charts and print files, compatibility with additional device drivers and improved device handling.

The program is priced at $995.

Electronic Cottage, 1842 Union St., San Francisco, Calif. 94123.

Practicorp International, Inc. has introduced **Executive Training Wheels**, a software program designed to provide computer functionality for the nontechnical manager.

The program runs on the IBM Personal Computer and compatibles. It has three parts: Executype, a self-paced program that teaches basic keyboard concepts; Execuwrite, a full-featured word processor; and *The Executive Training Wheels Primer*, a user's manual.

Executive Training Wheels costs $69.95.

Practicorp International, 44 Oak St., Newton Upper Falls, Mass. 02164.

■

Cubicomp Corp. has announced the **Picture Maker/20**, a member of its Picture Maker solid modeling family of three-dimesional computer graphics systems.

The system was designed to create off-line images. Images are stored as computer files that can be transferred to the Picture Maker/30 system through computer networking, disk transfer or cartridge tape.

Picture Maker/20 features 3-D animation and full-color paint software.

Picture Maker/20 is priced at $19,500.

Cubicomp, 3165 Adeline St., Berkeley, Calif. 94703.

■

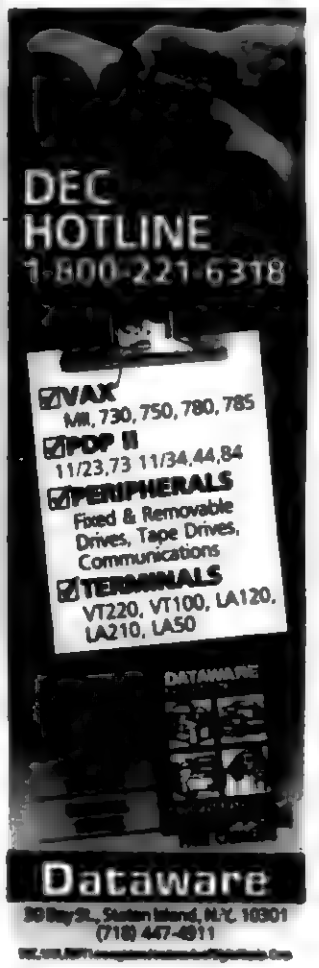
Eastern Benefit Systems, Inc. has announced **Flex/Net**, software for automating the management of employee flexible spending account benefits and **Admin/Net**, an employee data base system.

Flex/Net provides an automated audit trail as it verifies payroll deduction data. It determines claim benefits, prints checks and generates explanation statements.

Admin/Net tracks and sorts employee and depen-

Continued on page 86

BOEING COMPUTER SERVICES
A Division of The Boeing Company
BOEING



Continued from page 85

dent data for benefit records.

Both run on IBM Personal Computers and compatibles and can be used stand-alone or with the vendor's Claim/Net System.

A typical Flex/Net system costs $10,000. Admin/Net costs $7,500.

Eastern Benefit Systems, 200 Freeway Drive E., East Orange, N.J. 07018.

■

Success Software has announced **Schedule Graphics**, a program designed to print custom schedule charts from spreadsheet program files.

Schedule Graphics features graphics bar and milestone symbols for depicting activities and their relationships. Text and symbols can be combined and any time scale can be used to graphically display activity status.

Schedule Graphics runs on IBM Personal Computers or compatibles. It requires a dot matrix printer, and Lotus Development Corp.'s 1-2-3 is recommended.

Schedule Graphics costs $55.

Success Software, Suite 448, 14252 Culver Drive, Irvine, Calif. 92714.

■

Primavera Systems, Inc. has introduced **Finest Hour**, a project management system designed for short-duration, high-intensity projects in the power, process and manufacturing industries.

Finest Hour is an extension of the Primavera Project Planner. It can handle up to 10,000 activities. Up to 15 calendars may be defined in terms of hours and days. It can make hourly adjustments during plant maintenance, retrofits and outages.

Finest Hour requires 512K bytes of memory, a hard drive and Microsoft Corp. MS-DOS or IBM PC-DOS 2 or greater. It costs $5,000. Owners of Primavera Project Planner may swap their current software for Finest Hour.

Primavera Systems, Two Bala Plaza, Bala Cynwyd, Pa. 19004.

■

Gamma Productions, Inc. has announced **Multi-Lingual Scribe**, a multilanguage word processing program for IBM Personal Computers and compatibles.

The program allows users to write in combinations of English, most European languages, Hebrew, Greek, Arabic and Russian.

Multiple alphabets can be written in one file as well as viewed on screen and printed without hardware modification. Bidirectional text is fully supported by all the word processing features. Both ASCII files and Micropro International Corp. Wordstar files can be imported.

Multi-Lingual Scribe costs $184.

Gamma Production, Suite 609, 710 Wilshire Blvd., Santa Monica, Calif. 90401.

■

Applied Publishing Technolgoies has announced **Textplanner**, a typesetting-oriented text editor for IBM Personal Computers and compatibles.

Textplanner is based on the resident text entry module of the vendor's Pageplanner composition and page makeup system. It features split-screen editing, pop-up windows and instant access to all existing files from within a story.

The system supports full pathing of directories. It is compatible with Borland International, Inc.'s Turbo Lightning on-line dictionary and thesaurus.

Textplanner costs $495.

Applied Publishing Technologies, P.O. Box 3568, 1200 29th St. NW, Washington, D.C. 20007.

■

Microsystems Engineering Corp. has announced a personal version of its **Mass-11PC** word processing package as well as corporate and professional versions.

The personal version is suitable for floppy-based or laptop systems and small networks. It offers the same keystrokes and file structure as other versions.

The corporate version requires a hard disk and 320K bytes of memory. It is available for the IBM Personal Computer and the Digital Equipment Corp. Rainbow. The professional version is available only for the IBM Personal Computer with a hard disk.

The personal, corporate and professional versions cost $195, $295 and $395, resepctively.

Microsystems Engineering, Suite 400, 2400 W. Hassell Road, Hoffman Estates, Ill. 60195.

■

Softcraft, Inc. has announced **Laser Fonts**, a laser printer program said to provide fonts, downloading and font editing capabilities.

Laser Fonts includes fonts in sizes ranging from eight to 24 points and a data base of more than 1,500 mathematical and foreign language characters and special symbols.

Laser Fonts works automatically with Microsoft Corp.'s Word and Softcraft Inc.'s Fancy Font and Fancy Word. It runs on IBM PC-DOS and Microsoft MS-DOS computers with the Hewlett-Packard Co. Laserjet Plus, Canon U.S.A., Inc. LBP8A1 and 8A2 and compatible printers.

Laser Fonts costs $180.

Softcraft, 222 State St., Madison, Wis. 53703.

■

AT&T Information Systems and **Innovative Software, Inc.** have an-

Continued on page 90

[redacted]

SAS Institute Inc.
Announces

Lattice C Compilers for Your IBM Mainframe

Two years ago...
SAS Institute launched an effort to develop a subset of the SAS® Software System for the IBM Personal Computer. After careful study, we agreed that C was the programming language of choice. And that the Lattice® C compiler offered the quality, speed, and efficiency we needed.

One year ago...
Development had progressed so well that we expanded our efforts to include the entire SAS System on a PC, written in C. And to ensure that the language, syntax, and commands would be identical across all operating systems, we decided that all future versions of the SAS System—regardless of hardware—would be derived from the same source code written in C. That meant that we needed a C compiler for IBM 370 mainframes. And it had to be good, since all our software products would depend on it.

So we approached Lattice, Inc. and asked if we could implement a version of the Lattice C compiler for IBM mainframes. With Lattice, Inc.'s agreement, development began and progressed rapidly.

Today...
Our efforts are complete—we have a first-rate IBM 370 C compiler. And we are pleased to offer this development tool to you. Now you can write in a single language that is source code compatible with your IBM mainframe and your IBM PC. We have faithfully implemented not only the language, but also the supporting library and environment.

Features of the Lattice C compiler for the 370 include:

- Generation of reentrant object code. Reentrancy allows many users to share the same code. Reentrancy is not an easy feature to achieve on the 370, especially if you use non-constant external variables, but we did it.
- Optimization of the generated code. We know the 370 instruction set and the various 370 operating environments. We have over 100 staff years of assembler language systems experience on our development team.
- Generated code executable in both 24-bit and 31-bit addressing modes. You can run compiled programs above the 16 megabyte line in MVS/XA.
- Generated code identical for OS and CMS operating systems. You can move modules between MVS and CMS without even recompiling.
- Complete libraries. We have implemented all the library routines described by Kernighan and Ritchie (the informal C standard), and all the library routines supported by Lattice (except operating system dependent routines), plus extensions for dealing with 370 operating environments directly. Especially significant is our byte-addressable Unix®-style I/O access method.
- Built-in functions. Many of the traditional string handling functions are available as built-in functions, generating in-line machine code rather than function calls. Your code to move a string can result in just one MVC instruction rather than a function call and a loop.

In addition to mainframe software development, you can also use our new cross-compiler to develop PC software on your IBM mainframe. With our cross-compiler, you can compile Lattice C programs on your mainframe and generate object code ready to download to your PC.

With the cross-compiler, we also offer FLINK86™ and FLIB86™ by Phoenix Software Associates Ltd. The Phoenix linkeditor and library management facility can bind several compiled programs on the mainframe and download immediately executable modules to your PC.

Tomorrow...
We believe that the C language offers the SAS System the path to true portability and maintainability. And we believe that other companies will make similar strategic decisions about C. Already, C is taught in most college computer science curriculums, and is replacing older languages in many. And almost every computer introduced to the market now has a C compiler.

C, the language of choice...
C supports structured programming with superior control features for conditionals, iteration, and case selection. C is good for data structures, with its elegant implementation of structures and pointers. C is conducive to portable coding. It is simple to adjust for the size differences of data elements on different machines.

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NCR introduces a number of innovations.

The 9800.

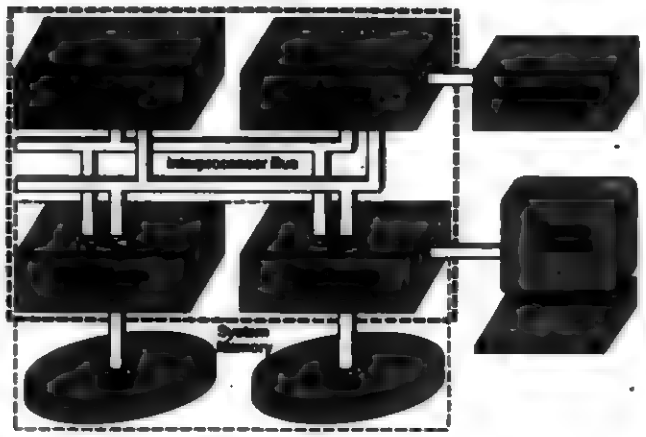
The evolution of the mainframe.

You have probably heard a lot about the computer revolution.

But revolution isn't the best way for a computer to change.

Evolution is. And the new NCR 9800 is a perfect example.

HOW TO BUILD AN EVOLUTION.



The evolutionary architecture in a 9800. Loosely coupled processors, connected by buses, let you upgrade in smaller slices and process faster.

The secret is architecture.

Inside the 9800, we loosely couple powerful application processors (these do the work), with data storage processors (these manage the work flow).

What does this mean to you?

Say your business, like most, processes its transactions in peaks and spurts. A 9800 can handle your work load better and ensure quicker response than a conventional mainframe of comparable power.

You see, we developed a special "system memory" for your most frequently used files. And all the processors can share these files. Automatically. What's more, the processors team up—again, automatically—during these peaks, so the system has the agility to process increased work loads, whenever they occur.

Sounds simple, but conventional mainframes can't do it unless someone writes complicated application software.

With a 9800, it's part of the system.

So the computer is more efficient, more economical, and very flexible.

HOW TO GROW A MAINFRAME.

The 9800 doesn't have to be upgraded in large pieces.

It grows gradually, just the way a business grows.

You start with the power you need, and then you can expand in smaller increments than with conventional mainframes.

You can even add job-specific modules to handle specific functions.

IT'S MORE FAULT-TOLERANT THAN YOU ARE.

Conventional fault-tolerant systems work one of two ways: Either by doing the work twice, which is unproductive, or by using a software solution that slows processing down.

We invented a more efficient system.

Set up a 9800 for fault-tolerance and, if a module fails, other modules take over while continuing to do their own jobs.

It'll run during a processor failure. Or a software failure.

It'll even run during routine maintenance or upgrading.

It's built with 32-bit VLSI technology that has fewer components than conventional technology.

So, the chance of a failure inside the 9800 is very slim.



NCR's highly-reliable 32-bit VLSI processor chip.

Because if something isn't there,it can't break.

THE REST.

The 9800 was built to be an excellent on-line transaction processor and an excellent general purpose processor.

So it can be tailored to do both jobs more economically than conventional mainframes.

It's also an open system.

And it uses SNA and X.25 communications, so it can work together with other computers you may already own.

It comes with popular software tools, like SQL and MANTIS,™ and with C, COBOL, and BASIC languages.

And you have a choice of many ready-to-run solutions for business.

Now, do you read the industry press?

Well, according to them, you can buy a computer like the NCR 9800, with its advanced architecture, that'll be just as flexible and economical from another computer company.

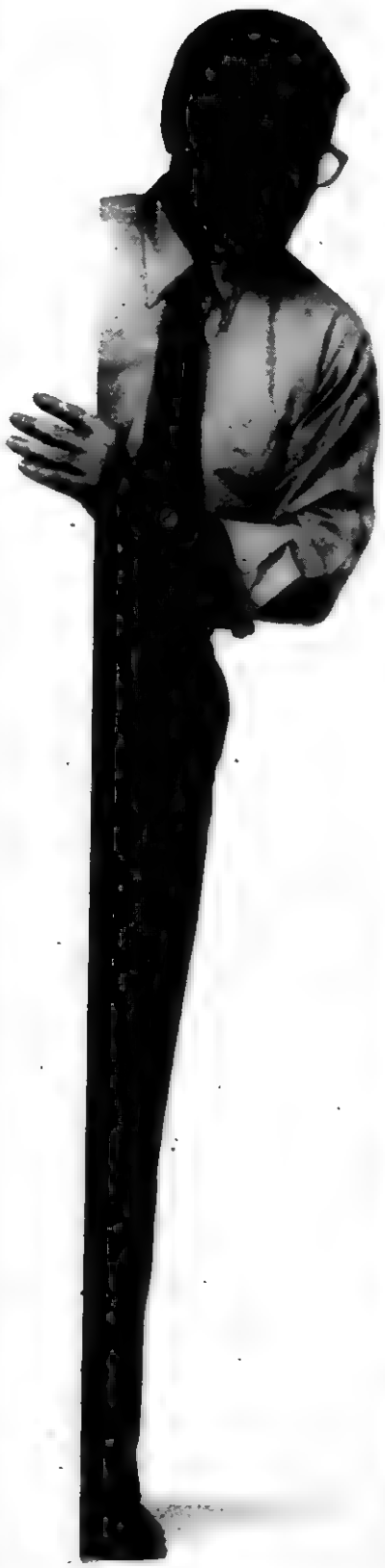
In about 1990.

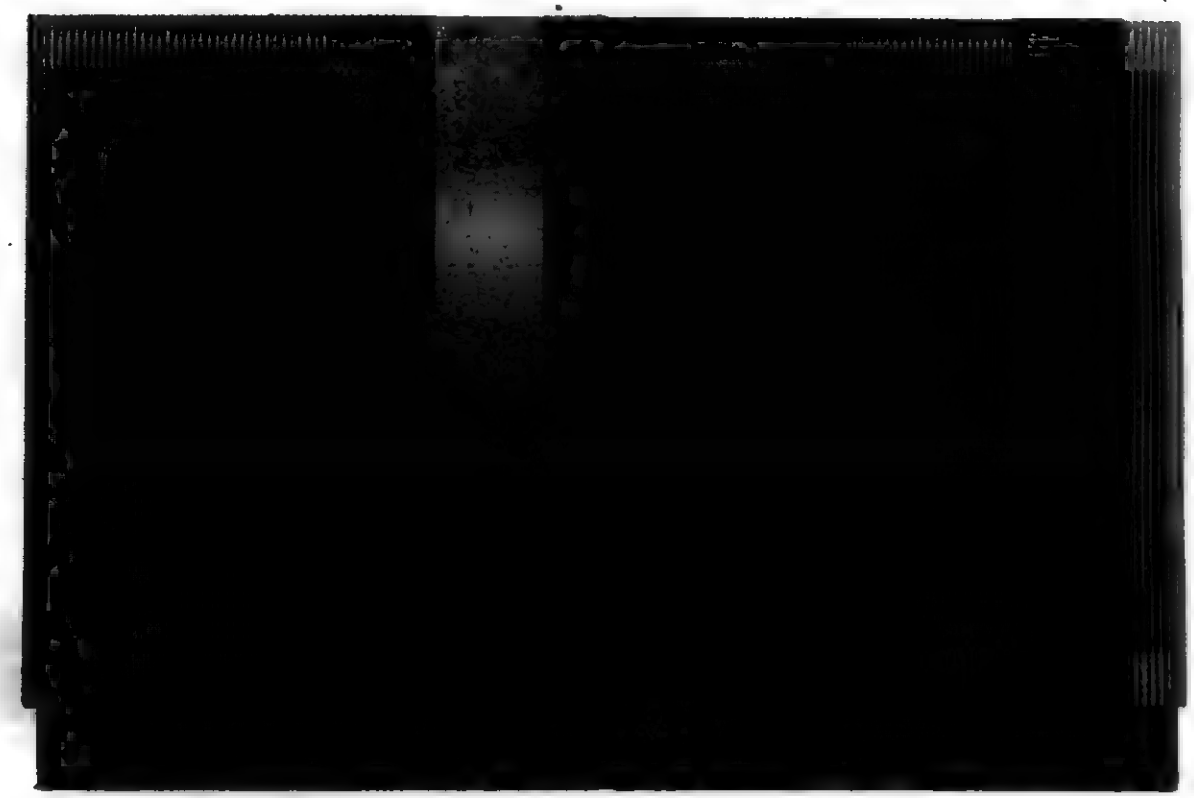
For information, call 1-800-CALL-NCR.

NCR 9800. The evolution of the mainframe.

NCR

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VTAM + NCP

NETSPY™ now offers more to MVS and MVS/XA sites interested in monitoring VTAM host and network response times.

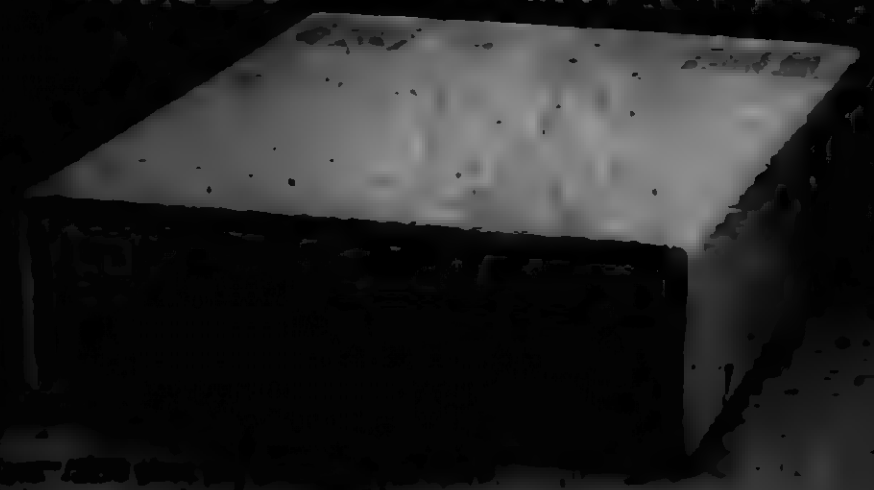
Basic NETSPY
- Provides response time and traffic statistics per application and per terminal.
- Three levels of response time—last, worst and average
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- Makes no modification to either the MVS or VTAM code; is not release dependent

New NETSPY
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LOCAL DATA

NEW PRODUCTS/MICROCOMPUTERS

Continued from page 88

nounced that they will co-label a version of Innovative Software's **Smart Software System** that will run under Microsoft Corp. MS-DOS and Unix.

AT&T will offer the package later this month for their Personal Computer 6300 and 7300 and later this year for the 6300+.

Smart Software System is a series of personal productivity applications. The conversion utility permits files and data to be exchanged between Unix and MS-DOS versions on PC 6300s or on 7300s equipped with DOS 73 coprocessors.

The Unix PC version will cost $895. The data base module costs $495; the word processing module costs $395.

AT&T Information Systems, 1 Speedwell Ave., Morristown, N.J. 07960.

Software languages

Wordtech Systems, Inc. has introduced **Hot C**, a C language compiler.

The basic Hot C package contains the compiler, a C language tutorial, a program editor and a symbolic debugger. Hot C is available for Microsoft Corp. MS-DOS, IBM PC-DOS and Digital Research, Inc. CPM/80 and CPM/86 operating systems.

The product costs $99.

Wordtech Systems, P.O. Box 1747, Orinda, Calif. 94563.

Software utilities

Publisher's Software Network has announced the **Text Indexer**, a program for the IBM Personal Computer said to scan any text file and create complete vocabulary or glossary word lists and an index showing the page numbers where words and topics are located.

The word list can be edited to remove unwanted entries and to add longer or multiple words. It can also be cross-referenced.

The program is priced at $239.

Publishers Software Network, 4314 Sage Circle, Salt Lake City, Utah 84124.

■

Cubicomp Corp. has introduced **True Color Paint**, a 16-bit true-color paint package for its Picture Maker personal computer-based, three-dimensional computer graphics system.

The package is said to enable users to display more than 65,000 colors within a single image. Colors can be blended and portions of an image can be tinted and shaded without affecting picture detail.

True Color Paint costs $3,950.

Cubicomp, 3165 Adeline St., Berkeley, Calif. 94703.

■

JEM Transform Technologies, Ltd. has announcd **Pendulum-RTM**, a product designed to allow personal computers to perform and improve upon the functions of hardware monitors used in measuring mainframe response time.

Pendulum-RTM allows a personal computer to monitor the response time of mainframe computers from companies such as IBM, Digital Equipment Corp. and Hewlett-Packard Co.

Pendulum-RTM costs $395.

JEM Transform Technologies, 14th Floor, 275 Slater St., Ottawa, Ont., Canada K1P 5H9.

■

Knipfty Software has announced **Tight Security Version 2.1**, an enhanced version of its compression and encryption software utility.

Tight Security is said to compress standard ASCII or text files up to 50% of their original size while encrypting the file.

Tight Security runs under IBM PC-DOS or Microsoft Corp. MS-DOS Version 2 or higher. It costs $129.95.

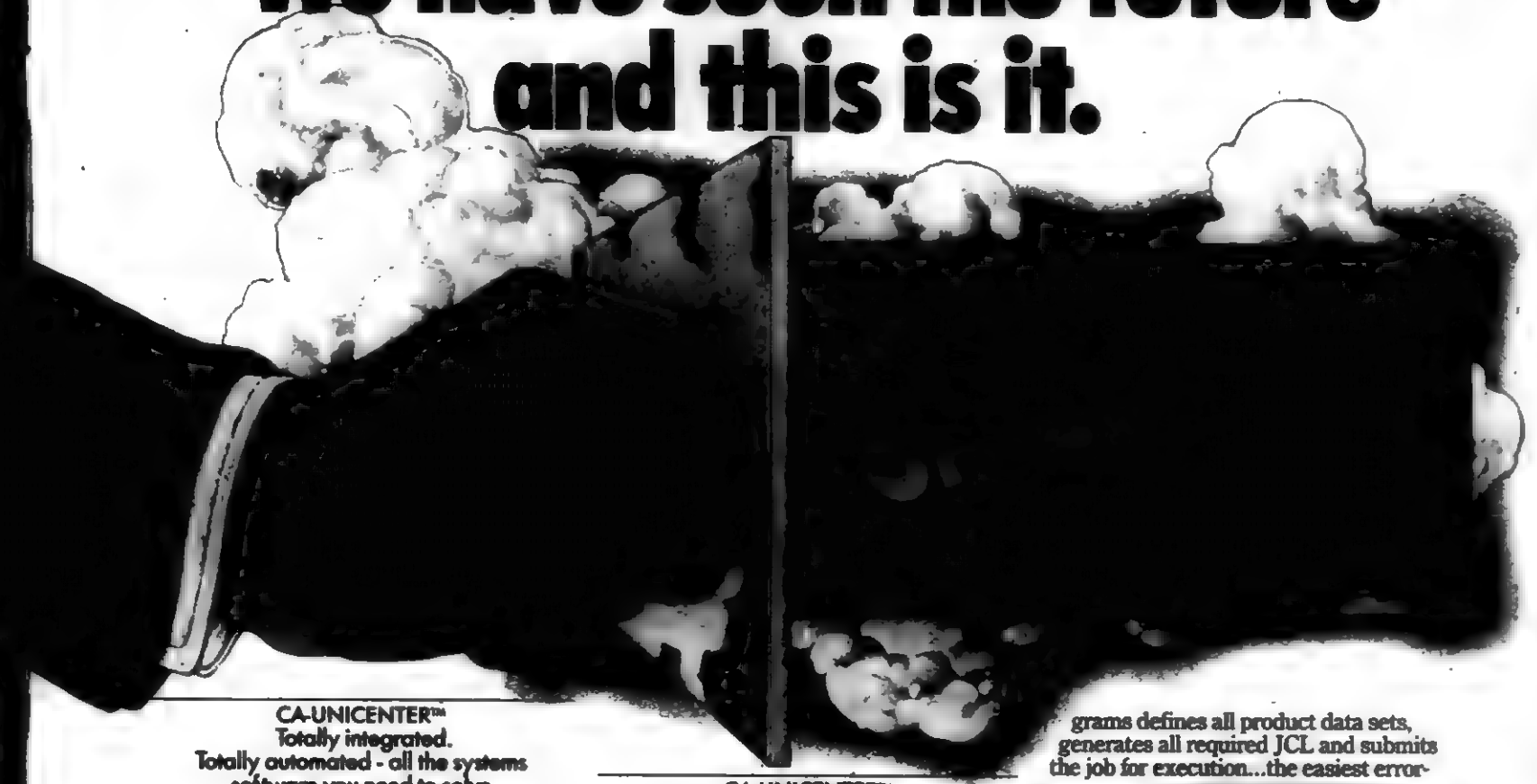
Knipfty Software, 24 Markwood Lane, East Northport, N.Y. 11731.

■

Software Development Factory has announced **Dbfind**, a multipur-

Continued on page 94

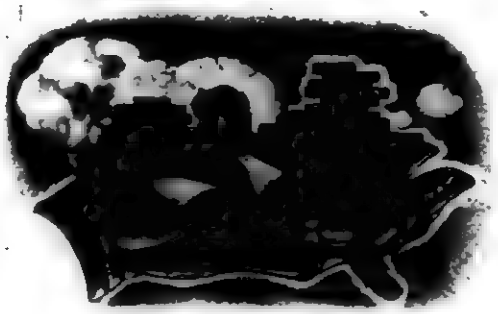
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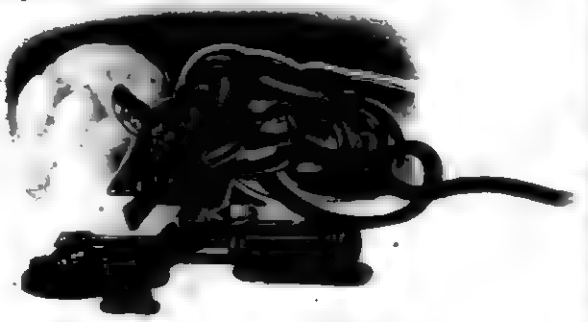
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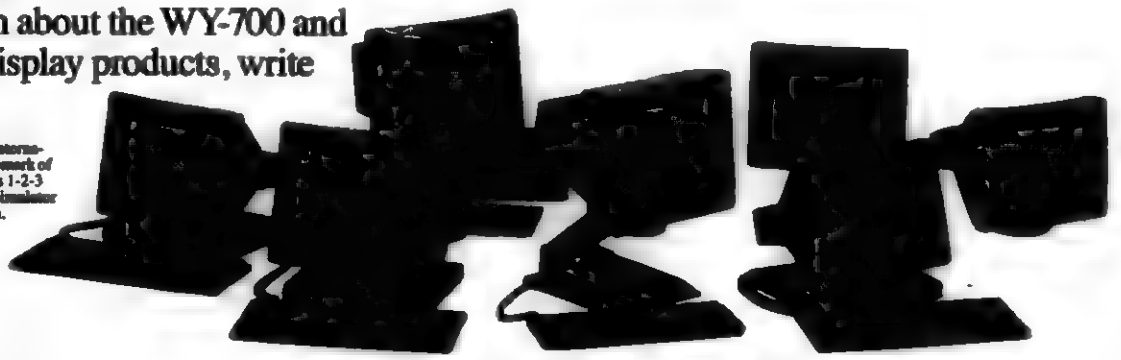
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*Datapro 1985 mid-year terminal shipment update.



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Continued from page 90

pose, professional-caliber programming tool for finding bugs in Ashton-Tate's Dbase command files.

Dbfind is said to list all syntax errors, generate a cross-module cross-reference and generate a single-module cross-reference. It supports either Dbase II or Dbase III.

Dbfind is priced at $99.

Software Development Factory, P.O. Box 1106, Hunt Valley, Md. 21030.

Software enhancements

Lifeboat Associates has released **Run/C Version 2**.

Run/C is a C language interpreter. Version 2 is said to include a fully integrated full screen editor, improved language implementation and performance and built-in graphics functions for IBM Personal Computers and compatibles.

Run/C is available for IBM Personal Computers, Personal Computer XTs, ATs and compatibles or other systems with Microsoft Corp. MS-DOS and ANSI terminal driver. It requires a minimum of 256K bytes of random-access memory.

Including a manual, Run/C Version 2 costs $120.

Lifeboat Associates, 55 S. Broadway, Tarrytown, N.Y. 10591.

■

Zylab Corp. has announced **Zyindex 2**, an enhanced version of its full text search software for IBM Personal Computers and compatibles.

Zyindex 2 is compatible with CD-ROM devices, write-once-read-many optical discs, certain local-area networks and 26 word processors, including IBM word processing protocols.

New features include select searching, the ability to display extended ASCII characters and an annotated mark-and-save capability.

Three versions are available. The standard version, which can search 500 files, costs $145; the Professional version, handling 5,000 files, costs $295; and the Plus version, handling 15,000 files, costs $695.

Zylab, 233 E. Erie St., Chicago, Ill. 60611.

■

Compupro has introduced **CP/M 68K Revision 1.3** an enhanced and updated version of Digital Research, Inc.'s operating system for Motorola, Inc. 68000-type processors.

New features include support for its Spuz 8 MHz slave processor, which allows 8-bit CP/M 80 programs to be run in a Motorola 68000 environment, support for interrupts with full type-ahead character input buffering, a full C compiler and a full Forth-83 language environment.

CP/M 68K Revision 1.3 costs $400. Licensed owners of previous CP/M 68K releases may upgrade for $125.

Compupro, 26538 Danti Court, Hayward, Calif. 94545.

Communications

Torus Systems, Inc. has enhanced its **Tapestry** local-area network software, **Remote Network Link** (RNL) and **Remote Access Gateway** (RAG) and introduced **Advanced Gateway Support** (AGS) and **Torus 3270 SNA Gateway**.

Tapestry Version 1.4, designed for use on Netbios-compatible network hardware or 3Com Corp. Etherlink hardware, offers enhanced external communications, improved compatibility with applications software and improved standard features. The Network Manager Pack costs $495, and the Workstation Pack costs $295.

RNL Version 1.4 provides Tapestry users remote access to the Tapestry network using ordinary phone lines and a personal computer equipped with a modem. RNL costs $295.

RAG configures a Tapestry network so that it may support RNL users. RAG costs $250 per network.

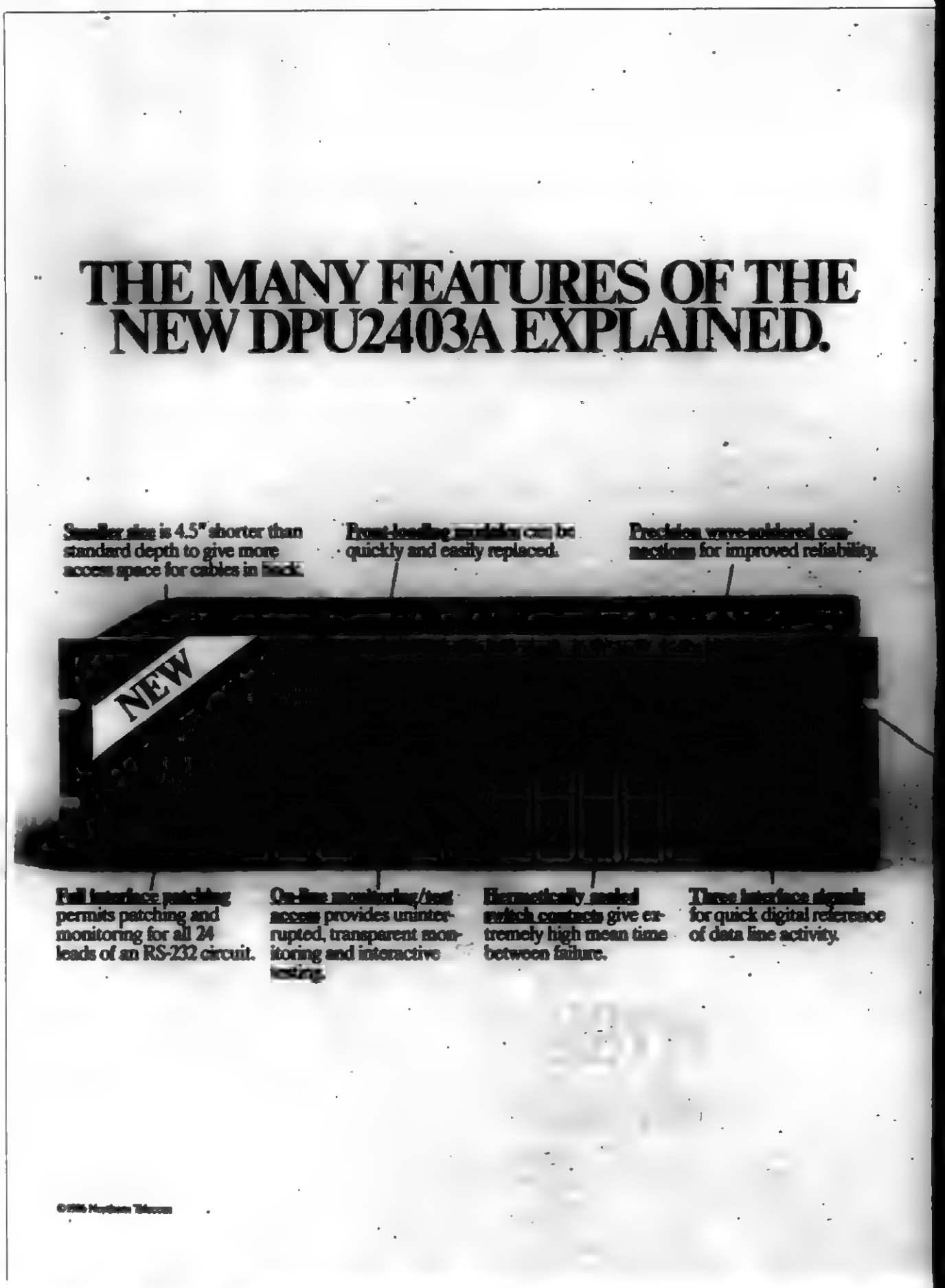
AGS extends the asynchronous communications capabilities of a Tapestry net to provide Digital Equipment Corp. VT100 emulation. It costs $795 per network.

The Torus 3270 SNA Gateway provides up to 32 Tapestry users concurrent access to an IBM mainframe computer. Prices range from $5,495 to $7,495.

Torus, Suite 105, 495 Seaport Court, Redwood City, Calif. 94063.

■

Standard Microsystems Corp. has introduced the **Arcnet-PC200** local-area net-



NEW PRODUCTS/MICROCOMPUTERS

work controller board.

The board is said to allow users to configure a local-area network on IBM Personal Computers or compatibles.

The user can string or daisy chain up to eight network nodes off of a single line. It has a 2K-byte on-board data packet buffer, providing four pages of packet storage.

The Arcnet-PC200 costs $595.

Standard Microsystems, 35 Marcus Blvd., Hauppauge, N.Y. 11788.

Trisystems has introduced the **TC-5251 Twinax**, a twin-axial emulator. TC-5251 Twiunax is said to allow personal computers to communicate to a host through either an IBM 5250 control unit or direct connection to the host with a local attachment.

The TC-5251 Twinax reportedly can be used to communicate with an IBM System/34, 36 or 38.

The hardware and software provide all the features and functionality of an IBM 5251 display station.

According to the vendor, it supports IBM 5224, 5225 and 5256 printers.

It also supports host software as well as applications designed for the IBM 5251, 5291 and 5292 terminals.

The TC-5251 Twinax costs $895.

An optional 3180 keyboard is priced at $329.

Trisystems, 74 Northeastern Blvd., Nashua, N.H. 03062.

Prentice Corp. has announced the **Popcom 2400**, a 2,400 bit/sec. half-card modem for the IBM Personal Computer and compatibles.

The Popcom 2400 is a full-duplex modem featuring automatic adaptive equalization, which adjusts varying phone line conditions to assure accurate data transmission over common carrier lines.

Other features include autoanswer, autodial, automatic bit rate and parity selection, autospeed recognition on answer and automatic call monitoring under software control.

The Popcom 2400 costs $595.

Prentice, 266 Caspian Drive, Sunnyvale, Calif. [illegible]

■

Advanced Computer Technology has announced the **ACT 2000 Telex** board for IBM Personal Computers and compatibles.

The board comes with software that allows users to receive and store incoming telex messages on the disk even while the computer is unattended or being used.

Other features include automatic transmission of previously prepared messages, destination checking and abbreviated dialing.

The ACT 2000 Telex board costs $495.

Advanced Computer Technology, Worcester-Providence Tnpk., Sutton, Mass. 01527.

■

Simware, Inc. has announced **Sim/RTM**, a personal computer-based application said to monitor system response across asynchronous X.25 and IBM 3270 networks.

Sim/RTM can operate in various network configurations including asynchronous networks and Systems Network Architecture and can be installed on both local and remote attached micros.

The software can emulate an IBM 3278 Model 2, Digital Equipment Corp. VT100 or a teletypewriter terminal and can be used to monitor response from any host system.

Sim/RTM costs $425.

Simware, Suite 100, 14 Concourse Gate, Nepean, Ont., Canada K2E 7S6.

■

Adax, Inc. has announced **Callsort**, a call accounting software package that runs on IBM Personal Computers and compatibles.

Callsort allows storage of call information from the phone system while the personal computer is being used for other applications.

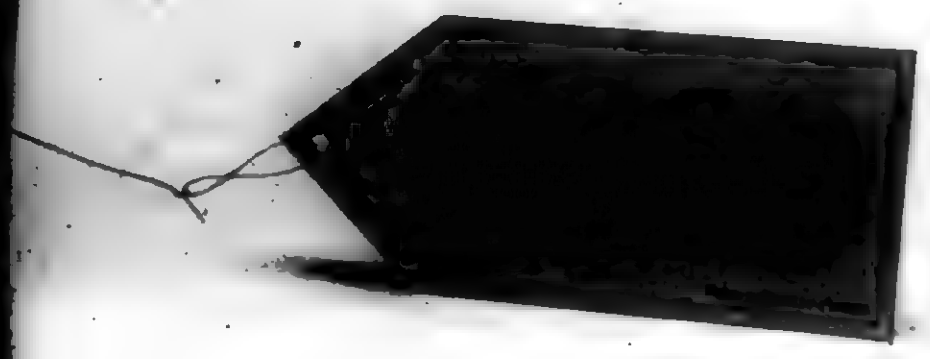
It generates standard reports including compilation by account or authorization code and provides a set of traffic reports. It also allows interfacing to other programs such as Lotus Development Corp.'s 1-2-3.

Callsort features a station directory package and a relative pricing module.

Callsort, capable of handling up to 200 extensions, costs $395. Callsort/1000, capable of handling up to 1,000 extensions, costs $895

Adax, 6961 Peachtree Industrial Blvd., Norcross, Ga. 30071.

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NEW PRODUCTS/MICROCOMPUTERS

Talbott Corp. has announced **Cometlink PC/XT** and **Cometlink PC/AT**, optional packages for its Comet PC/XT and PC/AT designed to allow these personal computers to double as batch terminals for uploading and downloading with IBM, Burroughs Corp., Digital Equipment Corp., Honeywell, Inc. as well as Sperry Corp. mainframes.

Cometlink PC/XT and PC/AT are single packages of hardware and software. They can be used for retrieving and manipulating data from the mainframe for word processing, spreadsheet and data base management applications, according to the vendor.

The Cometlink PC/XT is priced at $2,295. The Cometlink PC/AT costs $3,995.

Talbott, Suite 7, 2545 Chandler Ave., Las Vegas, Nev. 89120.

McDonnell Douglas Computer Systems Co. has announced **Reallink**, a personal computer connectivity software package.

The software is said to allow a Microsoft Corp. MS-DOS-equipped personal computer to be connected to a McDonnell Douglas Computer Systems Reality-based host minicomputer.

It allows PCs to run in terminal emulation mode. It also allows PCs to use the host as a file and print server.

The one-time license fee for Reallink is about $500 per personal computer.

McDonnell Douglas Computer Systems, 17481 Red Hill Ave., Irvine, Calif. 92714.

■

Alloy Computer Products, Inc. has introduced **NTNX**, software that enables the company's PC-Plus multiuser products to support applications software developed to run under Novell, Inc.'s Netware local-area network software.

NTNX supports all applications software for Novell local-area networks that employ Netware's logical record-locking calls. It runs transparently with Microsoft Corp. MS-DOS or IBM PC-DOS 3 or higher on the host personal computer, providing record- and file-locking controls. It also provides global random-access memory disk caching.

NTNX is priced at $395.

Alloy Computer Products, 100 Pennsylvania Ave., Framingham, Mass. 01701.

Data storage

EMC Corp. has announced a **series of memory upgrade options** featuring 256K bytes of random-access memory chips for Wang Laboratories, Inc. VS computers.

According to the vendor, the upgrades enable users to expand the memory capacity of their VS 85 systems up to 8M bytes and VS 100 systems to a maximum of 16M bytes.

The memory boards feature on/off switches, power lights and activity indicators to monitor board-level use.

The upgrades cost $6,000 per 1M byte.

EMC, 12 Mercer Road, Natick, Mass. 01760.

■

CMS, Inc. has announced the **Perfect 10 — CPII** 10M-byte hard disk for the Compaq Computer Corp. Portable II computer system.

The internal disk drive subsystem comes with formatting software and mounting hardware and cables and interfaces with the Portable II's built-in hard-disk controller. The four-head, 3½-in. drive is said to provide 85 msec average access time and replaces one of the floppy drives provided with the computer system.

The Perfect 10 — CPII costs $945.

CMS, 401-B W. Dyer Road, Santa Ana, Calif. 92707.

■

Sigma Designs, Inc. has announced the **Qic 36 Streaming Tape Controller**.

The Qic 36 card is said to use minimal power and fit in a single IBM Personal Computer XT short card slot.

According to the vendor, the con-

Continued on page 100

Why is MODEL 204 the pacemaker for handling larger databases?

Heartbeat response.

When it comes to fast response to queries and updates, there's no database too large for Computer Corporation of America's MODEL 204.

In fact, against the competition, the bigger the database, the better we look. Here's an example:

A large travel agency with 900-plus on-line terminals uses MODEL 204 to maintain information on accommodations and transportation options around the world. In a benchmark simulating 1,000 users, 1,920 complex transactions were made in one minute on the travel agency's 2-gigabyte database. Response time? An average of 1.1 seconds.

The simple fact is, there is no relational-based DBMS that can store more, or handle it faster than MODEL 204, no matter how complex your queries get.

Like one large direct marketing firm that uses MODEL 204 for on-line real time sales tracking and analysis.

Their 10-gigabyte database contains 4,000 fields, of which 3,000 are keyed. Average response time to extremely complex queries of 3,000 or more transactions per minute? Less than 10 seconds. For less complex queries, response time drops to less than 2 seconds.

Heartbeat response. Another way of saying MODEL 204.

Get the facts. Write John Donnelly, V.P. Marketing, Computer Corporation of America, Four Cambridge Center, Cambridge, MA 02142. Or, call 1-800-258-4100, extension 603.

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PRINTERS'

For what you used to pay for a 9-pin printer

When you see our new Pinwriter™ P6, P7 series dot matrix printers, you'll think you're in a time warp.

These are the first 24-pin printers that list for as little as $699. Or about what you would have paid for an ordinary 9-pin printer a year ago.

Now, that's progress. Especially when you consider our new printers have an advanced 24-pin printhead. And print data at 216 characters per second and crisp, dense letter-quality at up to 65 cps. Which is as fast as most 9-pin printers turn out data quality.

Actually these new Pinwriter dot matrix printers surpass every other printer in their price range. In their combination of speed, graphics resolution, the number of built-in fonts and low noise level.

None of which will surprise you if you know NEC printers. Because nobody does more with 24-pin technology than NEC. In fact, we now have more 24-pin printer models than any other manufacturer.

C&C Computers and Communications

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PROGRESS.

now, you can buy
our fully-featured
24-pin printer.

So if you're looking for a printer that will do more and do it better, just progress to your NEC dealer and you'll get it for less than you imagined.

If you would like more details about our full line of 24-pin Pinwriter printers, call 1-800-343-4418 (in MA 617-264-8635). Or write: NEC Information Systems, Dept. 1610, 1414 Massachusetts Ave., Boxborough, MA 01719.



NEC PRINTERS. THEY ONLY STOP WHEN YOU WANT THEM TO.

NEC

NEC Information Systems, Inc.

NEW PRODUCTS/MICROCOMPUTERS

Continued from page 94

troller gives users backup within single or multiple personal computer environments.

The Qic 36 Streaming Tape Controller is priced at $299.

Sigma Designs, 2023 O'Toole Ave., San Jose, Calif. 95131.

Printers/plotters/peripherals

Inmac Corp. has announced the **Universal Data Buffer**, designed as a holding tank for data sent to a printer or plotter.

The buffer is said to work with both serial and parallel interfaced equipment, leaving the computer free for other applications. Two peripherals may be buffered at once. Data may be sent to a plotter and a printer instantly without disconnecting cables.

The 64K-byte Universal Data Buffer costs $385, and the 256K-byte Universal Data Buffer costs $560.

Inmac, 2465 Augustine Drive, Santa Clara, Calif. 95054.

■

BDT Products, Inc. has announced two versions of the **Lettermate I/E** sheet feeder, both compatible with IBM's Quietwriter printer.

The sheet feeders can be added to the existing system. All parts snap together without any modification to either printer or IBM system.

The single-bin Lettermate I/E is priced at $295. An optional second bin may be purchased for $200. The dual-bin sheet feeder costs $495.

BDT Products, 17152 Armstrong Ave., Irvine, Calif. 92714.

■

Summagraphics Corp. has introduced a new version of its **Mactablet** graphics tablet for the Apple Computer, Inc. Macintosh.

The new version is said to provide 12 in. by 12 in. of active work area for all graphics needs, including professional drawings, freehand artwork and mapping. Work can appear on a one-to-one basis or be reduced on a direct scale to the screen size of the Macintosh. Drawings can be input freehand or traced through material up to ½-in. thick.

The Mactablet costs $549.

Summagraphics, 777 State St. Extension, Fairfield, Conn. 06430.

■

Juki Office Machine Corp. has announced the **Juki 6500** printer.

The Juki 6500 offers a maximum print speed of 60 char./sec., 10/12/15 pitch and proportional spacing. It comes standard with a 3K-byte buffer memory, expandable to 15K bytes. It provides special print features such as superscript, subscript, underlining, boldface, shadow printing and graphics capability.

The Juki 6500 is priced at $1,395.

Juki, 299 Market St., Saddle Brook, N.J. 07662.

■

Thomson Consumer Products Corp. has announced the **VM3801DA/DG** 15-in. monochrome monitor.

The monitor supports 132-col. displays and can transform color signals into 16 shades of amber or green. It operates at both 15.7 kHz and 18.4 kHz and can be used with either a monochrome or color graphics card.

The VM3801DG with a green display costs $199. The VM3801DA with an amber display costs $209.

Thomson has also added the ability to receive red-green-blue analog input signals and display up to 4,096 colors to its CM31481VI, CM36512VI, CM36432SI, CM36382SI and CM31311SI monitors at no cost.

Thomson, # 111, 5731 W. Slauson Ave., Culver City, Calif. 90230.

■

Philips Information Systems, Inc. has announced the **Philips Laserprinter**.

The laser printer was designed for the Philips 3004/3005 system but is said to be compatible with most personal computers. It offers seven fonts, including an additional eight-font cartridge, and can provide up to 400 custom-built fonts. It prints at speeds up to eight pages per minute.

The Philips Laserprinter is priced at $4,390.

Philips Information Systems, Suite 300, 15301 Dallas Pkwy., LB 35, Dallas, Texas 75248.

■

Syntest Corp. has announced the **SP-2010 Printer** designed for industrial applications.

The SP-2010 uses a 5-in. by 9-in. dot matrix impact print head driven by a fiberglass rubber belt. It provides an 80-col. print field and bidirectional printing at speeds up to 130 char./sec.

Internal electronics provide full feature control of font size, line and paper feed and dot-addressable graphics.

The SP-2010 costs $985.

Syntest, 40 Locke Drive, Marlboro, Mass. 01752.

■

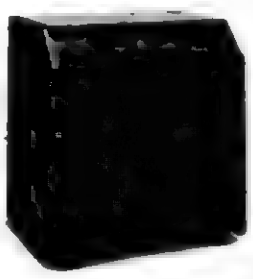
Summagraphics Corp. has unveiled an electronic computer mouse, called **Summamouse**, for use with the IBM Personal Computer and compatibles.

Summamouse features a driver and menu-selection system said to interface with software programs such as Lotus Develoment Corp.'s 1-2-3, Micropro International Corp.'s Wordstar and Microsoft Corp.'s Word. It has three action keys and operates on a 9-in. by 11-in. grid-patterned pad.

Other features include an onboard microprocessor, continual self-



Introducing multiple 3270 host access.



Multiple host access used to mean the expense of multiple controllers. The clutter of multiple displays. And the inconvenience of accessing multiple applications one at a time.

Our solution? Multi-host, multi-lingual network controllers that allow you to access up to four 3270 hosts and 32 Async hosts. And simultaneously view up to four "live" applications on a single Lee Data display.

Lee Data's "single system" approach to multiple host access is your passport to less

NEW PRODUCTS/MICROCOMPUTERS

checking, built-in RS-232C board and solid-state optical technology, according to the vendor.

Summamouse costs $119.

Summagraphics, 777 State St. Extension, Fairfield, Conn. 06430.

■

BDT Products, Inc. has announced **Flipper**, a device designed to keep laser printer pages in sequential order.

Flipper is said to fit most laser printers, according to BDT Products. These printers include the Hewlett-Packard Co. Laserjet and Laserjet Plus and the Canon U A. LBP-8.

According to the vendor, its bin holds 400 pages.

Flipper is priced at $200.

BDT Products, 17152 Armstrong Ave., Irvine, Calif. 92714.

Omnitronix, Inc. has announced the **Ramjet 256K-byte Print Buffer**.

The Ramjet comes with 256K bytes of buffer memory. It connects between the computer and the printer. It is available in either serial or parallel versions and is compatible with standard parallel or RS-232 printers. Features include a pause mode for using single sheets of paper and a power supply.

The Ramjet printer buffer costs $269.

Omnitronix, P.O. Box 43, Mercer Island, Wash. 98040.

■

Printer Products, a division of Capitol Circuits Corp., has announced the **Models S-600** and **S-610** slip and document flat-bed printers.

The printers feature up to 16K bytes of program memory, RS-422A interface and daisy-chain printer select for multiprinter environments. They print the 96-character ASCII set bidirectionally, 40-col. at 12 char./in. and at 3 line/sec. in three print modes.

Other features include top and bottom of form sensors, adjustable document stop, rapid line feed and self-test capabilities.

In quantities of 50, the S-600s cost $684 each and the S-610s cost $716 each.

Printer Products, 25 Denby Road, Boston, Mass. 02134.

■

Sigma Designs, Inc. has announced the **Model ATE-0000** expansion chassis for the IBM Personal Computer AT.

The ATE-0000 features from one to five programmable wait states, full direct memory access memory transfer, on-board erasable programmable read-only memory for configuration table storage and built-in test circuitry.

The chassis provides expansion slots for 10 add-on cards, either 16- or 8-bit, and can accommodate three half-height 5¼-in. peripherals. According to the vendor, ATE-0000 chassis can be linked to a single AT in daisy chain or star configuration.

The ATE-0000 is priced at $2,499.

Sigma Designs, 2023 O'Toole Ave., San Jose, Calif. 95131.

■

Printmanager, Inc. has introduced the **Printmanager Model PM6**, a six-port, printer-sharing system.

PM6 allows users to share lasers, plotters and other serial or parallel printers. One to five microcomputers can provide inputs to PM6's 64K-byte dynamically allocated buffer, which is upgradable to 1M byte.

Features include concurrent bidirectional input and output, 40 character start- and end-of-job messages, front panel selection for configuration, time-out, automatic form feed and end-of-job, handling of 300 to 19.2K bit/sec. rates and cascade mode.

PM6 costs $995.

Printmanager, 108 Water St., Watertown, Mass. 02172.

■

Mitsubishi Electronics America has introduced the **C-8652**, the **C-6679** and the **FG-6600**, three 15-in. high-resolution monitors for engineering computer-aided design and manufacturing workstations.

The C-8652 and the C-6679 offer 0.31mm dot pitch, self-convergence in-line gun, low power consumption and tap-changing power supply. The FG-6600 offers a 0.25mm dot pitch (0.31mm pitch optional), 1.28 by 1K-byte resolution, compared with 1,024 by 780 lines for the other two models.

The FG-6600, C-8652 and C-6679 cost $2,995, $2,495 and $2,195, respectively.

Mitsubishi, 991 Knox St., Torrance, Calif. 90502.

Board-level devices

Verticom, Inc. has announced the **H-16**, a 1,024 by 768 pixel graphics controller.

The H-16 was designed for personal computer-based computer-aided design and drafting applications utilizing the IBM Personal Computer AT and compatibles. It is said to emulate the IBM Enhanced Graphics Adapter, Color Graphics Adapter and Monochrome Display Adapter.

The controller has more than 1.3M bytes of display memory. It offers 16 displayable colors from a palette of 4,096.

The H-16 is priced at about $2,995.

Verticom, 545 Weddell Drive, Sunnyvale, Calif. 94089.

■

Paradise Systems, Inc. has introduced the **Hi-Res Graphics Card**, a video display adapter for the IBM Personal Computer family and compatibles.

The card is said to provide the

Continued on page 102

Plus Async access in a "single system."

clutter, less expense, and easier access to multiple applications.

To learn more about 3270/Async network controllers and other solutions for your growing information network, get the new Lee Data Passport.

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LEE DATA CORPORATION

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NEW PRODUCTS/MICROCOMPUTERS

Continued from page 101

maximum resolution and color from standard IBM color and monochrome monitors. It is compatible with the IBM Color Graphics Adapter, the IBM Monochrome Adapter, the Hercules Computer Technology, Inc. Graphics Adapter and the Plantronics Colorplus cards.

The Hi-Res Graphics Card costs $299.

Paradise Systems, 217 E. Grand Ave., South San Francisco, Calif. 94080.

■

STB Systems, Inc. has announced the **Chauffeur HT**, a video display adapter for IBM Personal Computer-compatible systems.

The Chauffeur HT is said to combine the ability to display standard color graphics adapter software on IBM-compatible monochrome monitors without any drivers with Hercules Computer Technology monochrome graphics and Tseng Labs 132 character compatibility.

The Chauffeur HT runs all color graphics adapter and monochrome printer adapter software on standard red-green-blue color monitors.

The Chauffeur HT costs $349.

STB Systems, Suite 125, 601 N. Glenville, Richardson, Texas 75081.

■

Star Gate Technologies, Inc. has introduced the **MRB-2000**, an expanded memory board for the IBM Personal Computer AT and compatibles.

The board is compatible with multiuser, multitasking operating systems and with systems running at 8 MHz. It is available with zero kilobytes, 512K bytes, 1M byte, 1.5M bytes and 2M bytes of memory.

Prices range from $282 to $872.

Star Gate Technologies, Suite 109, 33800 Curtis Blvd., Eastlake, Ohio 44094.

■

Agile has unveiled **Klone**, a replacement for Digital Communications Associates, Inc.'s Irma hardware.

Klone allows the attachment of an IBM Personal Computer or compatible and an IBM 3270 controller or Display Printer Adapter through an IBM 3270 coax. It features 8K bytes of random-access and display memory for emulating 3278 and 3279 Models 2, 3 and 4 screen formats.

Klone costs $595.

Agile, 4041 Pike Lane, Concord, Calif. 94520.

■

Sigma Designs, Inc. has introduced the **TurboEGA**, **Turbo400** and **Fastcache286** accelerator cards for the IBM Personal Computer and Personal Computer XT.

The Fastcache286 card includes 4K-byte cache memory, optional Intel Corp. 80287 coprocessor and hardware reset switch.

The TurboEGA was designed for general business applications, and the Turbo400 provides high-resolution graphics capabilities.

The Fastcache286, the TurboEGA and the Turbo400 cost $649, $899 and $949 respectively.

Sigma Designs, 2023 O'Toole Ave., San Jose, Calif. 95131.

COMMUNICATIONS

Controllers

Micom Systems, Inc. has introduced its **Micro4900 Digital Transceivers** said to automatically adapt to standard AT&T Dataphone Digital Service link speeds of 2,400, 4.8K and 9.6K bit/sec.

The transceivers combine Data Service Units with Channel Service Units to yield Integrated Service Units. They can operate in point-to-point and multipoint applications and can support synchronous inputs. They are available as stand-alone packages and as card modules.

Prices range from $645 to $725. A central site chassis, capable of holding a mix of up to 16 digital transceivers, leased-line modems and dial back-up units costs $995.

Micom Systems, P.O. Box 8100, 4100 Los Angeles Ave., Simi Valley, Calif. 93062.

Voice/data communications

VMX; Inc. has added several call-transfer features to its **Voice Message Exchange** system.

The enhancements include the ability to dial 0 to reach the operator before or after leaving a voice message when using either the call answering or message desk feature. Also, when a user accesses the voice mailbox he can now dial 001 to receive a dial tone, dial an extension number and initiate a transfer to another extension.

The Voice Message Exchange system ranges in price from $50,000 for a low-end, 100-user, four-port system to $500,000 for a high-end, 8,000-user, 170-port system.

VMX, 17217 Waterview Pkwy., Dallas, Texas 75252.

■

GTE Communications Systems Corp. has enhanced its **GTE Starlog** digital voice and data communication system.

The system is said to switch simultaneous voice and asynchronous or synchronous data at rates of 19.2K bit/sec. and enable users to have customized data bases for every station location.

New features include a complete lodging feature package, key telephone features such as one-touch operation for line or intercom, enhanced data options and expanded line capacity for up to 80 data sta-

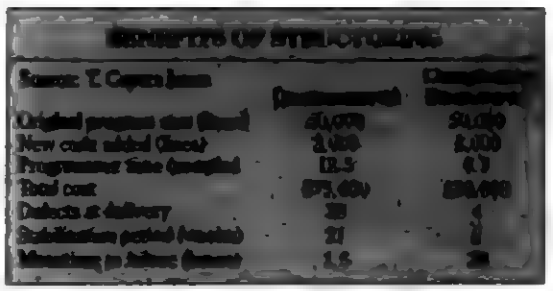
YOU DON'T HAVE A COBOL PROGRAM SO PATCHED AND TANGLED IT CAN'T BE STRUCTURED AUTOMATICALLY.

Until recently, there were only two ways to deal with the patched-up, hand-me-down, unstructured COBOL programs that consume up to 70 percent of your company's software effort.

You could continue to live with the old programs, patching and mending as best you could. Or you could scrap the programs, at enormous cost and disruption, in favor of an entirely new system.

But now there is a third alternative. COBOL structuring. The advantages of this alternative are enormous. Among them, the ability to reduce maintenance costs by 50 percent by more effectively using your programming resources.

The technological leader in COBOL structuring is Language Technology, Inc. In fact, of the very few companies who claim to have a COBOL structuring solution at all, Language Technology is the only one with a system, called RECODER,™ that is fully automatic. The others automate only a portion of the structuring task, leaving the really tough parts to be done manually, over a period of weeks or more, by trained experts, who, because they are human, will make mistakes.



The benefits of structuring are illustrated in this example, representing the costs of adding 2000 lines of new code to an unstructured program of 50,000 lines, as compared to adding the same number of lines to the same size structured program.

Based on proprietary language processing techniques and pioneering research in graph theory, RECODER has reduced the tremendously complex mathematics involved to a provably correct solution so complete that it does not force you to accept its own style of structured code. You can select the level of nesting, type of operators, complexity of expressions, formatting style, representation of procedures, and many other features that might be required by your own in-house standards.

RECODER, available as a service or by license, can automatically structure thousands of lines of COBOL in minutes, without the necessity of adding

NEW PRODUCTS/COMMUNICATIONS

tions according to the vendor.

A typical 64-station, mid-range, fully equipped system is priced from $250 to $275 per line.

GTE Communications, 2500 W. Utopia Road, Phoenix, Ariz. 85027.

Protocol converters

Micom Systems, Inc. has announced the **Micro7881** and **Micro7887** protocol converters for users of the IBM 3270 Information Display System.

The Micro7881 lets asynchronous CRT terminals and personal computers function as IBM 3278 display stations. The Micro7887 lets users replace IBM 3287 printers with any of a variety of ASCII printers with parallel or serial interfaces.

Both protocol converters attach to IBM 3270 control units or integrated display adapters using IBM Type A coaxial cable.

The Micro7881 costs $1,095. The Micro7887 costs $1,495.

Micom, P.O. Box 8100, 4100 Los Angeles Ave., Simi Valley, Calif. 93062.

■

Dynatech Packet Technology, Inc. (Dynapac) has added the **PBX.25 Gateway** to its X.25 Gateway product line.

The PBX.25 Gateway is said to meet the requirements of Northern Telecom, Inc.'s Meridian private branch exchange system. It allows users to link PBXs to form a private network. It offers a way to connect RS-422 PBX ports to a CCITT X.25 packet network or to communications equipment supporting X.25.

The PBX.25 Gateway is available in a 16-port unit for $7,240.

Dynapac, 6464 General Green Way, Alexandria, Va. 22312.

Software

The IMS Group has announced **IMS Telephone Software**, said to enable users to manage and control telephone systems' design, operation and costs.

The software operates from a single data base. It is composed of modules including equipment manager, maintenance manager, cable manager, call accounting manager and message center manager.

IMS Telephone Software is written in the C language. It runs under Microsoft Corp.'s MS-DOS on any IBM Personal Computer compatible. According to the vendor, AT&T Unix System V multiuser capability will be available in June.

IMS Telephone Software is priced at $10,000.

The IMS Group, 219 W. Rhapsody, San Antonio, Texas 78216.

Multiplexers/modems

Flexstar Corp. has introduced the **FS232 Multiplexer**, said to be able to link computers, terminals and printers using the RS-232C serial port of any IBM Personal Computer or compatible.

The unit can multiplex up to 32 devices or demultiplex 32 to one. It simultaneously transmits and receives data and control signals over the host single-port interface serial path with a cable length up to 100 ft. The RS-232C protocol supports commands of request to send, clear to send and transmit.

The 32-port FS232 costs $3,500.

Flexstar, 606 Valley Way, Milpitas, Calif. 95035.

■

Anderson Jacobson, Inc. has announced the **AJ 1411-LD** 14.4K bit/sec. multiport leased-line modem.

The modem is said to provide automatic fail-safe data transfer with automatic dial backup capability when leased lines fail. It also features a built-in time division multiplexer that enables up to six channels to transmit data simultaneously.

The AJ 1411-LD costs $4,995.

Anderson Jacobson, 521 Charcot Ave., San Jose, Calif. 95131.

Test equipment

Hard Engineering, Inc. has enhanced its **Bytebug 645**, a portable data line analyzer that incorporates a 672-char. LCD for full screen display.

The Bytebug 645 is said to operate at continuous synchronous speeds up to 256K bit/sec. half duplex, 128K bit/sec. full duplex or 38.4K bit/sec. asynchronous. The new feature, called Autofigure, enables the 645 to interpret communication line protocols to eliminate the need for entering setup parameters.

The Bytebug 645 comes with X.25 Level 3 analysis and Systems Network Architecture Level 2 analysis.

The analyzer costs $4,500.

Hard Engineering, P.O. Box 4185, Huntsville, Ala. 35802.

■

Fotec, Inc. has introduced the **Model S370** LED fiber-optic test source.

The S370 has both long and short wavelength LEDs for testing dual-wavelength systems and cabling. It has two microlensed LED sources at 820 and 1,300 nanometers. For testing connectorized cables, over 40 different adapters are available. When used with a dual-wavelength fiber-optic power meter, it allows the testing of any multimode cable for computer systems.

The S370 is priced at $1,600.

Fotec, The Schrafft Center, Box 246, 529 Main St., Boston, Mass. 02129.

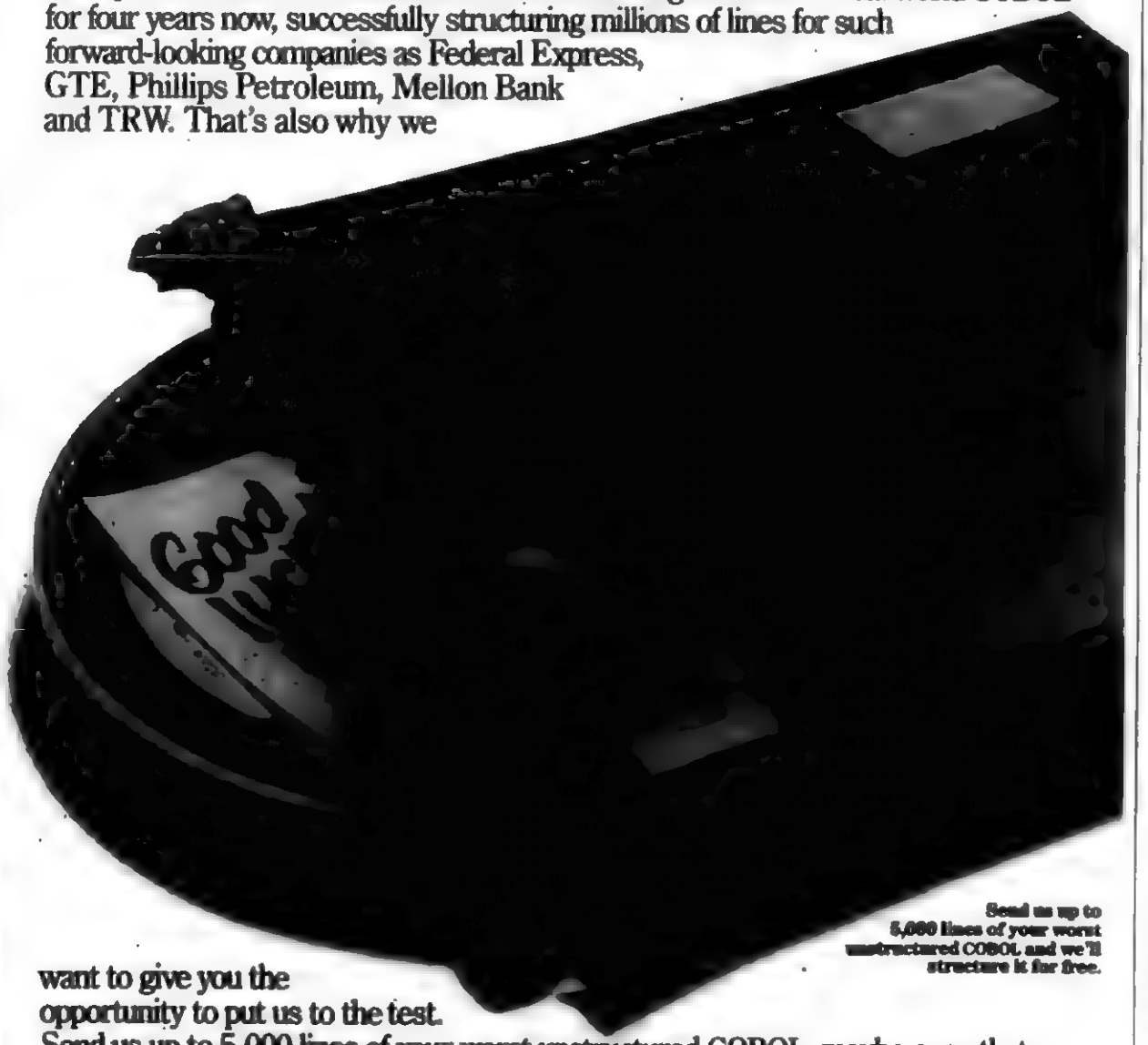
Auxiliary equipment

Electro Standards Laboratory, Inc. has introduced its **Model 8652-D** and **Model 9106** EIA RS-232 A, B, C,

Continued on page 104

consultants or any new people to your staff or of requiring any new skills of the people already on it. And, RECODER can do it with a cost effectiveness that will allow it to pay for itself within a year.

Because you hear a lot of promises from a lot of software companies, we can understand if you are skeptical about what we say we can do. That's why we want you to know that RECODER has been cutting its teeth on real world COBOL for four years now, successfully structuring millions of lines for such forward-looking companies as Federal Express, GTE, Phillips Petroleum, Mellon Bank and TRW. That's also why we



Send us up to 5,000 lines of your worst unstructured COBOL and we'll structure it for free.

want to give you the opportunity to put us to the test.

Send us up to 5,000 lines of your worst unstructured COBOL, maybe even that awful program written by the person who occupied your seat just before you did, and we'll structure it with RECODER for free.

To find out how, call us today at 1-800-RECODER or (617) 741-1507 or write Language Technology, Inc., 27 Congress Street, Salem, MA 01970.

LANGUAGE TECHNOLOGY

THE LEADER IN REDUCING SOFTWARE MAINTENANCE COSTS.

Continued from page 103

D, E, F switches.

The switches were designed to provide the capability to share one computer port among six peripherals or one peripheral among six minis, micros or mainframes. Both models switch all signals at the EIA RS-232 interface.

The Model 8652-D is priced at $395. The Model 9106 costs $495.

Electro Standards Laboratory, P.O. Box 9144, Providence, R.I. 02940.

SYSTEMS & PERIPHERALS

Processors

Sigma Information Systems has introduced the **SA-H124** stand-alone Q-bus system chassis for the Digital Equipment Corp. LSI-11.

The cabinet is said to fit under desktops. It has an eight-row, quad-wide Q-bus backplane that contains 16 dual slots with 22-bit addressing and Q-bus termination.

The SA-H124 is priced at $1,905.

Sigma Information Systems, 3401 E. La Palma Ave., Anaheim, Calif. 92806.

■

Pinnacle Systems, Inc. has announced the **Pinnacle XL020** and **XL020+**, two multiuser supermicrocomputers that incorporate the 32-bit Motorola, Inc. 68020 central processor with dual 68000 I/O processors.

The desktop XL020 supports up to 40 users. It features 2M bytes of random-access memory (RAM), expandable to 4M bytes, with hard-disk capacity from 72M to 290M bytes.

The XL020+ features 4M bytes of RAM, expandable to 16M bytes. Hard-disk capacity ranges from 119M to 860M bytes. It can support 80 users.

Both systems have eight serial ports and two parallel ports. The XL020 costs from $21,000, and the XL020+ costs from $29,900.

Pinnacle Systems, 10355 Brockwood Road, Dallas, Texas 75238.

Data storage

Hewlett-Packard Co. has announced the **HP 7933XP** and the **HP 7935XP**, enhanced versions of its high-end HP 7933H and HP 7935H disk drives.

The enhancement is in the form of a 1M-byte semiconductor memory cache placed in the controller of the 404M-byte drives.

According to the vendor, the controller cache stores the most active data, reducing the number of reads from the disk surface.

The HP 7933XP costs $27,200, and the HP 7935XP costs $29,800. A field upgrade kit costs $3,500.

Hewlett-Packard, .1820 Embarcadero Road, Palo Alto, Calif. 94303.

Power supplies

RTE Deltec Corp. has introduced the **TPC series** of three-phase power conditioners in the 10-kVA to 45-kVA power range.

The models are stepping controllers that offer 50Hz or 60Hz operation. Features include one-cycle response time, surge-current capability to 100% for one cycle, the capability of supporting 100% unbalanced load at output and automatic disconnect in the event of an output overload or phase failure.

The TPC series models are priced starting at $8,595.

RTE Deltec, 2727 Kurtz St., San Diego, Calif. 92110.

Components

Intel Corp. has announced the **iSBC 186/530, iSBC 186/100, iSBC 186/410** and **iSBC Mem/601** single-board products for Multibus II systems.

The 186/530 board is a communications engine that allows multiprocessing systems to connect to Ethernet local-area networks. The 186/100 CPU board uses an 8M-byte 80186 processor.

The 186/410 serial communications computer provides up to 10 channels of serial communications for host communications or direct terminal I/O. The Mem/601 board is a universal-site, nonvolatile memory expansion board.

Prices are $1,995, $2,595, $2,395 and $850, respectively.

Intel, 5200 N.E. Elam, Young Pkwy., Hillsboro, Ore. 97123.

Auxiliary equipment

Marvel Metal Products Co. has introduced a **laser printer cabinet** said to provide a station for a laser printer as well as related supplies.

It has a slide-out drawer with a divided section for font cartridges and an adjustable shelf for storing preloaded paper cassettes.

The laser printer cabinet is priced at $279.

Marvel Metal Products, 3843 W. 43rd St., Chicago, Ill. 60632.

PRICE REDUCTIONS

Thoughtware, Inc. has reduced the price of its **Management Training Library** software system.

The Library is an integrated and interactive training system consisting of 13 programs said to assess individual management skills, organizational effectiveness and personal style interaction.

The programs run on the IBM Personal Computer, Personal Computer XT and AT.

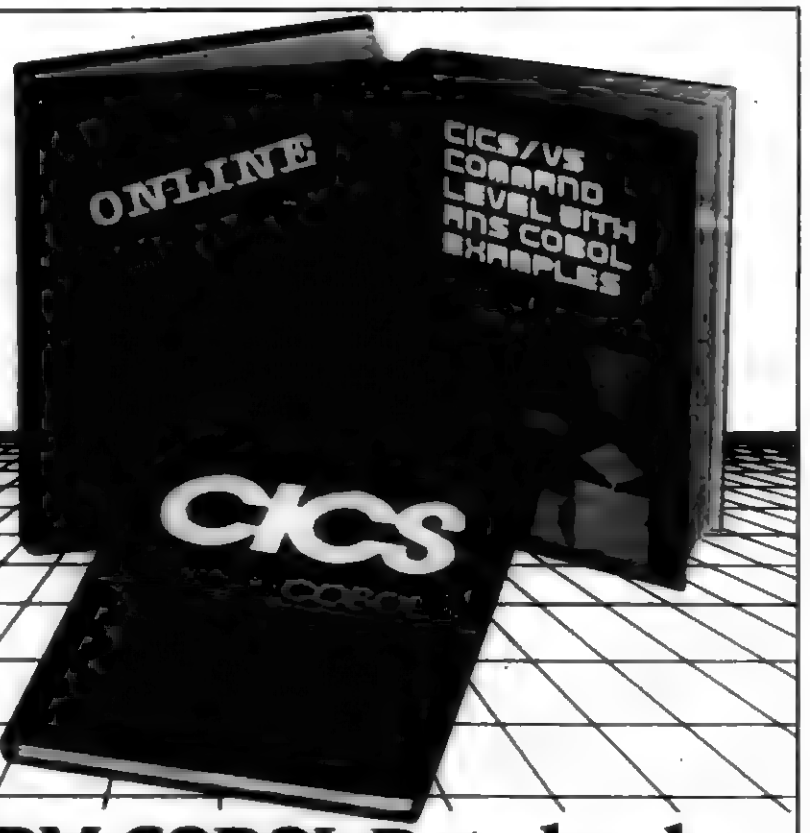
The system is now priced at $999. Each program is available for $99 individually.

Thoughtware, Suite 1000A, 2699 S. Bayshore Drive, Coconut Grove, Fla. 33133.

For the computer professional, these three books applicable to IBM mainframes are a must. But like so many fine books on computer-related subjects —hardware, software, languages, database management, artificial intelligence, and personal computing—they could be costly. That's why you need The Library of Computer and Information Sciences.

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CICS: Mastering Command Level Coding Using COBOL
William G. Bruno and Lois Bosland spell out how transactions are initiated, the role of internal CICS tables and work areas, how to handle abend processing and exceptional conditions, how to format screens using BMS, how to handle files, reading and browsing, adding and deleting, file pointers, and much more. Publisher's Price: $24.95

CICS/VS Command Level with ANS COBOL Examples
Pacifico A. Lim's practical handbook shows how to design and code in a CICS environment. All the tools and techniques necessary for on-line teleprocessing concepts, screen layout, BMS mapping, program components, the linkage section, pseudoconversational coding, and much more. Publisher's Price: $32.95

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Computerworld 1/086 1077

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If you still have questions or would like a product demonstration, simply call **1-800-426-1212, ext. 227.** Or write Codex Corporation, Dept. 707-227, 20 Cabot Blvd., Mansfield, MA 02048.



The new Codex 2680 19200 bps high speed modem.

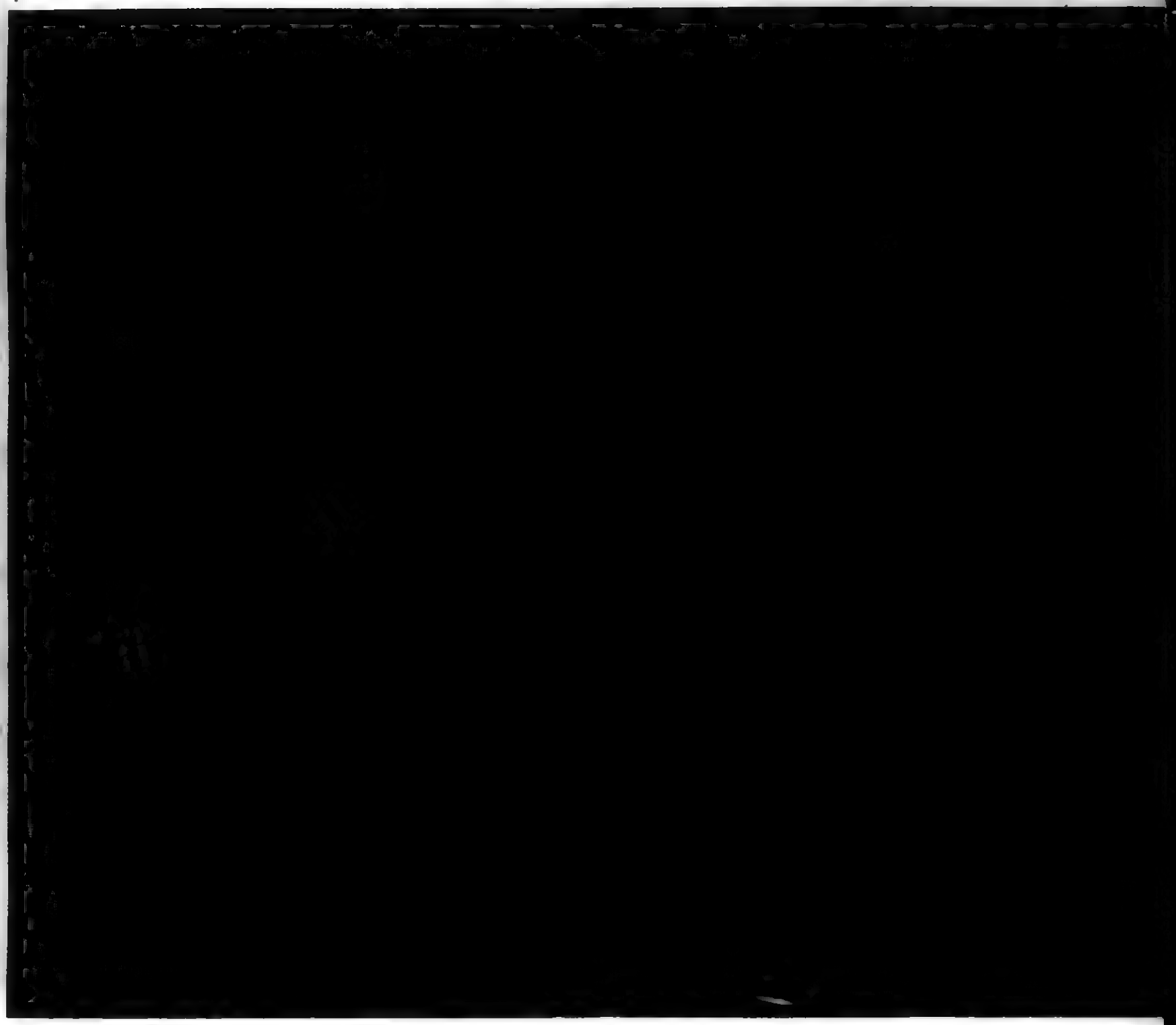
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*Based on average installation and leasing charges for 3002 D1 circuits as of 10/85.

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WITH THE MULTIPLE PERSONALITY.

ily make backup files while you continue on with other things. You can also schedule programs to run while you're away from your machine, so when you return, all the information will be waiting for you. The PC 6300 PLUS even affords you the convenience of sending and receiving electronic mail in the background while you run another program in the foreground.

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NEWS

CALENDAR

WEEK OF MAY 11

MAY 11-14, NEW ORLEANS — **Association for Systems Management (ASM) 1986 Annual Systems Conference.** Contact: Richard B. McCaffrey, ASM, 24587 Bagley Road, Cleveland, Ohio 44138.

MAY 12-14, DENVER — **Optical Storage '86.** Contact: Cartlidge & Associates, Inc., Suite M-259, 1101 S. Winchester Blvd., San Jose, Calif. 95128.

MAY 12-14, MINNEAPOLIS — **PC FAB Expo/Trade Show.** Contact: Shows Department, PMS Industries, 1790 Hembree Road, Alpharetta, Ga. 30201.

MAY 14, WALTHAM, MASS. — **Algorithms and Their Practical Importance to the DP Professional.** Contact: Deborah Dupee, Association for Women in Computing Program Director, Suite 21, 66 Chiswick Road, Brookline, Mass. 02146.

WEEK OF MAY 18

MAY 19, ANNAPOLIS, MD. — **Mapics Users' Conference.** Contact: Salem Corp., 1654 Poplar Lane, Annapolis, Md. 21401.

MAY 19-21, HILTON HEAD, S.C. — **Audit Managers Symposium VII.** Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

MAY 19-21, SAN FRANCISCO — **Hammer Forum West: Change and Continuity in End-User Computing.** Contact: Michael Hammer, Hammer and Co., Five Cambridge Center, Cambridge, Mass. 02142.

MAY 19-21, SAN FRANCISCO — **ID Expo, The Conference and Exposition of Automatic Identification Systems and Keyless Data Entry.** Contact: Expocon Management Associates, 3695 Post Road, Southport, Conn. 06490.

MAY 19-22, PHILADELPHIA — **Lasers in Manufacturing: SPOT '86 Conference and Exhibits.** Contact: Kathleen Warren, Technical Activities Department, Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

MAY 20-22, ATLANTA — **Eastern Telecommunications Showcase.** Contact: Agnes M. Pavel, Program Director, U.S. Telecommunications Suppliers Association, Suite 1618, 333 N. Michigan Ave., Chicago, Ill. 60601.

MAY 20-23, ORLANDO, FLA. — **Techex '86 Americas: The Annual World Fair for Technology Exchange.** Contact: Anne E. Kienner, Dr. Dvorkovitz & Associates, P.O. Box 1748, Ormond Beach, Fla. 32075.

MAY 21-23, NEW YORK — **New York University Symposium on Information Technology and Management Strategy.** Contact: Kenneth C. Laudon, Graduate School of Business Administration, New York University, 90 Trinity Place, New York, N.Y. 10006.

WEEK OF MAY 25

MAY 28-29, WASHINGTON, D.C. — **Systems/34, 36 and 38 Users Show.** Contact: Andrew Wahtera, The Producers, 360 Merrimack St., Lawrence, Mass. 01843.

MAY 29-30, SAN FRANCISCO — **Unix In Focus.** Contact: International Data Corp., 3350 W. Bayshore Road, Palo Alto, Calif. 94303.

MAY 29-31, BLACKSBURG, VA. — **Personal Computer Interfacing For Scientific Instrument Automation.** Contact: Linda Leffel, Virginia Polytechnic Institute and State University, Blacksburg, Va. 24061.

MAY 30-JUNE 2, ATLANTA — **Society of Telecommunications Consultants Spring Conference.** Contact: STC Headquarters, Suite 1410, One Rockefeller Plaza, New York, N.Y. 10020.

WEEK OF JUNE 1

JUNE 2-5, DETROIT — **Vision '86 — Applied Machine Vision Conference and Exposition.** Contact: Vision '86 Public Relations, Machine Vision Association of the Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

JUNE 2-5, NASSAU BAY, TEXAS — **International Symposium on Ada Programming Language Applications for Space Station Development.** Contact: University of Houston — Clear Lake, 2700 Bay Area Blvd., Houston, Texas 77058.

JUNE 4-6, SAN DIEGO — **1986 National Educational Computing Conference.** Contact: Susan M. Zgliczynski, National Educational Computing Conference 1986, School of Education, University of San Diego, Alcala Park, San Diego, Calif. 92110.

JUNE 7, BEIJING — **China-Didacta '86: The International Trade Fair for Educational Equipment.** Contact: Swiss Industries Fair, Secretariat China Didacta '86, P.O. Box CH-4021, Basel, Switzerland.

WEEK OF JUNE 8

JUNE 9-11, MYRTLE BEACH, S.C. — **The Association of Small Computer Users in Education 19th Annual Summer Conference.** Contact: Jack Cundiff, Horry-Georgetown Technical College, Conway, S.C. 29526.

JUNE 9-11, NORCROSS, GA. — **Time and Motion Study Fundamentals.** Contact: Institute of Industrial Engineers Registrar, 25 Technology Park/Atlanta, Norcross, Ga. 30092.

JUNE 9-12, BOSTON — **Network Management/Technical Control**

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NEWS

Conference and Exposition. Contact: CW/Conference Management Group, 375 Cochituate Road, Framingham, Mass. 01701.

JUNE 9-12, CHICAGO — **Com Lease Spring.** Contact: Show Management, 3825-I S. George Mason Drive, Falls Church, Va. 22041.

JUNE 9-13, SAN DIEGO — **MUMPS Users' Group 15th Annual Meeting.** Contact: MUMPS Users' Group, Suite 510, 4321 Hartwick Road, College Park, Md. 20740.

JUNE 10-13, ATLANTA — **Summer 1986 Unix Conference and Exhibition.** Contact: The Usenix Association Conference Office, P.O. Box 385, Sunset Beach, Calif. 90742.

WEEK OF JUNE 15

JUNE 16-20, CAMBRIDGE, MASS. — **Managing Information Technology: New Responsibilities in a Changing Environment.** Contact: Center for Information Systems Research, Sloan School of Management, MIT, E40-193, 77 Massachusetts Ave., Cambridge, Mass. 02139.

JUNE 17-18, PLYMOUTH, MICH. — **Robotic End Effectors: Design and Applications Seminar.** Contact: Mary Dombrowski, Special Programs Division, Robotics International of the Society of Manufacturing Engineers, One SME Drive, P.O. Box 930, Dearborn, Mich. 48121.

JUNE 17-19, ATLANTIC CITY — **Plas-Tech '86.** Contact: Delia Associates, P.O. Box 338, Delia Marketing Communications Center, Whitehouse, N.J. 08888.

JUNE 18-20, TOKYO — **Marketing Opportunities Seminar.** Contact: Agnes M. Pavel, Program Director, U.S. Telecommunications Suppliers Association, Suite 1618, 333 N. Michigan Ave., Chicago, Ill. 60601.

WEEK OF JUNE 22

JUNE 22-27, PHILADELPHIA — **Management Information Systems for Strategic Advantage.** Contact: The Registrar, Office of Executive Education, 200 Vance Hall, The Wharton School of the University of Pennsylvania, Philadelphia, Pa. 19104.

JUNE 23-25, ALBUQUERQUE, N.M. — **Integrated Fiber-Optic Technology Training.** Contact: Linda Castle, Optoelectronic System Consultants, P.O. Box 35525, Albuquerque, N.M. 87176.

JUNE 23-26, BOSTON — **ATE East '86.** Contact: Registrar, Morgan-Grampian Expositions Group, 1060 Commonwealth Ave., Boston, Mass. 02215.

JUNE 23-27, AMSTERDAM — **Fourth Annual European Fiber-Optic Communications and Local-Area Networks Exposition.** Contact: Cheryl MacDonald, Information Gatekeepers, 214 Harvard Ave., Boston, Mass. 02134.

JUNE 23-27, CHICAGO — **A/E/C Systems '86: The Computer and Management Show for the Design and Construction Industry.** Contact: Conference Director, A/E/C Systems '86, P.O. Box 11318, Newington, Conn. 06111.

JUNE 25-26, COATESVILLE, PA. — **Chester County Expo '86: CAD/CAM Conference from Micro to Mini.** Contact: Lee Smith, Central Chester County Vocational Technical School, 1635 E. Lincoln Highway, Coatesville, Pa. 19320.

WEEK OF JUNE 29

JULY 2-3, LAS VEGAS — **Full Meeting of the Design Automation Standards Subcommittee.** Contact: Ron Waxman, DASS Co-chairman, IBM FSD, 9500 Godwin Drive, Manassas, Va. 22110.

WEEK OF JULY 27

JULY 28-30, RENO, NEV. — **1986 Summer Computer Simulation Conference.** Contact: The Society for Computer Simulation, P.O. Box 17900, San Diego, Calif. 92117.

WEEK OF AUGUST 10

AUGUST 11-14, SNOWMASS, COLO. — **AM/FM International Ninth Annual Conference.** Contact: AM/FM International, Suite 820, 8775 E. Orchard Road, Englewood, Colo. 80111.

WEEK OF AUGUST 17

AUGUST 18-22, DALLAS — **Thirteenth Annual Conference on Computer Graphics and Interactive Techniques.** Contact: SIGGRAPH '86, Conference Management, Smith, Bucklin & Associates, Inc., 111 E. Wacker Drive, Chicago, Ill. 60601.

AUGUST 19-21, PHILADELPHIA — **Second Annual Physical and Electronic Security Symposium and Exposition.** Contact: Michael C. Otten, Booz, Allen and Hamilton, Inc., 4330 East-West Highway, Bethesda, Md. 20814.

WEEK OF AUGUST 24

AUGUST 26-28, SAN MATEO, CALIF. — **Interconnect '86.** Contact: Agnes M. Pavel, Program Director, U.S. Telecommunications Suppliers Association, Suite 1618, 333 N. Michigan Ave., Chicago, Ill. 60601.

WEEK OF SEPTEMBER 7

SEPTEMBER 9-12, ANTWERP, BELGIUM — **Second European Simulation Congress.** Contact: The Society for Computer Simulation, c/o Ghislain C. Vansteenkiste, Professor of Engineering, University of Ghent, Coupure Links 653, B-9000 Ghent, Belgium.

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Stratus Computer, Inc., Marlboro, MA 01752

COMPUTER INDUSTRY

Section begins on page 142

GEISCO changes tack, angles toward network applications

Company bailing out of remote services mart, president reaffirms

By Mitch Betts

ROCKVILLE, Md. — General Electric Information Services Co. (GEISCO) executives have a strategy for rebounding from the dismal state of the remote computing services market, but it is a strategy that may take four or five years to pay off.

Since the collapse of the time-sharing and remote services markets in the late 1970s, the General Electric Co. division has been redirecting its business toward providing value-added network applications, such as electronic document interchange (EDI) and automated logistics and payments systems, for specific industries [CW, June 10, 1985].

Walter W. Williams, GEISCO's president, told *Computerworld* in a rare interview that the moves are designed to make strategic use of the firm's worldwide telecommunications network to enter high-growth markets and to avoid the pitfalls of GEISCO's traditional time-sharing business.

Painfully aware that the time-sharing business died because the falling cost of hardware enabled corporations to take data processing in-house, Williams confirmed that he wants to steer clear of that kind of problem in the future.

'A partner to the MIS manager'

"Corporate executives are making more sophisticated demands on MIS departments, so we've become a partner to the MIS manager, rather than the competitor of the past," Williams said. He noted that GEISCO's new business ventures are not dependent on the cost of hardware or storage.



GEISCO President Williams

W. James McNerney Jr., senior vice-president for marketing and U.S. sales operations, said GEISCO foresees strong growth in inter-company transactions, so it is targeting such applications as medical insurance payments and EDI.

For example, GEISCO recently was selected as the preferred EDI vendor by six trade associations in the paper and publishing industries.

Prodding users to recognize benefits

However, analysts and GEISCO officials agree that the firm is leading the market, often in the position of prodding users into recognizing the benefits of the new intercompany applications.

Mark Winther, an analyst with Link Resources Corp. in New York, said GEISCO is betting the company on markets that have not fully developed. EDI, for example, may not provide significant network traffic and revenue for four or five years, he said, and even then may have slim profit margins.

"Their strategy is to get wired into an industry, via EDI or something similar, and then add additional layers of services on top of that. Their profitability is only going to come when they start building things on top of that asset," Winther said.

GEISCO President Williams put it differently: "We're giving birth to pieces of business that are going to be multimillion-dollar markets." Asked if the parent company will support GEISCO while its new business develops, Williams said GE has given his unit "tremendous corporate support" and considers GEISCO an important part of its high-technology portfolio.

The revamped GEISCO is eschewing generic telecommunications services in favor of sophisticated applications that few MIS departments could handle, Williams said.

Consequently, GEISCO is at least tacitly ceding the market for such generic services as packet switching and basic electronic mail to its competitors, including GTE Telenet Communications Corp. and Tymnet/McDonnell Douglas Network Systems Co.

"GEISCO's strategy is obviously not to be the low-cost communications carrier but to be one of the applied communications vendors," Winther said. "Their strengths are in building intelligent applications, like building a cash management system, an order-entry system or a dealer network," he said.

Sophisticated information exchange

Winther agreed with GEISCO officials that most MIS departments will not find it cost-effective to undertake the kind of sophisticated information exchange applications that GEISCO is developing. "They're betting that these applications are beyond the pain threshold of the MIS department," he said.

GEISCO officials also claim that they are offering customers a highly reliable teleprocessing network with

See GEISCO page 114

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Unsure economy stunts progress of software industry

Analyst sees no return to earlier growth rates

By Alan Alper

NEW YORK — Uncertain economic conditions and the inability of many corporations to absorb existing technologies are among the main factors severely stunting growth in the software and services industry, according to the Mountain View, Calif., market research firm Input.

Speaking at a market research panel during ADAPSO's 13th Annual Computer Software and Services Financial Forum recently, Input founder and President Peter Cunningham said the information services industry grew by a paltry 17% last year to $48.5 billion.

Although still growing, that percentage pales considerably in contrast to the industry's historic growth rate of approximately 40% a year.

The prospect for a return to past growth rates this year seems slim, Cunningham said. "I don't see anything in the first quarter that suggests things will improve this year," he noted.

Technology glut

Chief among the reasons for slower industry growth is the continuing technology glut, Cunningham said, which has crimped many end users' abilities to absorb new software products and services.

Much of the new technology already introduced at many corporations has yet to demonstrate to management tangible productivity gains that improve financial results, he added.

Given the slower growth and an economic revival that failed to materialize, Input's Cunningham stated that, despite claims to the contrary, the software and services industry "is affected by the general economy."

In an interview following Cunningham's presentation, Pansophic Systems, Inc. President and Chief Operating Officer William Nelson agreed with the market researcher's analysis.

"The computer industry is a cyclical business," he said. "It's like the auto industry; every time there's a recession, the computer industry will be affected."

Purchase decision procedures stiffer.

One reason for the software and services sector slowdown is that purchase decision procedures at many corporations have become drawn out, Nelson said.

Computer-related expenditures have become a large expense item at most corporations and have therefore come under increased scrutiny by top management, which needs cost-savings justifications before freeing the purse strings.

"Top executives no longer take the computer jock's word that the company needs a new program or system," Nelson said. "If the company has lived without it for the last six to nine months, the executive asks whether the company really needs it at all."

Processing services most affected

Processing services, the largest portion of the information services market, which in past years had grown better than 40% annually, appears to have been most affected by the industry slump. Revenue grew by only 14% to $17.3 billion, Cunningham noted. The professional services market grew only 19% to $7.4 billion last year, he added.

Turnkey software vendors posted collective revenues of $7.4 billion, an increase of only 16%. "These companies suffered the most from efforts by IBM and DEC," which offered competitively priced turnkey engineering systems, Cunningham explained.

While the software products sector grew by 20% in 1985 to $13.3 billion, last year's performance is weak in comparison to the 41% and 30% growth rates registered in 1983 and 1984, respectively.

"What happened here was that those companies which experienced explosive growth in past years ended up overshooting the market last year," Cunningham concluded.

EXECUTIVE REPORTS

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Every issue of Computerworld presents either a Product Spotlight or Executive Report. For advertisers it's still not too late to take advantage of one last topic for May!

In-house Publishing (Executive Report, May 26) Focus on the MIS manager's role in corporate electronic publishing. From host-based systems to departmental networks and stand-alone desktop publishing systems. Looks at integration in host-based systems and the role of the IBM PC and Apple Macintosh. Closing date May 9

And here's what's scheduled for June and July:

ISSUE	TOPIC	CLOSING DATE
June 2	Word Processing Software (Product Spotlight)	May 16
June 16	The BUNCH Companies (Executive Report)	May 30
June 23	Personal Computer Graphics (Product Spotlight)	June 6
June 30	Integrated OA Systems (Executive Report)	June 13
July 7	Data Security (Executive Report)	June 20
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PRODUCT SPOTLIGHTS

GEISCO angles toward networks

From page 113

global reach. Built-in redundancy and daily contacts with clients help to give the network an availability rating of 99.8%, 24 hours a day, according to Raymond W. Marshall, senior vice-president for technology operations.

However, analyst Winther said that GEISCO's network has lagged behind the other X.25 networks in supporting various conversion capabilities and putting intelligence in the nodes.

"So while it's the largest network in the world, in terms of its value-added features, it's not as wide-ranging as the others," Link Resources' Winther said.

BASF

Tandy, Apple show their age

From page 142

panded sales, but from a decrease in expenses, the result of automation and layoffs.

If sales continue their downward trend at Apple, what are the long-term prospects for a company whose two major microcomputers are not IBM compatible and whose Apple IIe uses an 8-bit technology introduced in 1977?

Without IBM Personal Computer compatibility, the Macintosh cannot win in the corporate marketplace, the only hot market in the industry right now. Apple is talking about linking its machines with other vendors' minicomputers and marketing the Macintosh to large businesses for desktop publishing.

However, most business micros still run in stand-alone mode, and IBM-compatible software is becoming increasingly available for IBM PC desktop publishing.

The Macintosh "simply has not obtained the momentum required to sustain it as a serious alternative to the IBM PC and compatibles in the business market," summarized industry analyst William Zachmann of International Data Corp. in a recent report.

'A tough Christmas for the Apple II'

As prices fall on the IBM PC and the Asian PC clones, both the Macintosh and Apple's cash-cow Apple II, an 8-bit machine that debuted in 1977, are likely to be severely harmed. "I suspect the last quarter of 1986 may make for a tough Christmas for the Apple II," Zachmann observed.

If Apple's long-term profitability seems questionable, the picture is bleaker at Tandy. Like Apple, Tandy cut its teeth in the home market. But Tandy's low-end offerings, such as the Color Computer II, are being blown away in the home market by more sophisticated newcomers such as Commodore Ltd.'s 125.

Worse yet, according to the Paine Webber report, Tandy's gamble for a share of the PC-compatible market — the Model 1000 — is selling almost solely to small business and home users.

Tandy feels retail pinch

Although Tandy never lived to fight for retail shelf space, the company is now feeling the pinch of operating some 450 computer retail stores at a time when the retail shakeout is still under way.

To compound Tandy's misery, 1986 will be a year marked by intense PC price cutting. Some analysts estimate an IBM PC will cost about $1,500 by the year's end, and Asian-made PC clones will sell for $800 in December. Indicating that it is already feeling the heat, Tandy recently put its IBM Personal Computer XT work-alike on sale for $1,599.

While it may seem outrageous, the answer to Tandy's need for new proprietary PC technology could be rather simple: Acquire either Commodore or Atari Corp.

Amiga could give Macintosh a run

Commodore, in particular, is saddled with millions in debts and yet has a machine, the Amiga, that could, in the right hands, give the Macintosh a run for its money.

As for Apple, the solution for the short run is to give the Macintosh optional IBM compatibility and, in the long run, to replace the IIe with a Macintosh-like PC selling at about the same $1,000 price.

Apple, in fact, is expanding its offshore manufacturing capacity and may have just such a move in mind.

ITC throws hat into commercial marketplace ring

By Mitch Betts

McLEAN, Va. — Iverson Technology Corp. (ITC), a systems integrator best known for landing government contracts at military and intelligence agencies, has announced an expansion of its marketing team in order to enter the commercial marketplace.

"Our decision to expand into the commercial integration field will carry us into the Fortune 1,000 companies, as well as the total government market," said Donald D. Iverson, chairman and chief executive officer.

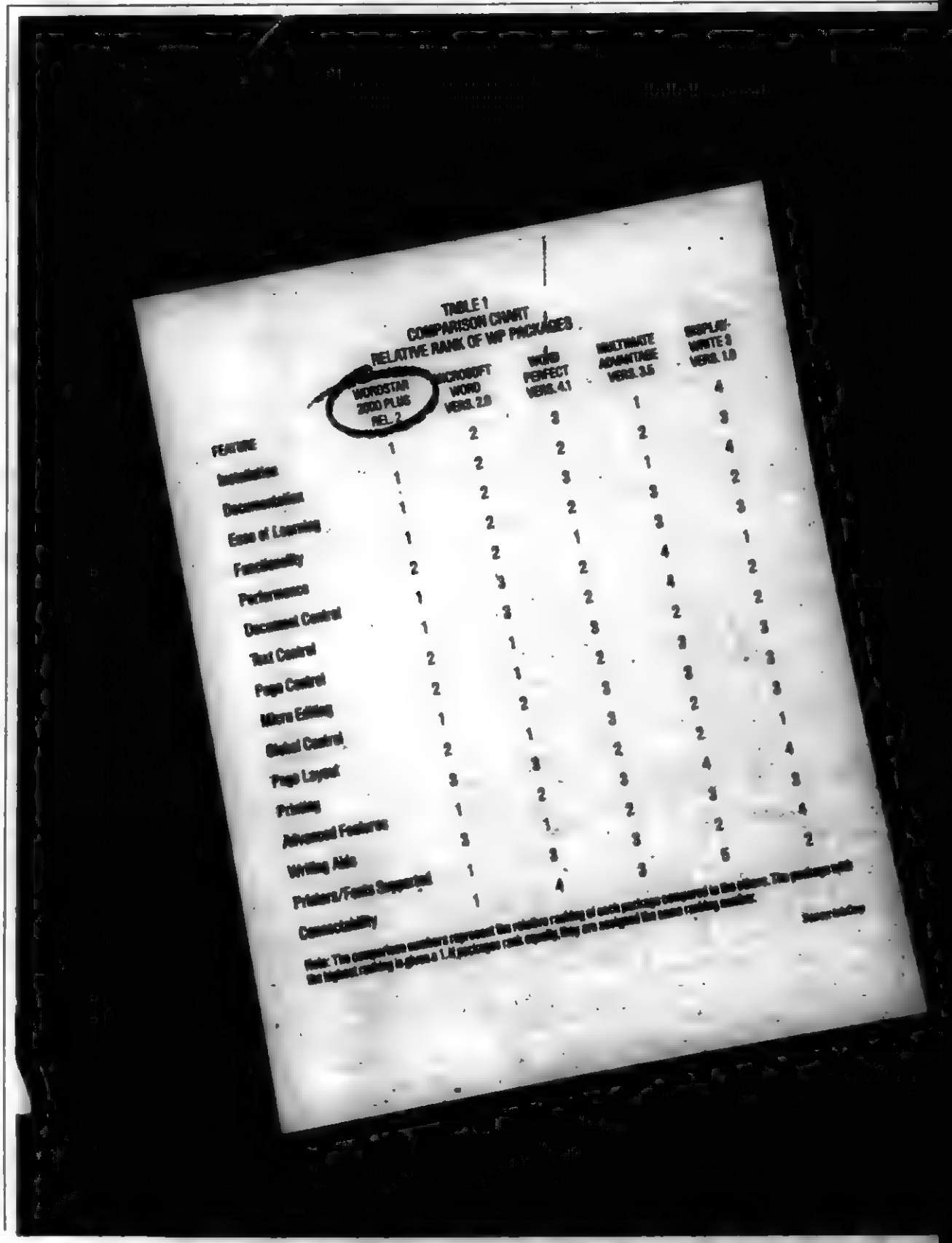
The systems integration firm has enjoyed rapid growth fueled by government contracts, primarily for systems that meet the Tempest security standard issued by the U.S. Department of Defense. Tempest equipment is shielded to prevent emissions of electromagnetic radiation that would disclose sensitive information.

The firm, founded by Iverson in 1978, went public in July 1985.

ITC stocked its marketing division with several former IBM salesmen. Kenneth E. Wylie, a former IBM and Masstor Systems Corp. marketing official, will head the division as senior vice-president of marketing.

Reporting to Wylie will be Barry S. Josephson, vice-president for federal marketing, and R. Joseph Market, vice-president for commercial marketing. Both men had extensive experience at IBM, ITC reported.

In addition, Edward K. Wachter joined ITC as vice-president of programs to manage a bid-and-proposal team and to establish the firm as an OEM of printers, plotters and optical character readers, ITC announced. Wachter came from Lockheed Electronic Co.'s Washington, D.C., office.



5¢ NICKELS AND DIMES

Masstor Systems Corp. reported a net loss of $9.8 million, or 61 cents per share, on revenue of $2.4 million for the year ended Dec. 31, 1985. This figure compares with a net loss of $17.4 million, or $1.11 per share, on revenue of $26.3 million in the previous year.

■

Icot Corp. announced revenue for the fourth quarter ended Feb. 1 of $12.4 million, compared with $6.2 million in the corresponding period a year earlier. Profits for the quarter were $1.7 million, or 18 cents per share, compared with $188,000, or 2 cents per share in the previous year.

■

Softech, Inc. reported revenue of $11.3 million for the third quarter of fiscal year 1986, a 26% increase over the same period a year earlier. Net income for the third quarter ended Feb. 28 was $578,717, or 16 cents per share, compared with 6 cents per share in the third quarter of the previous year.

■

L. M. Ericsson reported revenue for the year of $4.2 billion, up 11% over 1984. Income per share, after taxes paid and after estimated deferred taxes on appropriations, was $1.99, compared with $2.62 in the previous year.

Income before appropriations and taxes during 1985 amounted to $115 million, down from $206 million in 1984. Capital gains on sales of shares and property account for $43.7 million of this income.

■

Avant-Garde Computing, Inc. reported for the third quarter ended Jan. 31 a net loss of $1.3 million, or 35 cents per share, compared with earnings of $245,000, or 7 cents per share, for the third quarter of the previous fiscal year. Net revenue was $3.6 million for the quarter, compared with $5.3 million for the comparable period the year before.

■

Fortune Systems Corp. reported revenue for the first quarter ended March 31 of $10.7 million, compared with $9.8 million in the previous year. Profits were $345,000, or 2 cents per share, compared with a net loss of $3.8 million, or 18 cents per share, reported in the like quarter a year ago.

Olsen chides management

From page 142

'You've tolerated this all along and haven't done anything about it.' "

Olsen said DEC's ability to provide a family of compatible systems, all running the same software, was an important ingredient in the firm's stellar performance over the last nine months in the face of weak market conditions.

For the nine months ended March 29, DEC reported revenue of $5.4 billion, up 12% from the year-earlier period. Net income for the period increased 9.4% to $346.2 million.

Single-bus architecture

During Olsen's upbeat presentation, he extolled the virtues of DEC's use of a single-bus architecture, spanning the entire VAX line from the Microvax workstation to the firm's new high-end VAX 8000 series.

There is more software written to operate in VAX environments than for any other system's architecture, Olsen claimed.

"When the Russians want to steal a computer they steal one with the most software. That's why we get in trouble," Olsen joked.

'Dull organization'

The No. 2 computer maker, currently in favor on Wall Street, is essentially the same company that analysts excoriated just a couple of years ago for being complacent and obsolete, according to Olsen. "Two and three years ago they said we were a dull organization with a disciplined approach to computing. The PC was only a small part of what we do, and with that I was called too old," Olsen recalled. "Today, we have the same message. We may be dull, but today it pays off."

Olsen said DEC's disciplined approach to the design and manufacture of its new systems has paid dividends in the firm's ability to increase its operating margins from the 6%-to-8% range of a couple of years ago to 11% today.

"Of course, we don't discount like everyone else," Olsen said. "That is the most important part of margins, above anything else."

Operating margin low

DEC's operating margin, though trending upward, is still well below the firm's pre-1983 levels of 16% to 18%, noted Vice-President and Chief Operating Officer James Osterhoff.

With three new VAX systems — the 8800, 8300 and 8200 — at the beginning of their product life cycles, Olsen was optimistic regarding DEC's ability to continue the upward revenue and profit trends for the remainder of the year. He stopped short of offering any prognosis beyond saying, "There's no reason to think our profits will go down."

In anticipation of increased sales, Olsen said the firm would add personnel to its sales and support staffs. He declined to quantify the increased staffing levels, noting the hiring of additional sales representatives would depend on increased sales. A DEC spokesman said the firm has 6,000 sales representatives worldwide and a sales support team of 6,000.

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Sperry reports profit decrease, revenue increase of 15.5%

Blames slump, defense, aerospace operations

By Alan Alper

NEW YORK — Sperry Corp., citing the general slowdown in the computer industry and problems in its defense and aerospace businesses, last week reported that profits from continuing operations for fiscal year 1986 declined 3% to $280 million, or $4.92 a share. Revenue for the year ended March 31 increased by 15.5% to $5.7 billion.

For fiscal year 1986, net income was $46.8 million, or 82 cents per share, down 84% from last year's $286.7 million, or $5.15 per share. Sperry attributed its decline to a previously reported after-tax loss of $233.2 million, or $4.10 per share, resulting from the divestiture of its Sperry New Holland Division farm equipment business. For the fourth quarter, profits from continuing operations increased by 7.4% to $115.3 million, or $2.02 a share, while revenue jumped 13.5% to $1.8 billion.

In a prepared statement, Sperry Chairman and Chief Executive Gerald Probst said that in light of the computer industry slump and of internal problems in the firm's defense and aerospace operations, the firm's results were "satisfactory."

"Revenue and operating profit gains of more than 20% in our commercial computer operations were offset in part by lower profits of our defense and aerospace operations, which have experienced a strike and production problems that have largely been overcome," Probst said.

The Sperry chief executive said the firm was particularly pleased with growth in its micro products line and increasing evidence that its Unix effort is gaining momentum. The firm projected that orders and shipments of its top-of-the-line 1100/90 would continue at last year's levels while low-end microproducts would increase significantly. The company declined to provide specific figures.

Probst warned that first-quarter fiscal year 1987 results would be below year-earlier levels because of a relatively strong performance in the comparable period and heavy order activity in the fourth quarter.

The company declined to project first-quarter results. In the first fiscal quarter of 1986, Sperry earned $51.5 million on restated revenue of $1.2 billion, according to a company spokesman.

Despite the continuing computer industry slump and uncertainties over the impact of proposed federal budgetary changes, Probst said the firm expected to achieve revenue and operating profit growth in fiscal year 1987.

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Issue: July 9 - Closing: May 30

COMPUTERWORLD FOCUS

Compaq sales increase by 48%, income up 80%

By Eric Bender

ATLANTA — Compaq Computer Corp. continues to show steady financial growth, achieving sales of $144 million and a net profit of $8.3 million during the quarter ended March 31. The figures represent a 48% sales increase and 80% income boost over the Houston-based personal computer supplier's corresponding figures for first-quarter 1985.

Discussing the results at Comdex/Spring last week, President Rod Canion said Compaq's gross margins had climbed to 39% in the latest quarter, up from 32% the year before, although the company had nearly doubled spending on sales and marketing, from $11.0 to $21.3 million.

Compaq cut pricing on its original Intel Corp. 8088-based lines in February and on most of its other models last month, but Canion said the price reductions had been planned considerably in advance and were part of normal industry cost trends.

Overall, the company's unit sales are growing slower than revenue because of the transition to the higher priced IBM Personal Computer AT-compatible systems, Canion said. He estimated that in overall industry sales of ATs and AT-compatibles during the first quarter of 1986, IBM took 70%, Compaq accounted for 26% and other vendors sold 4%.

"Last year there seemed to be a belief that it was a wide-open race," he commented. But aside from IBM, "We're the only company to take a significant share," he claimed.

Canion described the turmoil in the microcomputer distribution channel as a consolidation rather than a shakeout. "The dealer network will continue to get stronger" as additional capitalization becomes available, he predicted.

Although many see Compaq and other IBM-compatible suppliers at risk as IBM accelerates development cycles, Canion downplayed the threat. "We can go from the beginning of design to having a product in volume production in as little as six months and more reasonably nine months. Anything new is not going to impact the market in that time."

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BUSINESS NOTES

Intel vs. NEC copyright trial delayed a week

The copyright infringement trial between **Intel Corp.** and **NEC Electronics, Inc.** was postponed a week because of a scheduling conflict in U.S. District Court in San Jose, Calif. Jury selection is expected to begin by midweek.

■

The **U.S. Department of Commerce** last week issued a final ruling that Japanese producers indeed are dumping 64K-byte dynamic random-access memory (RAM) chips in the U.S. The action confirmed a preliminary ruling in December that Japanese firms were selling dynamic RAM chips at below-market value.

If the U.S. International Trade Commission confirms within 45 days that the alleged dumping has hurt the U.S. industry, the government will impose penalty duties ranging from 12% to 35% to offset the Japanese price advantage.

■

South Korean manufacturing conglomerate **Daewoo Corp.** has acquired a controlling interest in **Zymos Corp.**, a U.S. semiconductor vendor hit hard by the industry recession. The move will give Daewoo four of the seven seats on the Zymos board of directors.

The buy-in was made via the purchase of a block of 6.3 million shares of Zymos stock at an unspecified, but below-market price, Zymos said. That block of stock had been held by Intermedics, Inc., which gave up the stock in exchange for being relieved of lease obligations and a commitment to advance funds to Zymos.

■

Software Publishing Corp. said it will join the ranks of microcomputer software vendors dropping copy protection in response to corporate customer requests.

The Mountain View, Calif., firm will issue new, unprotected versions of its two Harvard product line programs, Harvard Total Product Manager and Harvard Presentation Graphics, in mid-May, a company spokeswoman said. Copy protection also will be dropped for Software Publishing's best-selling lower end PFS line of products in their next upgrades.

■

Isuzu Motors Ltd. announced recently an agreement with Dallas-based Electronic Data Systems Corp. under which Electronic Data Systems will process research and development information and handle all international data transmission for Isuzu. According to Isuzu, the deal arose after Electronic Data Systems was purchased by General Motors Corp., which owns 38.6% of Isuzu.

The agreement will take effect this month and was signed by Isuzu and Electronic Data System' Japanese subsidiary, EDS Japan, in April.

Microcomputer Memories goes bankrupt

Crowded market takes toll on disk drive maker

CHATSWORTH, Calif. — Caught in a market with too many competitors, 3½-in. disk drive manufacturer Microcomputer Memories, Inc. filed for protection under Chapter 11 of the Federal Bankruptcy Code late last month.

An early entrant in the market for 3½-in. disk drives, Microcomputer Memories was founded in 1982. Two years later the company went public just as the window for high-tech companies was beginning to close.

"It may not have been that they did anything wrong. It just sounds to me like a company that was caught in a market with too many competitors," said consultant Ray Freeman, of Freeman Associates, Inc. in Santa Barbara, Calif.

Microcomputer Memories shipped its first 10M-byte disk drives in May 1984. Design changes delayed the introduction of its 20M-byte disk drive in January 1985, and by then, the market had already taken its toll. "Two design changes were probably too big a capital hit for Microcomputer Memories at a time when capital resources were getting conservative," noted Dataquest, Inc. analyst Jim Moore.

One month after the 20M-byte disk drive introduction, the company laid off 28% of its work force. This February, 26 more employees were laid off.

For the fourth quarter ended March 31, Microcomputer Memories lost $2 million on sales of $2.4 million.

The failure of the disk drive manufacturer comes just as the market for 3½-in. disk drives appears to be ripening, analysts say. Recently, IBM announced it would support a 3½-in. floppy disk drive in its newly released laptop computer.

"The length of time that it took for IBM to endorse the 3½-in. product certainly slowed down the market growth in that area," Freeman said.

— **Maura McEnaney**

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Select One

T-1 **Fundamentals of Network Control**
Gabriel Kasperek, President, Kascom, Inc.
The basics of network control, including problem diagnosis and repair, maintenance and operational issues.

T-2 **Integrated Voice/Data Corporate Networks**
Roshan Lal Sharma, Sr. Scientist/Consultant, Telecommunications Network Science.
Network topologies and their synthesis, cost-effective network planning, future trends in intelligent networks and their impact on network management and control.

T-3 **Cost Efficient Methods for Implementing New Tariffs**
Cheryl A. Cushing, Manager, Reference Services, Connections Telecommunications, Inc.
Post-divestiture tariff rules, including LATAs and POPs with a comparison of major common-carrier tariffs, and evaluation of intra-LATA access alternatives and a review of new regulatory alternatives to traditional network costs.

T-4 **ISDN I**
Samuel Lynch, Senior Consultant, Zatyko Associates.
Definition and concepts, application standards and world-wide status, plus comparison of ISDN against OSI Reference Model as standard.

T-5 **System Network Architecture I**
Thomas Routt, Senior Consultant, Zatyko Associates.
Current status of IBM's communications architecture, new extensions such as LU 6.2/APPC and NETBIOS and IBM LANs as "defacto" standards.

U.S. attempts to take wind from Asian software pirates' sails

Battle moving from the legislative arena to the police station

By Edward Warner
Computerworld News Service

WASHINGTON, D.C. — When approximately 70 police officers swooped down on a flashy Hong Kong shopping arcade last month, they were looking for software pirates and — thanks to the help of a U.S. software firm — they knew where to find them.

In all, 17 people were arrested, and $130,000 worth of illegally copied software was confiscated in the raid, which resulted from a tip by Cambridge, Mass.-based Lotus Development Corp.

According to Lotus spokesman Michael Blaber, Lotus laid the groundwork for the raid by conducting its own investigation of the shopping arcade, proving to the Hong Kong police that roughly 40 stores were selling pirated Lotus software — some for as little as $20 per package.

Lotus' action, reportedly a first for a U.S. software vendor, indicates the increasing involvement of U.S. software vendors in the battle against software piracy and how that battle is moving in some nations from the legislative arena to the police station.

At the request of the U.S. Department of Commerce, many nations, including Taiwan and Hong Kong, have granted copyright protection to U.S. products. Now, both the U.S. government and U.S. software vendors are pushing to have those laws enforced.

The Commerce Department's approach has traditionally been to educate nations that tolerate rampant piracy on the need for copyright laws and copyright enforcement. Taiwanese officials, for instance, will soon receive a series of Commerce Department seminars on enforcing their revised copyright law, according to Commerce Department international economist Eileen Hill.

The Commerce Department, however, is also becoming increasingly willing to flex its muscle against those who steal U.S. intellectual property, including recordings, videotapes and computer software.

Last week, the agency launched a new offensive against nations where piracy is widespread, threatening those nations with possible U.S. trade sanctions, including denial of the preferential treatment provided under the Generalized System of Preferences (GSP). The GSP gives developing nations a discount on the tariff they pay to bring goods into the U.S. and is particularly important to such trade-dependent nations as South Korea and Taiwan.

In a further show of U.S. strength, South Korea is now under investigation by the Commerce Department for allegedly violating U.S. product copyrights, which South Korean law does not recognize.

When it comes to software piracy, most experts agree that Asian nations lead the pack. In China, which has no copyright laws at all, an estimated 10,000 pirated copies of Ashton-Tate's Dbase software were sold last year, according to the company's executive vice-president for international and domestic sales, Ron Posner.

> ***"The Commerce Department is becoming increasingly willing to flex its muscle against those who steal U.S. intellectual property."***

Lotus estimates losses at $100,000 a month to Asian pirates.

To combat Asian software piracy, Ashton-Tate, Lotus and Micropro International Corp. last year formed a Hong Kong-based group called the Anti-Piracy Association.

The association, which also includes an Australian software distributor, is conducting a public relations war on Hong Kong-based piracy and is advising software publishers on how to get Hong Kong's copyright laws enforced, Posner said. Member vendors have also written to the world headquarters of their multinational corporate users urging them to warn their foreign affiliates against using pirated programs.

Posner, the chairman of an ADAPSO committee on international business practices, said he expects his committee, and ADAPSO itself, to become more involved in antipiracy efforts.

On the whole, however, the software vendors are battling international piracy behind the scenes, and only Lotus has successfully instigated a police raid. While Lotus sued U.S. users over what it claimed were pirated programs, overseas it has been more circumspect.

"It's easier to prove that a dealer knew he was violating the law," than to prove a user knew the software was pirated, Lotus spokesman Blaber concluded.

Control Your Network

Control Conference and Exposition


Kasparek Lal Sharma Cushing Lynch Routt Zatyko Rhue

T-6 Public/Private Data Network I
Daniel Zatyko, President, Zatyko Associates.
Current status of IBM's communication architecture, including applications and standards, and development of X.25 up to 1988 CCITT adoption.

T-7 MAP/TOP Systems Interconnection I
Donald Herring, Vice President, Zatyko Associates.
Status of seven layer OSI Reference Model as framework for future network compatibility, review of major vendor architecture - IBM, DEC, etc; migration to manufacturing automation and office communication protocols.

Tuesday June 10 1986

9:00 am - 5:00 pm
Select One

T-8 Problem Resolution and Network Management in SNA Networks
Fred Cook, Senior Consultant, Legg Mason.
Techniques useful in analyzing problems in SNA networks. Topics include detailed SNA sequences, VTAM trace, NCCF, NPDA, NLDM and a review of critical parameters in NCP System Generation.

T-10 Network Modeling/Design Workshop
Larry Rhue, Vice President, Connections Telecommunications Inc.
Network design calculations using MNDS PC-based design software and the complimentary Borland SIDEKICK package. Also included, queuing calculations in simple and complex network models, reflecting SDLC, BSC and X.25 protocols, statistical multiplexers and distributed concentrator networks.

T-11 ISDN II
Samuel Lynch, Senior Consultant, Zatyko Associates.
Technology and system/network/switching of ISDN, and certification and network testing, including 1986/87 field trials/user implementation.

T-12 System Network Architecture II
Thomas Routt, Senior Consultant, Zatyko Associates.
Technology and systems impact of SNA and relation to open architectures and protocols on networks from DEC and other vendors, and higher layer SNA services - DIA/DCA, PU 2.1, etc.

T-13 Public/Private Data Network II
Daniel Zatyko, President, Zatyko Associates.
Technology and systems impact of long distance, regional and in-house data networks, including message handling systems and office document interchange formats under different operating systems.

T-14 MAP/TOP Systems Interconnection II
Donald Herring, Vice President, Zatyko Associates.
Session will cover MAP/TOP common protocol connectivity, GM and Boeing programs, other vendor demos, user experiences and the implications of Corporation for Open Systems on MAP/TOP, vendor standards and products.

T-4 Planning the Network Control Center
Gabriel Kasparek, President, Kascom, Inc.
User considerations in the design, equipment selection, software, and instrumentation of a network control center and related vendor issues.

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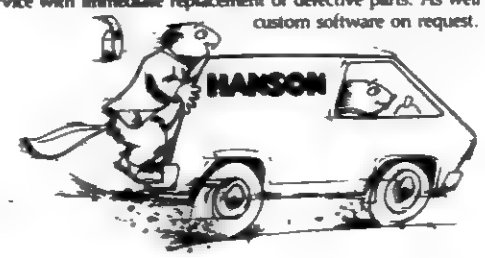
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4331-11	0.38	1 to 2
4331-2	0.50	1 to 4
4341-9	0.52	1 to 4
4361-5	0.70	2 to 4
4341-10	0.75	2 to 4
4341-1	0.88	2 to 4
4341-11	1.1	2 to 8
4361-4	1.15	2 to 12
3031	1.2	2 to 8
4361-5	1.45	2 to 12
*4361-11	1.4	4 to 16
4341-2	1.5	2 to 16
4341-12	1.65	2 to 16
3031-AP	2.0	2 to 8
4381-1	2.1	4 to 16
3032	2.5	2 to 8
4381-2	2.7	4 to 32
*4381-12	2.7	8 to 32
3033S	2.9	4 to 16
3083CX	3.3	8 to 32
*4381-13	3.8	8 to 32
3083E	4.2	8 to 32
3033N	4.3	4 to 16
3033EX	4.4	8 to 32
4381-3	4.5	8 to 32
3033UP	5.0	4 to 24
*4381-14	6.0	16 to 32
3083B	6.3	8 to 32
3083BX	6.5	8 to 32
3083J	6.6	8 to 32
3033MP	6.6	8 to 32
3033AP	8.5	4 to 24
3033U	8.7	8 to 32
3081D	9.0	16 to 32
*3090-150	10.1	32 to 64
3081G	11.0	16 to 48
3081K	14.0	16 to 48
*3090-180	15.4	32 to 320
3090CX	15.5	16 to 64
3090H	18.0	32 to 96
3084QX	28.7	32 to 128
3090-200	29.4	64 to 320
*3090-400	52.9	128 to 640

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SYSTEMS	MIPS	MEGABYTES
470V7	5.5	8 to 32
470V8	8.5	8 to 32
5840	8.4	16 to 64
5850	11.8	16 to 64
5860	14.0	16 to 64
5867	22.0	24 to 64
5868	22.0	32 to 128
5870	25.8	16 to 64
5880	26.6	32 to 128
†5890-200	28	64 to 256
†5890-300	38	64 to 256
†5890-600	64	128 to 512

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AS 8043	5.2	8 to 32
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AS 8063	8.4	16 to 32
AS 9040	7.2	8 to 48
AS 9050	9	8 to 48
AS 9060	11.2	16 to 64
AS 9070	16.2	16 to 64
AS 9080	20	16 to 64
†AS XL-80	28	32 to 256
†AS XL-90	50	64 to 256

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The above information is intended as a guideline for computer users on relative computer system instruction cycle times. All data have been derived from published documentation and represent reasonable estimates of average MIPS ratings. However Randolph is not responsible for the accuracy of the MIPS data. Cycle times will vary based on hardware software configurations, and system manufacturers continually modify computer models as design improvements in hardware and software arise.

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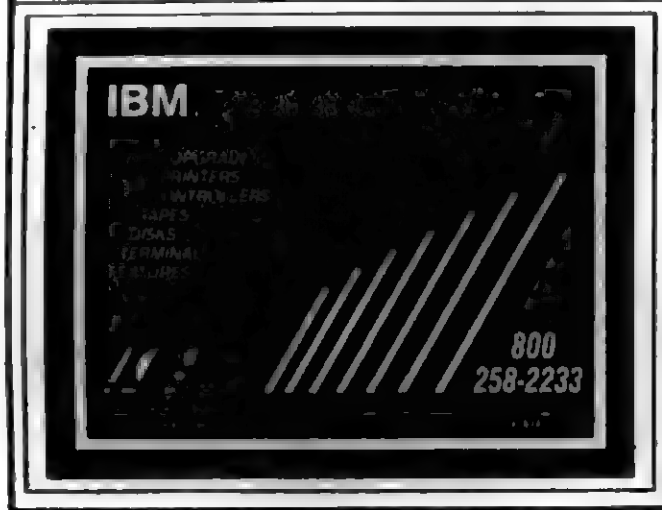
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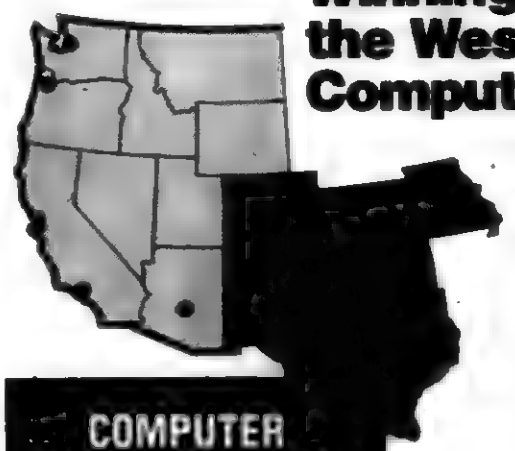
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1101 Kermit Dr., Ste 407
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ROBERT HALF of Austin
400 East Anderson
Suite 334
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(512) 835-0663

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MANAGER

Financial firm in DC seeks Sr Analyst with ten years experience. DEC required. Fortran and COBOL essential. Manage five. $45,000

ROBERT HALF of Washington
7316 Wisconsin Avenue
Suite 401
Washington, DC 20814
(301) 652-1900

ST. LOUIS

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Major Midwest service org running multiple CPU's (308X Series) under MVS/XA needs an Operations Supervisor with at least 2 yrs experience supervising a similar shop. Will manage 10+ operators and must know JES 2 and JCL. Position is on 1st or 2nd shift, so you must be open to either one. Salary to $33,000

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Stop doing 100% coding and expand your career! Dynamic manufacturer in St. Louis County is looking for a S/38 Prog/Analyst with at least 2 yrs experience programming in RPG III. This position offers visibility and a mix of programming and analysis. Salary to $28,000

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7733 Forsyth Blvd.
St. Louis, MO 63105
(314) 727-1535

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San Antonio, TX 78201
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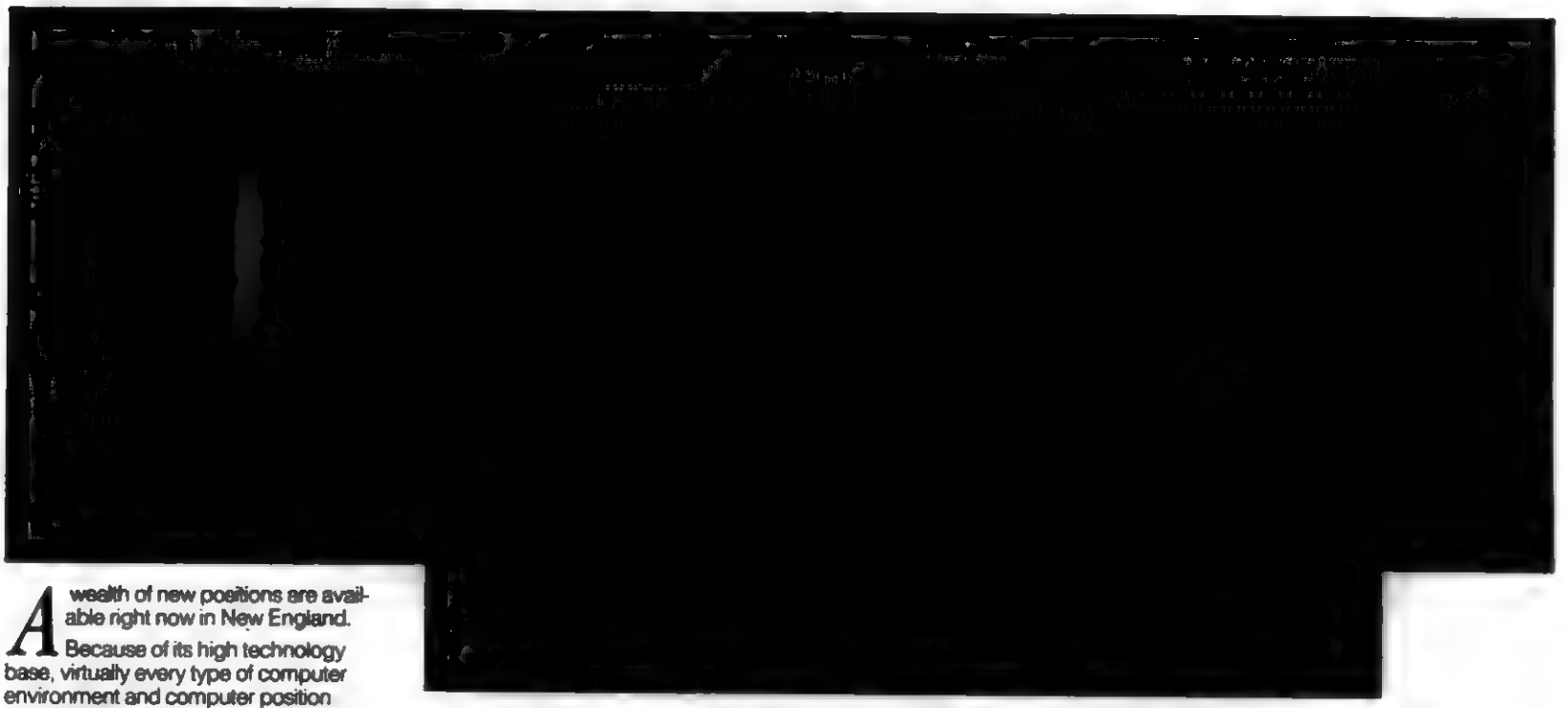
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Programmer/Analysts *(901-04)* Participate in three years of new development for on-line data manufacturing, inventory control and financial applications. Opportunity to learn CICS in a large-scale MVS environment. Connecticut-based. To $34,000.

Programmer/Analysts — Project Leader Potential *(901-05)* You will participate in heavy analysis and development and take control of major project modules. Background should include four or more years IBM COBOL and some analysis. Connecticut location. To $30,000.

Data Base Analysts *(901-06)* Get involved in significant growth. Participate in the evaluation of new plans by evaluating and selecting DB2, ADABASE, IDMS and IMS. Fortune 500 company located in Southern Connecticut. To $40,000.

Technical Services Manager *(901-07)* Lead group of MVS Systems Programmers in generation, tuning and support of multiple 308X's with 3090's on order. Support IMS DB & DC, "PC" gateways, and big network environment. Stratford location. To $70,000.

Software Engineers *(901-08)* You will develop voice recognition products. Norwalk-based company has future plans for major AI R & D effort. A degree in CS or EE plus two or more years experience in C, PASCAL or micro assemblers preferred. To $40,000.

Software Systems Development Manager *(901-09)* Norwalk-based company seeks individual to lead group responsible for operating systems and applications development of real-time closed loop applications in VAX/VMS/UNIX shop. To $60,000.

DP Manager/System 38 *(901-10)* Become key staff member in the implementation of manufacturing and other business applications for this $75 million Norwalk-based division of an international corporation. To $40,000.

Massachusetts

Senior Sales Representative *(901-01)* Sell 4th generation language software and DBMS software to major IBM users in Southern New England. This well-known software vendor seeks an experienced Sales Representative with at least three years of successful software sales to the IBM mainframe marketplace. To $100,000.

Systems Manager *(901-02)* Manage multiple VAX/VMS computer systems in an environment implementing PC's, DBMS and Ethernet. You will have contact with users and will work with various software/hardware tools. A degree and minimum of three years in-depth VAX/VMS experience sought. Marlboro location. To $42,000.

Telecommunications Analyst *(901-03)* You will set-up a complete telecommunications network for a new data center. This will involve selecting and implementing the most up-to-date data and voice systems. Three to six years voice and data communications equipment support and installation desired. Boston location. To $36,000.

Artificial Intelligence Software Engineer *(901-04)* A major systems vendor developing artificial intelligence and natural language capabilities onto their next generation of computers seeks a Senior Software Engineer with eight or more years experience in lead development. Natick location. To $55,000.

Senior RPG Programmer/Analyst *(901-05)* Major North Dighton distributor seeks a Senior RPG Programmer/Analyst to develop major new systems for their multiple System/38 and 4381 environment. Excellent opportunity to move into a large system environment. Management potential. Three or more years RPG III desired. To $37,000.

EDP Auditor *(901-06)* Major Framingham manufacturer with a newly implemented international distributed computer network seeks EDP Auditor to create and implement controls. European travel. Two or more years EDP Audit in an IBM OS/MVS environment desired. To $44,000.

Information Systems Director *(901-07)* Reading company is seeking an individual to lead our expanding data center. You will continue the expansion of distributed processing, the use of IDMS and 4th generation languages, and an information center. Ten years of experience including data center management, COBOL programming, IDMS knowledge, and a BS/BA degree is desired. To $75,000.

FORTRAN Software Engineer *(901-08)* Work with a variety of high-level languages including FORTRAN, PASCAL and C developing graphic interface software. These software products will connect mini and micro processing capabilities into one very large real-time processing system. Two to eight years of R/T software experience and a technical degree preferred. Wayland location. To $43,000.

Technical Support Consultant *(901-09)* A successful, medium-sized communications products company in Billerica seeks a Technical Support Consultant to diagnose and coordinate the technical solution to problems arising with LAN and other network products. This is a ground floor position. Three or more years experience developing or supporting communication hardware or software and a BS or BA degree is desired. To $41,000.

Project Leader *(901-10)* A leading financial services company is undergoing a major new development project. You will lead a fifteen person team in developing a completely new IDMS/R-based on-line system. An aggressive self-starter with a track record of successful systems development in an IBM/DBMS environment is desired. Boston. To $44,000.

IMS DBA *(901-11)* A fast growing IMS shop in the Boston area seeks one Intermediate and one Senior IMS DBA to participate in new systems development. You'll receive excellent benefits which includes an on-site health club. To $40,000.

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IBM Systems Programmers (6) — New Data Center *(901-13)* New subsidiary of major corporation in Boston is building a new data center, and is staffing a technical support group from scratch. Ground floor opportunities are available to Systems Programmers experienced in MVS, CICS, VTAM/NCP, or VSAM/DASD. To $48,000.

Information Center Specialist *(901-11)* Prestigious Investment Company in Boston seeks an experienced INFO Center Specialist to lead a three-person team. This is a high visibility position offering daily contact with senior executives. Strong knowledge of information center tools in an IBM environment, and the ability to work in a fast paced environment is desired. Securities industry knowledge a plus. To $42,000.

Programmer/Analysts IDS-II *(901-16)* Fast growing Boston suburban company which develops large-scale data base systems for the U.S. Government has several openings for individuals with three or more years experience on Honeywell/COBOL systems with IDS-II. Rapid promotion potential to Project Leader. Full relocation package. To $40,000.

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Senior Technical Writer *(901-15)* Leading Northern New England computer vendor, currently developing advanced UNIX-based supermini computers is seeking an individual to lead its technical documentation group. Three or more years experience in UNIX internals preferred. Excellent growth potential. To $30,000.

RPG III Programmer/Analyst — Ski Country *(901-17)* An unusual opportunity to live in the heart of Vermont Ski Country and work premier resort. Top technical environment and professional challenge with excellent benefits, free skiing, and full relocation. Prefer two to five years System/38, RPG III experience with business applications. To $35,000.

Software Engineer — Networking *(901-18)* New Corporate R&D center for major vendor. Join the development team of the most advanced networking and communications products. Five or more years software engineering and experience with IBM protocols, LAN's, or DECNET are desired. Excellent benefits and relocation. To $64,000.

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DATA PROCESSING

Systems Engineers – Join the Alliance Generation

Los Angeles

National Advanced Systems' Alliance Generation of IBM-compatible mainframe computers and peripherals have earned us a reputation in the marketplace as the leader in advanced technology systems, with unequaled reliability. Our success is a reflection of many alliances—from our partnerships in systems integration with world-class developers of hardware and software, to the teamwork and individual creativity we foster in our professional marketing and technical support staff.

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To qualify, you should have at least 8 years experience in the data processing industry, including 5 years systems programming experience in an IBM 4300, 308x, 3090 or large-scale IBM compatible systems environment. A bachelor's degree in a related field, ability to perform CPU and DASD capacity studies and detailed knowledge of MVS/XA and VM operating systems are highly desirable.

Interested in the Alliance Generation? If so,send your resume to: National Advanced Systems, SE Position, 1 Golden Shore, Long Beach, CA 90802. We are an equal opportunity employer. Principals only please.

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MVS SYSTEMS PROGRAMMER

The Applied Physics Laboratory (APL), a high-technology R & D organization located midway between Baltimore and Washington, has an immediate need for a Lead Systems Programmer. This individual would provide a lead role in evaluating, installing, testing, and enhancing MVS system software. In addition, the successful candidate should possess good communications skills and be capable of supervising other systems programmers. Minimum requirements include a BS degree in a technical discipline or its equivalent in education and experience, plus two years of experience with MVS operating system software or related MVS system software.

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MVS/XA Sys. Prog. (Mem./Assoc.)	To $45K

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Our systems group consists of four professionals and a staff of students who operate in an open environment, where each individual is encouraged to promote and develop ideas into actively supported projects. We offer an excellent benefits package and our employees have the opportunity to enter Bachelors, Masters, and Doctoral degree programs. Send resume, salary requirement, and three references, in confidence, by May 23, 1986, to Michael A. Short, Manager, Systems Support, Educational Resources Center, Clarkson University, Potsdam, New York 13676.

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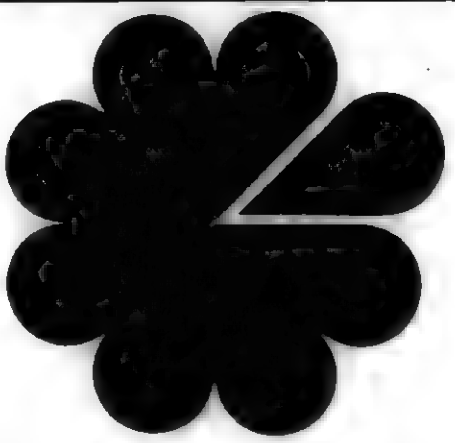
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Foreign Editorial/ Sales Offices

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Akers predicts 'demanding year'

From page 142

will introduce software, storage and communications enhancements.

• Supercomputing. Akers said IBM "expects to participate to a greater degree" in supercomputing applications. He cited strong response to the vector processing option on 3090 series mainframes from many customers, including Houston-based oil industry customers.

• Software source code. Responding to an independent software developer who claimed that IBM has not followed its own guidelines for easing the transition from its formerly unprotected source code, Akers defended IBM's 1983 decision to make its code proprietary. "We feel a tremendous obligation to serve our customers, but we feel no obligation to serve our competitors," he said.

• PC Convertible compatibility. Akers refused any comment on plans to make the recently announced laptop compatible with 5¼-in. drives.

Most shareholder attention focused on IBM's continued business in racially torn South Africa. Refusing to follow the recent withdrawals by corporations such as AT&T [CW, April 21], General Electric Corp. and Microsoft Corp. (see story below), IBM stockholders overwhelmingly defeated a shareholder proposal calling for IBM to end its South African business by the end of the year. IBM's board of directors had recommended the proposal be rejected, and it was supported by only 7% of the shares voted.

Both Akers and retiring Chairman John R. Opel said that IBM feels it is a progressive force for change in South Africa's separatist apartheid system. Opel said less than 0.5% of IBM's worldwide revenue comes from sales in South Africa and noted that IBM has reduced its work force there by 400 to 1,500 in the last 18 months.

"As a force for change, presence is better than absence," Opel said. He later admitted, however, that IBM believes "it is not within our power as a corporation to change political events in that country."

Microsoft severs S. Africa ties

REDMOND, Wash. — Microsoft Corp. recently severed business ties with South Africa because the firm said it believes its withdrawal will have more political impact in ending racial segregation there than its economic participation has.

Microsoft, which sold about $100,000 worth of software per year in the country, ended its agreement with South African computer distributor Automated Office Systems. Automated Office Systems currently distributes software from other leading U.S. vendors such as Lotus Development Corp., Micropro International Corp. and Borland International, Inc. as well as peripherals from firms such as AST Research, Inc.

Robert O'Rear, Microsoft's director of intercontinental operations, urged other U.S. computer firms to follow Microsoft's lead. "That's our hope," he said. "If we all join forces, we will send a stronger message."

Formerly, Microsoft donated its profits from South African sales to a charity, the American Friends Service Committee, that seeks to end apartheid.

"The pressure we have tried to bring as a participant hasn't had the impact that we had hoped," O'Rear said. "We have tried to change things by diplomatic means for as long as we thought we could."

O'Rear's comments were in sharp contrast to those from AT&T officials, who downplayed the significance of their firm's similar action.

BUSINESS NOTES

Memorex lays off 300 employees

Citing increased competition within the IBM mainframe disk drive market, **Memorex Corp.** last week laid off 300 workers in its Santa Clara, Calif., facilities. The layoffs affect workers in manufacturing, marketing and administration. Parent company Burroughs Corp. recently pointed to Memorex as one source of its 66% decline in profits for the quarter ending March 31.

■

Apollo Computer, Inc. signed a $50 million OEM agreement with longtime customer **Mentor Graphics Corp.** of Beaverton, Ore. The one-year, renewable contract allows Mentor to resell Apollo's recently introduced workstations, the low-end Series 3000 Personal Workstation and the high-end DN570, in its line of computer-aided engineering and design systems.

■

In an unusual hookup between an artificial intelligence software developer and a workstation vendor, **Intellicorp** and **Sun Microsystems, Inc.** announced they will jointly market Intellicorp's Knowledge Engineering Environment on Sun-3 workstations. The Intellicorp AI development software previously ran only on dedicated LISP workstations. Intellicorp Chairman and CEO Tom Kehler called the pact "a significant step in our strategy of making our development and delivery products widely available on general-purpose workstations."

■

Continuing its pattern of joint ventures in computer integrated manufacturing (CIM), **IBM**'s manufacturing systems division has teamed up with **Cincinnati Milacron, Inc.**, a vendor of factory floor controllers, to develop CIM software. The software is intended for workstations such as the IBM Industrial Computer.

CDC turnabout impressive, but investors still cautious

ACTIVE ISSUES
Kathy Porteus

Is now the time to reconsider Control Data Corp. (CDA — 22)?

Investors should be familiar with CDC's plight of last year when substantial losses, primarily in its computer businesses, forced the company to cancel a public offering, technically default on short-term loans and dramatically streamline operations. Investors may be less acquainted with the progress in CDC's turnaround.

Two weeks ago, CDC reported a first-quarter loss of $21.2 million, representing a significant improvement over last year's fourth-quarter losses of $297.2 million that included $121 million in special charges for restructuring. According to analysts, CDC's peripheral products business experienced a strong pickup during the March quarter. Also, the company's financial subsidiary, Commercial Credit Co., is beginning to show the benefits of a major restructuring.

Such positive signs cause some analysts to favor CDC as an investment opportunity.

"I see considerable improvements in CDC's stock price," says Gerard Hallaren, vice-president with Brean Murray Foster Securities, who currently recommends purchasing CDC stock. "By year-end 1986, the company's strategies will be a lot clearer than they are now." According to Hallaren, investors currently overlook how CDC is confronting Japanese competitors of its high-end disk products, how its mainframe business continues attracting new customers and how its Commercial Credit subsidiary provides a "safety net" worth at least $19 a share.

Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

"Japanese competition has been taking market share from CDC for a number of years," Hallaren says, "but I think that's going to reverse very soon." Such a change reflects high-reliability product ratings from customers and the rising value of the Japanese yen, which has thwarted Japanese aggressive pricing policies. Hallaren also cites improvements in CDC's mainframe business, in which 33% of last year's shipments went to new customers "at a time when the press on CDC was horrible."

Matt Meehan, vice-president with Salomon Brothers, Inc., is also positive about CDC's prospects, but he recently changed his recommendation from "accumulate shares" to "hold." He says he still believes that "the stock has the potential for considerable upside movement over the long term."

Nevertheless, Meehan expresses concern over a decline in computer system orders and certain financing issues that should have been resolved a month ago. These issues include CDC's sale of its Ticketron entertainment and wagering business, completion of bank agreements regarding the company's debt and the sale of public or private debt. "Indeed, when these things come together," Meehan says, "I would go back in on a more positive note."

Most analysts estimate CDC will break even in its current fiscal year ending Dec. 31, 1986, assuming that the company will return to profitability in the second half. But because of CDC's multifaceted reworking of its core businesses, financial subsidiary and bank agreements, many analysts and investors still prefer watching CDC's recovery process from the sidelines.

"Key to Control Data's return to profitability this year," says Gary Blauer, securities analyst with Dain Bosworth & Co., "is a recovery in the industry as a whole." Although Blauer acknowledges improvements in the company's ability to win in competitive situations, he says he feels "no hurry to jump in because Control Data's turnaround is still too far out."

MSA agrees to acquire financial, human resources software firm

ATLANTA — Management Science America, Inc. (MSA) said last week it agreed in principle to acquire Information Associates, Inc., a Rochester, N.Y.-based vendor of financial and human resources software for the higher education institution market. The agreement is for MSA to pay $15 million in cash.

It was the second such announcement for MSA within a few weeks. Last month, MSA said it agreed to acquire RTS Ltd., a Dublin-based vendor of manufacturing and financial software for IBM's System/36 and 38 minicomputers [CW, April 7].

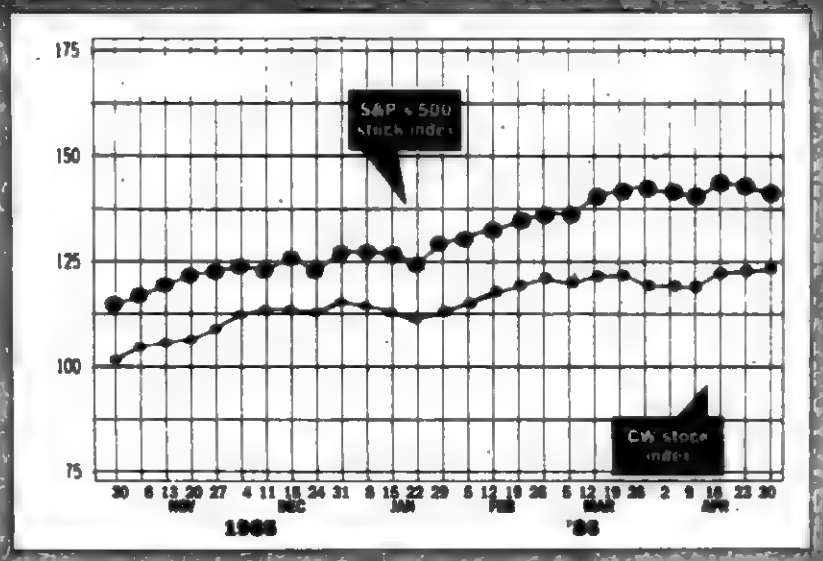
MSA will continue to expand its product line through acquisition and internally funded research and development, the company said.

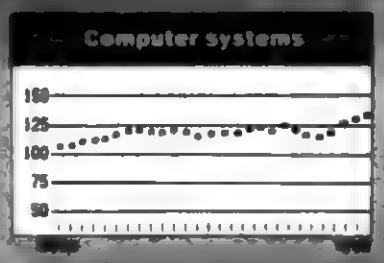
Information Associates' flagship product line is the Series Z, composed of software systems for financial records, student information, human resources and alumni records development, that operates on IBM mainframes or Digital Equipment Corp. VAX computers.

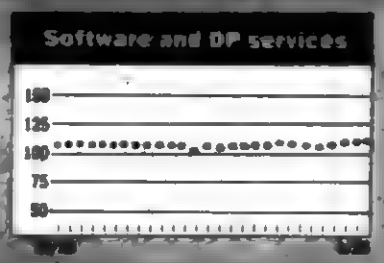
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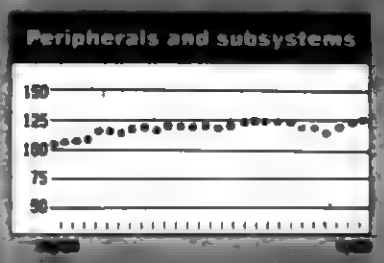
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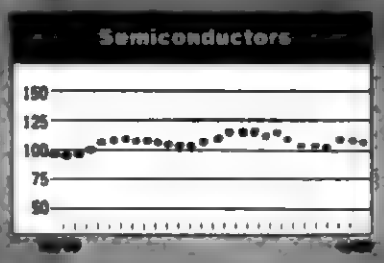


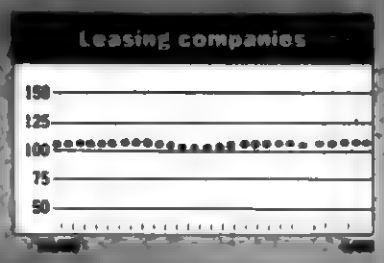












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Supplies and accessories	157.7	156.3
Semiconductors	108.3	110.6
Leasing companies	104.6	106.0
CW stock index	120.6	121.1
Standard and Poor's 500 stock index	144.6	146.6

Computerworld stock trading summary

CLOSING PRICES WEDNESDAY, APRIL 30, 1986

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	COMPUTER SYSTEMS				
O	ALPHA MICROSYSTEMS	5- 9	6 1/4	-1/4	-3.8
O	ALTOS COMPUTER SYST	9- 19	19 1/4	+1 5/8	+9.2
A	AMDAHL CORP	10- 18	16	+1	+6.6
O	APOLLO COMPUTER	9- 31	15 3/4	0	0.0
O	APPLE COMPUTER INC	14- 31	30 1/4	+5/8	+2.1
N	AT&T	19- 28	24 3/4	-1/4	-1.0
N	BURROUGHS CORP	52- 71	61	-1	-1.6
O	COMPAQ COMPUTER CP	5- 17	16 3/4	+1/8	+0.7
O	COMPUTER AUTOMATION	1- 9	2 1/8	+1/4	+13.3
A	COMPUTER CONSOLES	5- 14	10 5/8	+7/8	+8.9
N	CONTROL DATA CORP	15- 39	22 7/8	+1	+4.5
O	CONVERGENT TECHNOL	5- 13	9 3/4	-1/2	-4.8
O	CPT CORP	5- 8	4 1/2	-1/8	-2.7
N	CRAY RESEARCH INC	25- 79	78 7/8	-1/2	-0.6
O	DAISY SYSTEMS CORP	11- 38	13 1/2	+1/4	+1.8
N	DATA GENERAL CORP	31- 76	41 5/8	-2 5/8	-5.9
O	DATAPOINT CORP	8- 22	5 1/4	+1/8	+2.4
N	DIGITAL EQUIPMENT	86- 181	176 1/2	-4 7/8	-2.6
A	EECO INC	13- 16	15	+1/2	+3.4
N	ELECTRONIC ASSOC.	3- 7	5 7/8	-1/2	-7.8
N	FLOATING POINT SYST	18- 42	42 1/4	+1 3/4	+4.3
N	FOXBORO	22- 31	27 1/4	-1/8	-0.4
N	GOULD INC	20- 38	25 3/4	-1 1/4	-4.6
N	HARRIS CORP	22- 35	32 1/4	+2 1/2	+8.4
N	HEWLETT-PACKARD CO	28- 46	46 1/4	-1/8	-0.2
N	HONEYWELL INC	64- 87	75 1/8	-1/2	-0.6
N	IBM	117- 158	156 1/4	+1	+0.6
O	IPL SYSTEMS INC	1- 4	2 1/2	0	0.0
N	ITT CORP	28- 47	47 1/8	+1/4	+0.5
N	M/A-COM INC	13- 24	18 7/8	+1/8	+0.7
N	MANAGEMENT ASSIST	2- 28	2 1/4	0	0.0
N	MATSUSHITA ELEC(ADR)	48- 98	88 3/8	+7 1/8	+7.8
O	MENTOR GRAPHICS	13- 30	17 1/2	-5/8	-3.4
N	MODULAR COMPUTER SYS	6- 9	8 7/8	+3/4	+9.2
N	MOHAWK DATA SCI	1- 13	3 1/8	0	0.0
N	NBI INC	11- 2	12 1/8	+1/8	+1.0
N	NCR	25- 50	50 1/8	-1/8	-0.2
N	PERKIN-ELMER	22- 38	32 1/8	+1 3/8	+4.4
N	PRIME COMPUTER INC	18- 27	21 5/8	+1 1/8	+5.4
N	SPERRY CORP	58- 89	88	+1/4	+0.4
O	STRATUS COMPUTER INC	9- 28	22 1/4	-1	-4.3
O	TANDEM COMPUTERS INC	13- 31	31	+2 1/8	+ :
N	TANDY CORP	24- 44	38 1/2	-7/8	-2.2
O	TELEVIDEO SYSTEMS	2- 4	3 7/8	0	0.0
O	TELXON CORP	10- 33	30 1/2	-1	-3.1
N	TEXAS INSTRUMENTS	88- 141	108	-1 3/4	-1.2
A	ULTIMATE CORP	8- 32	30 7/8	+1 5/8	+6.8
O	VECTOR GRAPHICS INC	1- 1	1/8	0	0.0
A	WANG LABS "B"	15- 29	19 1/8	+2 1/4	+13.3
A	WANG LABS "C"	15- 29	19	+5/8	+2.1
N	XEROX CORP	37- 72	68	+1 1/4	+2.1
	SUPPLIES & ACCESSORIES				
N	AMERICAN BUS FRMS	21- 36	36 3/8	+1/4	+0.6
N	BARRY WRIGHT	17- 28	28 1/4	-1/4	-1.0
A	DUPLEX PRODUCTS INC	13- 22	21 1/2	0	0.0
N	ENNIS BUS. FORMS	14- 28	23 1/4	-2 1/8	-8.3
N	3M COMPANY	74- 107	104 3/4	+1 3/4	+1.6
N	MOORE CORP LTD	16- 27	26 1/2	+3/8	+1.4
O	STANDARD REGISTER	22- 46	41 3/4	0	0.0
N	WALLACE COMP SERVICE	39- 49	47 3/8	-5/8	-1.3

CLOSING PRICES WEDNESDAY, APRIL 30, 1986

EXCH		52-WEEK RANGE (1)	CLOSE APR 30 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & DP SERVICES				
O	ADVANCED COMP TECH	2- 5	5 1/8	+5/8	+13.8
N	ADVANCED SYSTEMS INC	9- 20	17 5/8	-5/8	-3.4
N	AGS COMPUTERS INC	10- 25	22 1/4	+1 3/8	+6.5
O	AMERICAN SOFTWARE	9- 15	10 3/4	+1/8	+1.1
N	ANACOMP INC	2- 6	5 7/8	+1/2	+9.3
O	ANALYSTS INT'L CORP	5- 11	6 3/4	0	0.0
O	ASHTON TATE	6- 27	26 1/2	+1/8	+0.4
O	ASK COMPUTER SYSTEMS	7- 25	13 1/2	-1/4	-1.8
B	ASTRADYNE COMP IND	1- 3	1 3/4	0	0.0
N	AUTOMATIC DATA PROC	35- 70	68	-1 1/2	-2.1
O	COMPUTER NETWORK	5- 9	7 1/2	0	0.0
O	COMPUTER ASSOC INT'L	18- 42	42	+1 1/4	+3.0
O	COMPUTER HORIZONS	5- 11	13	-3/8	-2.8
N	COMPUTER SCIENCES	13- 36	35	+7/8	+2.5
O	COMPUTER TASK GROUP	10- 26	26	+1/2	+1.8
O	COMPUTER USAGE	1- 3	1 7/8	0	0.0
O	COMPUTONE SYSTEMS	3- 11	5 1/8	+1/8	+2.5
O	COMSERV CORP	1- 6	4 3/8	0	0.0
O	COMSHARE	7- 12	10 3/4	+1/8	+1.1
N	CULLINET SOFTWARE	12- 33	14	+3/8	+2.7
O	CYCARE SYSTEMS INC	14- 27	13 1/2	+1/4	+1.8
O	HOGAN SYSTEM INC	4- 12	10 1/4	+1 7/8	+22.3
N	GENERAL ELECTRIC CO	58- 78	78 1/8	-3/4	-0.9
N	GENL MOTORS E (EDS)	20- 48	47 1/2	+1 1/8	+2.4
N	GTE CORP	38- 54	50 5/8	-1 1/2	-2.8
O	INFORMATION SCIENCE	1- 6	3 1/8	0	0.0
O	INFOTRON SYSTEMS CP	13- 24	18 1/2	+1 1/4	+8.7
O	KEANE ASSOCIATES	10- 20	15 1/2	+1 1/4	+8.7
N	LOGICON	25- 43	35 3/4	-3/8	-1.0
O	LOTUS DEVELOPMENT CP	15- 38	35 1/2	+2	+5.9
O	MCI COMMUNICATIONS	7- 13	10 1/8	-1/4	-2.4
O	MGMT SCI AMER INC	7- 16	13 7/8	-5/8	-4.3
O	MATHEMATICAL APP GRP	1- 8	1 7/8	0	0.0
O	MICOM SYSTEMS INC	12- 35	17	0	0.0
O	MICROPRO INT'L CP	2- 4	3 1/4	+1/8	+6.0
O	NATIONAL DATA CORP	8- 24	22 7/8	+1/8	+0.5
O	ON-LINE SOFTWARE INT	4- 14	13 3/4	+1/8	+0.9
N	PANSOPHIC SYSTEMS	14- 34	33 3/8	-1/4	-0.7
N	PLANNING RESEARCH	11- 23	21 1/4	+7/8	+4.2
O	POLICY MGMT SYSTS CP	16- 35	18 1/2	+1 1/2	+8.8
O	PROGRAMMING & SYS	4- 10	8 3/4	-1/2	-5.4
O	REYNOLDS & REYNOLD	30- 65	30 1/4	-1 3/4	-5.4
O	SEI CORP	13- 27	24 1/2	-1/2	-2.0
O	SHARED MEDICAL SYST	26- 38	37 1/8	-7/8	-2.3
O	SCIENTIFIC COMPUTERS	4- 8	4 5/8	0	0.0
O	SOFTWARE AG	12- 22	16 7/8	-7/8	-4.9
N	UNIS CORP	10- 18	16 7/8	-3/4	-4.2
N	UCCEL	11- 20	20 1/8	-1/4	-1.2
O	VMI SOFTWARE	17- 28	28 1/4	+1 3/4	+7.4
	SEMICONDUCTORS				
N	ADVANCED MICRO DEV.	22- 36	28 3/8	-1 1/4	-4.2
O	ADV'D SEMICONDUCTOR	7- 23	13	+1	+8.3
N	ANALOG DEVICES INC	14- 34	33 3/4	+3/4	+2.2
O	ANALOGIC CORP	11- 18	12 1/2	+1	+8.8
N	APPLIED MAGNETICS CP	9- 19	19 1/4	+3/4	+4.0
O	EXAR CORP	18- 28	21 3/4	-1/4	-1.1
O	MACDO CORP	3- 7	4 3/4	+3/8	+8.5
O	INTEL CORP	21- 33	28 1/2	-1/4	-0.8
O	MICRO MASK INC	5- 12	8 7/8	0	0.0
N	MOTOROLA INC	29- 48	46 3/8	-1 7/8	-3.9
N	NAT'L SEMICONDUCTOR	10- 15	14 1/8	-1/8	-0.8
N	TERADYNE	17- 33	27 3/8	+3/4	+2.8

EXCH		52-WEEK RANGE (1)	CLOSE APR 30 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	PERIPHERALS & SUBSYSTEMS				
P	AM INTERNATIONAL	3- 8	7 3/4	1/2	6.0
A	ANDERSON JACOBSON	2- 5	2 1/8	0	0.0
O	AST RESEARCH INC	7- 33	20	-2 5/8	-11.6
O	AUTO-TROL TECHNOLOGY	3- 13	5 1/4	+1	+23.5
O	AVANT-GARDE COMPUTING	3- 21	4 1/4	-1/2	-10.5
O	BANCTEC INC	6- 12	11 1/8	-5/8	-5.3
O	BEEHIVE INT'L	1- 2	1/8	0	0.0
N	BOLT BERANEK & NEW	20- 42	42 1/8	+3/4	+1.8
O	CAMBEX CORP	1- 3	1 1/4	0	0.0
N	CENTRONICS DATA COMP	3- 11	5 3/8	-1/2	-8.5
A	CETEC CORP	6- 9	8 1/8	-3/8	-4.4
A	COGNITRONICS	4- 7	5 1/8	-1/8	-2.3
N	COMPUGRAPHIC CORP	23- 36	23 1/8	-1	-4.1
O	COMPUTER TRANSCEIVER	0- 1	1	0	0.0
N	COMPUTERVISION CORP	9- 44	16 3/8	+5/8	+3.9
N	COMRAC CORP	12- 18	17 1/2	+5/8	+3.7
A	DATAPRODUCTS CORP	11- 20	15 3/8	0	0.0
A	DATARAM CORP	4- 16	15 1/8	-5/8	-3.9
O	DATA SWITCH CORP	4- 9	7 1/2	-3/8	-4.7
O	DATUM INC	5- 9	8 3/8	+3/8	+6.2
O	DECISION DATA COMPUT	10- 20	12 1/8	+1/8	+1.0
O	ENDATA, INC	2- 8	6 5/8	+1/8	+1.9
O	EVANS &SUTHERLAND	12- 27	26 3/8	-5/8	-2.3
O	GANDALF TECHNOLOGIES	5- 13	6 1/2	1/4	3.7
N	GEN'L DATA COMM IND	8- 21	11 7/8	+1/8	+1.0
N	HAZELTINE CORP	18- 30	18 1/8	-1/2	2.6
O	ICOT CORP	3- 12	12 3/8	+3/4	+6.4
O	INFORMATION INTL INC	10- 17	13 3/4	+1 1/4	+10.0
O	INTECOM INC	3- 11	4 1/8	+3/4	+22.2
O	MEGADATA CORP	3- 8	3 1/8	-3/8	-10.7
A	MSI DATA CORP	7- 13	12 5/8	+1 1/4	+10.9
N	MASHUP CORP	24- 52	50 3/4	-1 1/2	-2.8
O	NETWORK SYSTEMS CORP	11- 27	13 7/8	-3/4	-5.1
N	NO AMERICAN PHILIPS	32- 47	45	-1 1/2	-3.2
N	NORTHERN TELECOM LTD	28- 41	30 1/4	+1 1/8	+3.8
O	OMEX	1- 3	3/8	0	0.0
N	PARADYNE CORP	6- 18	8 1/2	-1/2	5.5
A	PENRIL CORP	7- 14	7 5/8	+1/4	+3.3
N	PLESSEY CO (ADR)	19- 38	37 1/2	+3 1/8	+9.0
O	PRINTRONIX INC	9- 18	13 3/8	+3/4	+5.9
O	QMS INC	8- 16	12 1/4	+7/8	+7.6
O	RAMTEK CORP	2- 7	4 1/4	+1/8	+3.0
N	RECOGNITION EQUIP	9- 17	13 3/4	+7/8	+6.7
N	SANDERS ASSOCIATES	30- 44	31 1/2	-10 1/4	24.5
O	SCAN-TRON CORP	9- 22	18 3/4	-2	-9.6
N	SCIENTIFIC ATLANTA	10- 15	11	-3/8	-3.2
O	SEAGATE TECHNOLOGY	5- 13	12	1/4	-2.0
N	STORAGE TECHNOLOGY	1- 5	4	-1/4	-5.8
O	SYKES DATATRONICS	0- 2	3/8	0	0.0
A	T BAR INC	5- 9	6 1/4	1/4	3.8
A	TAB PRODUCTS CO	14- 23	21	-1 3/8	-6.1
O	TANDON CORP	3- 9	5 7/8	0	0.0
A	TEC INC	8- 13	8	-1/8	-2.0
N	TEKTRONIX INC	47- 88	88 1/2	+1 3/4	+3.0
N	TELEX	34- 66	61	-1 1/4	-2.0
O	TELEDATA SYSTEMS CP	0- 3	5/8	-1/8	-16.6
N	TIMEPLEX INC	15- 23	16 7/8	+1/2	+3.0
O	TITAN CORP	4- 11	10 1/2	0	0.0
O	VISUAL TECHNOLOGY	1- 3	5/8	-1/16	-9.1
	LEASING COMPANIES				
N	COMDISCO INC	7- 24	22 1/4	-1 1/2	-6.3
N	CONTINENTAL INFO SYS	5- 21	20 5/8	+2 1/8	+11.4
O	FINALCO GROUP INC	4- 9	4 1/8	0	0.0
O	PHOENIX AMERICAN INC	2- 8	4 7/8	1/8	2.5
O	SELECTERM INC	8- 12	7 1/2	+1	+15.3
N	U.S. LEASING	32- 46	43	+3/4	+1.7

EXCH: N—NEW YORK; A—AMERICAN; P—PACIFIC; B—BOSTON; L—NATIONAL; M—MIDWEST; O—OVER-THE-COUNTER; S — SPLIT

O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Source: Trade Quotes, Inc.

COMPUTER INDUSTRY

INSIDE

GEISCO pursues new applications as the time-share market fades/**113**

The slow growth in the software and services industry will continue/**114**

Sperry ends a down year; Compaq reports another strong quarter/**120**

Control Data: An investor's bargain?/**140**

INSTANT ANALYSIS

"I am not convinced that corporate America needs an 80286-based machine on every desk."
— Andrew M. Seybold, the Seybold Group, Inc.

Akers sees 'demanding year'

Tells IBM shareholders cost controls will continue

By Clinton Wilder

HOUSTON — Warning of a "demanding year ahead," IBM President and Chief Executive Officer John F. Akers told IBM shareholders last week that Big Blue will continue its stringent controls on expenses and hiring until its U.S. business shows a significant pickup.

In remarks at IBM's 1986 annual meeting, Akers noted that the company cut discretionary expenses for travel and meetings by 10%, or $700 million, during 1985. He said such cost controls will continue and that IBM will reduce its hiring from college campuses much more than it did last year, to fewer than 1,000 graduates.

"We believe the prudent course for IBM is to expect a demanding year ahead, to make ourselves as a company as lean and vigorous as possible, and thus ready to take on our competitors when the turnaround comes," Akers said.

Akers did not predict when that might occur, but most indications so far in 1986 have pointed to another sluggish year for IBM and the mainframe industry in general.

In response to a stockholder inquiry about a potential stock split, Akers said the IBM board would not consider another split of stock without a significant improvement in its U.S. business. The company did, however, declare its regular quarterly dividend of $1.10 per share.

Although Akers refused to disclose specific product plans, he answered shareholder questions on the following product areas:

• System/36 and 38. Akers said IBM is working on hardware and software enhancements to provide better migration from its often-criticized mid-range sytems to 370-architecture mainframes. For the office environment, he said the company

See **AKERS** page 140

INDUSTRY INSIGHT
Edward Warner

Tandy, Apple show their age

Tandy Corp. and Apple Computer, Inc. have two of the longest life spans of any of the players in the personal computer industry. This year, while both have announced increased profitability, both are also showing their age; they have too long relied on cash-cow products whose technology blossomed years ago.

Tandy troubles arise from the double whammy of being in the computer retailing business (a fairly unprofitable line of work) and marketing personal computers that are either technologically outdated or at the mercy of Asian underpricing.

Tandy may have announced a 92% increase in profitability in its recent third quarter, but the majority of that $42 million in earnings came from consumer electronics products; revenue from Tandy's Computer Centers and Radio Shack stores was flat.

That could spell trouble in the long run for a company that gets a full 30% of its revenue from computers and peripherals.

Earlier this month Paine Webber, Inc. said in a report that it had downgraded its expectation of Tandy's earnings per share in fiscal 1986 from $2.75 to $2.60. Paine Webber blamed Tandy's disappointing PC sales.

In its most recent quarter, Apple also showed increased profitability. The $31.8 million that it earned in that quarter, while three times the revenue of the same period a year ago, came as revenue dropped 6% to $408.9 million. Apple is not making money from ex-

See **TANDY** page 116

Warner is editor of the Computerworld News Service.

Olsen chides management

By Alan Alper

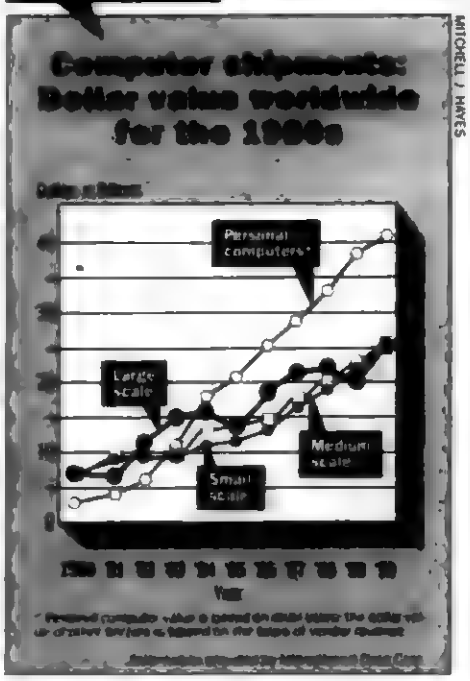
NEW YORK — The computer industry will not shake its debilitating doldrums until top managers at user corporations worldwide gain a better understanding of systems already installed and become more involved in the purchase of new technology, Kenneth H. Olsen, president and founder of Digital Equipment Corp. told a Wall Street gathering.

Speaking at a meeting of the New York Society of Security Analysts last week, Olsen said many of the industry's problems stem from tax laws that encourage corporations to purchase computers in excess of their needs, systems that in many cases cannot communicate with one another.

"People at the top are not used to getting involved," Olsen said. "They blame the computer industry for computers that can't talk to one another. I tell them,

See **OLSEN** page 117

DATA VIEW



Future Computing shuts down

McGraw-Hill dissolves mart research subsidiary

By Clinton Wilder

DALLAS — Future Computing, Inc., once the leading market research firm specializing in microcomputer tracking, was formally dissolved last week by its parent company, publishing giant McGraw-Hill, Inc.

Future Computing, which was widely rumored to be experiencing heavy financial losses in recent months, will be absorbed by another McGraw-Hill research subsidiary, Datapro Research Corp. Delran, N.J.-based Datapro, which publishes a highly regarded annual survey of mainframe users, will hire about 20 of Future Computing's employees.

McGraw-Hill laid off 58 other Future Computing workers, and cofounder and Chairman Egil Juliussen will leave at the end of the month.

Future Computing's rise and fall coincided with the growth and shakeout of the micro industry. Founded in 1981 by Juliussen and his wife Portia Isaacson, Future Computing reached estimated revenue of $7 million in 1984. The cofounders sold the firm to McGraw-Hill in July 1984.

Many in the industry believe that Future Computing lost credibility through overly optimistic projections of growth in microcomputer markets. But McGraw-Hill denied that the unit's credibility was a factor in its decision to terminate the business.

IBM fires volley in war on PC clones, protects AT system box design in UK

By Ralph Bancroft and Charles Brown
Computerworld News Service

LONDON — In the latest battle in its UK war on Personal Computer clones, IBM registered the design of its Personal Computer AT system box, gaining protection against copying by other manufacturers.

By registering the design of the AT box under the Registered Designs Act of 1949, IBM gained 25 years' protection against copying of the AT box's look, even where the physical dimensions of the copy are different.

The action also closed a loophole that may have enabled one London clone supplier, Qubie Ltd., to sell PC AT look-alikes. Qubie Managing Director Roger Harvey said IBM lawyers have already written him to demand that his firm sign a written agreement to stop selling its BT AT model or face legal action.

Comcen Ltd., the British company chosen by the IBM PC Users Group for its so-called approved clone, recently changed its front panel and read-only memory BIOS to avoid litigation, although it insisted that none of the changes it made to its clones have come at IBM's urging.

According to Comcen Sales Manager Gary Stone, IBM's crackdown on the clones was predictable. "With the numbers of compatibles selling, IBM is bound to be upset," he observed. "We just want to keep our act clean."

Our most advanced personal computer advances again.



With the Personal Computer AT,® IBM put advanced technology to work. To help boost performance. .

But even advanced technology keeps advancing.

Now IBM introduces enhanced models of the Personal Computer AT–computers that raise high performance even higher.

Think fast.

For some people, fast isn't quite enough. So the new models of the Personal Computer AT run up to 33% faster.

That means you can recalculate even the biggest spreadsheets in a flash. And sort through your data with astonishing speed.



20MB 30MB

A choice of hard files to meet your storage needs.

Store more.

Big news for people who work with big files.

A Personal Computer AT can now store more information than ever. IBM gives you a choice of hard files (fixed disks)—including a 30-megabyte size that stores up to 15,000 pages of words and numbers.

And if that's not enough, double it. Just add a *second* 30MB hard file, for a total capacity of 60MB.

A new set of keys.

Today, you can select an IBM Personal Computer AT with an enhanced keyboard.

It has separate cursor keys, a separate numeric keypad (for easier data entry) and twelve function keys.

It also has a main typing section that's modeled after the classic IBM Selectric® keyboard, which makes word processing easier than ever.

Diskettes that are just your size.

With a new option, the Personal Computer AT can run 3.5-inch diskettes. (They're smaller, but can store twice as much information as 360KB 5.25″ diskettes.)



A new option to let you run 3.5″ diskettes.

So now you can use programs and data in either format. And have the flexibility to work with other members of the IBM PC family that use 3.5″ diskettes.

Including the new IBM PC Convertible.

Family ties.

With new IBM products, the Personal Computer AT can more easily communicate with other PCs.

IBM's networking options, for example, let you share files from a variety of popular programs. While the IBM PC 3270 Emulation programs let you retrieve information from a mainframe.



New programs to help you communicate with other PCs. And mainframes, too.

You can also use the Personal Computer AT to run IBM PC XENIX® –an enhanced multi-user, multitasking operating system.

A powerful value.

The best news is, the Personal Computer AT now offers increased power without a higher price.

And if you qualify, you can conveniently charge your Personal Computer AT on IBM's Credit Card. Or lease one.with the IBM Commercial Lease Agreement.

See the new models of the Personal Computer AT at an Authorized IBM PC Dealer. Or call your IBM marketing representative.

For the name of a store near you, call 1-800-447-4700. In Alaska, call 1-800-447-0890.

IBM



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It's 1986. And some of the top people in the People's Republic have realized their backs are against the wall.

So who did they come to? Management Science America, Inc. After all, it takes more than inexpensive labor and material costs to compete in the twentieth century.

It takes a complete mainframe manufacturing resource planning system. Like ours.

Which offers products that other software companies don't. And includes INFORMATION EXPERT.™ The fourth generation technology that allows all your existing or new software systems to talk to one another.

For more information, you can talk to people in the People's Republic. Or talk to people at MSA. Namely Robert Carpenter at 404-239-2000.

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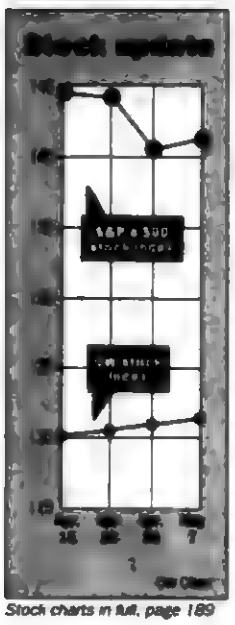
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COMPUTERWORLD

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Early users of the IBM Token-Ring network find products and information scarce. **Page 13.**

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Harris broadens its aim at the market, and at DEC, with a new line of processors. **Page 8.**

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Users rate Applied Data Research's new release of Ideal. **Page 45.**

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AT&T's Starlan fares well with early users who eagerly await gradual addition of features. **Page 19.**

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Foreign-made PC clones can be a bargain, but can also pose problems. **Page 35.**

■

Lotus Development Corp. will roll out a comprehensive set of customer agreements within six weeks, President Jim Manzi promised last week at the company's annual meeting. New sales, service and support arrangements will affect all customers, not just large corporate buyers, he said.

■

Just weeks after an aborted merger with 3Com Corp., forced vacations without pay are pending at Convergent Technologies, sources say. "It wouldn't surprise me, particularly on the AT&T side," John Girton, analyst at Birr Wilson & Co. in San Francisco, said in response to the reports. Convergent has pointed to a drop

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Burroughs targets Sperry

Users favor merger, expect broader service, technology

By Douglas Barney

A poll of Burroughs Corp. and Sperry Corp. users by *Computerworld* last week found a majority of those questioned in favor of the proposal to merge the companies.

More than half of the 40 users surveyed indicated they believe the combined computer companies would provide a greater array of technology, better service and more competition for IBM.

Others, particularly Sperry users, feared that the merger could have a negative impact by reducing the commitment to product lines currently in use.

In last week's survey, 21 users were in favor of the merger, 11 were opposed and eight were undecided.

See **USERS** page 7

Union of mainframe rivals aims to blunt IBM's lead

By Alan Alper and Clinton Wilder

NEW YORK — A bid to create the world's second largest computer company remained on hold late last week with Sperry Corp. declining to respond to an offer by Burroughs Corp. to acquire its New York-based mainframe rival for $70 per share.

Burroughs, making its second attempt within 12 months to combine the two traditional BUNCH companies, said it had begun acquiring Sperry shares in a so-called hostile takeover.

If successful, the $4.1 billion acquisition would represent the most drastic restructuring of the mainframe industry in a decade. The merged entity would pull far

See **UNION** page 6

NAS boasts line outguns Sierra

By Jeffry Beeler

MOUNTAIN VIEW, Calif. — Claiming performance gains of up to 80% over IBM's most powerful system, National Advanced Systems Corp. last week announced two multiple-processor mainframe additions to its AS/XL family.

The two machines, aimed at customers such as banks and large retailers with rapid growth in processing volume, are said to offer 40% and 80% throughput advantages over IBM's 3090 Model 400.

NAS also introduced an entry-level CPU that the company characterized as basically a degraded version of its previously announced 3090-compatible uniprocessor,

See **NAS** page 4

Support charges irk Wang users

By Donna Raimondi

Wang Laboratories, Inc.'s new software support plan, set to be implemented on July 1, has longtime customers grumbling. The users say they want proof that Wang's historically haphazard software services will be improved before they agree to pay for them.

The Wang Software Services program will require users to pay for services that have heretofore been provided free.

"They were giving it away, and all of a sudden they have started to charge money for it," says Charles Raudonis, director of research and development at Fidelity Mutual Life Insurance Co. in Radnor, Pa.

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CW EXCLUSIVE

Trailblazers: A hardy few set out in search of LU6.2 riches

By Eddy Goldberg

When it comes to pursuing the goal of peer-to-peer, multivendor connectivity promised by IBM's Logical Unit 6.2 communications protocol, nearly every major user has the same thing to say:

"You first."

Though managers within the roughly two dozen DP shops surveyed by *Computerworld* maintain that they are seriously considering and definitely planning to use LU6.2, most are waiting for someone else to be the pioneer.

One person not willing to wait is Joseph T. Brophy, senior vice-president of data processing at the Travelers Insurance Cos. in Hartford, Conn., who thinks LU6.2 should greatly facilitate office automation. "We're pretty excited about it," he says. "It's a standard architecture, so a lot of hardware and software vendors can develop products and fill in niches in IBM's product line — and let us get on with the job of automating the office."



Brophy

IBM introduced LU6.2 in July 1982. Also called APPC, for Advanced Program-to-Program Communication, LU6.2 provides users with protocols for peer-to-peer communication, allowing applications programs on dissimilar processors to communicate with each other as peers.

Though IBM software support for LU6.2 is still limited, many users are willing to wait for its promise to be delivered in usable products.

"When you have a breakthrough like this, you're pleased. So what if you have to wait a year or two? When it becomes available, we'll be there," says George DiNardo, executive vice-president of the information management and research department at Mellon Bank, N.A. in Pittsburgh.

"For IBM, LU6.2 is a direction statement," DiNardo says. "They have nothing yet, but if LU6.2 produces

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NEWSPAPER

IBM users group at age 30: Toasting past, looking ahead

Guide comes of age, changes with time

By James Connolly

PEORIA, Ill. — Finding better ways to recognize emerging technologies and to share information about the changing DP environment are key goals for a powerful IBM users group as it marks its 30th anniversary this year.

Guide International Corp., which derived its name from Guidance for Users of Integrated Data Processing Equipment, was founded by representatives of 44 IBM 702/705 user organizations in December 1956. In an interview last week, Guide President John E. Nack reported that the organization now has 2,800 member companies and organizations, with each running an IBM 4300 or larger system. Nack discussed the ways Guide has changed, its future and its relationship with IBM.


John Nack, Guide president

"We have come of age a bit in recognizing that we are an information exchange service. We thought for a period of time that we were not, or we tried not to be. We were trying to be a group of people who got together and worked on projects and brought requirements to IBM," Nack said. But, he said, Guide also found that many people were joining the organization in search of a chance to exchange knowledge.

"In the last few years we have decided that we also are an information exchange vehicle," Nack noted.

Guide wants to concentrate in the future on providing a format for that exchange, rather than solely trying to influence IBM, according to Nack, who is in his third year as Guide president and is a manager with Caterpillar Tractor Co. in Peoria.

Three major conferences

Guide holds three major conferences a year, including one in Chicago the week of July 13. Much of the work at those conferences will continue to be done through the independent project format, under which groups of 10 to 40 members take a two-year-long look at a technology or product before issuing white papers for the information of other members and issuing recommendations to help steer IBM in its product development, Nack said.

Guide now has 180 projects running and has a data base of several thousand user requirements for IBM's consideration. Those projects address topics such as the strengths and weaknesses of IBM products in areas like in-house publishing and VM security software requirements. Each project team meets several times per year, listening to presentations by IBM representatives, conducting roundtable discussions and meeting with users experienced with a product or technology.

Nack estimated that Guide has a success rate of better than 90% in getting IBM to address user suggestions.

During the past two years, IBM has started to acknowledge Guide's input by briefly mentioning in new product literature that a product or enhancement is intended to address a particular Guide requirement.

"We have a good interchange with IBM, particularly early in the life of a product with the product developers, so I believe that there is an opportunity for both IBM to shape our opinion of the product and for us to shape IBM's opinion of the product. I think an awful lot of that goes on," Nack said.

IBM listens

He also said that it is natural for IBM to listen carefully to established groups like Guide. Guide was established for the benefit of commercial DP operations rather than the scientific, engineering and educational organizations that were the founders of the other 30-year-old IBM user group, Share.

"When we gather our collective voices on an issue and we say that this is a Guide issue, then IBM should take that into consideration. We represent 2,800 of their largest users," he said.

Nack observed that Guide is changing in more ways than in the information-sharing area. "In order to be a viable user organization, we are going to have to tune the membership requirements to the reality of the world. If the reality of the world becomes that there are relatively fewer large glass houses and relatively significant increases in the numbers of System/36s on down, and those are the folks who want to come to our meeting, then we are going to have to allow some changes in our membership requirements.

"I really think what you are going to see happen is that organizations like ourself have to tune up to different sets of requirements based on the kinds of services we are trying to provide," he said.

Nack noted that one example of how the structure is changing is the addition of Guide divisions that address the telecommunications and end-user computing areas.

"For instance, my telecommunications division might — and I have to say 'might' — in order to be effective, require a different set of membership requirements than the operating systems group on account of the fact that I am dealing with an entirely different set of problems," he said.

"There would be no reason, perhaps, in the future to exclude somebody who is a PBX user but does not happen to use an IBM mainframe, if what you are trying to do with the communications division is have a project that works on PBXs," Nack continued. "The IBM/Rolm acquisition makes that an even more interesting circumstance for us."

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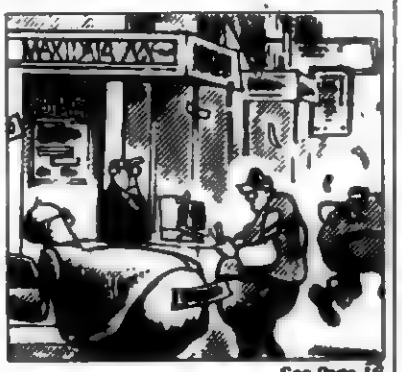
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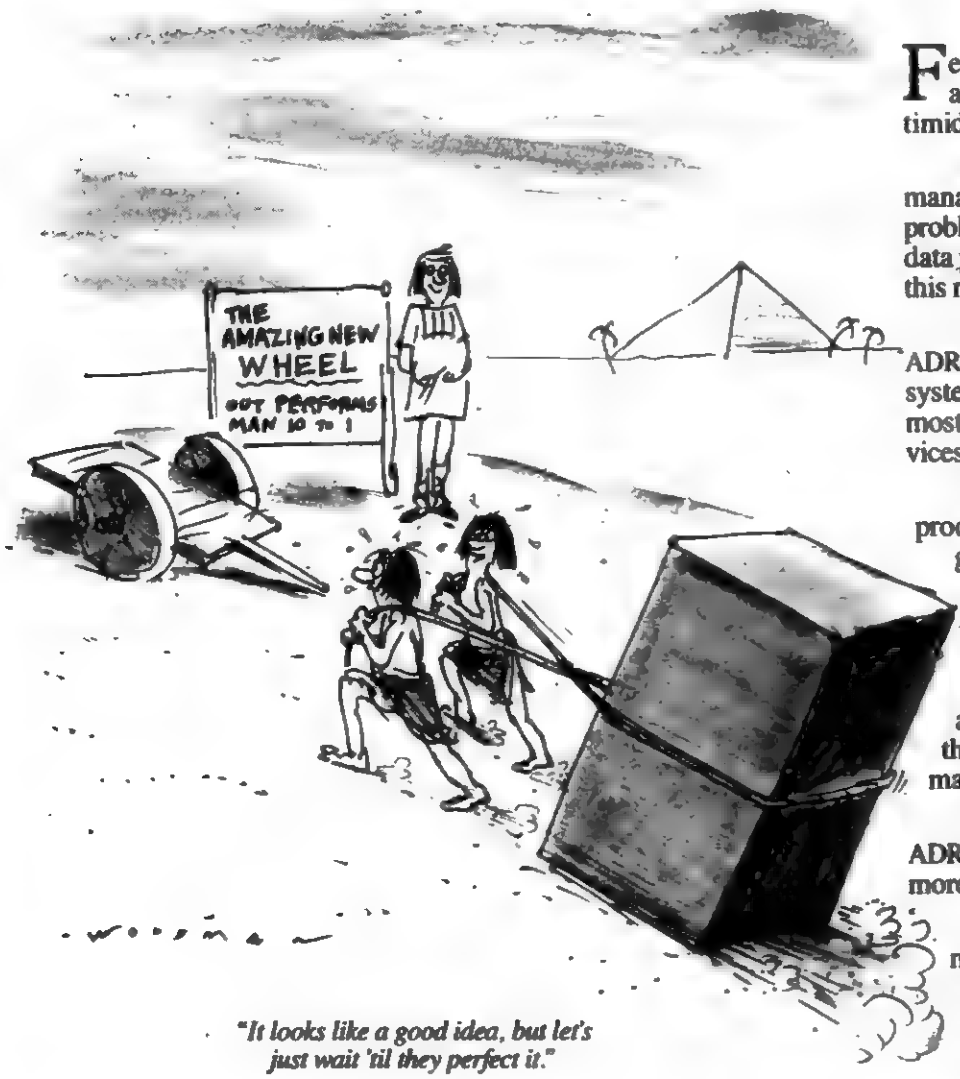
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Data General laptop offers hard-disk option

But not using dealers may be 'big mistake'

By David Bright

NEW YORK — Data General Corp., which experienced weak demand for its first laptop computer, last week introduced an upgraded, IBM PC-compatible version with an optional 10M-byte internal hard disk drive and improved displays.

The Data General/One Model 2 system, priced from $1,795, is the first laptop from a major computer vendor with an integral 10M-byte hard disk drive and an electroluminescent display.

While analysts gave the DG/One Model 2 high marks, they warned that DG must quickly establish its marketing presence. AT&T, Compaq Computer Corp. and Wang Laboratories, Inc. are all expected to bring out hard disk-equipped laptops later this year.

Initially plagued by engineering difficulties such as displays that customers claimed could barely be read, the DG/One, introduced in September 1984, has so far achieved sales of no more than 15,000 units. That is less than half of the initial industry expections for the system, estimated Larry Lefkowitz, microcomputer group associate editor at Datapro Research Corp. of Delran, N.J.

DG's introduction of the less than 12-lb Model 2 system follows by one month the debut of IBM's PC Convertible, which carries a base price of $1,995. Analysts believe DG may have a hard time selling the laptop outside of the firm's existing customer base, especially since the system will not be sold through dealers.

"They've got a window of three to four months that will ultimately dictate how successful they are in this market," said John McCarthy, research manager at Forrester Research, Inc., Cambridge, Mass.

McCarthy said that DG's decision not to sell the laptop through dealers is "a big mistake" and that, in the face of 30% volume discounts offered by IBM, DG will have to discount the system heavily to volume buyers.

One drawback with the DG/One Model 2 is the external battery pack required for the electroluminescent models.

With the new system, users have a choice between the 25 line electroluminescent display and an improved LCD. The electroluminescent display costs an extra $1,000.

An LCD version of the DG/One Model 2 sells for $1,795, with 256K bytes of memory and one 3½-in. floppy disk drive. A basic system with serial and parallel ports and a built-in battery and charger is $1,995. With a 10M-byte hard disk, the LCD version's price moves to $2,995.

An electroluminescent model with one floppy, a 10M-byte hard disk drive and 640K bytes of memory costs $4,635. Options include an internal 1,200/300 bit/sec. modem for $450 and a second serial port for $195.

A two-drive DG/One system is now priced at $1,495. The new LCD screen is available as an upgrade to existing DG/One systems.

NAS boasts line outguns Sierra

From page 1

the AS/XL 60. Prices for the AS/XL 50, 90 and 100 start at about $3.1 million, $9.8 million and $12.4 million, respectively.

The four-processor AS/XL 100 provides 2.9 to 3.4 times more performance than the AS/XL 60 uniprocessor, which roughly equals the power of IBM's 3090 Model 200. The three-processor AS/XL 90 outperforms the AS/XL 60 by a factor of 2.4 to 2.7, according to Carl Claunch, the vendor's director of worldwide systems planning.

Both the AS/XL 90 and AS/XL 100 exceed the internal throughput of the AS/XL 80, NAS' previous top-of-the-line mainframe, which corresponds to the 3090 Model 400. The AS/XL 80 is 70% to 90% faster than the AS/XL 60, Claunch said.

The entry-level AS/XL 50, a 3090 Model 180-class machine, runs 20% to 40% slower than the AS/XL 60, Claunch said.

The announcement of the three AS/XL models came only about two weeks before NAS is scheduled to begin shipping the AS/XL 60 and AS/XL 80, which were introduced in March 1985.

Shipments of the AS/XL 50 are scheduled to begin during the first quarter of 1987, with the AS/XL 90 and AS/XL 100 to follow two quarters later.

Most powerful CPUs

NAS officials described the AS/XL 90 and AS/XL 100, which are still under development at Hitachi Ltd., as the most powerful IBM-style CPUs yet conceived.

Each of NAS' Sierra-class mainframes can be upgraded in the field to the family's next largest member, NAS officials said.

NAS user John Cook, vice-president of computer operations at Concord, Calif.-based Central Bank reacted indifferently to the introductions. "I really know very little about the announcement, but judging from what I've just heard, I'd say the most important feature of the products is their increased horsepower," he said. "But who cares? Everyone is assuming that any time now, some more powerful machines will also be coming from IBM."

Some other users, however, greeted last week's announcement positively. "I suspect very-high-end customers might be extremely interested in the new NAS products," said John Kline, director of information services at Dayton, Ohio-based Mead Corp.

The main difference between the various AS/XL models is the way their hardware building blocks are combined. Two AS/XL 60s, when tied together, yield an AS/XL 80. An AS/XL 90 consists of an AS/XL 60 coupled with an AS/XL 80 and the largest of the five systems combines two AS/XL 80s.

A minimum AS/XL 50 configuration comes with 32M bytes of main memory and 16 channels, expandable to 128M bytes and 48 channels. A basic AS/XL 90 and AS/XL 100 combines 128M bytes of internal storage with 48 channels and expands to a maximum of 512M bytes and 96 channels.

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TOP OF THE NEWS

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in business from AT&T as one reason behind revenue declines.

■

More acquisitions could be in store at Management Science America, Inc. (MSA), company President William Graves told investors at a Hambrecht & Quist conference in San Francisco last week.

MSA is currently sitting on approximately $100 million in cash, which will be reduced to $80 million with the recent acquisitions of RTS Ltd. in Dublin and Information Associates, Inc. of Rochester, N.Y. "We could do another two or three acquisitions like Information Associates this year," Graves said.

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- **SyncSort CMS**—Sorts CMS, SAM (OS or DOS), or VSAM files • Can be invoked from COBOL, PL/1 or BAL programs • Dynamically allocates disk space • Selects relevant records for sorting • Reformats records on output • Performs summaries of designated numeric fields • Produces reports with pagination, headings and dates • Can often produce simple reports in one day rather than, say, five. Much more, too.

(3) THE FINEST TECHNICAL SERVICE: Our Technical Service specialist are experts in their individual fields. You can count on fast, efficient, courteous service in both backup or sorting operations. More than 85% of all user requests for service are resolved within 24 hours.

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Sperry faces the fate of mainframe dinosaurs GE and RCA

Burroughs clawing for No. 2 position

By James Connolly

There was a time when the logos of General Electric Co. and RCA Corp. were attached to more than the consumer goods, such as televisions, for which they are best known. Each made mainframe computers, and each, like Burroughs Corp. and Sperry Corp., saw IBM chew up their market share.

ANALYSIS

Now Sperry faces the same fate that the computer divisions of GE and RCA encountered in 1970 and 1971 — the prospect of being absorbed by another computer maker. In RCA's case, the acquirer was Sperry. In GE's case, Honeywell, Inc. absorbed a failing venture.

The desire to regain its No. 2 position from Digital Equipment Corp. by building a $10 billion company is driving Burroughs' pursuit of Sperry.

In one way, Burroughs Chairman W. Michael Blumenthal's second attempt to absorb Sperry makes sense. As members of the BUNCH group of mainframe vendors, Burroughs and Sperry have seen their market share slip, particularly in comparison to IBM. It seems logical that somebody has to do something to slow the erosion of the non-IBM base.

According to estimates by the market research group International Data Corp. (IDC), IBM's U.S. shipments of large systems soared from $1.7 billion in 1981 to $6.8 billion last year, while Burroughs' shipment figures edged up from $400 million to $450 million and Sperry's figures fell from $450 million to $350 million.

A recent *Computerworld* survey of a half-dozen users of BUNCH-member NCR Corp. equipment turned up three who had jumped to IBM, while calls to 20 Sperry user sites last week revealed that seven had gone to IBM.

But other than providing a united front to fight IBM — a front that would be built on incompatible processor lines — questions remain about the acquisition.

IDC analyst Don Bellomy says, "It does not make sense except as Blumenthal's attempt to get out of the BUNCH and into the 'BID' — Burroughs, IBM and DEC." He says he doubts a combined unit could provide the product line or profit figures to justify a merger.

Bellomy points to Honeywell's gradual phasing out of the GE product line, and adds, "If I were a Sperry customer with a sense of history, I would be a little concerned."

He notes that while Blumenthal promised to maintain the Sperry product line — in an era when companies like DEC are emphasizing compatibility — there is no guarantee that Blumenthal's eventual successor will honor that promise.

Last week's survey of users revealed a general feeling of support for the merger. But some users, particularly Sperry customers, voiced doubts.

Those Sperry customers seemed concerned their systems may get tossed aside when it comes to support and development. Those customers might be worried because they have seen Sperry make a commitment to Unix-based systems and Burroughs largely steer clear of Unix.

While those fears are not unsubstantiated, some observers were noting last week that the more likely scenario would be continued support for Sperry's 1100 line of mainframes and a gradual migration of Sperry customers into a common architecture.

If that happens, most customers probably will cope. But the name of Sperry, which has already replaced the venerable name Univac, will fade into the background with other failed mainframe names like GE, RCA and Xerox Data Systems.

Sperry and Burroughs: Worldwide shipments and installed bases

	Large Systems	Medium-Scale Systems	Small Systems
[illegible] 1985 shipments (millions of dollars)	830	[illegible]	670
Installed base	1,340	4,920	52,000*
Sperry Corp. 1985 shipments (millions of dollars)	630	[illegible]	[illegible]
Installed base	990	3,430	19,000*

* Figure excludes sales revenue, purchases and under OEM agreements. Installed base figure [illegible] of small systems were returned, according to Information Data Corp. estimates.

Information provided by IDC, May 1986 estimates.

Union aims to blunt IBM's lead

From page 1

ahead of the other BUNCH companies with some $10.5 billion in revenue. But it would be saddled with two highly incompatible large-system product lines.

Burroughs Chairman W. Michael Blumenthal said last week his proposal to acquire Sperry is intended to enhance the competitiveness of both firms against IBM.

"It is a move, the beginning of a process, to create another viable U.S. multinational advanced computer manufacturer and marketer to challenge the market leader," Blumenthal said.

Blumenthal emphasized that if the merger is approved, both firms' sales organizations and distinct mainframe architectures — Sperry's 1100 series and Burroughs's A and V series — would be preserved.

But most observers believe the merger makes little sense unless the new company develops a single computer architecture to which both Burroughs and Sperry users can migrate. "You can eliminate some redundancies on Day 1, but to really see the benefit, you have to have a unified product line in the five- to seven-year time frame," said mergers and acquisitions specialist Harvey Poppel of Broadview Associates in Fort Lee, N.J.

The creation of an alternative to IBM, Blumenthal said, would eliminate "the fear factor in the purchase of computers." Many potential users of non-IBM equipment are reticent to commit to anyone but Big Blue, he said.

Burroughs made an earlier merger offer last June, but withdrew it when Sperry objected to various elements of the plan. Sperry's hesitancy in responding to the offer last week led analysts to anticipate it would fight the Burroughs takeover attempt.

To remain independent, Sperry would have to repurchase its outstanding shares, a development believed to be unlikely given the huge expense entailed. Sperry would have to sell one of its business units to raise the money needed.

"The customer would suffer if Sperry, in the process of trying to remain independent, weakens its financial structure," Poppel said.

Rumors had circulated last week that Sperry had considered a long list of potential "white knight" partners, or firms that could make a tender offer to compete with the $70 a share Burroughs bid. Sperry stock rose above the $70 mark on the speculation and on anticipation that Burroughs might up its offer.

The Burroughs offer, which was $5 per share higher than its unsuccessful bid last June, consisted of 55% in cash and the balance in Burroughs' preferred stock and debt securities.

This time, Burroughs did not wait to be rejected and moved to take matters into its own hands.

A source inside Sperry said that despite past acquisition passes made by Burroughs, ITT and others, last week's proposition "caught us with our pants down." The source likened the acquisition offer to a military operation where surprise is the key to success.

Blumenthal indicated that despite mainframe product line overlap there is much that is complementary between the two firms. While Sperry is strong in scientific and government markets, Burroughs has a huge installed base in the financial services sector.

By combining certain operational activities the merged firm would obtain substantial cost reductions through greater economies of scale, Blumenthal said. In the first year of operation, the combined firm could save $150 million, he estimated.

Some analysts took issue with Blumenthal's cost savings analyses. "It's not like at General Motors where you have Chevy and Pontiac under the same roof and can use the same engine in each," said Donald Haback of Smith Barney, Harris Upham & Co. "There's little commonality of parts in the mainframe business."

William Easterbrook of Kidder, Peabody & Co. remarked that Blumenthal could easily obtain the cost savings he projected through plant consolidations and layoffs. "That's something he doesn't want to talk about until the deal is done," Easterbrook said.

Because of the huge expense of the acquisition, analysts said that a newly created corporation would be carrying an excessive amount of debt. Standard & Poor's Corp. placed the debt securities ratings of both Burroughs and Sperry on its credit watch list.

"With that debt, I think Blumenthal's got quite a challenge," said George Podrasky, an analyst with Duff & Phelps, Inc. in Chicago.

AT A GLANCE

SPERRY

- Established, 1933
- Merged with Remington Rand Corp., developer of Univac I, to become Sperry Rand, Inc., 1955
- Acquired RCA Corp. computer customer base, 1971
- Changed name to Sperry Corp., 1979

Fiscal year 1986 (ended March 31)
Revenue: $5.74 billion
Profits: $47 million
Assets: $5.9 billion
Employees: 65,932
Foreign subsidiaries: 33

AT A GLANCE

Burroughs

- Established as American Arithmometer Co., 1886
- Reorganized as Burroughs Adding Machine Co., 1905
- Built memory device for ENIAC, 1952
- Acquired computer maker, Electrodata, 1956
- Acquired System Development Corp., 1980
- Acquired Memorex Corp., 1982

Fiscal year 1985 (ended Dec. 31)
Revenue: $5.03 billion
Profits: $248 million
Assets: $4.55 billion
Employees: 60,500
Foreign subsidiaries: 27

Merger could challenge IBM or mire new giant in debt

By Clinton Wilder

What kind of $10 billion company would result from the marriage of Burroughs Corp. and Sperry Corp.?

Burroughs Chairman W. Michael Blumenthal foresees a resource-rich hybrid with both the muscle and the marketing presence to compete with IBM in the mainframe world.

But other observers predict a debt-saddled giant unable to capitalize on synergy because of incompatible computer architectures, warring management and clashing corporate cultures. And the hostile nature of Burroughs' acquisition bid is certainly not going to help the marriage.

"The key is whether two companies that have viewed each other as competitors can suddenly be made to feel warm about each other," said Harvey Poppel of Fort Lee, N.J.-based Broadview Associates.



Kroger

"The major element is two very strong, distinct cultures," Poppel added. "The middle and upper-middle management are career Burroughs people. Sperry was a pioneer in the business, and most of its people have also been there their entire careers."

The fate of Sperry's top management within the new company, notably Chairman and CEO Gerald Probst and President and Chief Operating Officer Joseph Kroger, would be very uncertain. Their opposition to Burroughs, particularly Kroger's, was considered the major obstacle to the merger last year, and Sperry's refusal to comment last week seemed to indicate its management is still strongly opposed to losing its independence.



Blumenthal

Blumenthal said he saw a role for Sperry management in the combined firm but stopped short of saying whether there was room for Probst or Kroger. "I won't speak about individuals; it's hardly appropriate," he said.



Probst

Charles Varga of The Cerberus Group, Inc. in Frenchtown, N.J., a firm that tracks merger and acquisition activity, said "anywhere from 10,000 to 20,000 jobs" could be eliminated by the combination of the two companies.

Correspondent Alan Alper contributed to this story.

Users favor firms' merger

From page 1

On the whole, Burroughs' users expressed more optimism, and Sperry users expressed more concern about the proposed merger.

"Burroughs wouldn't want two financial software products, and its package is considered more advanced than Sperry's," said Jim Helfer, assistant vice-president of systems and programming for Coral Gables Federal Savings & Loan Association based in Miami, Fla. "So there could be some pressure for us to convert to the Burroughs system."

A majority, 21 users, said they believe the merged company would be better able to meet their own future processing needs. A similar number, 24, said the combination would be more competitive..

Many users view size as the major benefit. "They will have a broader footing, including a larger sales and field engineering force," said Steve Main, DP manager for the diversified firm Hopper, Inc. in California.

One user expects the combination to have more of an impact upon Digital Equipment Corp. than on IBM. "They'll be coming at the lower end of the market, and that is going to cut into DEC more than IBM," said Robert Poirier, director of operations for Floral Network, Inc. in Chicago.

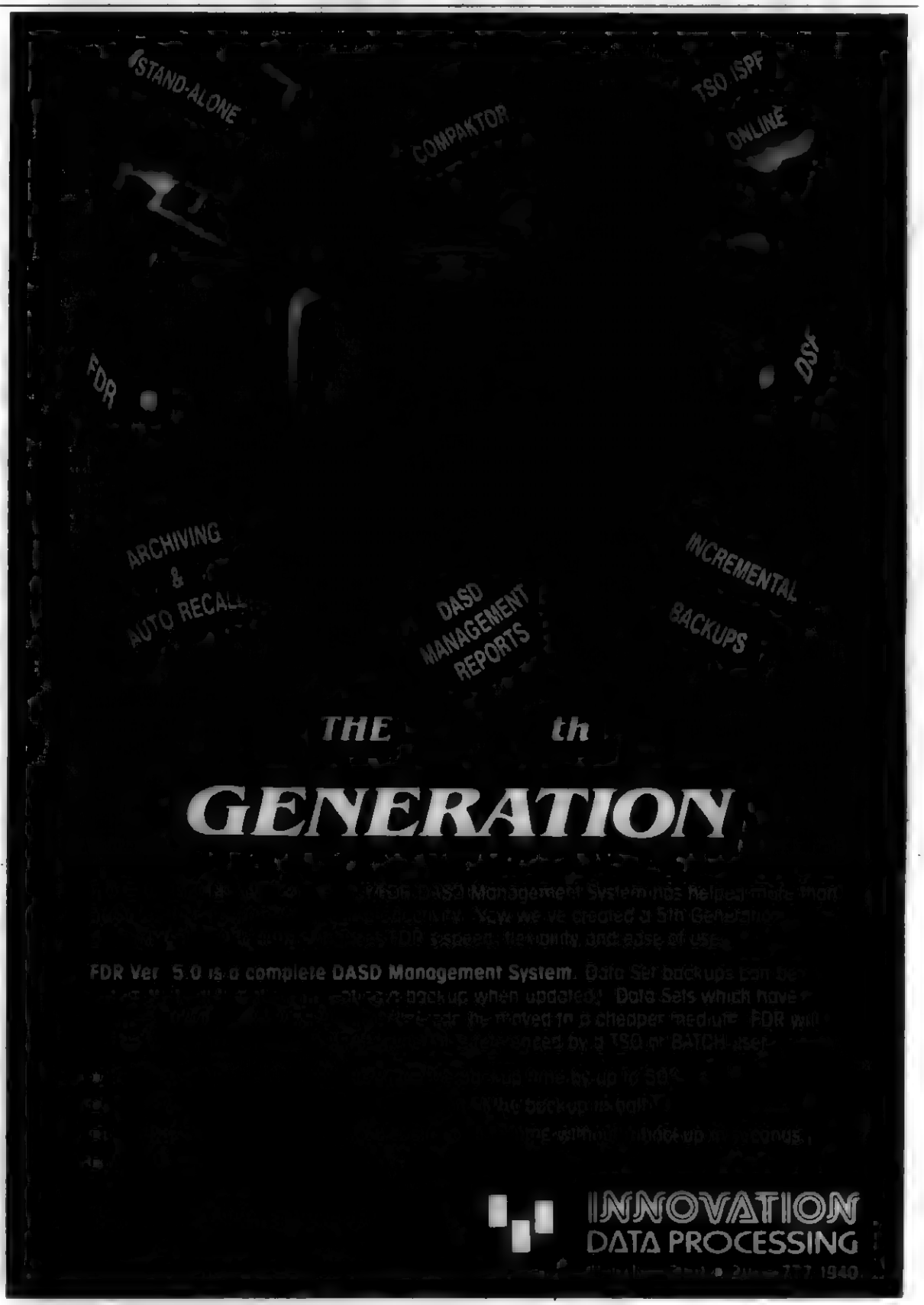
Critics of the merger fear that a battle for corporate control, as well as the complicated process of combining the firms, will reduce the short-term commitment to customer service and product development.

"They may get too big too fast and fall flat on their faces," said Davy McClary, operations manager, Indiana Lumbermans Mutual, based in Indianapolis.

Thirty respondents expressed confidence that their systems will not be abandoned as a result of the merger, and seven were concerned that their systems might be abandoned.

"I really don't see how such diverse operating systems and machines can merge successfully," said Kirk N. Cobb, director of MIS for Munford, Inc., an Atlanta-based operator of convenience stores and a Burroughs user.

Contributing to this report were staff members Rosemary Hamilton, Mitch Betts and James A. Martin.



Harris to launch Unix-based processor line

Target: DEC hold on general-purpose mart

By James Connolly

FORT LAUDERDALE, Fla.— Seeking to expand its customer base beyond the aerospace and defense markets into the general-purpose Unix market, Harris Corp.'s Computer Systems Division today is scheduled to announce four supermicrocomputers and superminicomputers.

The Harris MCX-3 and MCX-5 lines are targeted at the low-end and middle of Digital Equipment Corp.'s VAX product line. Built around the Motorola, Inc. 68020 microprocessor, the MCX-3 and MCX-5 are intended to fill out the Unix-based processor series that Harris introduced a year ago with the HCX-7. The CX Series is aimed at computer-aided design, civil engineering, electrical engineering and software engineering.

Harris claimed performance figures of 1.5 million instructions per second (MIPS) for the basic CPU and 3.6 MIPS for each CPU with a floating-point accelerator. The MCX line includes the single-processor MCX-3 Model 40, the single- or dual-processor MCX-3 Model 60, the single- or dual-CPU MCX-5 Model 60 and the two- to four-CPU MCX-5 Model 70.

Harris' Director of Product Marketing Rick Maule said, "The incumbent out there is DEC, and that is who we are going after. As they lay down each of their cards, we want to lay down one of ours." He positioned the HCX-7 line against DEC's VAX 8600, the MCX-3 against DEC's Microvax and the MCX-5 against DEC's mid-range 8200 and 8300.

He said along with the expansion of the CX line, Harris will continue to enhance its earlier H-Series of superminis and Harris Station Series workstations.

Another Harris official, Vice-President for Marketing Robert Mitro, said the keys to Harris' ability to expand its market include the ability to offer high-performance systems for each level, adherence to standards such as Unix, efforts to build a national support system modeled after that of IBM and the continued adaptation of third-party application software source code for its systems.

He said Harris wants its scientific and engineering customers to make more general use of Harris systems, citing as an example the U.S. Corps of Engineers' running data base applications as well as engineering applications on Harris equipment.

Expanding from traditional market

Sandra Gant, an analyst with Infocorp of Cupertino, Calif., noted that Harris has been a sleeper in the supermini marketplace. "I think they can leverage from their traditional market into other areas. But there are some noble competitors out there who will not sit still," she said.

International Data Corp. analyst David Moschella added, "They are good at what they do, and they are right for the markets they are in. Harris traditionally has had good products, but they have had trouble getting outside of those government markets."

Maule said that Harris went outside of the company for much of the technology for the MCX Series, acquiring the 32-bit CPU boards and backplane cluster from Masscomp before adding its own packaging and peripherals. The HCX-7 uses a Computer Consoles, Inc. processor.

The basic MCX processor is the pedestal-style MCX-3 Model 40, which consists of two printed circuit boards with a 16.7-MHz 68020 and room for a Motorola 68881 floating-point processor. It offers an 8K-byte cache memory, a 12M byte/sec. memory bus and up to 10M bytes of main memory and supports up to 12 users with optimal performance, Maule said. The Model 40 costs $18,700.

At the high end of the MCX Series, the cabinet-version MCX-5 Model 70 provides up to four processors and supports up to 64 users in high-performance applications such as real-time simulation, according to Harris. The Model 70 supports 4G bytes of virtual address space per process, 128M bytes of physical address space and 32M bytes of memory. It costs $73,000.

IBM software ties PC to host

IBM last week introduced the PC/Host File Transfer and Terminal Emulator Program, a software offering that links IBM Personal Computers asynchronously to Systems Network Architecture (SNA) hosts through an IBM 3708 Network Conversion Unit or 3710 Network Controller.

The $200 package is the first designed for PC-to-host access through the 3708 and 3710 devices, an IBM spokesman said.

The 3708 and 3710 were designed to allow protocol conversion between ASCII and Synchronous Data Link Control environments. "We look at them as important links in some network chains where both environments exist," the spokesman said.

Linked to an MVS, VM or VSE/SNA host, the PC/Host software gives PC users full screen 3270 terminal emulation and file transfer capability, IBM said. This is done in protocol conversion mode with the 3708 or 3710, according to the company. That mode also permits a single communications line to support both display and printer capabilities.

PCs also can emulate a 3101 terminal and attach to the 3708 or 3710 in protocol enveloping mode. This gives access to asynchronous applications on the SNA host or to an asynchronous host.

— Eric Bender

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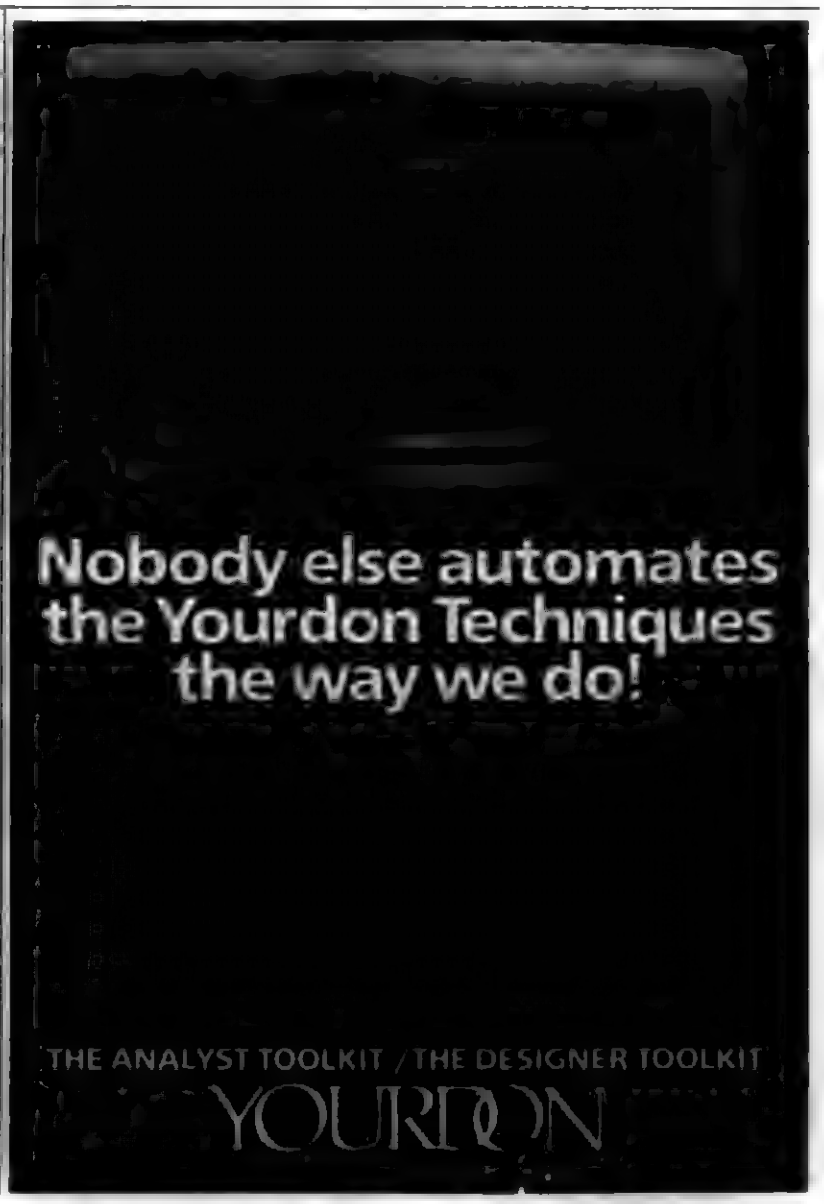
The GUIDELINES :
- Represent DB2 knowledge and experience gained at different installations
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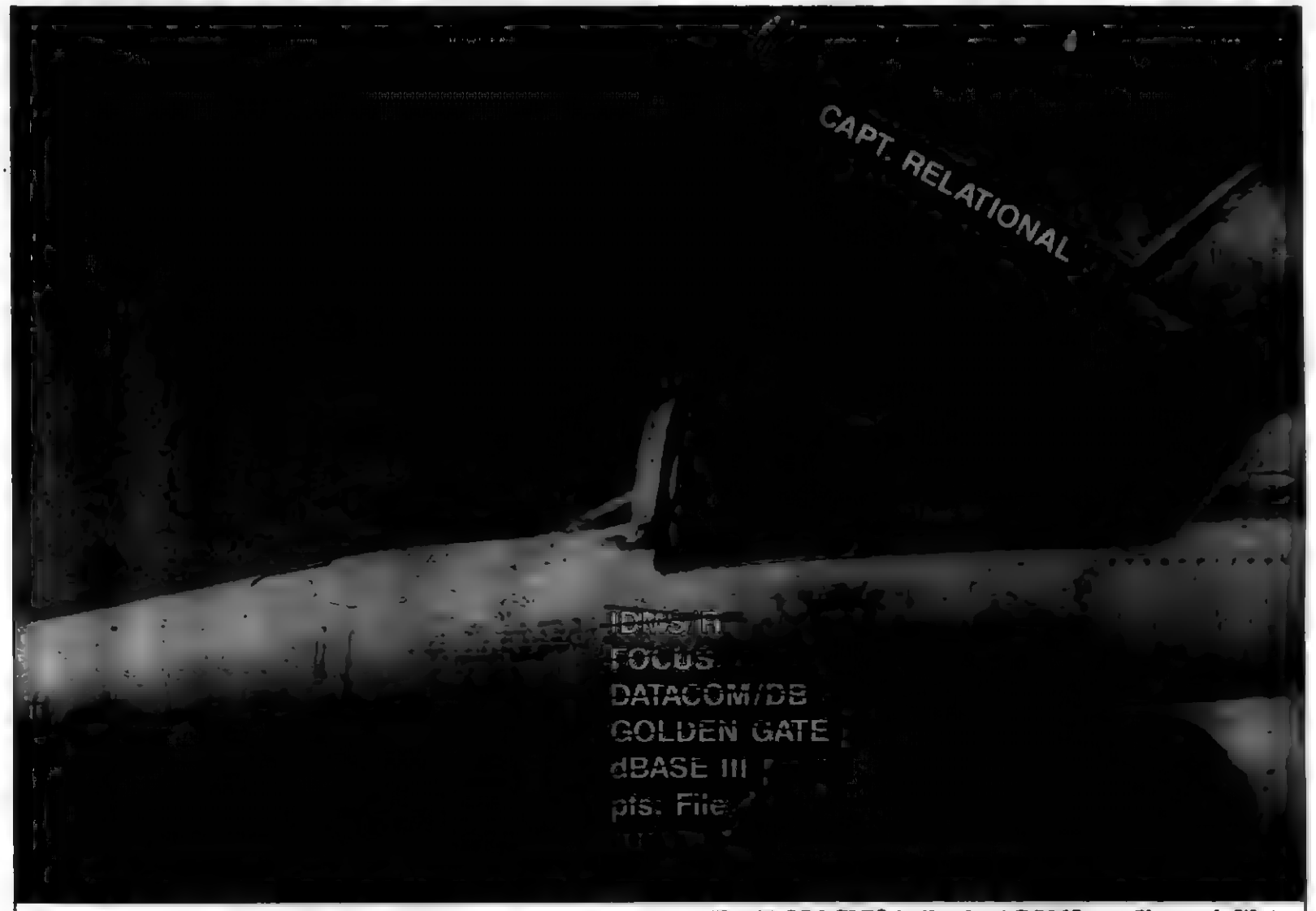
The GUIDELINES are currently available for DB2 Release 1. DB2 Release 2 will be available in the near future. The GUIDELINES address ten major areas:

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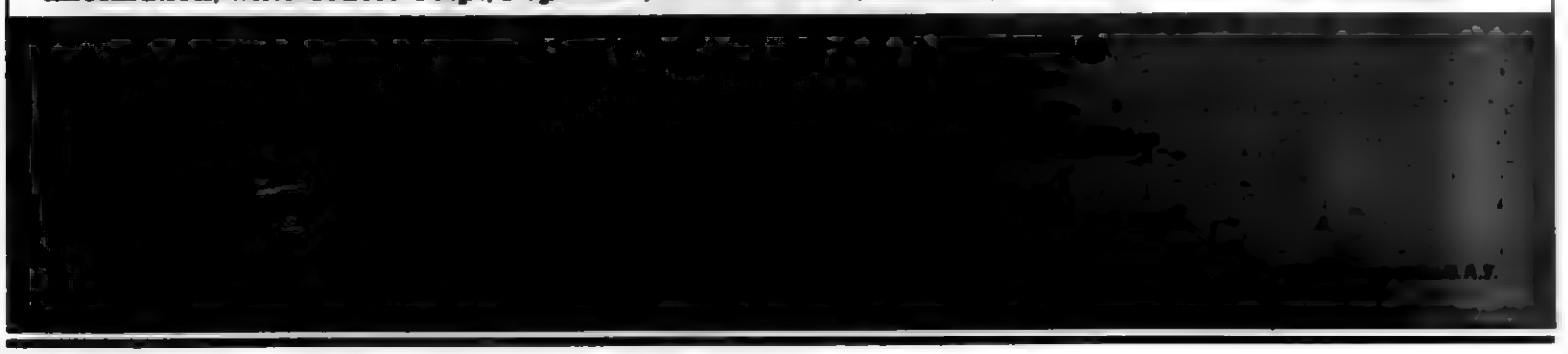
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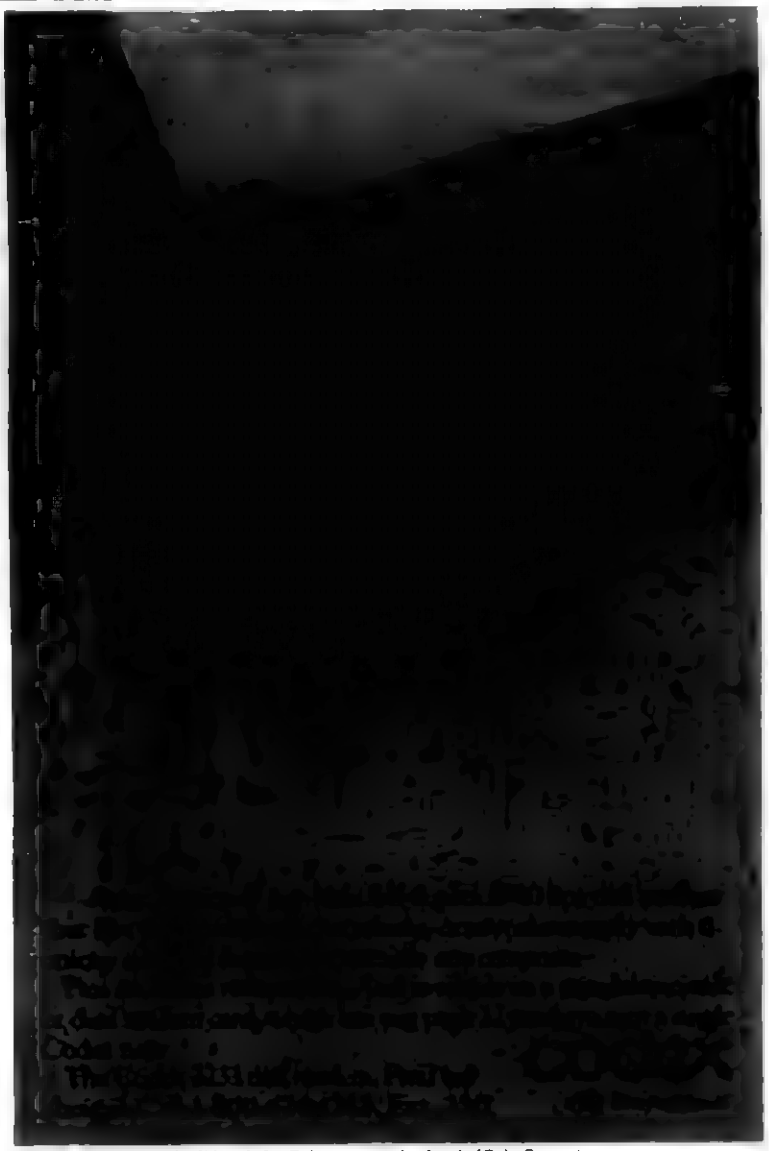


Support charges irk Wang users

From page 1

research and development at Fidelity Mutual Life Insurance Co. in Radnor, Pa. "We have 30 sites across the country, so it is going to cost us a pretty good chunk of change."

The plan is not unlike what other vendors such as IBM and Digital Equipment Corp. offer, but Wang users have been disappointed by past experiences and say they are unwilling to accept the program. Ironically, the current controversy comes at a time when Wang had been concentrating extra effort on improving its traditionally spotty customer service efforts.



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Raudonis' sentiment was echoed by Wang users in other parts of the country. "Wang support wasn't that good to begin with, and now they want us to pay for it," says an indignant customer with two dozen OIS systems in the Northeast.

The Wang Software Services program is a three-tier plan that company officials say will provide operating system and application software updates automatically, a monthly software maintenance bulletin, telephone support and, if necessary, on-site maintenance (see story below). By July 1, customers who have not registered for the plan will have to pay for software support services on a time and materials basis.

Wang's traditional problems in the software service arena are close to legendary. In fact, Dr. Wang's re-emergence as the controlling force at Wang was sparked, in part, by these shortcomings.

"If Wang can provide decent service, it would be worth it to the customer to pay for it," says Vincent Flanders, associate editor of *Access 86*, a Wang-specific magazine. "Nobody that I know thinks they can do it," he adds.

"We looked at our competition and found that we were the only major manufacturer who had not done this. We are just getting in step with the competition," explains Raymond Cullen Jr., senior vice-president of Wang's Customer Services Operations.

"We are making an investment in a significant number of analysts who can solve problems," adds Donald Desrochers, Wang's vice-president of operation support. "Before, the customer would have to take the initiative and order the upgrades on his own," Desrochers says. "We did not provide automatic updates or a bulletin on a regular basis."

"Wang says, 'all the other companies, like IBM, charge like this,' but I say, 'as soon as I get the kind of service IBM gives, I'll pay that kind of charge,' " says the major Wang user in the Northeast who asked not to be identified. The user will seek proof of Wang's commitment to better service before he decides whether or not to enroll in the plan.

"We have never paid for new software releases before," says Dennis Sweeney, cash manager in Pepsico, Inc.'s treasury department. Pepsico uses Wang word processing machines, and it is "extremely rare" for the company to call Wang on software issues. "I suspect it will be cheaper for us to pay for the upgrades as we need them than to enroll in the plan. That will force us to take a closer look at whether or not we really need upgrades."

Wang will have to prove itself in the software service arena before he feels comfortable about paying for it, Raudonis says. "We don't expect Wang to change all that much. They need better trained technical people on the support staff. The couple of telephone support calls that we have made have not been encouraging. Support is weak, thus far," he adds.

"I don't believe in the past we were prepared to deliver the services the customers were expecting," Desrochers admits. "We are committing to the level of support the customer wants. He will receive assistance and direction, and an escalation process will be apparent to him," he adds.

Three regional support centers created in the past nine months will be the focus of the support services, says Desrochers. By July 1, support services will be fully staffed and trained.

Three-tiered service offering

Wang Laboratories, Inc.'s new software support contract is composed of three levels of service:

- Subscription Software Service provides automatic updates to the operating system and a monthly software maintenance bulletin.
- Telephone Software Support provides the Subscription Software Service plus telephone support and a remote diagnostic link. The remote link requires that the machine being tested has a Wang personal computer attached.
- Comprehensive Software Support provides the two services mentioned above plus unlimited on-site services as Wang deems necessary.

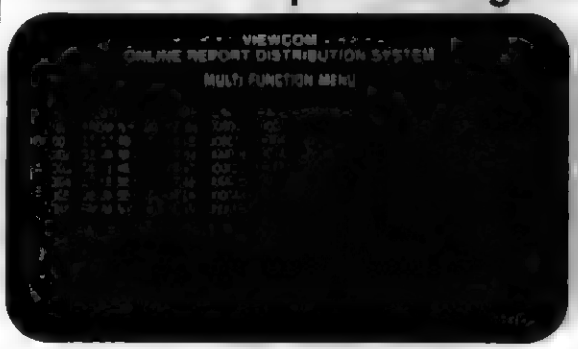
Charge examples follow:

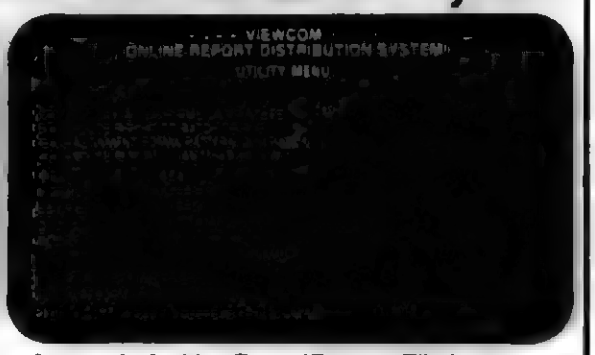
- A monthly charge of $80 per machine for the Comprehensive Software Support plan on VS 5, 6, 15, 25, 45, 50 and 80 systems; $65 for the Telephone Software Support plan; and $40 for the Subscription Software Service. There are additional monthly charges for application software packages.
- For VS 85, 90 and 100 systems, Comprehensive Software Support costs $140 per month per machine, Telephone Software Support costs $105 and Subscription Software Service costs $70.

— Dennis Eisenstadt

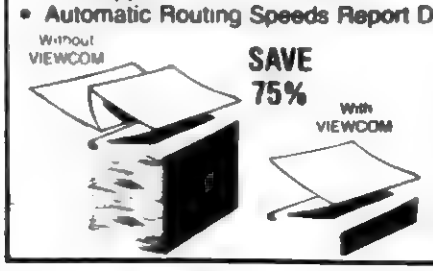
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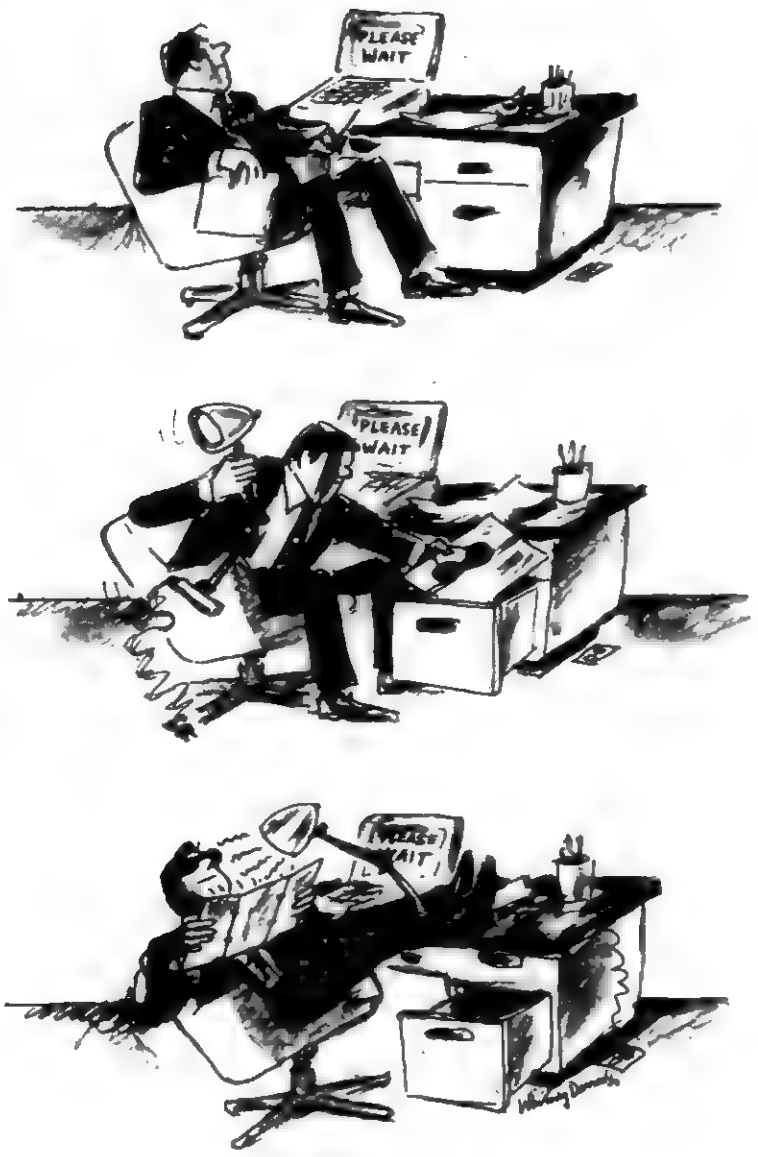
- Multi-Function Menu Gets You There Faster
- On-Line Report Viewing Saves Paper
- PC Support Puts PCs To Work
- Automatic Routing Speeds Report Distribution
- Automatic Archive Purge/Restore Eliminates Report Reruns
- Automatic Report Segmentation/Bundling Saves Time
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Trailblazers seek LU6.2 riches

From page 1

a standard interconnect, it represents a tremendous potential."

Although LU6.2 use in production environments is still in its early stages, IBM currently supports it on an increasing number of systems and products, including the System/36 and System/38 and the Token-Ring local-area network. While LU6.2 is supported on CICS, IBM's popular teleprocessing monitor, IBM has yet to announce support for it on IMS, its widely used data base management system.

Major non-IBM computer vendors increasingly are announcing their commitment to provide integrated network connections to Systems Network Architecure (SNA) by incorporating LU6.2 into their own equipment. In fact, LU6.2 support, or the intention to provide it, is increasingly becoming a checklist item for MIS managers planning major hardware purchases.

Brophy welcomes the adoption of LU6.2 by non-IBM system vendors. "We're pretty much an IBM technology shop," he says, "but we want alternatives; not so much in hardware but in software application packages. We'd like to integrate applications on Wang or DEC into our network."

Before more widespread implementation of LU6.2 becomes a reality during the next 12 to 24 months, three hurdles must first be overcome: hardware vendors must implement it on their systems, software developers must become familiar enough with it to write applications and enough "bleeding-edge" pioneers must show that LU6.2 can work in a corporate environment. Only parts of the solution are here today.

"It's just a facility. Once you have it, you've got nothing until you write applications," says Les Moss, senior computer scientist at Citicorp/TFI, a Santa Monica, Calif.-based developer of computer systems for parent company Citicorp. Moss plans to use the LU6.2 protocol to interface a variety of equipment with IBM's SNA environment.

Moss says he would like a standard way of writing applications that communicate with each other, rather than using an ad hoc process every time, and that LU6.2 promises to provide that. "A lot of interface questions are answered in advance with 6.2," he says. For MIS managers considering the pros and cons of LU6.2, Moss says, "It's basically an application development issue. When does he start developing his applications using 6.2?"

At Travelers, where IBM's Token-Ring network is being tested, Vice-President of Telecommunications Trav Waltrip says the company is dealing with the issue of just which applications to rewrite. He says this is a problem all companies will have to confront when implementing LU6.2.

Existing applications

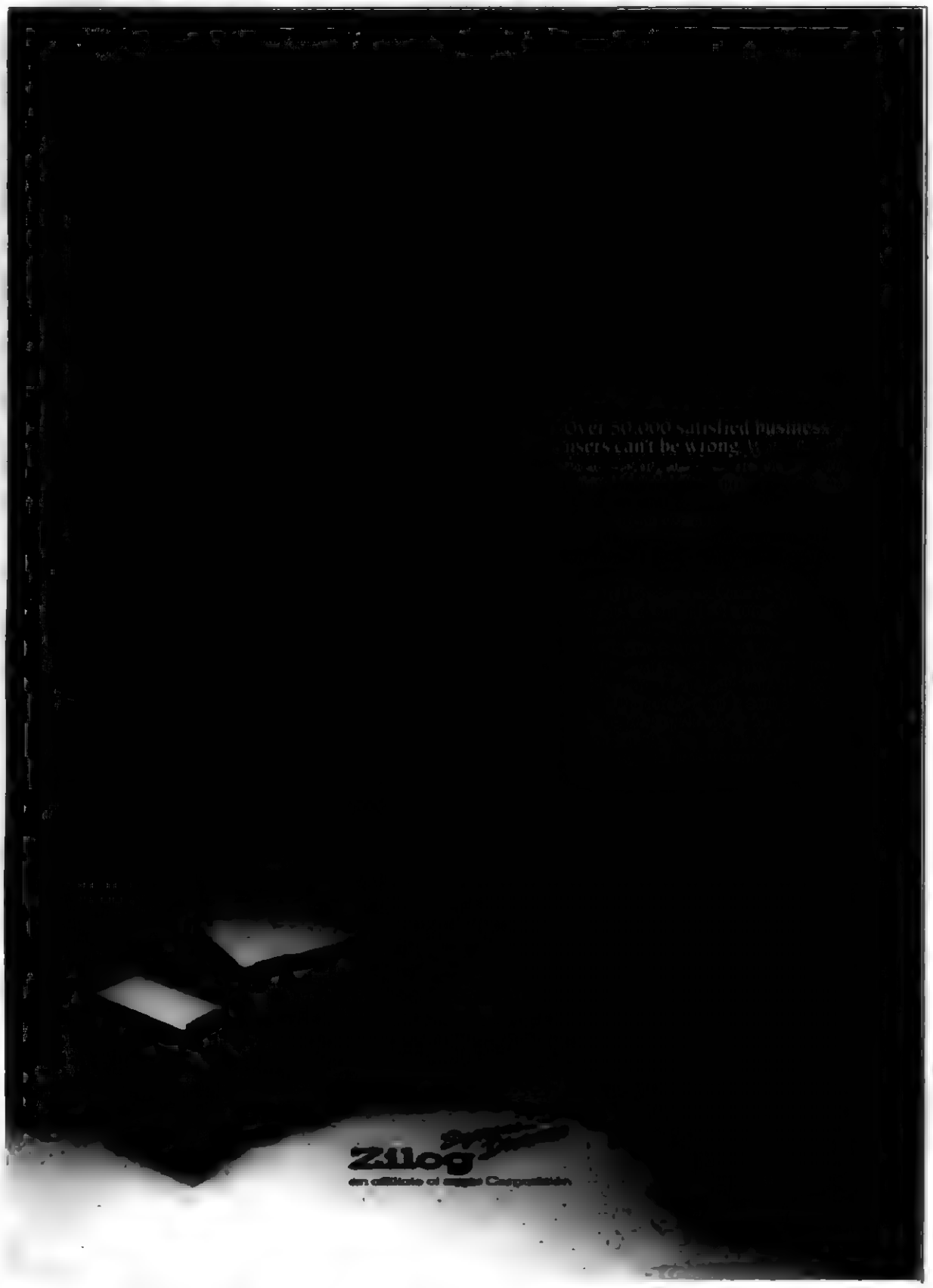
"They'll have applications that were written before LU6.2 and will have to decide if they are going to rewrite them," he points out. In order for existing applications to work on the Token-Ring, he explains, the current LU modules, which deal with telecommunications, must be identified and rewritten.

Choosing which ones to rewrite first is a strategic decision, and not all applications should necessarily be rewritten, Waltrip says. He said Travelers is beginning by rewriting those applications that run under CICS. However, the company has many applications that run under IMS, and until IBM announces LU6.2 support for IMS, there is no plan to rewrite those applications.

Despite many companies' initial uncertainty of the nuts and bolts of LU6.2, Waltrip asserts that "LU6.2 within SNA is the most exciting thing to come along in a long time." He foresees tremendous production gains arising from cooperative processing, with intelligent workstations able to work directly with the host computer.

Another company working with an LU6.2 product is the Fireman's Fund Insurance Co., headquartered in Novato, Calif., which recently in-

See **TRAILBLAZERS** page 15



DP crime bill goes to House

By Mitch Betts

WASHINGTON, D.C. — The Judiciary Committee of the U.S. House of Representatives recently approved an interstate computer crime bill and forwarded it to the full House for a vote within the next few weeks.

The Computer Fraud and Abuse Act of 1986, sponsored by Rep. William J. Hughes (D-N.J.), would for the first time expand federal jurisdiction to computer crimes involving private-sector computers in two or more states [CW, April 28]. The proposal also would make it illegal to traffic in computer passwords belonging to others.

The House Judiciary Committee approved the bill on a voice vote after amending the bill to include securities brokers and dealers in the bill's definition of financial institutions. The bill prohibits computer frauds involving computers used by the federal government and financial institutions as well as computer crimes involving private-sector computers in two or more states.

Hughes said he is confident that the bill will be approved quickly by the full House.

Token-Ring users face product shortage, information lag

Potential buyers await evaluation before purchasing

By Elisabeth Horwitt

IBM is not providing potential customers with enough useful, user-oriented information about its Token-Ring network to make a buying decision, users and consultants say. Although IBM claims volume shipments began in March, several sources report that at this point only major IBM customers have received products.

"IBM needs feedback from users like us in order to better support and train future users of its token network," says Richard Fromm, assistant treasurer at Bankers Trust Co. in New York.

The bank decided to "make a leap of faith" and install IBM's network, despite the lack of user-oriented information, because "we have the internal office systems people that can interpret the low-level technical information IBM supplies," Fromm says.

Other companies without the in-house technical resources of Bankers Trust are unlikely to gain the information they need to make a choice from IBM's "extremely general documentation" or from training courses that "currently are geared to developers and OEMs that will go home and write code," Fromm says.

'Lack of information'

"A lot of our clients are interested in IBM's Token-Ring but still feel they lack the information and hands-on experience to figure out whether the network will work right in their companies' communications environments and meet their application needs," says Nathan Roseman, president of New York network design and consulting company LAN Services, Inc.

The company hopes to provide design, installation and support services for the network but is currently awaiting the delivery of a 25-node system, on order from IBM.

An IBM spokeswoman said that the Token-Ring network became generally available through authorized retailers March 18. Shipment figures were unavailable from IBM.

Companies that have released information about their token-ring plans include Bankers Trust, McKesson Corp. and Travelers Insurance Co. Representatives from Aetna Life & Casualty Co. and United Airlines refused to comment on reports that their companies are making plans to install IBM Token-Ring networks.

Travelers is currently testing four token-ring networks in its computer science and telecommunications departments.

"We decided we would use the 802.5 token-ring standard two years ago, even though no products were available from IBM at the time," Vice-President of Telecommunications Travers Waltrip says.

Expanding net installation

Travelers is expanding its network installation slowly, Waltrip notes, "because of the limited availability of network cards."

"I know of a few managers, mostly in banks, who are ordering IBM's Token-Ring network sight unseen; but they are under political pressure because management believes that the best decision is no decision — that is, to go with IBM," Roseman says.

Bankers Trust was able to get the Token-Ring ahead of most companies, Fromm claims, "because of our strong relationship with IBM. I have to believe that the total number of users is small; at least one dealer I talked to doesn't expect a shipment until June."

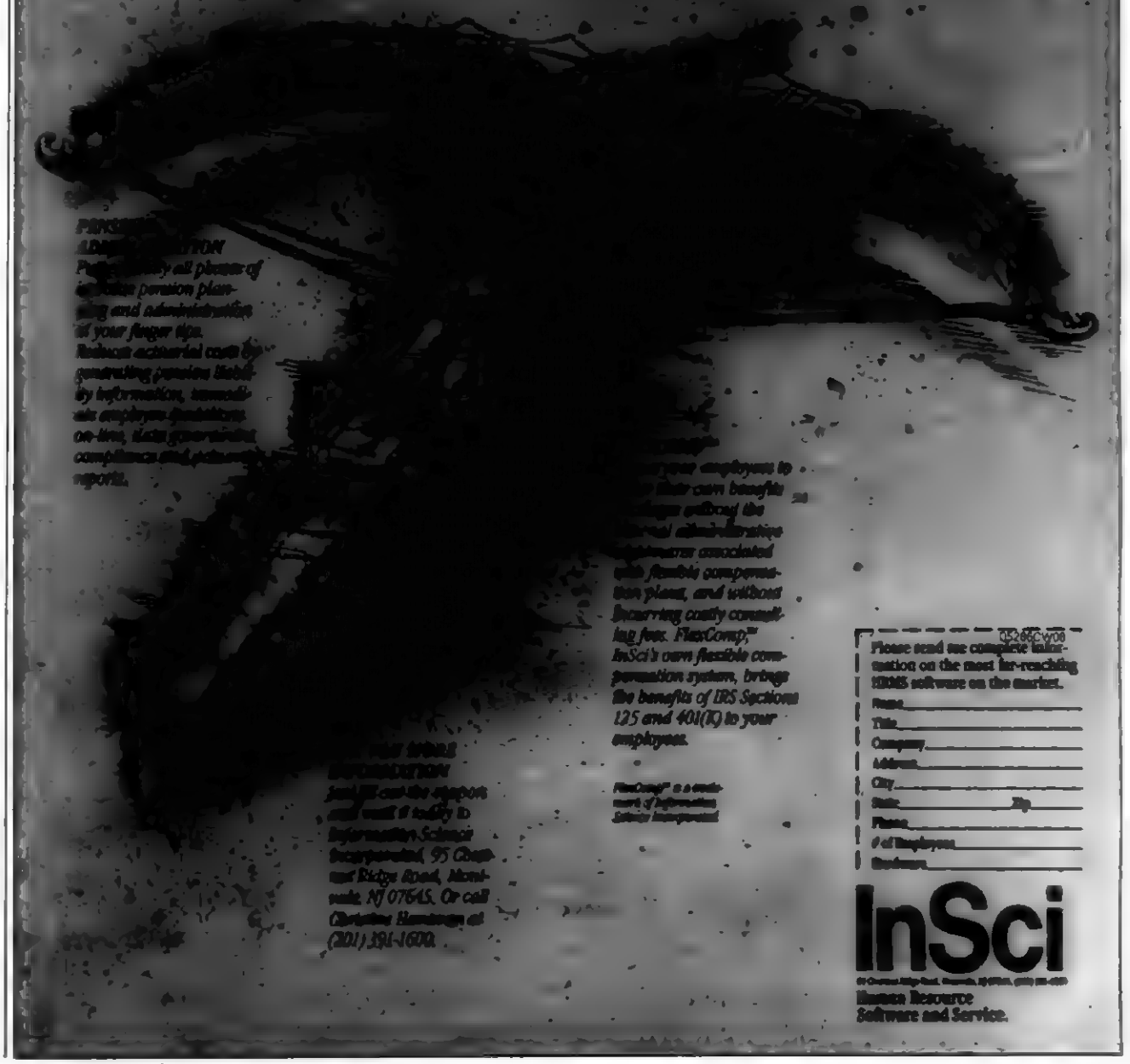
The bank chose the Token-Ring net because of its "hardy, open, expandable architecture," reports Lydia Borgatta, who is in charge of advanced workstations for the bank. "We anticipate

See IBM page 14

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IBM net users face shortage

From page 13

many third-party manufacturers supplying links to various non-IBM systems."

She adds that she was "encouraged by the number of vendors I saw attending IBM Token-Ring classes at [an IBM training facility at] Raleigh."

Borgatta emphasizes that her group "would not recommend the Token-Ring everywhere in the bank. We are also a very large Decnet shop."

McKesson Corp., a San Francisco-based, $6.3 billion distributor, plans to use token rings to connect an existing installed base of some 100 IBM System/36 machines.

Six weeks ago, the company installed an IBM Token-Ring network connecting 10 IBM Personal Computers and several printers, but its long-term purpose is to connect an existing installed base of some 100 System/36s, according to Vice-President of Technical Services and Telecommunications John Fitzgerald.

McKesson plans to use System/36s as file servers for limited office applications and as gateways to remote sites over a Digital Dataphone Service network, for an installation of approximately 1,000 IBM PCs. "We wanted a low-cost, twisted-pair network," Fitzgerald reports.

The company initially looked at AT&T's Starlan as well as the IBM Token-Ring but chose the latter, partly because "IBM is committed to linking System/36s, and AT&T is more into PBXs," Fitzgerald says.

McKesson also chose IBM's network because, "while AT&T has good physical interfaces, its networking software is not as far along as IBM's LU6.2."

McKesson must wait for several crucial components of its network to become available. IBM has told the company that the 3270 Personal Computer connection should be out by the end of this year, and the System/36 connection, which IBM announced in April, should be available by first-quarter 1987.

In addition to the hardware interfaces to link System/36s to the network, the company needs LU6.2 communications software that will enable System/36s to communicate with mainframe hosts on a peer-to-peer basis, "so the System/36 can initiate and control the dialogue and not always wait for the host," Fitzgerald says.

It may be some time before the software will appear, "but we'd rather wait for someone — preferably IBM — to write the software than do it ourselves," he explains.

"We are looking at a year's worth of evaluation and development before we have our system," Fitzgerald says. "And the total functionality we want is still a year or two away. But at least with IBM, it's a safe bet that we'll have it eventually."

Other companies are not so sure, however. The scarcity of definitive performance data has caused a number of users to hold off on committing to IBM's Token-Ring pending more complete information, Roseman says.

Several of his clients have decided not to bother waiting for IBM and have installed other vendors' token-ring networks, he adds.

> ***"The scarcity of definitive performance data has caused a number of users to hold off on committing to IBM's Token-Ring, pending more complete information."***

LAN Services is currently working with Merrill Lynch & Co. to install a Proteon, Inc. token-ring network running Novell Corp. Netware software at the brokerage company's new headquarters at the World Financial Center in New York. Attempts by *Computerworld* to question Merrill Lynch were unsuccessful.

"Right now, people are deciding whether they want to buy their token rings from us, from 3Com Corp., from Ungermann-Bass, Inc. or from IBM," Proteon Chairman Howard Salwen says.

Network and software vendors that plan to market products that add value to IBM's network say they are disappointed with customer response since the initial IBM announcement.

"We expected the announcement to generate enthusiasm for our future token network products," Bridge Communications, Inc. President William Carrico comments. "But so far, we've had fewer leads than we expected."

Bridge announced this fall that during the first half of this year, it would bring out a series of communications products linking the token-ring net to a variety of workstations as well as to Ethernet.

Cory Casanave, vice-president of software development for Data Access Corp., reports that a few customers have been asking whether the company's networking data base management system, Data Access, can be ported easily from the PC Network to the IBM Token-Ring net.

"We tell them, yes." Casanave says. "I don't believe you can buy the token ring at the store yet," he adds.

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Liquor Control Board of Ontario

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The Liquor Control Board of Ontario (LCBO) supervises distribution of alcoholic beverages throughout Ontario and operates over 600 retail outlets. The LCBO is conducting a project to evaluate the potential use of automated Retail and Point-of-Sale (POS) systems in its stores. Current project activity includes pre-qualification of suppliers to identify those who most closely meet the LCBO's requirements.

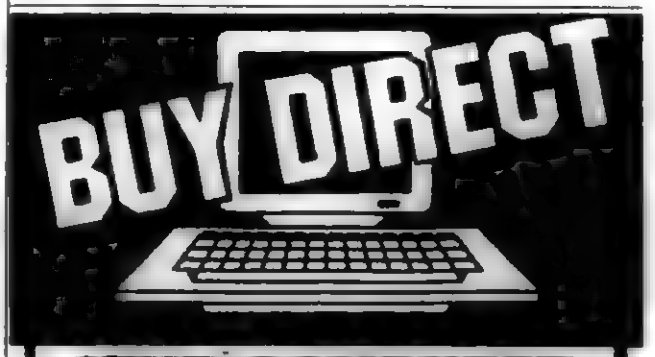
Pre-qualification will be based on suppliers' responses to a Request for Information (RFI). Evaluation criteria will include supplier strength, retail experience and support mechanisms, and system features such as reliability, documentation and ease of use.

The RFI will be issued on Friday, May 23, 1986, and responses must be received by 5:00 p.m. EDT, Monday, June 9, 1986.

Suppliers who wish to receive the RFI should, by May 21, forward the name, title and full address of the individual to receive the RFI to:

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Trailblazers seek LU6.2 riches

From page 12

stalled IBM's SNA Distribution Service (SNADS). SNADS is an architecture for asynchronous distribution of information between users, implemented as part of IBM's Distributed Office Support System (Disoss). It provides delayed delivery services, eliminating the need for a complete end-to-end session between the originator of a transmission and the destination. Two nodes on a SNADS network exchange data using LU6.2.

Fireman's Fund already had Disoss Version 3 Release 3 in place when it installed SNADS to connect the company's 60 IBM 8100 DPPX systems to Disoss for distributed electronic mail transactions. There are about 1,000 users on the network, most with IBM 3180 terminals. About 100 have IBM Personal Computers (XTs, ATs and 3270 Personal Computers). Plans call for bringing all the company's 12,000 employees into its electronic mail facility.

Why SNADS? "Because we did not want to place all of our electronic mail processing facilities on the host," says Dan Eubanks, programming manager for the Fireman's Fund. "We wanted to use our distributed network for host offloading, for communication line offloading and for local messaging if the host or the lines were not available."

Eubanks says the immediate benefits of using SNADS are better performance for local messaging and less impact on other host applications, since the host is shared with some large IMS applications. As an example, he says, "If a user on one of our distributed 8100s wishes to send a document to another user on that same 8100, it does not have to go to the host and back, which would be the case if he were not a SNADS user."

For users, it simplifies the electronic mail function, since they are not required to know the type of terminal or equipment recipients have; nor do they need to know the location. "They don't need different formats for different users. The system takes care of it," Eubanks says.

However, there still are some obstacles to overcome. LU6.2 enables SNADS users to communicate node to node, but the administration of directories over multiple computer systems is a nettlesome problem for Eubanks. Right now, the sender has to know the receiver's user ID. The master directory resides in Disoss and is transmitted weekly as a document to the users, who can then create their own distribution list.

The difficulty is that as a document, as opposed to a system file, there is no way to incorporate the master directory into the electronic mail system. "There is no good automated solution to that yet," Eubanks regrets. "That's what I'd like to see."

According to Dale Vanosdol, a CICS programmer responsible for electronic mail systems at Cummins Engine Co. in Columbus, Ind., "Having two machines communicate can be very complex. There needs to be a lot of communications intelligence out on the network. We can either look for packages or push the vendors for it."

Execs' pay up 15% from '85

By David A. Ludlum

NEW YORK — Pay for data processing and information management executives is up 15% from last year, with the biggest raises going to systems and communications managers, according to a new survey of 30 blue-chip companies.

The rates of salary growth are the highest reported in the four years that the annual study has been conducted, according to Edward Perlin of Edward Perlin Associates, Inc., which performed the survey.

The average 15% increase in total compensation for data processing and information management executives is more than twice the 6% to 7% average reported in the study last year.

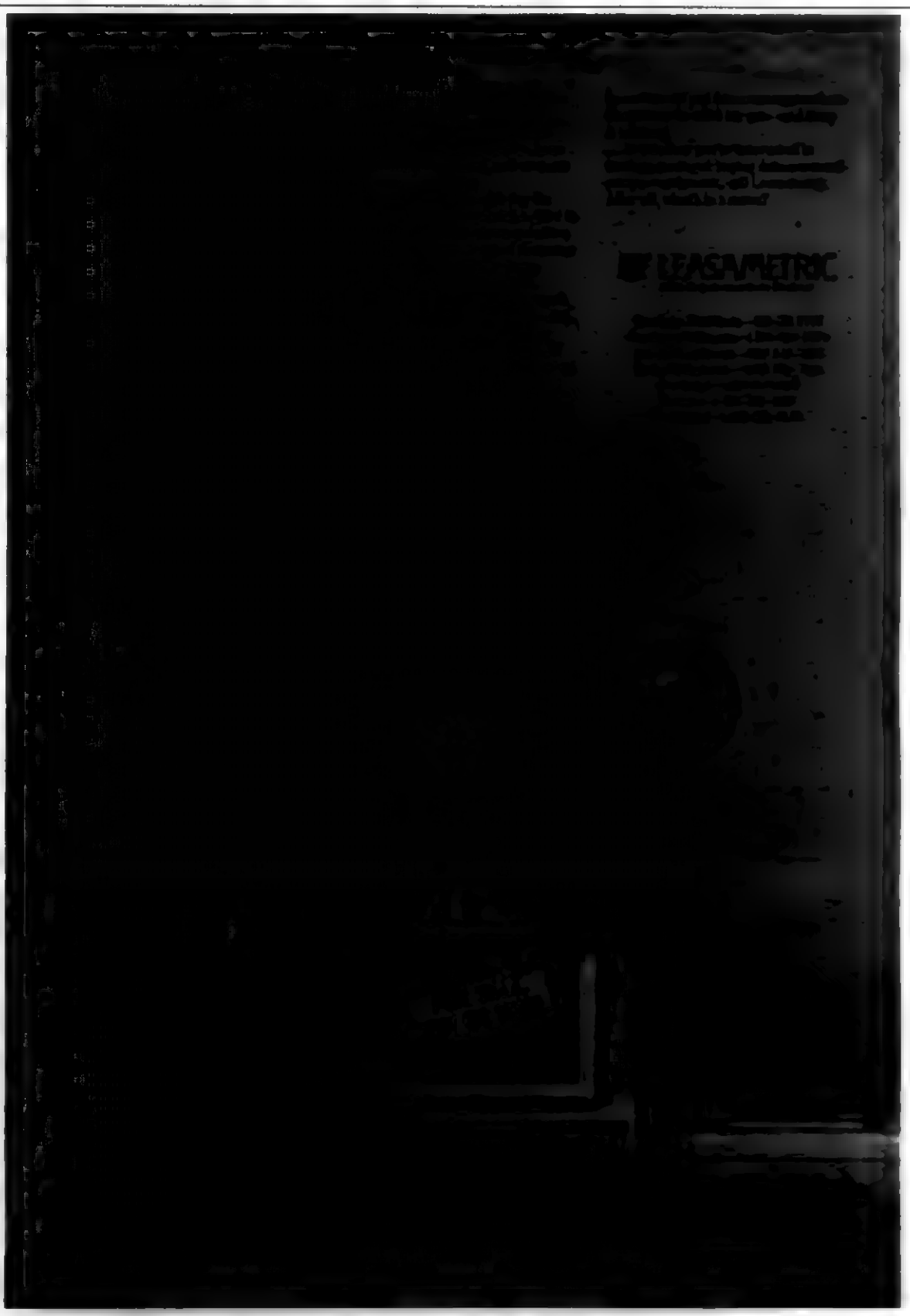
The survey covers more than 1,000 positions at 30 large companies, most of them in banking, insurance and financial services. Annual base salaries for the jobs range from $58,000 to $149,000. Changes are reported for 22 job classifications.

The positions showing the greatest gains in total compensation are system architecture and resource management head (36%), manager of international communications network planning (34%), group head for communications and information management (28%), telecommunications services head (27%) and group head for systems design and development (25%).

Big pay increases for telecommunications managers follow fast growth in demand for executives in that area since the divestiture of AT&T, said Roger O'Connor, a spokesman for Edward Perlin Associates. Knowledge of systems is sought as firms assess the utilization of their systems, he said.

The only positions showing less than 5% growth in total compensation are head of office automation at less than 1% and area head, top position in seniority, at 2%.

The increase for head of office automation is small because the job is being assigned to "lower level people," O'Connor said. The increase for area head is small probably because raises for the position averaged an unusually large 15% to 20% last year, he added.



VIEWPOINT

EDITORIAL

Shotgun marriage

Burroughs Corp.'s proposed takeover of Sperry Corp. has not only raised stock prices but a great many questions as well. Burroughs' chairman, W. Michael Blumenthal, appears determined to consummate the deal, with the avowed hope of creating the world's second largest computer company and a more viable competitor to IBM.

Meanwhile, Gerald Probst, Sperry's chairman, and Joseph Kroger, Sperry's president, seem adamant about their company going it alone, showing little interest in a shotgun marriage.

For good reason. Over the past two years, Probst and Kroger have streamlined and focused Sperry toward its traditional markets and have successfully sought a number of OEM agreements with other U.S. and Japanese vendors.

Blumenthal, however, is undeterred. He spent most of last week arguing that the merger is in the best interests of both companies and their customers, since Sperry offers strength in markets and geographic areas in which Burroughs lacks a presence and Burroughs is strong in areas that have been weak for Sperry.

We question that argument.

What, for instance, will become of each company's product line, from desktops to high-end mainframes? Burroughs executives insist they would remain separate but equal. If so, what is the point of a merger, other than short-term cost savings?

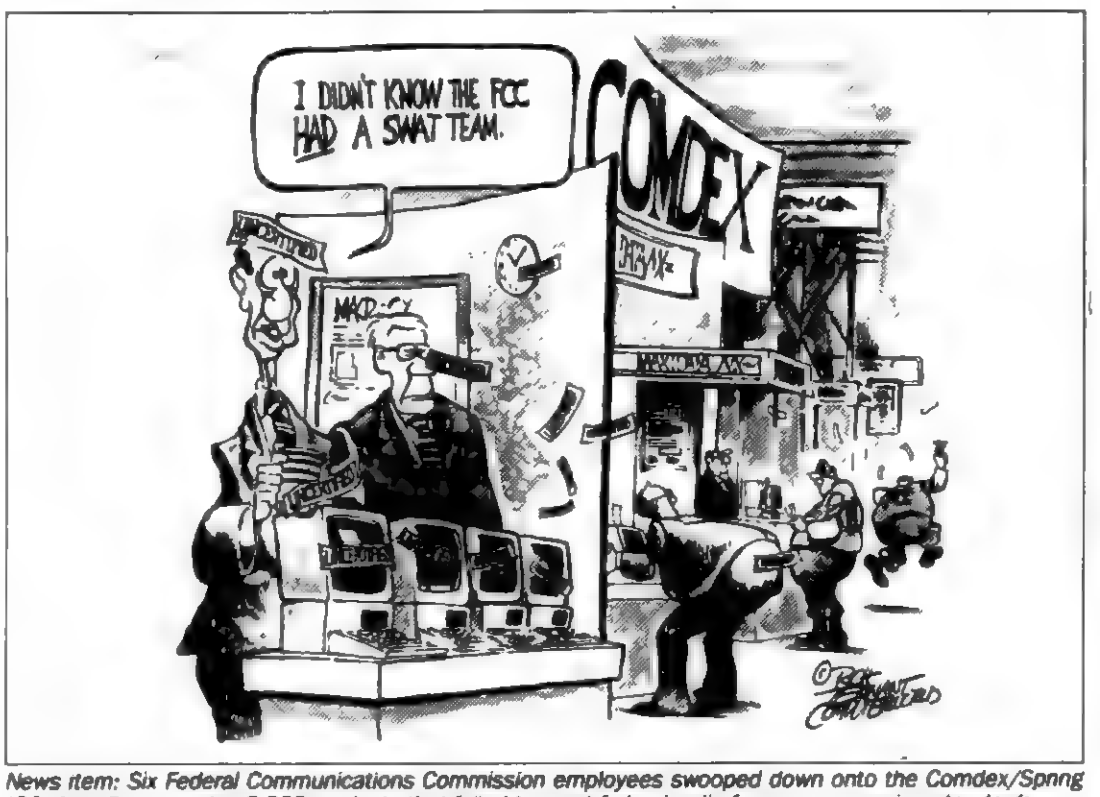
Product integration has been a key to Digital Equipment Corp.'s recent success. It is what users are demanding of IBM. What are users now to make of Burroughs' protestations regarding product independence? Currently, Burroughs and Sperry machines are incompatible and uncomplementary. What systems will be pushed by the newly combined sales force? What impact will that have on years of product development?

Indeed, the more than $4 billion required for Burroughs to complete the merger will certainly cut deeply into available reserves for research and development spending. In an industry driven by technological advances and dominated by one company with seemingly endless R&D resources, such a setback could cause irreparable damage for both Burroughs and Sperry.

We also echo the sentiments of analysts who question the merging of two of the traditional BUNCH companies. All five have been plagued by stagnant mainframe customer bases and major marketing crises for the past decade or more. The merger of one plodding, uncertain computer giant with another simply may create an even bigger plodding uncertain computer giant.

Perhaps the greatest obstacle of all to happy Burroughs-Sperry nuptials is the incompatibility of corporate cultures. It will take years before a workable merged environment evolves, and the computer industry waits for no one. If the takeover turns hostile, the cultural issues are exacerbated, and key people will certainly leave or be eased out of Sperry.

All in all, not a pretty picture. The world could certainly use at least one more effective, industrious, innovative computer company. If this is the result of the Burroughs-Sperry merger, we would happily stand corrected on the points raised above. We certainly bid them Godspeed toward this end.



News item: Six Federal Communications Commission employees swooped down onto the Comdex/Spring '86 show floor, tagging 2,500 products that failed to meet federal radio frequency emission standards.

LETTERS TO THE EDITOR

Dangers of a national data center

Your editorial, "Computers Aren't the Issue" [CW, April 14], fundamentally misstates my position on the establishment of a de facto national data center that threatens citizen privacy and personal autonomy. I also believe the editorial misreads the federal law that forms the basis for my contention. This is unfortunate since you also express welcome privacy concerns about government data collection practices that we readily endorse.

You quote me as follows: "Today, a de facto national data center is being created by this authority and modern computer technology." I obviously mean that computer technology is being used by government to implement a program to link personal record systems together and not that computers alone are posing this privacy threat. I am not a Luddite, nor am I wrong about the technical feasability of on-line access to these data bases.

I submit that it is *Computerworld* that "goes off in the wrong direction entirely" on this issue by failing to read all of the Deficit Reduction Act of 1984 (DEFRA). My concern about the creation of a national data center is not based on the section of the act that sets up a pilot program to deduct delinquent government loans from income tax refunds but on Subtitle C, which for the first time requires every state to establish a computerized State Income Eligibility Verification System.

In bureaucratic parlance, each state is now required by DEFRA to design a system to assure the "timely and efficient exchange" between federal, state and local agencies of "information" on beneficiaries or specified welfare and entitlement programs.

In effect, once a person signs up for a government welfare program, a considerable body of personal information, even confidential tax return information, may be assembled about that individual and thereafter exchanged governmentwide to detect government fraud and abuse or to keep those who do not qualify off the rolls.

Many view this de facto data center with less than alarm. They reason that if there is a privacy right of citizens to exercise some control over personal information in the possession of government and private institutions, welfare beneficiaries either waive that right, or it is outweighed by the public interest in government efficiency. We strongly disagree.

Those who are prepared to argue that poor people waive privacy rights should give pause. The middle class is about to become part of the national data center. Already the Office of Management and Budget is considering legislation to expand DEFRA data exchanges and links to Pell grants, guaranteed student loans, veterans' programs, health education assistance and other programs. New wage data sources such as government wages and benefits, railroad retirement and veterans' benefits would be added to the data base. Applicant claims would be checked against information in other benefit program files, state wage reports and Internal Revenue Service unearned income data, and the information from these programs would in turn be available for cross-checking.

Computerworld states that "the core of the issue is the question of what personal data the U.S. government is going to gather and store and who is going to have access to this data and for what purpose." We are in complete agreement.

Jerry J. Berman
Director
ACLU Project on Privacy and Technology
Washington, D.C.

Unions can protect DP professionals

Howard Karten's article, "When management calls a tune professionals won't play" [CW, April 21], on ethics and professional status was quite interesting. However, the tone of the article was far more timid and pessimistic than it need be. Most DP personnel have the same useful option available to them that their colleagues in other professional fields have adopted — unionization.

Well over 90% of all professional actors and musicians belong to unions as well as half the print journalists, three-fourths of public school teachers and about 200,000 college faculty members. The 28 unions affiliated with the AFL-CIO's Department for Professional Employees represent almost three million employees. DP professionals need to join together for mutual protection and advancement. They are eligible to do so under current laws and should move to join organizations devoted to improving their professional status. There is no need to continue to suffer in silence.

Dennis Chamot
Department for Professional Employees, AFL-CIO

VIEWPOINT

AI perspective: Japan's fifth generation to America's micros

Consider the captain of a Japanese fishing boat fishing for tuna in Ariake Bay off the southern tip of Japan. He has learned his craft from his father who learned it from his father. He knows the best time of day to sail, the type of nets to use, how deep to cast them and when to pull them in. He is an expert. But if a typhoon comes along and he is forced to fish off the coast of Hokkaido, he is in deep water, no longer an expert. He may try his old ways and hope that they work. Finding that they don't, he might experiment with different nets, ask a local captain what to do or, if Kazuhiro Fuchi has his way, consult a computerized expert system.

Such a system would contain the accumulated knowledge of thousands of fishing boat captains from all over the world along with data, heuristics (rules of thumb) and knowledge from oceanographers, meteorologists, geographers and naturalists. It would be easily accessible and readily understandable to someone with no knowledge of computers.

Fuchi, director of the Institute for New Generation Computer Technology where the fifth-generation computer project is housed, is an intense and energetic man. His knowledge of the field is awesome, and he is said to be one who, by sheer force of will, can make something out of nothing.

Fuchi admits to having had "a very skeptical opinion of artificial intelligence for a long time." To reach meaningful goals, however, Fuchi feels it is necessary to employ many different approaches and methods. For example, he asks, "Is existing computer technology enough? I don't think it is. But by making a new computer can we solve the whole problem? No, it is not that simple. We must also study thought processes and many other things."

Thus the fifth-generation project focuses on a wider range of research than do most other AI systems. The reasoning mechanism, for example, can access six different approaches (forward chaining, backward chaining, simulation and so on), and the natural language interface deals not only with meaning and semantics but also with translation between English and Japanese.



By DAVID H. AHL

Many articles mention the fifth-generation project and supercomputers in the same breath. Although some of the research is being carried out on large machines, Fuchi says, "The real impact will be on the computers that are readily available to people — personal computers — rather than mainframes or supercomputers." Fuchi thinks that widely available expert systems will have important implications for company structure and management. Such systems will permit a much more decentralized organization because appropriate knowledge will be available wherever it is needed rather than at one central point.

Until recently, AI research in the Western world was moving in a quite different direction. In 1960, John Bronowski proposed in the British scientific journal, *Nature*, that machines could be taught to play chess and that it would be possible to devise a machine that would learn, mature and even develop a style of play. Ever since then, devising chess playing programs has remained a central focus of Western AI researchers who argue, plausibly, that chess is one of the most intellectual activities of human beings and that by programming it one will learn a great deal about the way people think.

In the late '50s AI research grew even more ambitious when Allen Newell and Herbert Simon announced they were going to build a general problem solving (GPS) machine. GPS was actually less formidable than its name would imply; basically, it was a set of approaches for solving rather rigidly defined problems. GPS spawned a few descendents, but it was largely forgotten in the '60s and '70s as AI research rushed on in several other directions, most notably robotics, expert systems, pattern recognition and natural language processing.

Like those programming chess, researchers working on natural language systems tried to mimic human thought processes and, in a sense, teach the computer to understand what it was reading or hearing. Many humorous anecdotes came out of this research: the computer that translated the saying "out of sight, out of mind" to mean "blind idiot"; the difficulty computers had distinguishing between "He threw the ball" vs. "He threw the ball for charity." Although no one has yet demonstrated convincingly that a computer can understand anything in the sense that a human being can, two extremely useful principles have come out of this research: parsing (analyzing a string of words to identify the meaningful components and the relationship among them) and a recognition that natural language processing is next to impossible unless context is specified in advance.

Research projects in robotics and pattern recognition are proceeding apace, but what is most interesting today is a confluence of the other techniques — natural language processing and expert systems — along with a combination of resurrected problem solving concepts from GPS and several non-AI sources. Most of this work is taking place at the microcomputer end of the spectrum in small companies like Micro Data Base Systems, Inc., Teknowledge, Inc., Expertelligence, Human Edge Software Corp. and Neuron Data Corp. Thus, we seemed to have backed into an approach similar to that of the fifth-generation project, albeit with much less planning and on a much smaller scale.

Compare Guru from Micro Data Base Systems to Fuchi's ideal system for a fishing captain. Using Guru, you enter your own data, your own reasoning and your own heuristics. Others can also enter data and rules. When you later consult the system, the inference engine tries to determine the best approach to solving your problem — forward chaining, backward chaining or the use of "certainty factors," which are used to deal with uncertain or fuzzy situations. Guru also includes integrated standard business software.

The market for such systems so far is tiny, but it is bound to grow as new software tools are developed to combine what we know about the human mind with the power of the digital computer, tools that will work faster than any human being and think more profoundly than any computer.

Ahl founded Creative Computing Magazine *and is the author of more than 20 books on recreational, educational and professional computer applications.*

Calculating bottom-line benefits of end-user computing

My friend Jim has just taken over end-user computing at a large firm. Its senior executives want to know what they are getting from all those personal computers and from all those query and information retrieval systems. They would like to see tangible benefits from their computer investment. If they don't, Jim has a *big* problem.

Jim's employer got into end-user computing partly to quiet complaints about the MIS backlog. "If you're so smart," said MIS, "we'll give you some tools, and you can do the work yourselves." With PCs and easy-to-use packages, soon everyone was doing just that.

But the MIS backlog didn't go away. Hardware budgets soared: for the PCs, mainframe resources to support them, mainframe software where the PC wouldn't do the job and still more mainframe resources for that software. Senior management began to wonder why. Some said end-user computing can't be justified on a cost-benefits basis.

But companies can — and must — identify benefits in end-user computing. The first step is to analyze why computer investments are made.



By EFREM MALLACH

- To do more of the same. Firms need increased computing resources to cope with business growth, more product variety and increased regulation.
- To do the same things more efficiently; for example, to replace a battalion of file clerks. This and similar applications are presumably cost-justified.

Some end-user computing is in this category. Senior management may ask, "Why do we still need X managers and Y analysts with all those PCs?" They must also ask how much more complex business has become, how much faster they must react and how many managers and analysts they would need without the PCs.

- To do more effective things. This is where the remaining end-user computing comes in. Can Jim's employer respond better to environmental changes? Can it develop better new offerings? Can it price them more profitably? Can it respond to competition more quickly, with sharper focus? These are high-leverage issues. Computers are necessary for dealing with them.

End-user computing is justified by the second and third reasons. As with any justification, we come down to one question: Is the bottom line better with or without end-user computing? This depends on how it is being used and what would have been done otherwise. There are typically three possible answers to these questions.

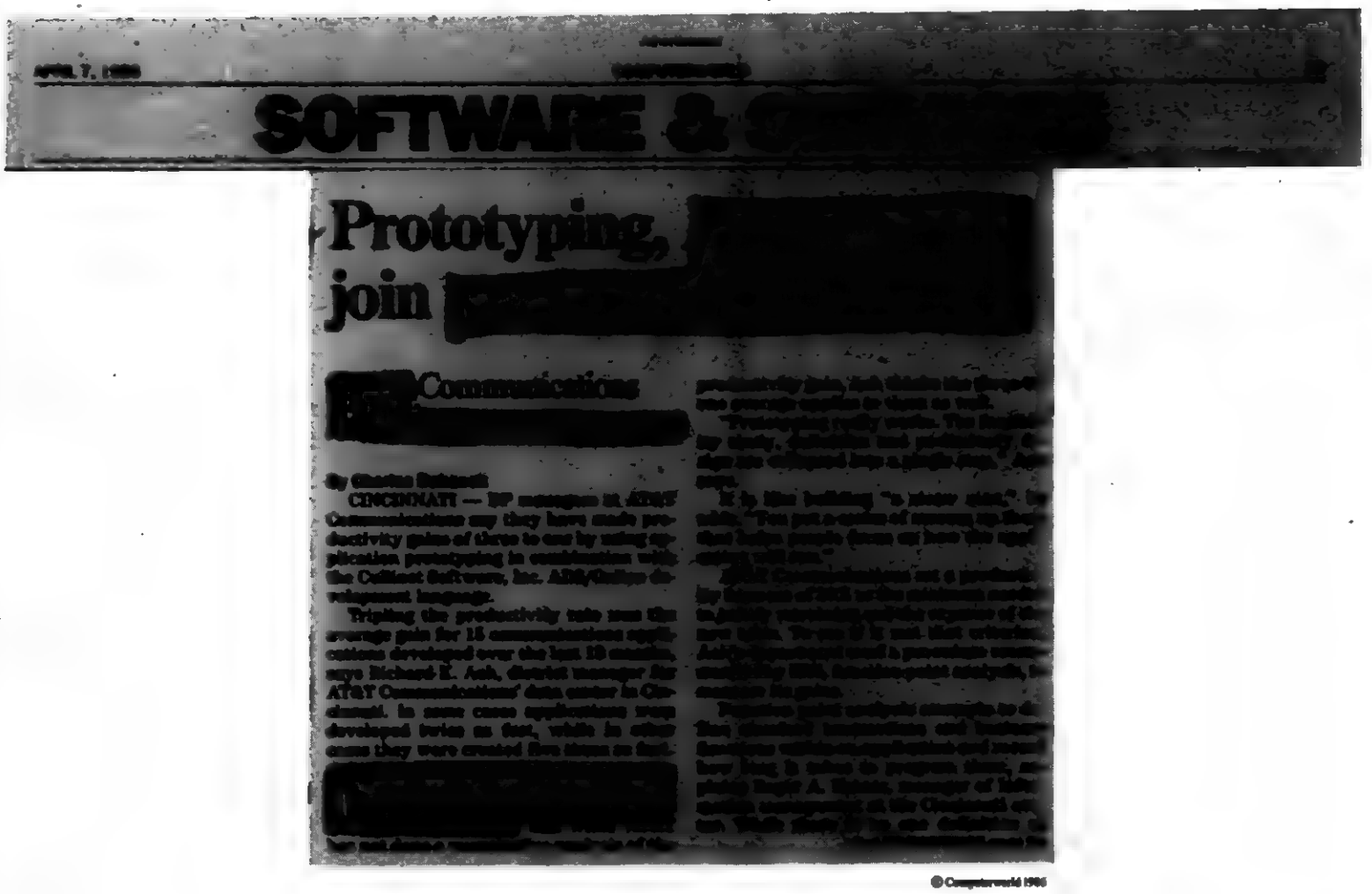
- The job would have been done manually. There is a savings that can be documented and quantified, either in terms of reduced staff hours or improved quality of the result.
- The job would not have been done, and it should be. The benefits of doing the job can be quantified.
- The job would not have been done, and it should not be. This is not a problem with end-user computing. This is a management problem and a problem with the users' information literacy. A computer can be misused as easily as any other tool.

Such an end-user computing review will help Jim consolidate his position. It will provide management with the documentation it wants. It may suggest areas in which end-user computing is not well used and should be cut back. It will also suggest areas in which its use should be expanded. If bottom-line benefits are projected, management should go along.

At the same time, Jim will learn what types of end-user computing are beneficial. This will suggest the types of equipment to procure for its expansion. By focusing on objective characteristics, this type of analysis is relatively vendor independent.

Mallach is associate professor of computer science at the Boston College School of Management and a consultant to top managers of vendor and user organizations.

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CINCINNATI — DP managers at AT&T Communications say they have made productivity gains of three to one by using application prototyping in combination with the Cullinet Software, Inc. ADS/Online development language.

Tripling the productivity rate was the average gain for 15 communications applications developed over the last 18 months, says Richard E. Ash, district manager for AT&T Communications' data center in Cincinnati. In some cases applications were developed twice as fast, while in other cases they were created five times as fast.

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COMMUNICATIONS

WIRE TAP
Daniel Minoli

Phone changes benefit users

Several recent developments in telephone network technology should have direct and favorable impact on the data communications user. This column will discuss some of these changes, which will begin to be felt in the next two to four years.

• **Clear 64.** Various central office and carrier equipment vendors are in the process of addressing and solving the technical barriers to "clear 64."

When this limitation is solved, users will be able to access fully transparent mode 64K bit/sec. bandwidth on pulse code modulation-based transmission channels that transmit digitized voice. The existing switches now deployed at central offices were designed to treat the eighth bit of each word as a separate entity used for housekeeping (signaling) and synchronization functions.

The result has been 56K bit/sec. transmission offerings such as AT&T's Digital Dataphone Service, which cannot be easily interfaced either with 64K bit/sec. satellite channels or European clear 64K bit/sec. transmission offerings.

Another related limitation arises from the fact that existing D4 channel banks used by telephone companies cannot perform synchronization effec-

See PHONE page 23

Minoli is a lecturer with New York University's Information Technology Institute as well as a full-time data communications researcher and strategic planner.

Starlan earns high marks

But users must wait for AT&T's promised features

By Stanley Gibson

Starlan, the local-area network that AT&T Information Systems began shipping in volume for the first time this month, has fulfilled the vendor's promises of simplicity and ease of installation but still lacks important features, users and analysts report.

First announced more than a year ago, Starlan was designed to network AT&T's line of Microsoft Corp. MS-DOS- and Unix-based computers as well as the IBM Personal Computer family at rates of up to 1M bit/sec. over ordinary twisted-pair telephone wire. The hardware and software products that became commercially available May 1 enable users to install a basic Starlan network, in which MS-DOS-to-MS-DOS and Unix-to-Unix communications can take place.

Still missing, however, are some important networking features. Several of these features will be introduced gradually during the remainder of this year, according to AT&T.

Software enabling AT&T 3B2 computers to communicate over Starlan should be available in June. A bridge between Starlan and AT&T's Information System Network should be available in July. A program that turns an AT&T Unix PC into a server for MS-DOS systems should be coming out in September. All server programs will eventually have IBM 3270 protocol capability, AT&T says.

One of the reasons for the slow rollout of the product is that AT&T wanted to be sure the system was in fact reliable and easy to use. "You put it in, and it works," explains Matt Balkovic, AT&T director of networking laboratory computer systems, who designed Starlan.

The network gets high marks for ease of use from Mark Bierle, director of informa-

See STARLAN page 24

Western Union's EZ Access hooks Wang minis to Easylink

By Elisabeth Horwitt

EZ Access, a communications software package that enables Wang Laboratories, Inc.'s VS minicomputers to access Western Union Corp.'s Easylink electronic mail service, was recently introduced by Western Union.

The product is one of a series of computer connections planned by Western Union as part of its efforts to "move into the large corporations by interfacing with their systems," according to Jay Castergine, executive product manager of electronic mail services.

Through EZ Access, Wang VS users can send messages via Easylink to other Wang VS systems and Telex systems subscribing to the service. Documents cannot be revised after transmission unless loaded into a word processing document. Messages can be delivered as hard copy through Western Union's Mailgram service.

The announcement is far more important to Western Union than it is to Wang, according to Walter Ulrich, president of Walter Ulrich Consulting in Houston.

"For computer companies like Wang, the package is just another bell and whistle. But the future of electronic mail services depends on tapping customers' internal electronic mail networks. The big potential market for companies like Western Union and MCI Communications Corp.

See WESTERN page 23

NEW THIS WEEK

- Northern Telecom offers enhancements for its Meridian DV-1 system
- DEC introduces Vaxcluster Console System for managing Vaxcluster systems

For more on these and other new products, see pp. 121-154.

INSTANT ANALYSIS

"To end users, network throughput or performance degradation is less important than whether they will be able to make their favorite software package work on the network as easily as it works on a stand-alone personal computer."

— Richard Fromm, assistant treasurer, Bankers Trust Co. in New York

Fiber-optic networks expected to mushroom over next decade

Present demand low, short-haul benefits high

By Elisabeth Horwitt

While current demand for optical-fiber local-area networks remains stunted, a rapidly growing user segment will take advantage of the medium's short-haul advantages over the next decade, according to a report published this year by Newport, R.I., consulting firm Kessler Marketing Intelligence (see chart).

Sales figures for 1985 included in the report indicate that optical-fiber products are generating a very small percentage of local-area network vendors' total revenues. In 1985, Ungermann-Bass, Inc. sold only five optical-fiber networks, generating total revenue of $2.6 million, according to the Kessler Marketing Intelligence report.

Proteon, Inc. did approximately $1 million worth of fiber business in 1985, the report said. "And since most fiber-based networks are large installations, they probably sold only one or two networks," concluded Jon Zilber, Kessler Marketing's manager of market research.

Fiber network sales made up only one-seventh of Proteon's total 1985 sales, but the company expects that this year as much as 30% of its revenue will come from optical-fiber products, Zilber added. And in 1985, optical-fiber local-area network installations made up less than 1% of total network installations, according to Scott Haugdahl, senior analyst at Minneapolis-based consulting company Architecture Technology Corp. "If you take out personal computer networks, the number is close to 5%, however," he added.

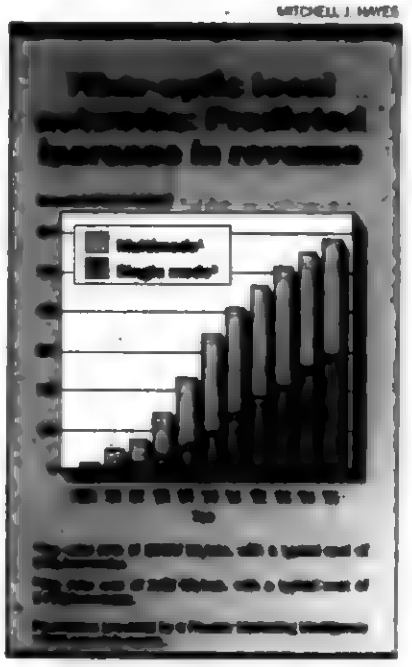
Nevertheless, support of optical fiber has been growing, Architecture Technology reports. On the vendor side, Proteon, Nestar Systems, Inc., IBM, NEC Corp. and Fujitsu America, Inc. are among the companies promoting fiber-based token-ring networks.

Arnet Communications Corp. and Fibronics International, Inc. are coming out with products that provide optical-fiber connections based on a variety of network standards, including token ring, Ethernet and RS-232. And the Institute of Electrical and Electronics Engineers, Inc. 802 Committee is currently working on an optical-fiber version of the 802 local-area network standards.

IBM announced in April an Optical Fiber Repeater, priced at $6,650, that, used in conjunction with twisted-pair wiring, allows users to link multiple twisted-pair token-ring networks over distances of up to 6,600 feet. Type 6 cable, which IBM has specified for its cabling system but has not made available yet, defines two optical-fiber cables that will pro-

See FIBER page 24

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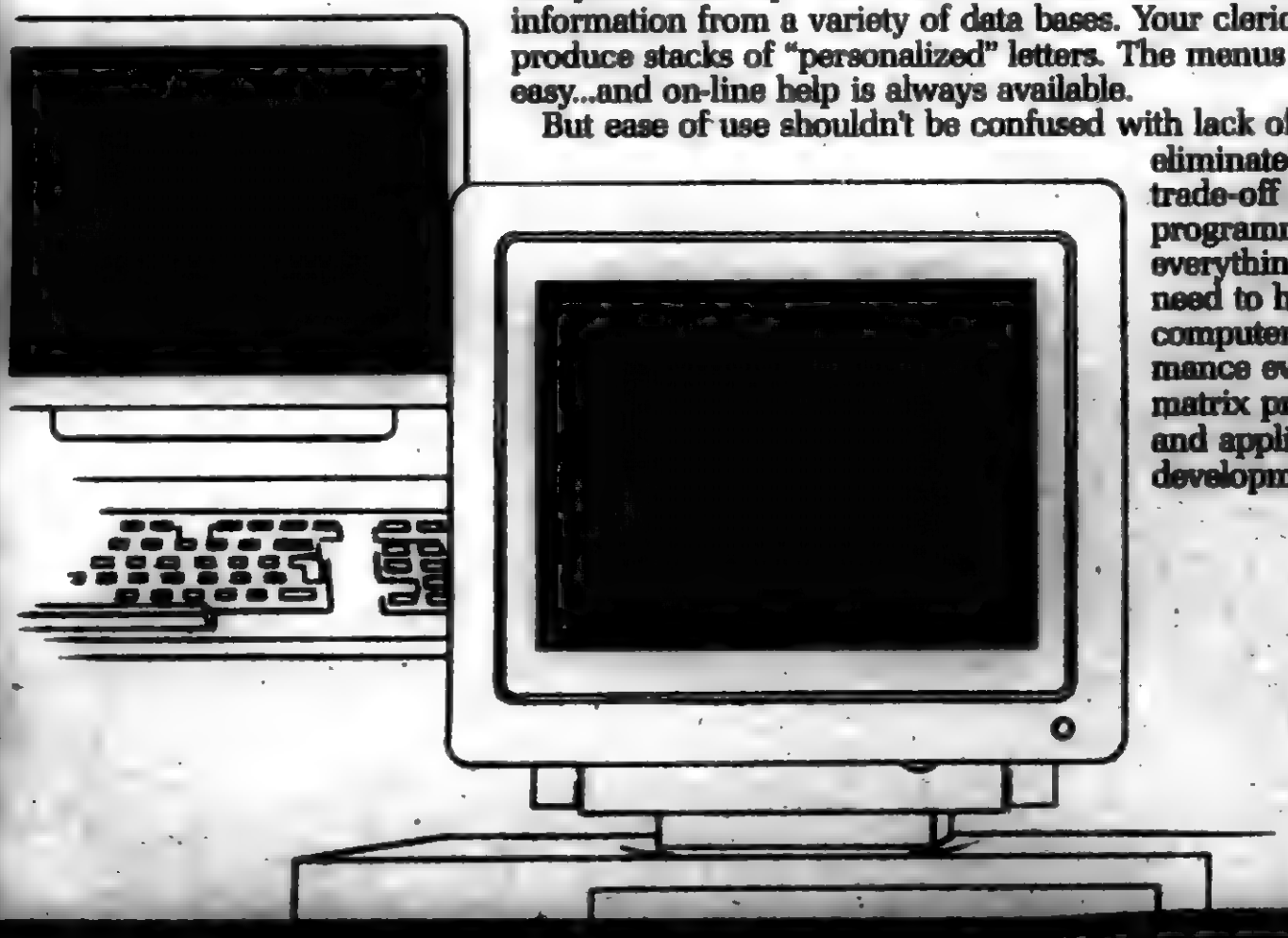
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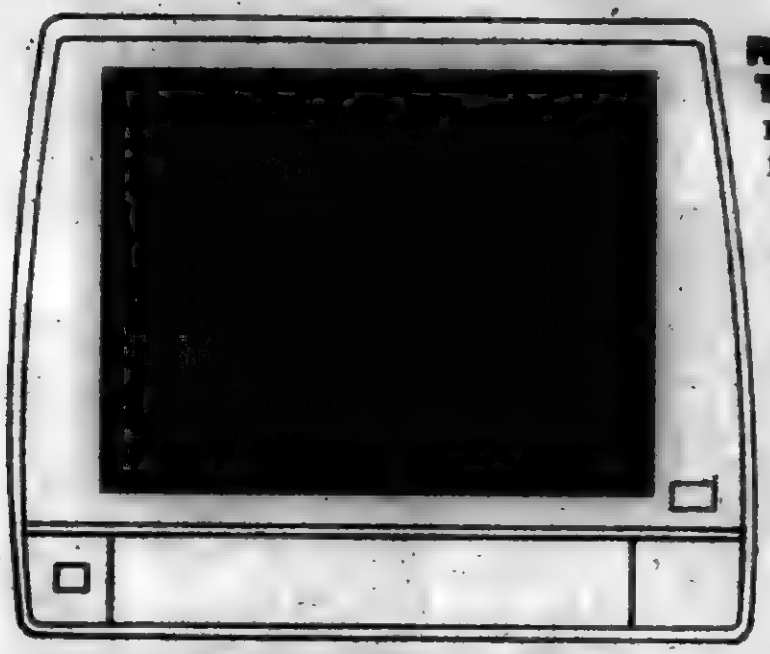


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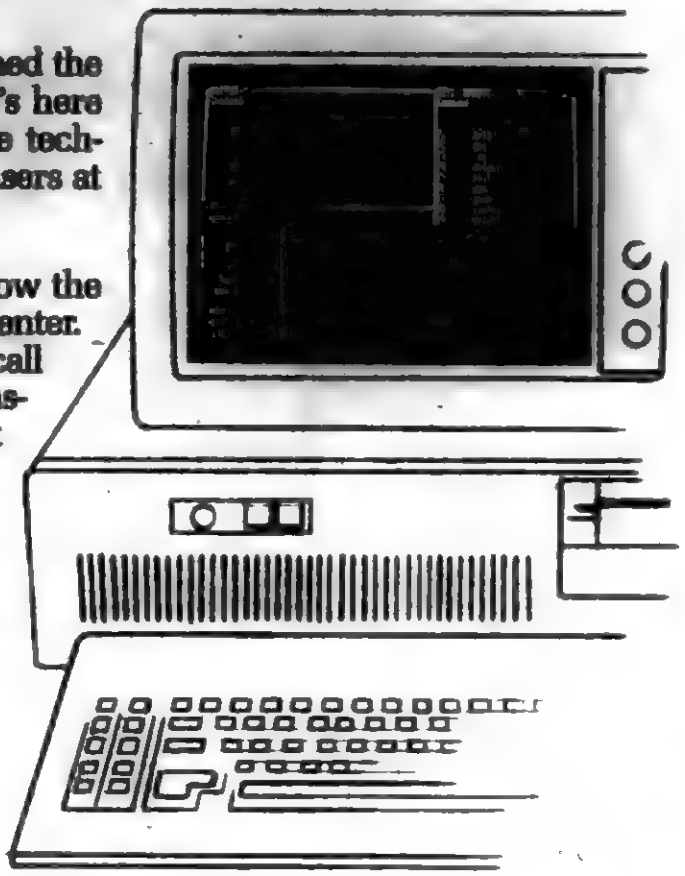


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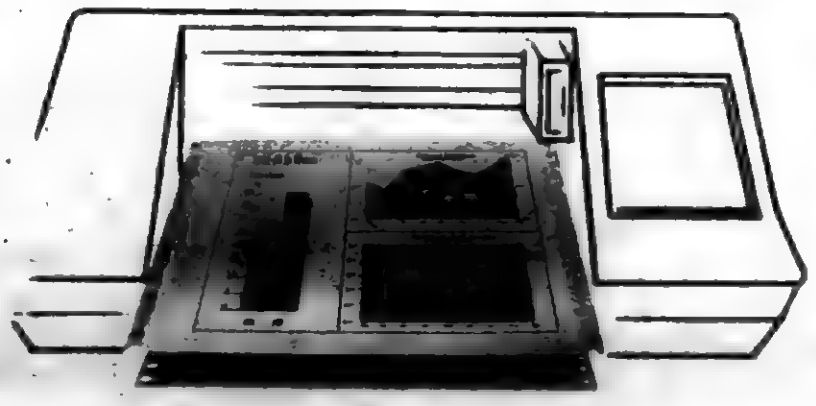
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INFOTRON SYSTEMS

Phone changes benefit users

From page 19

tively unless there is an average of at least 12% "1" bits.

As a result, link-level errors because of lost synchronization can occur during binary or graphics transmissions in which there can be a long stream of "0"s.

The ISDN architecture, which will be available soon, will provide both bandwidth and transparency.

Terminal adapter cards will ascertain that the synchronization and "1" bits are present in appropriate density. As a result, users will receive additional bandwidth and fewer link-level errors.

• **Extended superframe.** Recently introduced, T1 carrier equipment only requires 2K bit/sec. to manage a T1 line, instead of the 8K bit/sec. that was required by the older technology. This leaves 6K bit/sec. available for other service-related purposes.

The extended superframe and enhanced extended superframe soon to be implemented will allow, among other things, use of the new bandwidth for services that enable users to reconfigure their network in real-time via a data terminal.

However, first the vendors have to agree on how to allocate the extra bandwidth.

• **Network elements.** Network elements are intelligent devices that perform, among other functions, monitoring and surveillance of telephone equipment at the telephone network.

Network elements permit proactive management of the network, avoiding dependence on an outage report to spot a potential problem.

To be effective, this new breed of devices needs to transmit the collected performance data to remote computerized systems. This communication is achieved via the freed-up bits made available by the new signal formats described above, which constitute embedded operations channels.

The end user can expect better service because of the deployment of network elements by way of better bit/block error rates and channel uptime and availability.

• **DS3 service.** DS3 digital transmission facilities that can handle 45M bit/sec. data rates are starting to become available to the user. A number of divested telephone companies offer metropolitan networks tariffed at the DS3 rate.

An example of this is Illinois Bell's Novalink service. In other geographical areas, individual case basis tariffs may be available to large customers.

DS3 off-premise facilities, as opposed to in-house local-area network facilities, may be used as mainframe channel extenders that connect to remote peripherals such as disk drives, laser printers and communications processors.

It is estimated that by 1990 there will be five times as many DS3 circuit miles as there are today.

• **Syntran and add/drop multiplexers.** The current DS3 format does not provide an efficient way to extract smaller subchannels from the full 45M bit/sec. bandwidth, making it difficult for the many users who want to use the DS3 channel to support multiple sites.

A new format called Synchronous Transmission (Syntran) that is being proposed Bell Communications Research would overcome many of the problems intrinsic in the current standard and move the DS3 backbone network closer to all-digital ISDN service.

Add/drop multiplexers, which are currently under development by several switch vendors, will facilitate insertion and removal of subrate signals from a 45M bit/sec. facility without having to demultiplex and remultiplex the entire channel.

The plant enhancements described above are contributing to the gradual establishment of a true end-to-end, fully digital network, which will offer substantial benefits to the data communications user.

Western Union offers mini link

From page 19

is providing large corporations with that outside connection. If Western Union knocks on Wang customers' doors and says, 'Here is a transparent interface to our service,' they may decide to use Easylink instead of MCI Mail or Telemail," Ulrich said.

Priced at $2,500 per Wang system, EZ Access supports up to 256 terminals. Product features include billing of messages to individual clients or departments, confirmation of delivery and security functions.

"If your Wang system has an autoanswer capability, Easylink will dial it up and send mail to the appropriate mailbox automatically," Castergine said. If not, mail resides in Easylink mailboxes until the recipient accesses it.

The communications package was developed by The Information Organization Corp., an authorized Wang software developer based in San Francisco. Western Union also offers Easylink connections for Digital Equipment Corp. VAXs and IBM mainframes. Currently under development is a link to IBM's Professional Office System (Profs).

In March, MCI announced a package developed by Soft-Switch, Inc., which provides connections enabling IBM Profs users to access MCI Mail.

"Products of this type will become obsolete when the X.400 electronic mail standard allows everybody to connect with everybody," Ulrich commented.

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Starlan earns high marks

From page 19

tion processing services for the state of South Dakota's accounting department in Pierre. Bierle is in charge of a Starlan system that has been up and running for about six weeks.

Bierle says an AT&T PBX technician installed the hardware in the system on a Sunday afternoon, and a few days later, Bierle's own DP department installed the software while AT&T personnel observed.

Bierle claims that he can teach anyone to use the system in five minutes.

Bierle chose Starlan because he wanted to be able to use existing twisted-pair wire and purchase the system from a major vendor.

The current South Dakota accounting department's network of 13 AT&T Personal Computer 6300s will eventually expand to some 300 PC 6300s connected in groups of between five and 50 devices, according to Bierle.

"You really do need a dedicated file server," is Bierle's only recommendation for improving the system.

"Starlan is a very appropriate and very well-designed product for the widest variety of physical environments of any network on the market," says David Terry, president of Newport Consulting of Boston.

An entry-level Starlan consists of up to 10 PCs strung together in daisy-chain fashion over a maximum end-to-end distance of 400 feet. Larger networks of up to a theoretical maximum of 1,200 computers located over a total distance of 1,600 feet may be built in a star configuration with a hub, or Network Extension Unit, located in a wiring closet.

Although Terry says Starlan is "not priced as aggressively as it could be now," he says later versions will use the new Intel Corp. 82588 chip, which will cause dramatic price reductions. "It will be the lowest priced among the standard networks," he says.

Components available now include the following: PC 6300 Network Access Unit, priced at $595; PC Network Program, $125; Unix PC Network Access Unit, $595; Unix Network Program, $125; 3B2 Network Access Unit, $895; 3B2 Network Program, $395; and Network Extension Unit, $575. Volume discounts are available.

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Available In PC, XT & AT	Yes	Yes
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Fiber networks to mushroom

From page 19

vide point-to-point links between the token rings over even greater distances.

The major obstacle to widespread user acceptance, "lack of easy, cost-effective network taps," should be overcome in the next few years, Zilber said. In the meantime, vendors have circumvented the tapping problem by using optical fiber as a backbone medium that connects multiple networks based on other media.

"We're targeting intelligent buildings and campus environments," said David Monk, director of marketing at 5-year-old optical-fiber network vendor Artel. Monk cited three reasons that fiber is becoming the favored medium in these areas: distance, environment and capacity.

Optical fiber reportedly can support many hundreds of channels, an aggregate throughput of 200M bit/sec. or more, over distances of up to 40 or 50 miles without the need for a repeater, Monk said. "And it is immune to lightning and other electrical disturbances."

Ideal for campus connections

These qualities make optical fiber ideal for connecting a group of local-area networks on a campus, as a growing number of organizations are discovering. A case in point is the Harvard University Faculty of Arts and Sciences.

Last fall, the organization's technical staff decided to use optical fiber to connect 13 buildings in Cambridge, Mass., but chose not to use fiber to connect hosts and terminals within the buildings.

"We looked at several options," said technical associate Scott Bradner. "We had already installed baseband Ethernets in each building. We considered extending the baseband from building to building with repeaters, but the distances were too great. Baseband cable requires a repeater every 500 meters."

The college's second option was to use broadband coaxial cable as a backbone running between the baseband Ethernets. "But that would require installing a $4,000 modem at each node," Bradner pointed out.

The technical staff figured out that, even taking into consideration the fact that all 13 buildings were either already connected or about to be connected by broadband cable, the list price of installing an optical-fiber backbone would be only two-thirds the price of the broadband connections.

The Faculty of Arts and Sciences and Division of Applied Sciences currently use baseband Ethernets within buildings and optical fiber between buildings. The fiber connections radiate from central points to form three star configurations. The school plans to install another fiber link out to the observatory building, which currently communicates with the rest of the college over an expensive leased-line connection.

The technical staff had considered replacing the intrafacility baseband networks with optical fiber, but decided against it, "because it's much easier to install and move devices on baseband," Bradner said.

SYSTEMS & PERIPHERALS

HARD TALK
James Connolly

Why aren't users buying?

In looking at their own less-than-stimulating financial results, computer vendors have tended to pat themselves on their backs during the past year, asserting that their systems are powerful enough to satisfy users' needs and blaming that satisfaction for the lack of systems orders.

That may be true in some cases. It may be that a system delivered in late 1984 or early 1985 will keep the user happy and will keep that customer's checkbook pocketed for a year or so. But a recent survey by International Data Corp. (IDC) raises some questions about this theory.

"Existing computer capacity is adequate for near-term (1986) needs" was a statement presented in the IDC poll of 74 users and 69 vendors who were asked to say whether they agreed or disagreed with the statement. The respondents answered using a five-point scale, with the number 1 representing the strongest agreement with the statement that capacity is adequate and 5 indicating disagreement.

The average user response was 3.3, indicating moderate disagreement, while the vendors leaned toward adopting a capacity-is-adequate stance with a 2.9 average.

But IDC analyst Tom Elliott, who organized the survey, warned that while the averages indicate only a slim difference of opinion between the vendor and user groups, the groups see the capacity issue from vastly different points of view.

See WHY page 34

Connolly is Computerworld's senior editor, systems & peripherals.

Culler Scientific to offer 'personal supercomputer'

By James Connolly

SANTA BARBARA, Calif. — Having already targeted a series of minisupercomputers at the higher performance market, Culler Scientific Systems Corp. last week announced what it claims is a personal supercomputer designed to provide parallel processing on a network with workstations.

The Culler PSC, Culler's low-end system, is being offered under a joint marketing agreement between Culler and Sun Microsystems, Inc. and is designed to run on an Ethernet network in conjunction with Sun-2 and Sun-3 workstations.

Unlike Culler's other computers — the Culler 7 line of minisupercomputers that was announced in October — the PSC does not contain a kernal processor, which is the CPU that the Culler 7 line uses to execute the operating system and systems resource management.

With the PSC, those tasks are handled by the Sun workstation.

In conjunction with the PSC announcement, Culler announced 25% price cuts for the Culler 7 line of systems, which are now priced from $275,000 to $750,000.

Culler Marketing Vice-President Jeff Simon said a key feature of the Culler architecture is the integration of scalar, array and vector processing in the user processor — which is the heart of the PSC and which works in conjunction with the kernal processor in the Culler 7.

The PSC uses transistor-to-transistor logic and 128-bit words. It runs Sun software and applications, including modeling and simulation packages, produced by five third-party developers. It can support up to 16 users on a network, according to Simon.

Simon claimed that the PSC performs 18 million instructions per second (MIPS), running single-precision Whetstones and

See CULLER'S page 34

Hospital gets first dose of 9800

System to support medical, administration operations

By Jeffry Shecter

PHOENIX — NCR Corp.'s latest mainframe gained its first customer only a little more than a week after the machine's April 22 introduction.

In a development that coincided with the 16th annual international NCR Users Conference (Nucon), St. Louis-based Deaconess Hospital recently became the first buyer to sign a contract for the Model 9800 processor. The deal was completed in Phoenix at Nucon '86, a three-day event sponsored by the Federation of NCR User Groups.

Delivery of the 9800, which the hospital plans to use for both administrative and clinical purposes, is scheduled to take place during the fourth quarter of 1986 or the first quarter of 1987.

Deaconess has prided itself for a long time on being one of the health care industry's pacesetting users of information technology.

In 1969, the institution became one of the first U.S. hospitals to install an on-line order entry system, according to Homer Schmitz, Deaconess' senior vice-president for management resources.

Currently, the hospital serves as a beta test site for Care, an unreleased family of NCR-developed software modules that reportedly automate all phases of health care management.

The decision to order a 9800 was prompted by more than the hospital's desire to uphold its reputation as a technological trailblazer. Deaconess sees the contemplated acquisition as an opportunity to

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INSIDE

Data Switch offers a channel connector to compete with IBM's Model 3088 unit/26

Cromemco announces a ruggedized supermicrocomputer/30

MIPS Computer Systems introduces RISC-based OEM products/34

NEW THIS WEEK

- National Semiconductor offers Designer Kits for 32-bit systems

- For more on this and other new products, see pp. 121-154.

INSTANT ANALYSIS

"If I were Harris, I would be working really hard to leverage what I was already doing well."

— Sandy Gant
[redacted] analyst
on Harris Corp.

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TOWER SYSTEMS INTERNATIONAL

Data Switch offers alternative to IBM channel connection

Price/performance advantage claimed

By James Connolly

SHELTON, Conn. — Trying to take advantage of a claimed price/performance advantage over IBM, Data Switch Corp. recently announced two products that allow channel connections among IBM and IBM-compatible mainframes.

Data Switch positioned its Model 1488 Multisystem Interconnect Unit against IBM's Model 3088 Multisystem Channel Communication Unit. Each 1488, like the 3088, is designed to interconnect up to four mainframes, but the 1488 offers more functionality for less money, according to Data Switch officials.

The second announced product is the Data Switch Model 101 Channel Link, which provides point-to-point connections between two mainframes or can be used as a backup link with a 1488.

The Model 1488, which a Data Switch spokesman claimed is the only competitor of the IBM 3088, uses Data Switch's channel-extension and matrix switching technologies to establish multiple internal data paths for connections between computers at channel speeds. That use of multiple fixed paths improves throughput by reducing the time spent on channel path selection, according to Data Switch.

The Model 1488 was designed to support 192 logical channel-to-channel adapter links connecting four processors and can be configured to provide connections with additional CPUs and Model 1488s.

Data Switch claimed that in virtually all applications the Model 1488 can replace the 3088 without impact on existing software.

The company also said the Model 1488 provides flexibility in channel address selection by allowing the systems programmer to use any number of 32 available addresses. The Model 1488 also features its own power supply and provides backup link capabilities for $10,000, and the $95,000 IBM 3088 requires a second 3088.

Data Switch said a two-CPU Model 1488 with optional backup costs $50,000, and a four-CPU version costs $90,000. The Model 101 costs $15,000.

The products are designed to operate within Data Switch's network control system, including the Model 1400 peripheral matrix switch, which incorporates switching, monitoring, testing and fiber-optic channel extension.



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INTERNATIONAL COMMUNICATIONS ASSOCIATION

cpw

Hospital gets dose of 9800

From page 25

improve its adaptability to rapid, unforeseen change, Schmitz said during a Nucon '86 interview.

He noted that, like many other industries, the health care field is undergoing upheaval and turmoil as it enters a new era marked by greatly increased competition, alternative mechanisms for delivering treatment and new pricing strategies. The chaos comes at a time when equally profound advances are sweeping the hardware and software arena.

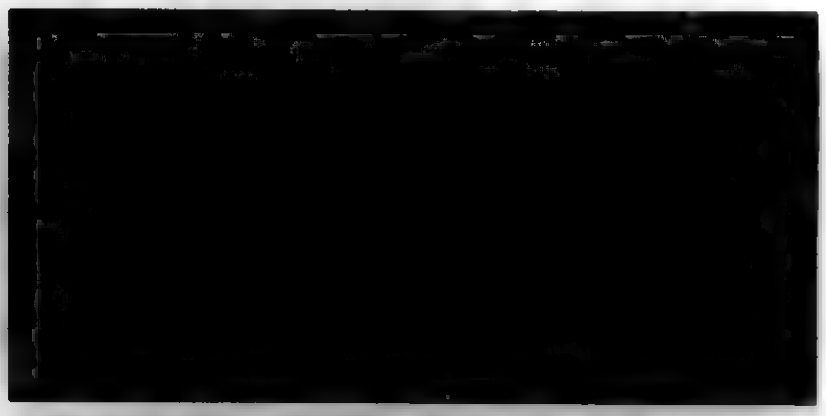
In the face of such overwhelming changes, Schmitz said, Deaconess was forced to ask itself a key question: What precisely will the health care system of tomorrow look like? In trying to answer the question, Schmitz and his colleagues defined two sets of future systems requirements — one for management or administrative applications and another for clinical applications.

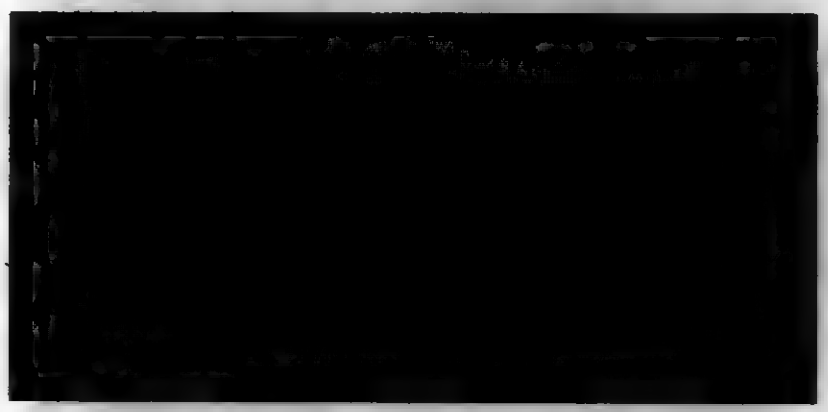
On the management side, a prerequisite for a fourth-generation health care system is the ability to analyze patient data for price setting pur-

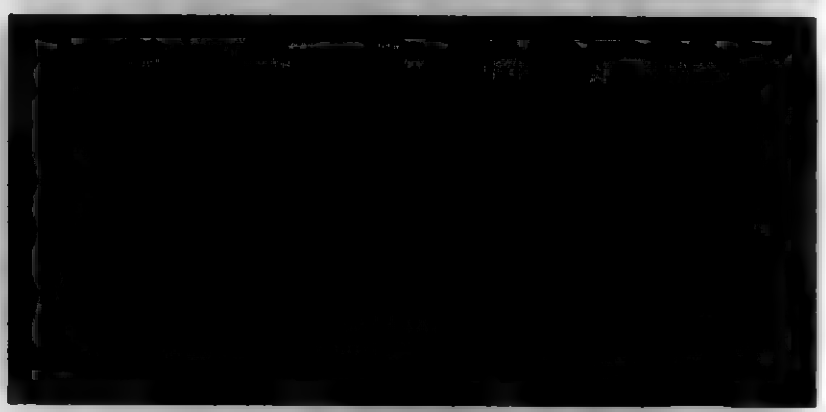
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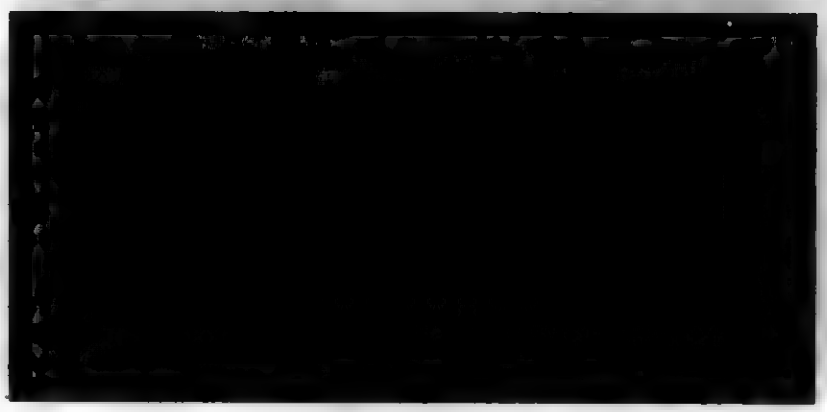
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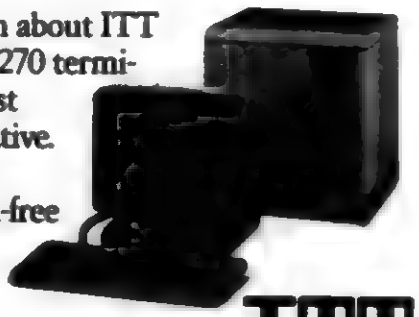
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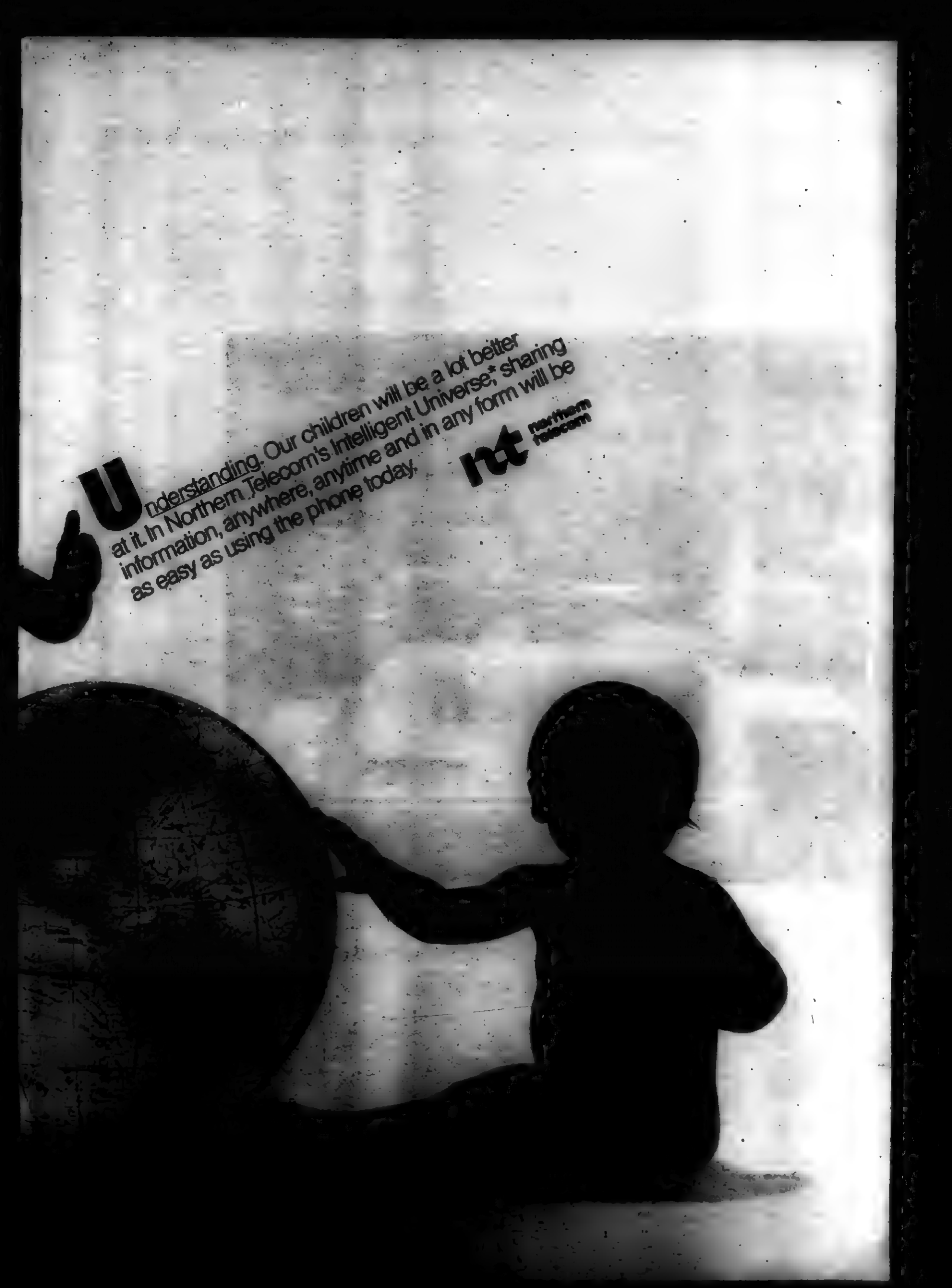
Which means everyone in your company can now work two jobs at the same time. Rather than choose between them.

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Cromemco launches ruggedized, multiuser supermicro

Made for military and industrial use

By Donna Raimondi

MOUNTAIN VIEW, Calif. — Cromemco, Inc. has announced a ruggedized multiuser supermicrocomputer designed for use in noise-sensitive, industrial and military environments.

The system, priced between $12,995 and $18,000 depending upon configuration, runs under Cromix, a proprietary AT&T Unix System V-like operating system. System V can be added for $2,000.

Cromemco is in the process of obtaining Tempest certification, according to Edward Fearon, owner of Computer Crossroads of America, Inc., a distributor and dealer of Cromemco equipment. The CS200 was designed for use in military applications, such as the Data Cartridge Tape Loader Verification system used in mission planning on fighter planes and in flight training.

"They are a very specialized company in that they concentrate on the hardware, keeping to data bases and program languages in software. Typically, a dealer for Cromemco has to write or port applications from someone else's box," Fearon said.

The rack-mountable CS200, based on Motorola, Inc.'s 68010 processor, includes a heavy-duty power supply and an all-metal chassis said to be noise-tight. Main memory comes in a 1M-byte nonerror-correcting quantity. Additions in 2M-byte error correcting increments can be expanded up to 16M bytes in a system. Internal hard disk storage is available in either 50M- or 140M-byte capacities. In systems configured with 2M bytes or more of memory, a 750K-byte random-access memory is allocated as a buffer area. The standard system is a two-user model, but support for 16 or more users can be added.

The system supports IBM 3270 bisynchronous communications, X.25 and Ethernet.



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DPM01SOW

Hospital gets dose of 9800

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poses and to otherwise support the decision making process. Most existing health care systems "simply weren't put together to provide the kind of information hospitals need" to price their services competitively and to cope effectively, Schmitz said.

A health care system for the future also requires enough flexibility to respond to dramatic changes in the way hospitals operate. Such systems, Schmitz said, "have to be able to manipulate data in new ways that today can't even be imagined."

On the clinical side, meanwhile, a state-of-the-art system must guarantee uninterrupted service, which Schmitz hopes to address with the fault-tolerant features of the 9800. The hospital will keep its current NCR 8645 running the Care modules and a back-office 8595. "At the very least, a delay in obtaining the right data could diminish health care quality. In some cases, it could even be a matter of life or death," Schmitz said.

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What does NCR's 9800 add up to?

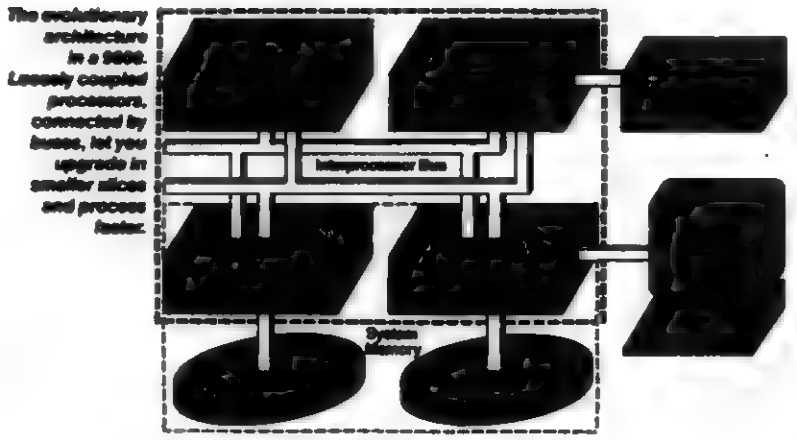
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Luckily, the new NCR 9800 is anything but a conventional mainframe.

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HOW TO BUILD AN EVOLUTION.



The evolutionary architecture in a 9800. Loosely coupled processors, connected by buses, let you upgrade in smaller slices and process faster.

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You see, we developed a special "system memory" for your most frequently used files. And all the processors can share these files. Automatically. What's more, the processors team up—again, automatically—during these peaks, so the system has the agility to process increased workloads, whenever they occur.

Sounds simple, but conventional mainframes can't do it unless someone writes complicated application software.

With the 9800, it's part of the system.

So the computer is more efficient, more economical, and very flexible.

HOW TO GROW A MAINFRAME.

The 9800 doesn't have to be upgraded in large pieces.

It grows gradually, the way a business grows.

You start with the power you need, and then you can expand in smaller increments than is possible with conventional mainframes.

You can even add job-specific modules to handle specific functions.

IT'S MORE FAULT-TOLERANT THAN YOU ARE.

Conventional fault-tolerant systems work one of two ways: Either by doing the work twice, which is unproductive, or by using a software solution that slows processing down.

We invented a more efficient system.

Set up a 9800 for fault-tolerance and, if a module fails, other modules take over while continuing to do their own jobs.

It'll run during a processor failure. Or a software failure.

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NCR's highly-reliable 32-bit VLSI processor chip.

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So, the chance of a failure inside the 9800 is very slim.

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The 9800 was built to be an excellent on-line transaction processor, as well as an excellent general purpose processor.

And it can be tailored to do both jobs more economically than conventional mainframes.

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Culler's 'personal supercomputer'

From page 25

12 million floating-point operations per second. The PSC, which features two parallel processors, costs $98,500 and will be available on a limited basis during the summer and generally available in the fall.

Simon said that most buyers of the PSC already will have disk and tape configurations on their Sun workstations. He added that more than one PSC can sit on a network.

Analyst Jeffry Canin of Hambrecht & Quist, Inc. noted that Culler features an entry-level price lower than that of some competitors, such as Scientific Computer Systems, Inc., Alliant Computer Systems Corp. and Convex Computer Corp.

'Need fast scalar processing'

He also said, "If you look at the performance, it appears to be a pretty good balance between fast vector and fast scalar processing, and most applications, even in the scientific field, do need fast scalar processing."

Simon reported that several Culler-7 systems have been installed, but he declined to identify the user sites.

Culler President Gerald V. Butler claimed that the PSC gives users access to supercomputer-type power for less than $6,000 per MIPS. "Culler now offers processing power from the PSC to beyond the Cray Research, Inc. Cray 1-S, bracketing competing minisupercomputers and opening the market to thousands who could not consider costlier alternatives."

MIPS Computer Systems jumps into OEM mart with RISC-based products

By James Connolly

SUNNYVALE, Calif. — Acknowledging that they hope to gain from IBM's and Hewlett-Packard Co.'s endorsements of reduced-instruction set computer (RISC) technology, a 2-year-old company last week jumped into the OEM market with a set of RISC-based products.

MIPS Computer Systems, Inc. announced its R2000 product line and said its first customer is Prime Computer, Inc., which plans to use a MIPS CPU board in a workstation product.

"There is no question that IBM has done a lot for the technology with its RISC-based product, and HP underscored it," said MIPS President Vaemond H. Crane of IBM's February introduction of its RT Personal Computer and HP's announcement of its HP 3000 Series 930 and 950 RISC-based superminicomputers.

The R2000 product line is based on a custom 32-bit CMOS, said to perform up to 10 million instructions per second (MIPS).

The Unix-based boards are the R2100, R2300 and R2600 CPU boards, which are designed to perform from 3 to 5 MIPS.

The component kits are the R2065/12 and the R2065/16, which include a 12.5-MHz or 16.7-MHz CPU chip and binary code for MIPS' UMIPS operating system, utilities and C optimizing compiler.

The M/500 development system is configured around the R2300 board. A base system includes 4M bytes of memory, a 337M-byte disk drive and a 60M-byte tape drive.

Available now, the R2100 costs $3,170 in OEM quantities; the R2300 costs $4,775. The R2600 will be available during the fourth quarter and costs $6,420.

The R2065/12 component kit will be available during the third quarter for $1,750. The R2065/16 costs $2,250 and will ship in the first quarter of 1987.

The basic configuration of the M/500 development system costs $59,900 and is available now.

Why aren't users buying?

From page 25

Elliott charted the responses and found that the majority of vendor responses bunched close to that 2.9 average. But the users were polarized — either heavily on the pro side or on the con side. Few users took the moderate middle road, despite the impression that the 3.3 point average gave.

Elliott's conclusion was that while individual users may not be spending as heavily as they have in the past because they are absorbing existing capacity, such is not the case for everyone.

That conclusion leads one to speculate about why people are not buying computer equipment. One often-cited possibility is that the economy has not recovered as well as the federal government says it has. Another possibility, also frequently mentioned, is that a lot of people remain unexcited about the latest vendor offerings.

Difficult to justify a $5 million system

The reason people aren't buying is probably a little of both. If a user company is tightening its belt, it becomes more and more difficult to justify a $5 million system that provides a minimal performance gain.

The only justification for many users these days is the promise that the system can expand as their company grows, a promise that becomes meaningless if that growth does not materialize.

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SMALL TALK
Eric Bender

Software hits, lower profits

Businessland, Inc. Senior Vice-President Enzo Torresi neatly summed up the computer dealer's never-ending headache: "The channel tends to stabilize at the point of minimum profitability."

At Comdex/Spring in Atlanta two weeks ago, Torresi was talking about microcomputer software pricing, although his comment covered other product categories just as well.

From a reseller's point of view, the biggest pricing problem remains software's uneasy status as a quasi-commodity offering. High-end dealers buy into expensive promotion and training efforts for a new package. Then, soon after sales start to climb, they see the software flying from the mail-order houses at bargain-basement prices.

"Success works against you in the long run," Torresi remarked. "Even the best software evolves into a commodity in about 24 months."

That may be good news, of course, to corporate buyers, who keep grinding away toward revamped purchasing agreements, as others at Comdex/Spring emphasized.

"I've got a stack of 60-page documents, written by someone in the DP department playing junior attorney," complained John Yates, an Atlanta lawyer who advises software firms. Yates, a partner at Vaughan, Roach, Davis, Birch and Murphy, added that these homegrown contracts typically end up with "a price that gives the product away."

However, the few major software

See SOFTWARE page 44

Bender is Computerworld's senior editor, microcomputers.

IBM aftermarket vendors confront tricky issues

By David Bright

Vendors of add-on products for IBM Personal Computers are not having an easy time of it. In this highly competitive business, suppliers are confronting several pressing issues: a controversy about expanded memory approaches, the determination of product focus in a rapidly changing market, distribution and pricing.

Richard Shapero, senior marketing director at AST Research, Inc., says he has been losing sleep worrying about misunderstandings caused by the expanded memory controversy. While the Lotus/Intel/Microsoft Expanded Memory Specification (EMS) is being promoted for bypassing the IBM PC's 640K-byte memory limitation, AST, Quadram Corp. and Ashton-Tate have developed another product called the Enhanced Expanded Memory Specification (Enhanced EMS).

Meanwhile, AST and Quadram have developed a bit of a rivalry concerning compatibility. "There's a lot of confusion," Shapero observes.

As a superset of EMS, Enhanced EMS is said to run software written for both. Unfortunately, says Quadram President Robert Brown, Enhanced EMS does not quite provide total compatibility.

"It's time for us to stop lobbing grenades and to be responsive to the industry's needs," he says.

Hoping to clear up the issue, Quadram last month announced the Quad EMS+ board, which Brown claims bridges the gap between the two specifications. With prices starting at $495 for a 256K-byte configuration, the board supports up to 2M bytes of addressable memory and is guaranteed to be hardware- and software-compatible with both specifications.

So far, the software development industry has shown much more interest in EMS, although Enhanced EMS is considered by many to give better support for multiple applications. For multiple-application environments, EMS supports Microsoft Corp.'s Windows package, while Enhanced EMS is tied to Quarterdeck Office Systems, Inc.'s Desqview. Software running under Windows reportedly requires more modification than that running under Desqview.

See IBM page 38

Zenith 'supports' 3½-in. drives

Announces graphics card, Xenix option for Z-200

By Douglas Barney

ATLANTA — At Comdex/Spring '86, Zenith Data Systems Corp. asserted that its IBM Personal Computer-compatible desktop systems are ready to accept 3½-in. disk drives. The firm also announced an enhanced graphics adapter for high-resolution graphics and text, availability of Microsoft Corp.'s Xenix System 3 for the Zenith Z-200 Advanced PC and a real-time clock.

Zenith declared support for 3½-in. micro floppy disk drives but did not offer such products. "We haven't announced actual plans for 3½-in. drive machines," said Michael Brenner, director of product planning. "What we are showing is that Zenith machines as they are going out the door today are ready for 3½-in. drives. The software is there, the disk controller is there, and all you have to do is decide you want a 3½-in. drive and bolt it in."

However, no support was announced for 3½-in. drives in the Zenith Z-171 lap-size machine. "We have no plans to change the 171 to 3½-in. drives. Such drives could probably be put inside, but we have not been experimenting with that," Brenner said.

The $499 Zenith Z-439-A Enhanced Graphics Adapter card provides 640 by 350 pixels and can present 16 colors with

See ZENITH page 40

INSIDE

Word Perfect software family gets shell software/37

Gold Hill Computers announces a runtime package for Golden Common Lisp/37

NEW THIS WEEK

- Kaypro upgrades its IBM-compatible micros
- Omnitel offers Omnipak multifunction card with a 1,200/300 bit/sec. modem

For more on these and other new products, see pp. 121-154.

INSTANT ANALYSIS

"Until the standard PC that IBM ships is a graphics box, IBM has absolutely no compelling reason to make a decision in the graphics arena."

— William Higgs, manager of graphics products, Digital Research Inc., on graphics-based operating environments for IBM Personal Computers

Corporate buyers find ups and downs of Asian PC clones

Imports can cost half, but there may be a catch

By Edward Warner
Computerworld News Service

FRAMINGHAM, Mass. — Highly rated by the consumer market but so far shunned by most corporate buyers, the Korean-made Leading Edge Products, Inc. Model D personal computer has established a large-user foothold at the Dennison Manufacturing Co. Based on price and IBM compatibility, the office supplies manufacturer has already taken delivery of two dozen of the machines, which are made by South Korea's Daewoo and sold by Leading Edge.

Dennison estimates that it spent less than half of what it would have cost to buy similarly equipped IBM Personal Computers. The company had already purchased 140 models of an earlier edition from the Canton, Mass., supplier.

Between 300,000 and 500,000 cheap IBM PC clones, almost all of them made in Asia, will be sold in the U.S. this year, says personal computer industry analyst Aaron Goldberg of International Data Corp. in Framingham.

While some clones will be sold by U.S. subsidiaries — Epson America, Inc., for instance, markets the Equity I — others will be resold by U.S. distributors, such as Leading Edge, or by large retail chains.

So far, the clones have gone largely to the home market, where their compatibility has been proven. Now, however, industry analysts say the Asian machines are headed for the office. The reason, says analyst Seymour Merrin of the Gartner Group, Inc. in Stamford, Conn., is that corporate PC buying is becoming as simple as buying any other commodity. Companies seek a compatible product that does the job — at the cheapest price.

When a corporate manager buys a generic IBM PC compatible, the savings can be substantial. An IBM PC with 256K bytes of memory, twin diskette drives, a Hercules graphics board and a monitor costs about $2,495. An equally configured Leading Edge Model D costs $1,495.

As with many bargains, though, sometimes there is a catch. For Dennison, the catch became apparent when the first Model Ds arrived. Under Dennison's agreement with Leading Edge, an open-ended number of Model Ds were to be supplied, each with additional memory, reports Jeff Bullock, Dennison's PC manager.

Each of the Model Ds was also supposed to have undergone a preshipment reliability test, but when the first 24 or so Model Ds arrived, Bullock realized they had neither received the extra memory nor the burn-in test. The machines, he says, "were not coming the way we required them from Leading Edge."

Leading Edge operations coordinator Buddy Carp acknowledges that his firm has had shipping problems with its Dennison order but notes

See BUYERS page 40

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MICROCOMPUTERS

Word processing developers open Word Perfect Library

By Peggy Watt

ATLANTA — Developers of the popular word processing program Word Perfect have released the Word Perfect Library, a bundle of utilities that also integrates the company's several products.

Shown for the first time at Comdex/Spring '86 last month, the $129 Library features a shell that enables a user to write custom menus for data access and transfer among different applications, including Word Perfect, the spreadsheet Math Plan and the Data Path data base software.

The Orem, Utah-based software developer also announced the change of its name to Word Perfect Corp. from Satellite Software International, to identify more closely with its major product, company spokesmen said.

Windowing environment

Word Perfect Library offers a limited windowing environment, allowing the user to switch between programs with a single keystroke. It provides for keyboard macros to run under any programs, includes a calculator, appointment calendar, alarm clock, file manager, notebook and editor, and supports the Lotus/Intel/Microsoft Expanded Memory Specification to take advantage of random-access memory (RAM) beyond 640K bytes, according to Word Perfect.

"We originally developed a lot of these programs for our use in-house," said W. E. Peterson, Word Perfect executive vice-president. The calculator, for instance, includes scientific, financial, programming and statistical modes, and provides a host of display modes, including hexadecimal, binary, exponential notation and floating decimal.

"It seemed better suited to make a collection," Peterson said, so programmers added the notebook, including an address list and autodialer, other utilities and even a game.

The Library requires 384K bytes of RAM to run with the shell, Word Perfect and Math Plan, developers said. It now is available for the IBM Personal Computer Personal Computer XT, AT and compatibles. A hard disk is recommended.

The Library may also provide a boost for Word Perfect's other, lesser known products. While the data base and spreadsheet, both out for more than a year, are not as full-featured as the market leaders, they were intended to supplement Word Perfect and now can be integrated with the Library shell.

Introduced in 1982, the word processing program remains Word Perfect's primary product. The company's current focus is less on new products than on porting existing products to other systems, said Dan Lunt, vice-president of marketing.

Besides its Microsoft Corp. MS-DOS group, the company has divisions for Apple Computer, Inc.'s Apple II, Data General Corp. systems and Digital Equipment Corp.'s VAX and expects to offer Word Perfect on such Motorola, Inc. 68000-based systems as the Apple Macintosh, Lunt added.

Word Perfect already offers a corporate site licensing program that is essentially a volume purchase plan and allows updates without the return of original disks and duplication of documentation by the company, Peterson said.

Gold Hill utility product allows PCs to create runtime LISP applications

By Douglas Barney

CAMBRIDGE, Mass. — In a move aimed at allowing personal computers to deliver Common LISP applications, Gold Hill Computers, Inc. late last month announced a product that creates a runtime version of applications written with its Golden Common LISP (GCLisp) language.

The utility product, called GCLRun, allows developers to produce low-cost stand-alone applications by creating executable files from compiled GCLisp programs, the firm said. GCLRun will be available in June for $5 to $100, depending upon volume.

According to Carl Wolf, president of Gold Hill, GCLRun allows developers to distribute applications written in LISP simply and cheaply. With GCLRun, the user does not have to use a special LISP machine or load LISP onto the computer to run LISP-based applications.

"There is a pent-up demand for the ability to develop an artificial intelligence application on a reasonably priced machine," Wolf said. "You have a lot of people who bought LISP machines in 1982 and 1983, have developed applications and would like to disseminate those. You have got to deliver on a personal computer."

In addition to corporate developers, some 80 independent developers, including some of the major microcomputer software suppliers, are using Gold Hill's products, Wolf said.

Language interface

Programs written in other languages such as Microsoft Corp.'s version of C or Lattice C can be integrated with GCLRun using the product's foreign language interface. The interface allows GCLisp and C programs to access each others' data structures, providing greater efficiency and programming flexibility, the firm claimed.

In addition, GCLRun runtime output can access the Microsoft MS-DOS command line, giving developers the ability to create applications with command-line parameters.

GCLRun runs on IBM Personal Computers and compatibles with at least 256K bytes of random-access memory (RAM), but Gold Hill recommends at least 512K bytes of RAM

IBM aftermarket confronts issues

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Overall, many vendors of add-on products seem extra cautious, watching one another closely in an attempt to figure out which products might have the best success. No longer can they afford to bring out what they think are technologically advanced products and then hope that sales take off.

Brown acknowledges Quadram's cautiousness but says his company has always been prudent. At some companies, like Quadram and Ideassociates, Inc., that conservatism translates into diversity. That way, if any one product area fizzles out overnight, the business can shift to other offerings in the company's repertoire.

At Ideassociates, what products are most in demand depends on what month it is, quips Nora Feldman Gildea, director of marketing. The company currently offers products for IBM PC-to-IBM-minicomputer communications, IBM PC-to-IBM-mainframe communications, disk storage, networking, multifunction applications and graphics.

Further strengthening the EMS camp, Ideassociates in late March introduced the 4M-byte capacity Idea Supermax/EMS card for the IBM Personal Computer AT. Prices for this card range from $595 to $2,395.

Currently, at Ideassociates as well as AST and Quadram, one hot area is IBM PC-to-System/34, 36 and 38 links. According to Shapero, AST's revenue in that area has grown from nothing to $10 million in one year. Because of this boom, all three companies plan to bring out more IBM 5251-compatible products.

The bulk of Quadram's $75 million business comes from its multifunction memory, graphics and communications products. Brown expects graphics and IBM PC-to-host communications products to see the most activity in coming months.

While diversity may have helped Ideassociates and Quadram, the concept is not working too well for Tecmar, Inc., which offers more than 70 products. Last month Tecmar laid off 70 to 80 employees from its work force of 400, according to published reports. Tecmar President Martin Alpert, however, said those figures are inflated.

The company is now reducing its number of products, Marketing Vice-President Richard Dorman notes. Tecmar's new thrust may include high-speed local-area network products, to be introduced at Comdex/Fall '86.

Comdex/Fall may also see the arrival of controller-mounted 3½-in. hard disks with capacities as high as 45M bytes. This should reflect the current demand for easily installed hard-disk storage that does not use up any desk space. Western Digital Corp., Verbatim Corp. and Mountain Computer, Inc. all report strong interest in their controller-mounted drives. And one of Ideassociates' hottest items is the 2¼-in.-high Diskit 2 dual hard disk drive that fits under the IBM PC's monitor.

Following up on the success of its 20M-byte Drivecard, Mountain has come out with a 30M-byte $1,449 version. At last month's Comdex/Spring, Western Digital introduced its 20M-byte Filecard 20, which retails for $895. "The market seems to want 20M bytes," claims Chet Brown, vice-president of Western Digital's Enhanced Peripherals Division. "It's a magic number."

> ***"No longer can vendors afford to bring out what they think are technologically advanced products and then hope that sales take off."***

However, reflecting the mood of caution, Western Digital did display a 30M-byte version as a means of gauging market demand. Brown predicts that 45M-byte Filecard-like devices should be on the market by Comdex/Fall.

Emulex Persyst, a division of Emulex Corp., is focusing on sophisticated graphics and communications boards, Vice-President Jim Orris says. An example of such a product is the DCP-88, an Intel Corp. 8088-based coprocessor card that holds up to 500K bytes of random-access memory and handles up to four IBM 3270 communications lines while the PC's processor is busy with other work.

While vendors gear up for more reseller activity, competition at the low-end retail level is pushing prices down fast. For instance, Western Digital recently dropped the price of its Filecard 10 from $1,095 to $795.

And at Comdex/Spring, AST cut the prices of several of its IBM PC family add-in boards. The changes came in response to IBM's April price cuts, according to Thomas Stickel, AST senior vice-president of sales and marketing. The suggested retail price of one of the boards — Six Pak Plus — was cut from $395 to $249. "That trend will definitely continue," AST's Shapero says.

Because many lower-end retail products are more easily copied, some companies are targeting more sophisticated, more expensive products at the value-added dealer and value-added reseller channels. Among the firms headed in that direction are Emulex Persyst, Alloy Computer Products, Inc. and Quadram.



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Buyers find ups, downs of clones

From page 35

that the Model Ds received by Dennison have run well, once configured with enough memory.

Bullock agrees but says the initial problems with the Model D have caused Dennison to take a second look at its agreement to buy from Leading Edge. That agreement, Bullock says, was only an oral one, after the Dennison legal department rejected Leading Edge's written contract.

Earlier this year, Leading Edge announced a machine clearly intended for the business market: a $2,495 personal computer with a 10M-byte hard disk drive, 1.2M-byte diskette drive and a monochrome monitor.

The company also plans to announce an agreement with RCA Corp. under which RCA will provide on-site service to Leading Edge corporate users.

Corporate users are not the only ones who have taken a liking to Asian-made IBM PC compatibles. Personal computer dealers, caught in a time of shrinking margins on the IBM PC, are finding the fat margins of the Asian compatibles — reportedly as high as 35% for the Model D — to be a blessing.

Tony Morris, president of Morris Decision Systems, Inc., a New York-based dealership that focuses on corporate sales, says, "A lot of dealers are finding they just can't get paid enough by selling IBM today. So they'll go whichever way they can to stay in business." Morris Decision Systems and MBI/Microsource, an East Coast dealer chain that targets corporate accounts, are both said to be considering taking on Asian-made compatibles.

Clancy/Paul, Inc., a five-store computer retailing chain based in Princeton, N.J., claims to be selling 400 Model Ds per month.

Balking at lesser known vendors

While ready to veer from buying IBM, some corporate buyers balk at choosing Leading Edge or other lesser known machines. Though 20% of the several thousand PCs at North American Philips Corp. in New York are non-IBM, Thomas O'Leary, director of MIS technology, points out that the machines were purchased only from AT&T and Telex Computer Products, Inc., large firms with which Philips has a long-standing business relationship.

"Leading Edge, for me, would only be as good as the retailer supplying it," he adds.

Dennison did have a business relationship with Leading Edge prior to ordering the Model D. Since the early 1980s, Dennison had manufactured diskettes for resale by Leading Edge's Elephant Memory Systems division. When Leading Edge decided to pull out of the diskette business, Dennison bought the Elephant Memory name and began marketing the diskettes itself.

During that time, Dennison also got into personal computing and bought 140 of its 200 PCs from Leading Edge. Those machines, made by Mitsubishi Electronics Corp. for resale by Leading Edge, were among the first Asian-made PC compatibles to be marketed in the U.S.

In 1985, however, Leading Edge became embroiled in a lawsuit with Mitsubishi, and problems arose with the Mitsubishi machines that Dennison was receiving, Dennison's Bullock recalls.

Leading Edge replaced the Mitsubishi PC clone with the Model D in late 1985.

Despite the earlier problems, Bullock says Dennison agreed to a quantity of them at a discount.

Dennison, which earned only $6.7 million on $661.5 million in sales in 1985, was looking to cut costs, but the company first tested the Model D and found it to be "one of the most compatible of the compatibles," he says.

Things looked rosy until the Model Ds arrived in less-than-acceptable condition. All things considered, Bullock says, "there might be a down side to dealing with [a company] other than IBM."



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Zenith 'supports' 3½-in. drives

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an enhanced color monitor. Available in June, the card takes up one expansion slot, includes a light pen interface and runs on IBM, Zenith and compatible computers.

"The Enhanced Graphics Adapter is important because it is a single board that supports both color and monochrome applications," Brenner claimed. Zenith introduced its own enhanced graphics adapter card because "our strategy has been to supply complete systems," he said.

Zenith also announced that Microsoft's Xenix System 3 is now an option on the Zenith Z-200. Advanced PC, an IBM Personal Computer AT-compatible machine.

"Zenith customers have requested that one of our offerings be a multiuser operating system of the Unix variety," Brenner said. "We are shipping System 3 now, and System 5 is announced but not delivering."

The $69 stand-alone real-time clock allows users to keep track of times and dates of directory records without inserting that information every time the system is booted. The clock runs on Zenith, IBM and compatible PCs.

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Software hits, lower profits

From page 35

vendors that showed up at Comdex were not giving away much more than a few tip-of-the-iceberg flashes about changing customer agreements.

With all the options in distribution and support, "there's no such thing as one size fits all," said Michael Kolowich, Lotus Development Corp.'s vice-president of marketing.

User, vendor agreements

But after extensive beta testing of various arrangements, Lotus and its customers are arriving at agreements on support, connectivity, communication between vendor and user and other potential flash points. These will not emerge in one grand document carved in stone at Lotus headquarters but in a series of quiet steps.

"They're being slipstreamed in, even as we speak," Kolowich said.

As one example of initiatives, Kolowich mentioned Lotus' executive briefings for large customers. These have turned into day-long workshops at which "sales people tend to be a minority of the participants," he said. "If it's a hot-button issue, we may bring in the guys actually doing the coding and designing."

He confirmed that Lotus still intends to make a mid-year announcement on local-area network-tailored products and pricing.

Special laptop pricing

Other pricing news will be made sometime in the next month or so as Lotus ships software for IBM's PC Convertible, with some form of special pricing for those who use the laptop as a second machine.

"Users who want to run a second copy on a second machine should not have to pay full price," Kolowich said, although he did not disclose how Lotus will resolve the tangled issues involved.

As always, long-term pricing trends received much attention, with the general consensus being that productivity packages will stay about the same or drift down slightly.

Naturally, some vendors are more comfortable with that trend than others, and development costs are seen in varying ways.

Software Publishing Corp. spends 25% of its sales dollars on research and development and wants that money back and then some, commented President Fred Gibbons.

But Spencer Leyton, vice-president of sales and business development at Borland International, Inc., took another tack: "How much does it cost to put two guys in an apartment with a computer?"

> ***"The few major software vendors that showed up at Comdex were not giving away much more than a few tip-of-the-iceberg flashes about changing customer agreements."***

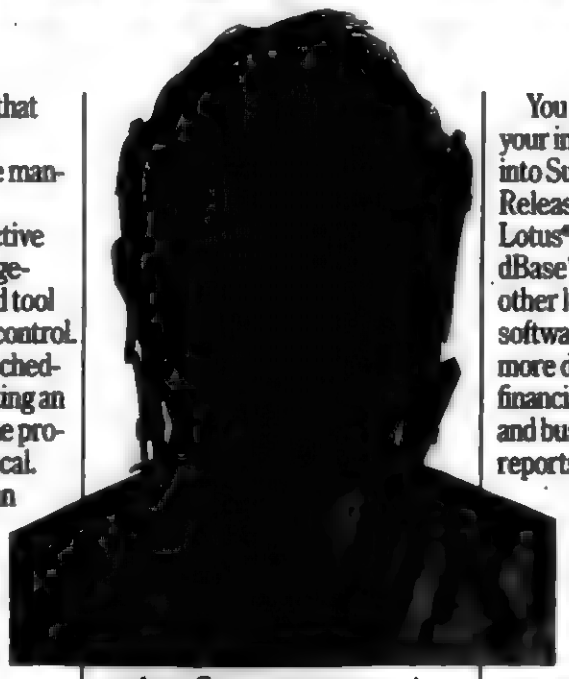
However, vendors may spend much more than that. Leyton revealed that $8.8 million had been poured into Analytica Corp.'s Reflex data analysis package. Among that spending, $3.5 million went into advertising and related costs before the product shipped. When Borland acquired Reflex, it repositioned the software at a fraction of the original price and created a bestseller.

Both vendors and resellers expect moves toward unbundled support plans. Paperback Software International, which already charges for telephone time, "does get people who want to step through, at a dollar per minute, how to plug the machine into the wall," President Ronald Ogg remarked.

More users, however, call for help with specific applications, he said. The setup doesn't pay for itself, but it does help Paperback control support costs.

"We all talk about unbundling, but it is not at all an easy thing to do and remain profitable," Torresi noted. While IBM made that move, "it took seven years to unbundle successfully," he added.

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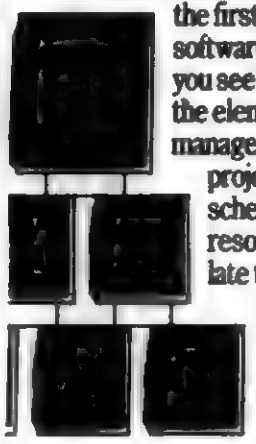
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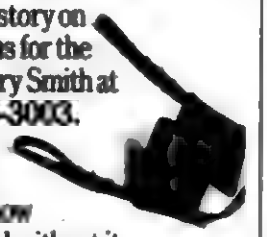
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SOFTWARE & SERVICES

SOFTLINE
Les Gilliam

DP, users must lay down arms

Reflecting back over the past 30 years in data processing, many of us have had the opportunity to witness marvelous advances in hardware and software technology. But do you know what has not changed in all that time in most companies? It is the opposing forces of users against DP.

Why must the DP organization and its users be adversaries? Why is there not a reasonable level of trust and cooperation? Why must so much energy and time be spent in quarreling about what the user wanted vs. what DP provided?

Are we not making any progress in our industry on this vital issue? I suggest a review of seven areas.

Policies. Has the management of your company determined the specific authority and responsibilities of the computer organization? Has this been communicated to all users? Are the users and DP playing by the same rules?

Lest you think this is not an important factor, just consider how many users are buying their own personal computers or other low-cost desktop units with plans to develop their own systems at a lower cost and on a more timely basis.

Will they someday want to connect their incompatible micros to the corporate network? And will management one day wonder if anyone is leading the company toward the maximum benefit

See DP page 48

Gilliam is an independent computer and management consultant based in Ponca City, Okla. He is a member of the Independent Computer Consultants Association and has been in data processing for 30 years.

Cincom woos DEC users

President Yablonski says 'IBM-only' no solution

By Charles Babcock

Cincom Systems, Inc. of Cincinnati is trying to regain a leadership position in the sale of data base management systems as it replaces its aging Total product with a relational data base management system, Supra. At the same time, Cincom is trying to expand its share of such application markets as accounts receivable and manufacturing software.


Yablonski

Cincom is also, surprisingly, one of the few large vendors to show significant revenue growth in sales to Digital Equipment Corp. customer sites. Cincom sales to DEC customers in 1986 are projected to reach 20% to 25% of revenue, which totaled $90 million last year. In 1985, Cincom was almost exclusively dependent on sales to IBM sites, which accounted for 95% of its revenue that year.

In a recent interview, Dennis Yablonski, president and chief executive officer of Cincom, spoke about the DEC market and general trends in the industry.

CW: I hear you are rapidly expanding your sales to DEC customers. How is that?

YABLONSKI: We have won some business where Cullinet Software, Inc., Software AG of North America, Inc. and McCormack & Dodge Corp. just couldn't compete because they came in and offered an IBM-only solution. The customer says, "That's wonderful, but what we want to do is put our master production scheduler on the IBM mainframe because it's a big application, and we want to put shop-floor control and purchasing out in the plant on a DEC."

The customer is telling them, "Your solution is to centralize everything on a big IBM mainframe with remote job entry, and that doesn't fit with what we're doing. We want to put computing and data and files out there locally. So we want DEC, and we want a compatible software strategy." We're the only major player offering that now. . . .

See CINCOM page 47

Speedier Ideal captures users

By Charles Babcock

PRINCETON, N.J. — Applied Data Research, Inc. (ADR) has incorporated sizable performance gains in Release 1.3 of Ideal, unveiled last week, according to early users of the fourth-generation application development system.

"We did a recompile of all our applications under 1.3. We are finding a tremendous increase in on-line response time," said Les McNelly, senior systems programmer at L. L. Bean, Inc., the Freeport, Maine, outdoor clothing supplier.

L. L. Bean used a system monitor to compare the response times of Release 1.3 and Release 1.2 and found that 1.3 aver-

See SPEEDIER page 46

TASC hurls Fastbol at maintenance time, automates analysis

By Eddy Goldberg

READING, Mass. — The Analytic Sciences Corp. (TASC) is today releasing Fastbol, an on-line, real-time interactive Cobol tool the company claims can halve the time needed for analysis by maintenance programmers.

Fastbol fits into any MVS/TSO or VM/CMS environment and uses standard IBM systems software. It integrates two maintenance steps: analysis and change. By working closely with IBM program editors, it allows programmers to perform both analysis and editing while remaining with-

See TASC page 48

INSIDE

SPSS, Inc. upgrades its SPSS-X package for DEC systems/46

NEW THIS WEEK

- D&B Computing Services offers DBC/1012 interface for Nomad2
- Computer Associates upgrades CA-Top Secret

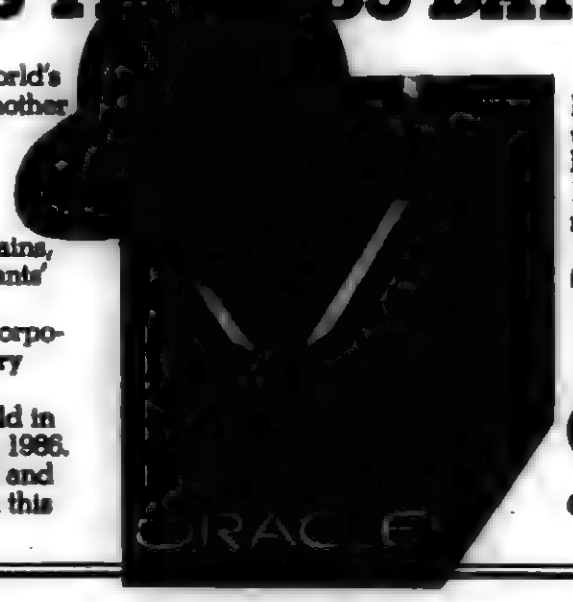
For more on these and other new products, see pp. 121-154.

INSTANT ANALYSIS

"The theoretical basis on which relational systems are founded is the relational model. By contrast, the basis on which much criticism of those systems is founded might more accurately be characterized as the relational muddle."

— C. J. Date at the Informix IUG Cincom users group in Orlando, Fla.

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Speedier Ideal captures users

From page 45

aged a 65% improvement over the previous version. What had been a 2.4-sec. response time dropped to 0.67 sec. in one instance and from 3.07 sec. to 0.97 sec. in another, McNelly said.

ADR claims CPU time for on-line transaction processing should decrease 35% under the new release.

"Our systems management people have noticed quite a difference in the stats coming out under CICS," said Michael C. Nekechuk, data administrator for the Canadian Broadcasting Co. in Ottawa. Nekechuk said that the statistics indicated faster CPU times but that they had not been analyzed yet for an average.

ADR has sold 715 copies of the application development system since it was first issued in September 1983. The enhancements are particularly significant in a fourth-generation language that has been sold as a heavy-duty application development system for the CICS environment rather than as an end-user tool.

Some customers, however, said ADR was only slowly improving its Ideal documentation, which was "everybody's complaint with Release 1.2," said George Halkias, data base administrator at J. T. Baker Chemical Co. in Phillipsburg, N.J.

Joseph W. Farrelly, vice-president for research and development at ADR, said most of the performance gains came as a result of "shortening the instruction path lengths to perform the same function."

Among the other gains cited by ADR were the following:

- A 30% reduction in average on-line transaction storage, achieved by trimming the number of program blocks that need to be stored per function.
- A 35% reduction in the requirement for temporary storage of I/Os between a mainframe and terminal, achieved by reducing the instruction set required.
- A 50% reduction in CPU time for batch processing Ideal applications, achieved through improved communications between Ideal and ADR's Datacom/DB data base management system. When the application indicates a sequential read of the data base is required, Datacom/DB can execute the read sequentially rather than take repeated "get record" instructions. This speeds up batch processing the most, Farrelly said.

Because of the batch processing improvement, Farrelly said Ideal can be used "for a lot larger set of programs" than it could before, including programs previously done in Cobol. He stopped short of using ADR's advertised claim that Ideal was "a functional replacement for Cobol."

"Where you are considering writing an extremely large batch program, give us a call, and we can advise you on whether Ideal is suitable for it," he said.

L. L. Bean's McNelly said his firm measured the amount of code being pulled into main memory to execute an Ideal application and found it had been reduced from 122K bytes to 74K bytes, a 39% reduction.

Halkias of J. T. Baker Chemical, another early user, said the amount of Ideal code that was "re-entrant" or shareable among multiple users had also increased.

"Before Release 1.3, a program might be 5,000 bytes of shareable code and 15,000 nonshareable. Now we notice 15,000 bytes shareable and 5,000 nonshareable," he said. The larger amount of re-entrant code reduces the amount of mainframe memory that has to be devoted to any one application, he said.

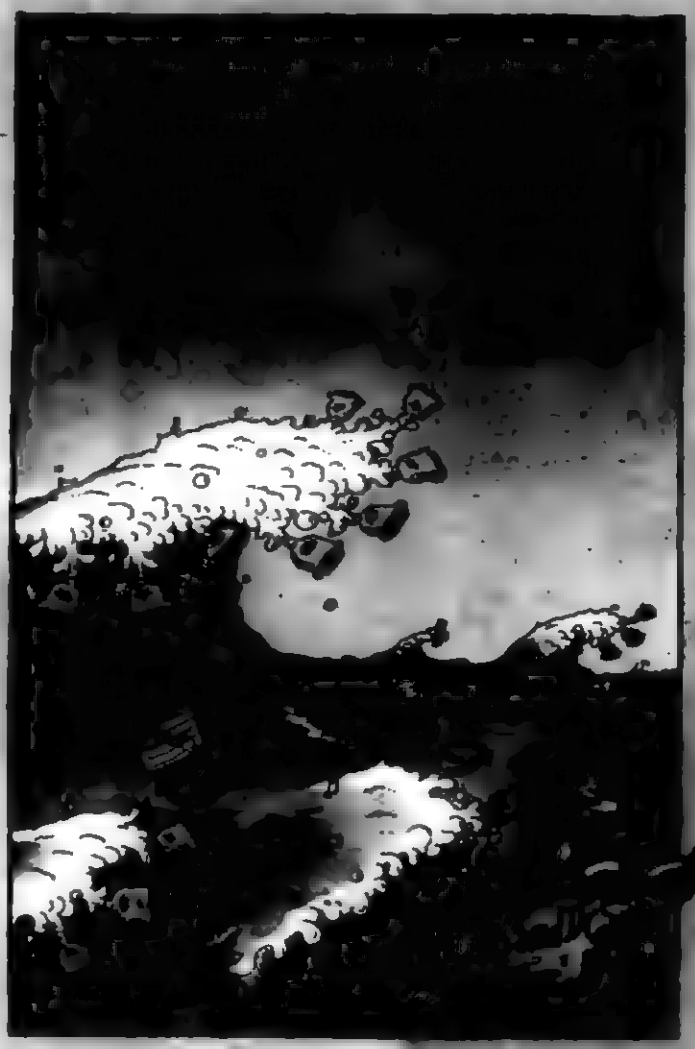
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SPSS enhances VAX/VMS data management tool

CHICAGO — SPSS, Inc. recently announced an upgraded version of its data management and analysis software for Digital Equipment Corp. systems running under VAX/VMS.

Release 2.2 of SPSS-X, scheduled for availability in mid-June, includes several new procedures and command files that allow it to be used for system management. Release 2.1 had been geared more toward end users and data management.

The added procedures provide managers with access to such files as disk usage, accounting and the error log. These files can then be analyzed for chargeback purposes. The software provides examples of how to manage and analyze the data.

Managers can then produce such reports as "CPU by User Group by Time of Day" and "Disk I/O Operations and Queue Depth." The software has a Tables option, allowing for report generation in a table format. SPSS said the software can also be used with its SPSS Graphics package, which can produce printed reports with diagrams and charts.

Secondly, an interface to DEC's Datatrieve, a data management language used with DEC's data base management software, has been added to Release 2.2 of SPSS-X. Users can access Datatrieve data while using SPSS-X by specifying particular data bases.

Users of Release 2.1 can upgrade to SPSS-X 2.2 for free, the company said. A first-year license for new users is $6,500, with a $5,000 annual renewal fee.

— Rosemary Hamilton

Cincom woos DEC users

From page 45

CW: Your Mantis product is serving as an interface between the two, isn't it?
YABLONSKI: Yes. Mantis can run on either DEC or IBM hardware, and a Mantis application for one will run under the version of Mantis that serves the other.

CW: Isn't a DEC-IBM strategy particularly apropos of manufacturing?
YABLONSKI: It's especially true in manufacturing. The current wave in manufacturing automation is you can't put in a manufacturing system unless it integrates with a financial system. Purchasing has to integrate with account payables. Everything you do in order management has to tie in to accounts receivable. All that has to tie in to general ledger. So, you can't just buy a manufacturing system; you have to buy manufacturing and financial software and make sure it all fits together.

CW: What was Cincom's revenue last year?
YABLONSKI: In the low $90 millions.

CW: How much of an increase was that?
YABLONSKI: It was up about 8%. For us it was kind of shocking because we were used to 25% to 30% growth.

CW: When did you decide there was going to be a slowdown?
YABLONSKI: We recognized about 18 months ago that the market was going to level. The 30% growth that everybody was experiencing was going to be impossible for the $100 million software companies to maintain. We started to scale back our forecasts on revenue and expenses at the same time. Last year our expense growth was 5%; this year it's been about 3%.

This has been absolute culture shock for us. We've dragged people kicking and screaming through this. All of our guys are growth-oriented managers. We had to say, "Okay, you're now going to be looked at for how you spend money, and everything you do is going to be evaluated as to its return, and all those pet projects that you had going on that aren't delivering are now gone." We did it well before anyone else did and we're through it.

CW: How did you spot a slowdown that others missed?
YABLONSKI: Our forecasts were that the slowdown was coming, that it was imminent, and we did that partly intuitively but partly quantitatively. I can look at a pipeline and tell you what business will look like six months down the road.

CW: What pipeline were you looking at?
YABLONSKI: The forecasts made by our field sales representatives. You have to factor in that some sales reps give you great news. Some give you conservative news, so they can be heroes. But if you have a big enough sales organization and you factor these things in, you can get a reasonably accurate picture of how things look down the road.

CW: I still don't understand how you saw it when others, even IBM, didn't.
YABLONSKI: I think part of the reason is that we're private, and the psyche of a private company is conservative. We're not worried about pleasing a board of directors.

CW: What do you think is the appeal of your new data base management system, Supra?
YABLONSKI: One of the benefits of Supra is that you are not tied to any one physical access method. You can have one file be indexed, another file be chained, a third file be clustered, and fourth file could be randomized. There's eight or nine different choices that a Supra user has. You could have an application that is indexed because it has a lot of inquiries. Or another application is chained because it's doing a different kind of processing.



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DP, users must lay down arms

From page 45

of automation?

Or is DP still in its ivory tower, too stubborn to come down and learn the business and become familiar with the users' needs?

Methodology. Suppose a company wanted to build an office building. The firm was not sure how much money it could afford to spend on the building, but it knew it wanted the project quick and cheap. It wanted the building to meet its needs for many years, but no, the company didn't have time to do a needs-projection study.

In fact, the firm's prior experience with architects had really been a lot of trouble, with all those meetings and endless detail questions. "We've got the land. Couldn't we just hire a contractor to start, and we'll sort of tell him what we want as we go along?"

Does that sound insane? It happens every day in DP shops all around the world. When will our industry develop standard practices?

Education. How do you tell management, and specifically the users, that feasibility studies, a formal statement of needs, documented design of the system, official approval of the project, commitment of people and funds, detailed task lists and schedules are all required before a single program is written?

How do you convince them that all this preliminary architectural work will result in a system that meets their needs?

Conversely, are the DP people able to recognize when the user needs a metal building or only a mobile trailer?

Planning. A well-managed DP organization will maintain a set of long-, medium- and short-range plans. Typically, the long-range plans will cover a three- to five-year period and will be valuable in projecting space needs and equipment order lead times and contracts. The users should be asked to participate in developing the business rationale on which the plan is based.

The medium-range plan is the annual work plan developed and documented as a joint effort between each user and the DP group. This document should be viewed as a type of contract between the two parties, as to the services desired by the users, the agreement by DP to provide those services, the estimated cost of the services and the approximate schedule.

The short-range plan is a monthly document that provides a summary of what was accomplished during the prior month, revisions of the annual plan as requested by the user or required by DP and a detailed schedule of what is to be accomplished in the next month. The user will receive a copy of this report, and a meeting will be held to discuss it.

Communication. Most problems between users and DP either start or are enlarged by the lack of communication. Many people don't want to tell the user bad news. But consistent, truthful sharing of pertinent information is vital for good user relations.

Commitment. When the annual work plans, along with budgets and staff levels, are approved by management, you are making a commitment to the various users to carry out the plans as jointly prepared.

However, the user who has a reason to doubt that the DP people are doing their very best will never be fully satisfied. Commitment must be proved.

Competence. Even the best policies, methodology, education, planning and communication will not overcome a lack of competence. Be sure you have the skilled people and resources to do the job right before making the commitment.

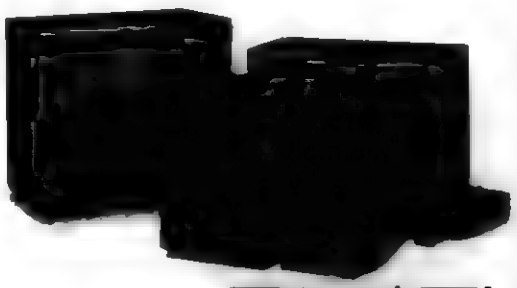
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TASC hurls its Fastbol

From page 45

in a program. Analysis is done directly from a program's source code.

Recent studies estimate that maintenance consumes from 50% to 75% of a company's programmer resources. Half of that maintenance time is spent analyzing and understanding programs, according to Barry Tudor, director of TASC's Commercial Information Systems Division. By automating the analysis phase, Fastbol allows Cobol maintenance programmers to increase their productivity, he claimed.

"Being on-line allows programmers to understand and make changes at the same time. Being in the editor allows changes to be made as you go," Tudor explained.

One beta user who reviewed the product found Fastbol's on-line interactive capability useful. "It allows you to migrate through an application quite comfortably. At a glance, you can determine what all the entity relationships are for a particular field and how one field affects all others," he said. Fastbol's cross-referencing capabilities also were very good, he added.

Fastbol features a set of five commands. The Logic Flow function helps trace the path of logic, while two others, How-Set and How-Used, show variable relationships.

The other two tools facilitate documentation. Comments provides access to existing notations left within the program, while History allows programmers to keep a log of maintenance activities for later use.

Fastbol is available for $25,000 per site, defined as three CPUs.

Product Spotlight

Edited by Barbara Wierzbicki

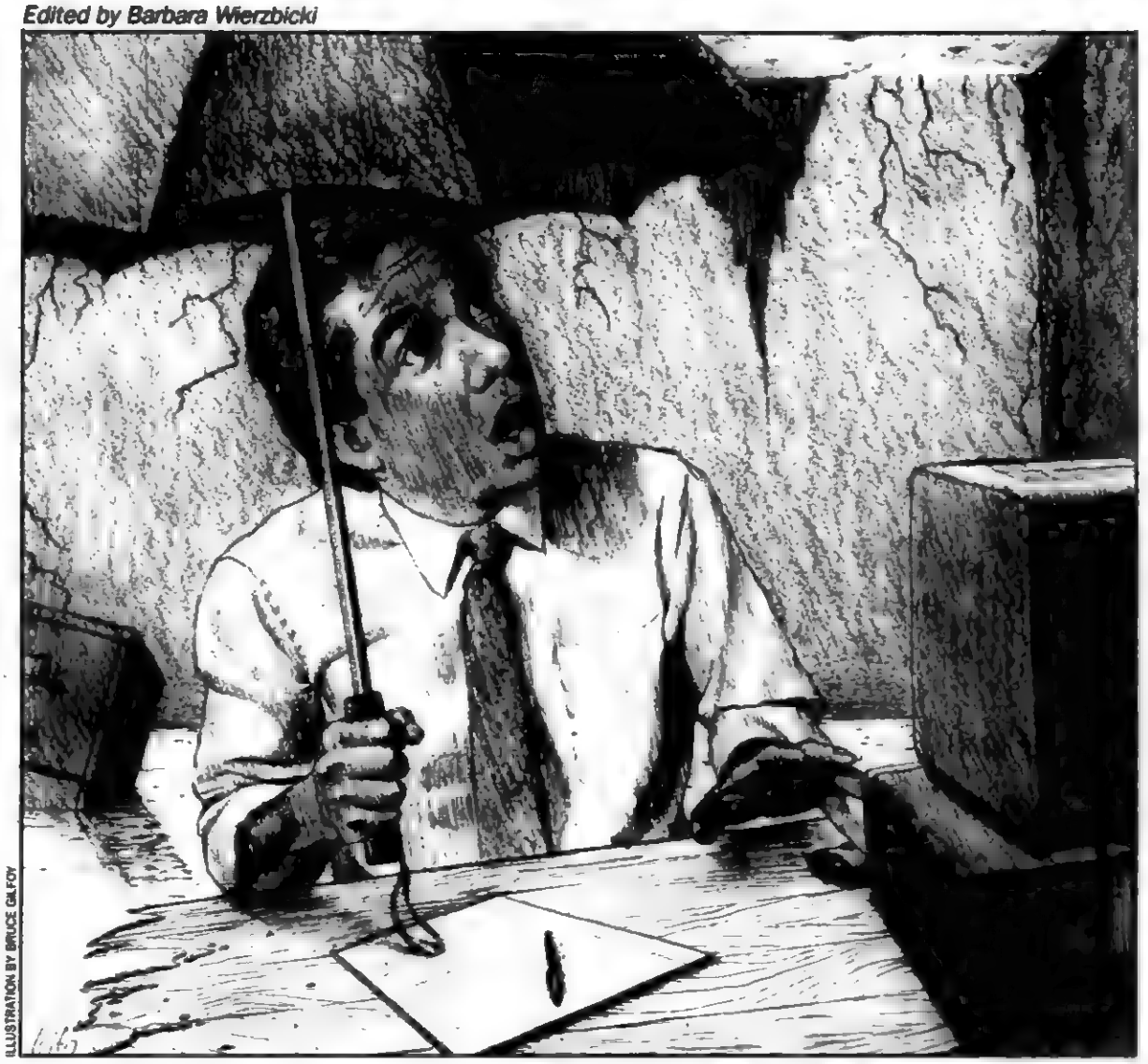


ILLUSTRATION BY BRUCE GILFOY

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Disaster recovery

Making plans that could save your company

By JOE PEDIGO

If you want to see a data processing manager shudder, assign him the task of implementing a disaster recovery plan. Devising a master schedule of procedures, inventories and personnel to prepare for the possible move to a disaster recovery site guarantees to make any manager's head spin.

And should senior management fail to endorse planning — with user participation — as a priority, attempts to provide organization and definition to planning are further complicated. Granted, many DP managers are experienced with the business functions serviced and probably can prioritize application recovery with acceptable accuracy. However, many managers do not want this responsibility, reasoning that users should have the primary say about the time frames and priority with which computer services are recovered.

Not only does the user need to identify critical applications, he must review procedures necessary to utilize the central processing function that could be relocated to an alternate site. Without user planning, the relocated central processing function may be operational but of little practical value to the actual users.

Confusion and obscure objectives will kill a disaster recovery plan before it ever leaves the drawing board. We talk about disasters in the data center, hence the need for a disaster plan. But what qualifies as a disaster? Ask 10 members of your recovery organization, and you can expect 10 different answers.

We need to define a disaster so that clear and decisive communication about the interrupting event can be conveyed throughout the company. Not only must DP be informed, the user community and senior management also need to know the specific meaning of an interruption and the predefined actions that will result. The most widely accepted definition labels a disaster as "any event that results in a decision to recover at the alternate site."

Now that a disaster has been defined, escalation plans can be established. Escalation plans are necessary because not all interrupting events are expected to qualify as a disaster. In fact, minor interruptions will be the rule, not the exception.

Typically, three escalations are adopted:

In plain English, the key is salesmanship. A manager who knows how to sell a disaster recovery plan has half the battle won at the outset.

Pedigo is vice-president of contingency planning at Total Assets Protection, Inc., a management consulting firm based in Arlington, Texas, that specializes in disaster recovery planning.

Your plan could save the company

Continued from previous page

• Minor interruptions that should negligibly affect users and computer operations.

• Intermediate interruptions that may necessitate users implementing alternate procedures until services are restored. The decision is to repair and recover at the original site.

• A major interruption that results in a decision to recover at the alternate site with full mobilization of the recovery teams.

The first escalation denotes a minor interruption.

The second and third escalations deal with a more serious interruption and the decision to go or not to go to the alternate site. This decision alone is enough to frighten even the most competent data processing manager.

Members of the executive-level management staff should also participate in deciding whether to adopt either the second or third escalation plan.

Without boundaries, the planning effort is ill defined and can easily get out of control.

To avoid this problem, the manager should develop a list of plan premises as suggested below:

• Worst-case interruption. Design the disaster recovery plan to handle a total destruction of the data center. It should also allow recovery at the worst interruption point of the daily product cycle.

• Minor interruption. The plan, although designed for the worst case, should be inherently able to support recovery for minor interruptions.

• Level of detail. The plan should provide sufficient detail to enable an experienced staff to recover computer processing. (This assumes that not all of the experienced staff will be incapacitated by the interrupting event.)

• Alternate site or sites. A worst-case interruption dictates the need to have a remote site or sites to effect recovery.

• Damage to data center only. Although user functions may be in close proximity to the data center, this plan does not assume that user functions may also be impacted by the same interrupting event. User function recovery should be addressed in separate planning efforts.

• Off-site storage. The remote, off-site storage contains the only resource with which to effect recovery.

The manager should coordinate these plan premises with the internal audit department for concurrence. Should audit concerns arise, the premises may need to be negotiated before proceeding further.

A thorough disaster recovery plan must be viewed from two perspectives. To that end, the manager should appoint both a development and implementation leader and a person who will assume ongoing maintenance duties.

The project development leader should ideally be experienced with large applications systems and a good portion of the existing applications systems, since he will work with both the user community and senior management.

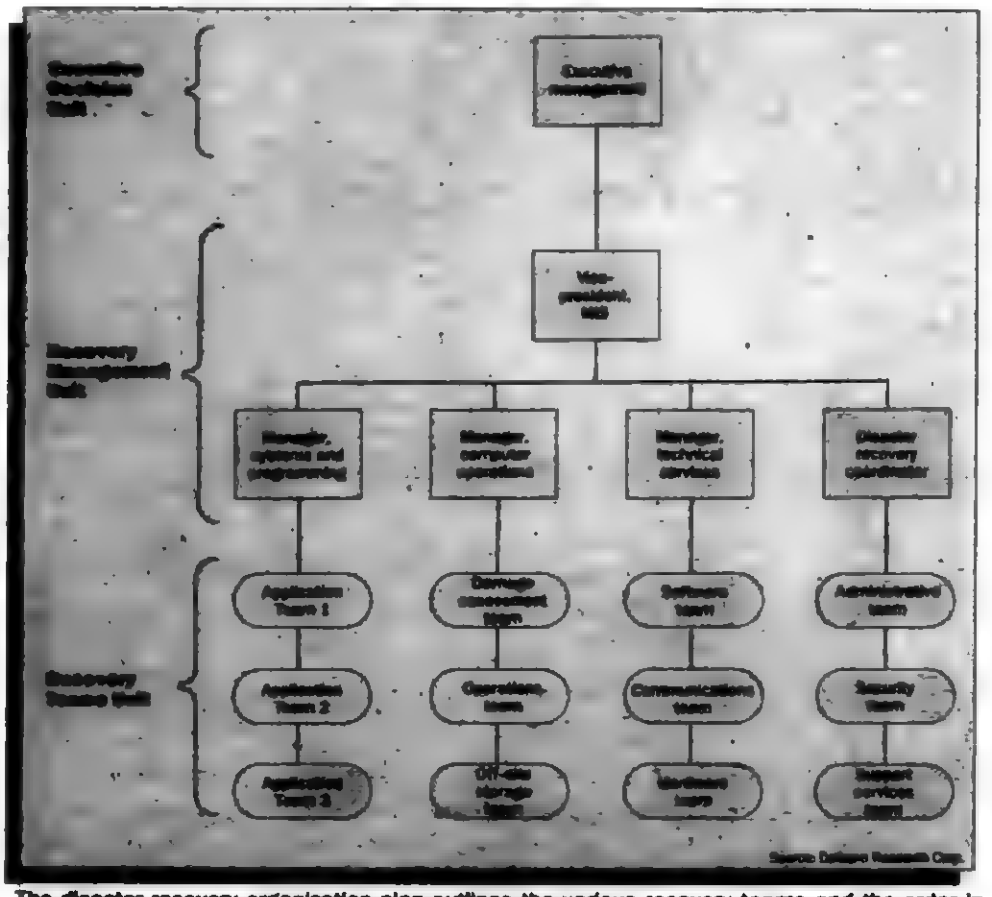
The leader must also interact with the specific skill disciplines within data processing, such as communications, operating system software, hardware, operations and applications systems, in addition to prioritizing applications systems for recovery.

To be reasonably effective, the leader should be able to devote an average of 75% of his time to the project. The maintenance person, typically a junior analyst or pro-

Continued on page 54

MITCHELL J. MAYES

DISASTER RECOVERY ORGANIZATION



The disaster recovery organization plan outlines the various recovery teams and the order in which they must be mobilized in the event of a disaster.

Holiday fire puts firm's disaster recovery plan to the test

By ALAN ALPER

It was Thanksgiving Day 1982 . . . that Norwest Corp., a Minneapolis financial services concern, tested the full scope of its disaster recovery plan.

A fire, set in an adjacent building undergoing demolition, ravaged the firm's 17-story headquarters facility. The office building was essentially empty, and there were no injuries. And despite extensive damage to its administrative facilities, the firm, which is the holding company for Norwest Bank — an institution with some $6 billion in assets — was able to return to operation by the Tuesday of the following week.

Norwest's disaster recovery plan, completed only six months before the devastating fire, was the firm's saving grace, according to John Nugent, senior consultant with Norwest's Financial Institutions Group. At a recent seminar on disaster recovery planning sponsored by the American Management Association, Nugent said, "Without it, we would have never survived."

Although Norwest lost a number of data and word processing systems, affecting its instant cash and internal controls operations, the 2-in.-thick recovery plan document expedited its return to business. The firm survived, even though its plan "was drafted on the supposition that one or two departments were out of service, not the entire organization," Nugent reveals.

Norwest began contingency planning in the late 1960s after the formation of Norwest Information Services (NIS), a wholly owned subsidiary that handles the EDP requirements of Norwest's 140 affiliated banks in a seven-state Midwest region.

Ironically, it was a 1973 fire near NIS' only data center that made disaster recovery planning a burning issue. Although the data center was untouched, the prospect of losing all of its computer data prompted NIS to establish another processing center. NIS opened its second data center in 1977, a move that not only distributed the work load but also created an alternative processing site in the event the primary center went down. In the fall of 1980, the alternative processing site was moved from its parent's headquarters to another facility, a serendipitous move considering the 1982 fire.

Unfortunately, most organizations need a near disaster to spur them into action. Many corporations have to strive hard to overcome the ingrained mentality that, "It can't happen here," Nugent says. Questions such as the cost of not operating, legal culpability and financial penalties usually provide the impetus to get upper management moving, he notes.

To that end, corporate executives must ask the hard question: What is the maximum time to belly-up if a data center goes down? "I've spoken with insurance companies who said they could operate without a data center for 30 days or longer," Nugent says. "That's hard to imagine."

In fact, a recent University of Minnesota study indicated that after a data center is down for more than four and a half days, most organizations have a hard time surviving. For financial institutions, a firm is in jeopardy of not surviving after only 38 hours, he adds.

A disaster recovery plan alone does not guarantee survival. A study conducted by Data Processing Security, Inc. states that of the companies surveyed that touted having recovery plans and that had experienced disasters, only 5% had workable plans. "That's one in 20," Nugent remarks. "That's not many."

Nugent notes that most of the plans failed because they had not been adequately updated and maintained. "Once they were completed, they were put on the bookshelf and never looked at again," he says.

Nugent concedes that it is very difficult to validate the effectiveness of a disaster recovery plan until it is put into use. The problem, he notes, is that so many firms are engaged in around-the-clock operations that there is little time to induce computer outages to test plans.

Nugent suggests that a corporation test portions of the plan to assess its overall efficacy. ■

Alper is Computerworld's Mid-Atlantic correspondent.

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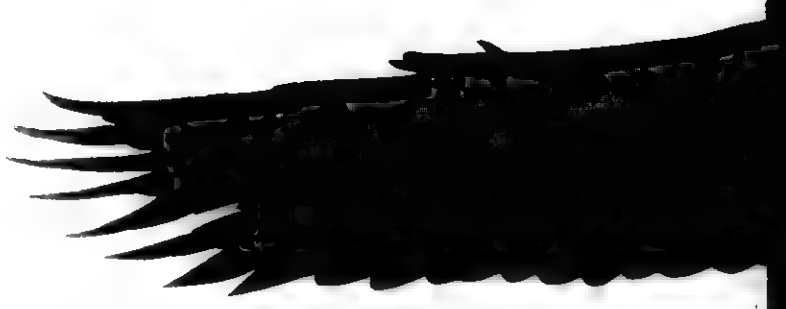
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Continued from page 50

grammer with administrative capabilities, should be assigned to work with the leader for the project duration.

The project team so far consists of 1.75 staff members. For a large, two-mainframe data center with a typical network, this team should be complemented by an additional one to two staff members in the aggregate. (The aggregate consists of staff time contributed by special shell disciplines such as communications and software.)

For the data center size mentioned above, the project generally requires an average of eight to 10 months to complete. Upon implementation of the plan, the leader hands project control over to the maintenance person, who, by this time, should be knowledgeable about the administrative requirements of the plan. .

Identifying critical applications demands interaction between the project manager and the user community, because user recovery requirements will be the justification for senior management to approve the funding for a recovery strategy. The Business Impact Analysis (BIA) methodology ranks applications systems for recovery by evaluating financial losses and operational impacts should computer services be interrupted. The ranking is the net result of recovery time frames, adjusting for dependent applications. The recovery time frame represents the critical time line from the point of the interruption up to the point an application system must have been updated to current status.

Establishing recovery time frames hinges on the ability of the project team interviewers to guide users effectively to conclusions on the longest possible time they can be without computer services. Typically, this time frame is that point beyond which financial losses and operational impacts become unacceptable to the company as a whole, as well as to individual user departments.

While conducting the BIA, the manager needs to be sensitive to the costs involved in maintaining a backup plan. He must understand one of the basic trends in planning: the shorter the time frame specified to recover the most critical application, the higher the cost to maintain a plan. Conversely, the longer the recovery time frame, the lower the cost. While this trend is not an absolute, it has proven to be a reliable guideline. Therefore, the BIA interviewers should seek the longest possible recovery time from each user knowing that maintenance costs can probably be reduced. One way to achieve longer recovery time frames is to explore alternate user procedures. Data processors are often surprised that manual procedures for many critical applications, such as payroll, can still be employed, although some are good for only short time frames.

Obtaining approval from both the user and senior management of the priority ranking of applications systems for recovery and their accompanying critical time lines represents the milestone for identifying critical applications. To prepare for approval, the manager should have the results reduced to graphics or summary form with adequate detail backup.

The graphics can include a chart listing applications systems by recovery priority with critical time lines shown on a per-day scale. Other charts can summarize the financial loss and operational impacts by application system as concluded by the user. These final documents will be the base planning criteria for the next phase of disaster recovery planning.

Developing a recovery strategy may commence once users and senior management approve the priority list for recovery with critical time lines. Most of the work effort at this stage is performed by data processing, whose primary objective is to develop a recovery strategy that best meets the needs of the organization.

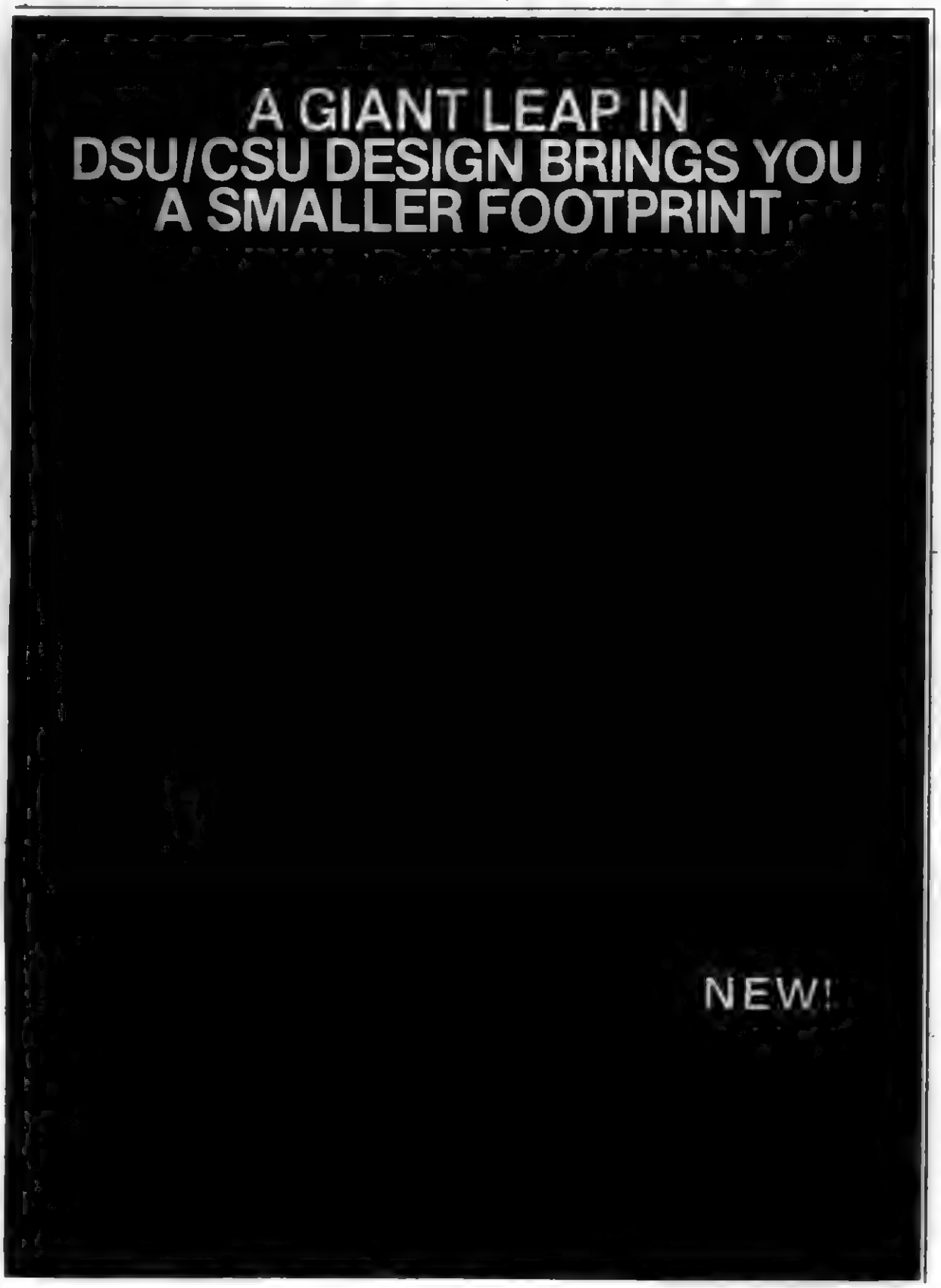
A recovery strategy is simply the process of selecting the most practical and cost-effective alternate site to go to in the event that the original center experiences a major interruption. Basically, the selection criteria for choosing an alternate site consists of the following:

- The earliest time computer processing must commence at the alternate site to meet critical time lines.
- The minimum configuration(s) required to process critical applications.
- The minimum communications requirements to satisfy critical applications processing.

The project team begins shaping a recovery strategy by developing applications recovery scripts, typically free-form narrative statements that summarize the essential information needed to recover applications systems. These scripts, used by applications systems personnel during recovery to design a reconstruct and update plan, help restore production files to current status within specified time lines using only backup stored off-site.

The applications recovery scripts should specify the saving of input documents by the user or data entry in anticipation of a major interruption, the saving of input after the interruption and the method and time frame required to reconstruct and update files. Although these scripts identify which production files are to be backed up and with what frequency, I strongly recommend conducting a verification. Actual testing generally produces 30% to 40% additional files that demand inclusion in the backup rotation.

As part of the ongoing contingen-



cy program, the systems analysts need to reconcile any rotation schedules with computer operations. The analysts should verify that all backup files produced are accurate and can be used for recovery purposes. Applications recovery scripts should become part of the disaster recovery plan and should always reflect the actual backup rotation scheme.

Hardware, software and applications specialists should be involved in developing the time frames for operations recovery. The hardware and operating system planners must determine the minimum computer configuration that can be utilized for recovery, as well as reasonable compatibility of software. Some plans today specify configurations at least equal to or greater than the existing equipment because of data base architecture or because of projected overload activity during the reconstruct and update processes. Planning may also specify what configuration is needed during the initial stages of recovery and what

> ***Data processors are often surprised that manual procedures for many critical applications, such as payroll, can still be employed, although some are good for only short time frames.***

equipment upgrade is needed for subsequent recovery stages.

Using the results of the applications recovery scripts and other data, the planners develop base recovery time frames. Base recovery consists of loading operating system and subsystems onto an alternate computer, loading communications software systems and checking backup circuits and loading the latest versions of backup production files onto the alternate computer and verifying the accuracy of files.

The team usually calculates the time frames required for the base recovery events based on the existing computer system to develop a standard. Variations on the standard can be calculated based on minimum equipment requirements and on other configurations that may exist in an alternate site.

The third specific time frame involved in resumption of computer processing at an alternate site concerns operations recovery. Operations recovery consists of a reconstruction of production files from the latest off-site versions up to the point of the interruption and an update of production files from the point of interruption through the current day of business activity.

Obviously, base recovery and operations recovery time frames are subsets of the critical time line. Considering the highest priority application(s), the required base and recovery time frames must be satisfied to meet the critical time line for the higher priority application(s). Reconciling these time frames also provides the planners with the earliest time that base recovery must commence at the alternate site.

At this point, the project team can list the criteria for selecting the alternate site. The list should contain the following parameters:

- The time frame from the interruption point to the point that recovery processing must commence.
- The minimum computer configuration required to process critical applications.
- The minimum communications devices and backup circuits required for critical applications.
- The minimum space requirements for essential staff members.
- The minimum support utilities required for the minimum computer configuration as well as for any planned upgrades in subsequent stages.

With these criteria, the project team can poll alternatives available from the various commercial backup centers (see story page 56) and can select two or three options to present to the senior

Continued on page 60

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Contingency options abound with off-site backup facilities

By MARY AINSWORTH

"No!" responded a contingency planning manager for a major corporation when asked if the company would build its own disaster recovery site. "Not only is it expensive," he continued, "but someone would decide to use the facility before a disaster, and soon it would be an *additional* instead of a *backup* facility. After looking at all the alternatives, we contracted with a hot-site vendor."

What options exist if your company decides it also wants to look outside for a disaster recovery location?

Choices vary depending on your specific needs — options include a reciprocal agreement to use another company's computer facilities, a cold site, a hot site or mobile hot and cold sites. Since each disaster recovery option has its own advantages and disadvantages, managers should select the option best suited for their specific company's operations.

A reciprocal agreement, made between your company and another, allows each to back up the other in the event of an emergency. Although a cost-effective alternative, the reciprocal agreement offers no guarantee that the other company will not be facing an emergency that it considers as critical as yours when disaster arises. Needless to say, the company with the working computer facility will probably consider its job of higher priority than yours. However, some companies find this the only alternative if they have computer systems from vendors that are not in the mainstream of the market.

A cold site (or shell site) provides companies with an emergency facility ready to house a computer system in the event of a disaster. It is built with adequate air-conditioning and raised flooring, both necessary to support computer systems. However, successful recovery operations hinge on your having well-made plans to move in the necessary computer system and supplies to the cold site in a timely fashion. Simulated tests of this recovery aspect should be conducted to ensure that all will function properly if a real disaster strikes. Plans should also be made for the needs of the DP people staffing the site such as desks, telephones, running water and rest rooms. Vendors are available that offer subscriber services to their cold-site facilities.

A hot site provides both the site and the needed backup computer system — generally available for use within 24 hours after notification. However, hot sites are the most expensive alternative because not only the site but a fully configured computer system are included. Vendors are available that offer subscriber services to hot-site facilities.

A mobile hot or cold site, beyond providing backup similar to standard hot or cold facilities, offers the flexibility to move the site to a location your company specifies. This is an emerging market with only a few vendors, such as Provident Recovery Systems of Cary, N.C.

Since the standard hot site is the most expensive option, a list of criteria for its selection follows:

- Type of host computers supported. The hot site must provide the same computers (or CPU-compatible systems) that are installed at your

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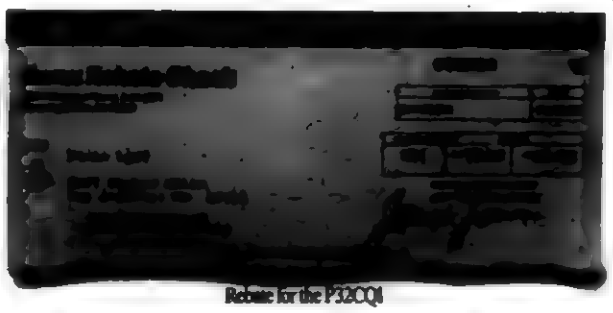
Ainsworth is senior associate editor for "Datapro Reports on Information Security," published by Datapro Research Corp. of Delran, N.J.

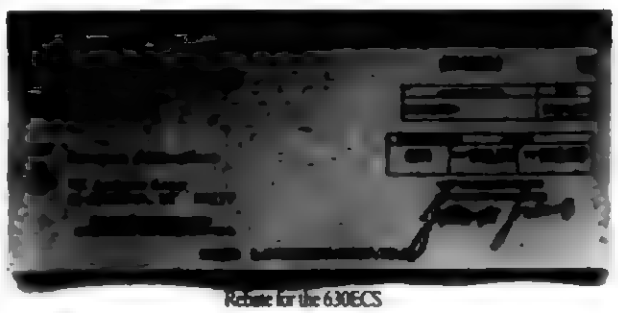
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main data center.

• Location of the hot site. Many believe that a hot site should not be located in the exact geographic area of the main computer center it will replace, because if a natural disaster such as an earthquake or a flood should occur, both sites could be damaged. However, location at too great a distance from the main facility means that the staff would have to be transported to and housed at the remote site. Disaster plans should then cover personnel costs for transportation, lodging and food. (Even if these expenses are acceptable, many employees will not leave their families in the event of a disaster.) The location of a vendor's back-up site is another consideration. If you were unable to use your primary contracted hot site, what alternative location would be available?

> ***Prioritize the jobs that your company has to run in the event of an emergency. Only critical high-priority jobs should be scheduled for the hot site.***

• Number of communications lines. If your company's recovery operations depend on receiving data from remote sites, check to see what communications lines are available at the hot site. If additional lines are needed, plan to install them as soon as the site is selected.

• Amount of test time. Test time at the hot site will allow you to ensure the effectiveness of your recovery plans. Costs for testing should be detailed in the contract; some vendors require that subscribers test their procedures as part of the contract.

• Current and maximum number of subscribers. This number reflects other companies that also contract to use a site's backup facilities. Some vendors limit the number of subscribers. It is not only important to know how many others are subscribers, you should also learn what procedures exist if more than one subscriber needs to use the site at the same time.

• Site security. Whether a hot site provides a 24-hour on-site security staff is an important consideration for some subscribers. Sites may also have physical security installed, such as closed-circuit TV and/or card access systems.

• Data storage. Some sites have storage capacity sufficient to house subscribers' magnetic tapes, microfiche and documentation. Extra charges may be made for this service.

• Plan storage. Most vendors allow subscribers to store their disaster recovery plans at the hot-site location.

• Technical support. Systems programmers and other technical personnel are available at some hot sites to help subscribers implement their backup procedures.

• Monetary considerations and terms. These factors are critical to your decision and include subscription rates, initiation fee, per diem/usage charge and length of contract. The subscription rate is generally a monthly charge paid by a subscriber to the service. The initiation fee (also known as the declaration fee) is the amount charged to the subscriber at the time of request (notification) to use the emergency services. The per diem/usage charge is the cost per day for actual emergency use of the site and may include the initiation fee. The length of the contract describes the amount of time that the subscription will be in effect.

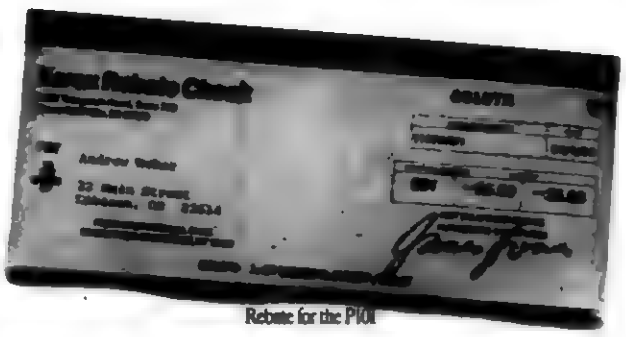
Not only should you consider these criteria in determining which vendor best meets your hot-site needs, you should also prioritize the jobs that your company has to run in the event of an emergency. Only critical high-priority jobs should be scheduled for the hot site, and only the configuration needed to run these jobs should be contracted for with the vendor. ■

XEROX

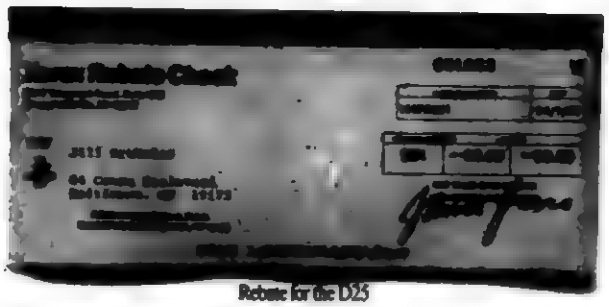
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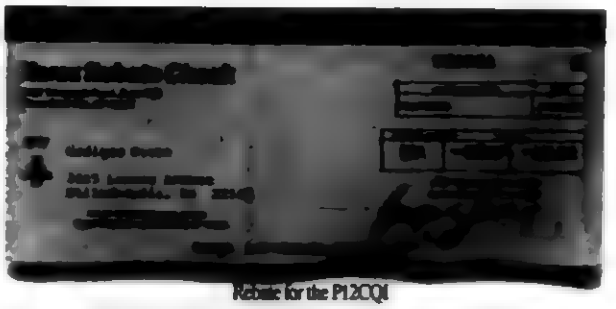
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Interview

Preparing for catastrophe: 'You can't dodge the bullet'

Not protecting the reams of information kept on magnetic tapes and disks from natural or human-related disasters places corporations in a precarious state. Security industry research shows that most companies could not survive more than one week without their computer systems. Yet 25% of the Fortune 1,000 companies have not implemented disaster recovery plans and 25% to 50% of the remainder have inadequate plans in place. Raymond Hipp, president of Comdisco Disaster Recovery Services, Inc., spoke with Computerworld Associate Editor Barbara Wierzbicki about disaster recovery planning and implementation.

What is the biggest barrier to DP acceptance of a recovery plan?

The problem with disaster recovery is that it's not something anybody wants to do. The only time you're going to use a disaster recovery plan or get your return on that investment is if some catastrophic event or serious contingency outage takes place. It's something that gets tremendously in the way of the day-to-day production and development environment that most DP executives were hired to manage. It has a rather poor perception on the part of senior management and data processing management as something that you put off until the very end — until the auditor or the outside regulatory body comes back again or until the board of directors brings enough focus to the question of "What if?" and the risks are acutely defined. Once that takes place, you can't dodge the bullet any longer.



Comdisco's Raymond Hipp

> *"On a minimum of two times per year, organizations should assemble the team, bring it into the recovery center and exercise the plan."*

What, then, is the argument that a DP or MIS director should make to top-level management to justify spending on disaster recovery?

The argument today is not voiced as it was four or five years ago. Back then, most of the pressure came from the bottom up; that is, data processing management had already focused its attentions and was trying to make senior management aware of the need for disaster recovery planning. Today the argument seems to be coming from both parties. There's an awareness and a willingness to deal with the problem as there never has been before, but the project has to be appropriately defined, staffed and equipped in order to get the proper job done.

Have federal laws prompted businesses to implement contingency plans?

Well, I think that was probably the main reason a couple of years ago, particularly in the regulated industries like banking, insurance and public utilities. But most of that business has already come forward and has done something about the problem. I don't think it's the government per se or even outside auditors as much as it used to be. It's more a matter of pragmatism. And that is an understanding and an awareness of the catastrophic events that the loss of the DP utility would bring to a corporation. If you put a pencil to that, in most corporations, that's a big number.

How often should a disaster recovery plan be tested full scale?

On a minimum of two times per year, organizations should assemble the contingency team, bring it into the recovery center and exercise the plan. You do that for two or three or four tests. After that you do a pull-the-plug test, where — with as few people knowing other than senior management — you walk into the data center one morning and say, "You are no longer in business; you have just had a contingency." That's when you're going to find out how prepared you are.

Can you describe how disaster recovery services are priced by taking a typical large company's annual expenditures and breaking them down by service levels?

One percent of the data processing budget is a good barometer to use as a planning tool to discern the [illegible] ery. That includes the contingency planning, the permanent staff, the travel required to perform testing at the recovery center, the subscription to hot-site recovery services, the whole ball of wax. When I first heard this several years ago, I thought it was too simple to throw a number out like that, but frankly that's about as good a number as I've been able to come up with.

What options are available for smaller companies that can't afford hot or cold sites?

One advantage that minicomputers and microcomputers have from a processor and peripherals standpoint is that they don't require as much of the environmentally conditioned facilities as do the larger systems. In other words, they don't require water chilling or motor generators, they require less air-conditioning and so on. They have much smaller networks, so it is easier to restore those organizations on a real-time basis. The first thing that smaller shops have certainly got to be doing is focusing on having their data backed up and off-site.

How effective are alternatives such as warm backup and mutual aid agreements?

In my mind, there is no benefit to the reciprocal agreement of mutual aid. I don't really see that conversation taking place very often in the U.S., because if you ever put that into practice, in essence you would have two disasters rather than one. It's not just the auditors that go through that — anybody with a nickel's worth of experience understands that problem. . . . The mutual aid reciprocal agreement is definitely on its last legs. The warm site, [illegible] communications capabilities, has some application for the mainframe center. As long as you've got the communications network — and if you don't have a lot of special devices on your mini — you could probably get that environment back up in a week or so.

When should a company build its own disaster recovery center?

That's strictly economics. There are a number of large companies that have built their own redundant backup centers nationwide but here's what happens: First, it is virtually impossible to protect that environment from development work. Any time you leave spare capacity in an organization, somebody's going to figure out a way to get at it. When you eventually run out of production capabilities, the backup center turns into a total production environment — and you've lost it. Then you've got to go build another backup center and then another.

The second thing that happens is when a company starts examining the ongoing costs of keeping that capability in sync with all of its own growth plans, the cost gets totally out of line as compared to subscribing to a service.

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Continued from page 58

management staff.

Be advised: Top-level management's main concern with the bottom line will require providing hard figures on the costs involved in maintaining each of the proposed alternatives. These costs are ongoing and are to be viewed as a special type of insurance premium that provides protection against potential losses and impacts identified in the BIA.

It is at this point that the manager can expect to be challenged about the probability of an interruption. Therefore, the project team must be prepared to provide statistics on probabilities of fire, flood, storms and other disasters.

Logistical analysis to recover the data center represents the next phase of disaster recovery planning. Once senior management approves an alternate site, it is time to address the logistics of making the alternative work.

The first course of action is to design the disaster recovery organization (DRO), a predefined synchronized set of recovery actions to be executed in the event of a disaster. Surprisingly, recovery actions can be extensive but at the same time quite logical. The ideal DRO reflects the organizational structure of the data processing department. The diagram on page 50 depicts a typical DRO that may be developed for an organization. A summary of the recovery teams' functions is as follows:

Damage assessment team assesses the damage to the data center and estimates the mean time to repair or replace and resume operations. The team should present findings to the DRO manager within four to five hours of the interruption.

Security team establishes and enforces security at the damaged facility in accordance with predefined procedures and any special instructions conveyed by management.

Off-site storage team establishes control of and organizes the off-site storage facility.

Administrative team establishes the command post for the DRO and provides administrative and clerical support to the DRO and recovery teams, including extraordinary expenses and personnel and family administration.

Software team installs and examines operating system software, subsystems and production files on the backup computer system to assist in the reconstruct and update process.

Communications team switches data and voice communications facilities from the original site to the alternate, installs communications software modules and assists in examining circuits and devices.

Application team analyzes and determines the start point from which reconstruct and update processing must commence. This team takes the lead in the design and publication of the reconstruct and update plan and coordinates all production file update activity.

Hardware team acquires and installs any equipment designated for emergency order or relocation in the alternate site.

Operations team establishes operational facilities at the alternate site that will include accessories, scratch tapes, forms, stock paper and shift schedules. This team performs the reconstruct and update processes at the alternate site.

Support services team secures housing and office space for personnel and provides logistical support, including transportation of material, supplies, equipment and personnel.

In a worst-case interruption, items at the original center are not usable for recovery. Therefore, items stored off-site must be sufficient in number to bring recovery of DP services to an acceptable level. In addition to identifying the many different items that will be required, the manager must ensure that they are maintained in current and complete form. I suggest assigning maintenance responsibility to the appropriate team and monitoring the program with periodic audits.

Last, management should support contingency procedures in order to have a viable ongoing plan. Without management support, the plan will be outdated and unusable within a year. Why spend money to develop a plan if there is no intent to update it?

Once the project team has outlined the logistical plans to effect recovery, they, together with the recovery teams, should conduct a structural walk-through with management for concurrence and approval.

Documenting the plan can then occur. You may develop your own plan or select one of several formal plan formats available in the marketplace today. Whichever option is exercised, the manager's overriding concern must be the ongoing maintenance of the plan and the possibility that the plan may actually be used. Simplicity of content and good organization should be its objectives.

A sample plan outline that can be used as a model for any organization is summarized below.

- Introduction: Includes objectives, scope, authorization and the premises upon which the plan has been developed.
- Recovery time frames: Includes documentation and charts depicting base recovery and operations recovery time frames and critical time lines, as well as indicating time-related events necessary to achieve recovery processing at the alternate site.
- Recovery strategy: Includes a complete overview of the entire plan to reflect all the synchronized actions and events that must take place to effect recovery. Also addresses command posts, extraordinary ex-

Chances are you don't currently audit your operating system—even though it's ultimately in control of information used to manage your organization. And for good reason.

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For more information, contact Shawn McLaren today, at 1333 Lawrence Expressway, Santa Clara, CA 95051-3595; (415) 941-4558; Telex 357437.

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pense, insurance claims, personnel administration and so on.

• Qualifying a disaster: Includes an explanation of escalation plans, the decision processes in selecting an escalation plan and formulating a plan announcement.

• Applications systems subplan: Includes the plans for recovering applications systems (contains the applications recovery scripts) and maintenance responsibilities.

• Hardware/software subplan: Includes the plans for recovering the hardware and operating system software elements of the data center and specifies maintenance responsibility of respective off-site items.

• Communications subplan: Includes the plans for recovering the communications element of data center services and specifies maintenance responsibilities.

• Workstation subplan: Includes the plans for recovering data entry and other key workstations in operations and specifies maintenance responsibilities.

• Off-site inventory subplan: Includes the plans and procedures for cycling and storage of items off-site and actions during recovery mode.

• Disaster recovery plans: Includes a definition of the organization, objectives and actions and responsibilities of management and recovery teams.

• Emergency notification plan: Includes a plan to notify the disaster recovery organization and other key offices and the sequence of notification.

• Plan administration: Includes ongoing procedures to maintain the plan as well as to schedule and conduct tests of the plan.

Before a formal plan is adopted, obtain concurrence from the key members of the disaster recovery organization to ensure that it is logistically sound and complete with necessary actions. Comments or suggested changes are reviewed in joint session to conclude a final version of the documented plan.

Testing the plan is typically conducted after there is reasonable assurance that all elements of the recovery strategy have been implemented, such as additional equipment, backup communications and file rotation schedules.

Organizing a test scenario that utilizes only off-site files and documents is not that difficult, given a little time and a staff of good planners. What is difficult to determine is how best to utilize a test to ensure wide acceptance and support of the plan in years to come. Visions of DP personnel overloaded with assignments — who may have indicated interest in the plan but who have not demonstrated that interest — come to mind. Sure, a test can be conducted, but if no forethought is applied, hardly anyone in the organization can benefit from the test. It can result in nothing more than having two or three people proceeding to the alternate site, loading off-site tapes, running the selected applications and reporting the results.

Let's get smart. Use this opportunity to test the newly developed plan in a way that will educate and inform multiple groups in the company about the plan. Think in terms of a tactical exercise, with a well-defined test scenario. The test will be simulated for this first round. The scenario will outline a specific, believable disaster that has occurred. The disaster enables the test planner to develop a multitude of problem statements that must be worked out by the recovery teams. A wall clock can be used to depict a progression of time over a three- to five-day period. The actual exercise may only require five to six hours.

Two to three user departments can be invited to participate. Make sure the users represent the most critical applications systems. Invite the senior officer who authorized the expense for the plan development and the recovery strategy. Complement the senior officer with others such as the internal auditing manager and the chief financial officer. Senior management can be the evaluation team.

Obtain an open space area isolated from the daily business environment and provide tables for each team or group. State that the rule for communication between tables is by written message — not verbal. Assign secretaries, clerks, operators and similar staff as runners. Announce at the beginning of the exercise that two or three key team members have been incapacitated by the interrupting event. No, they cannot go home. They will become referees to ensure that the rules are followed.

Begin the exercise. As teams begin to work through the scenario problems and write messages to each other, the runners take the messages to the addressees and to the evaluation table. The evaluation table is the recipient of all messages; thus, it is in a position to know how overall play is proceeding. And it won't be long before one of the users develops an urge to probe with, "When are you bringing my application up?"

Any DP manager electing to try this type of exercise for a newly developed plan has better than a 50% chance that the plan will "live" for a long time. The results of such tests have proven to be successful in educating data processors, users and senior managers alike on the complexities of a recovery plan.

In plain English, it's salesmanship. For a plan to be successful, it has to be sold. The old adage, "A problem well stated is a problem half solved" is appropriate. A manager who knows how to sell a disaster recovery plan has half the battle won at the outset. ■

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DISASTER RECOVERY HOT SITES

ARKANSAS
Systematics, Inc.
4001 Rodney Road
Little Rock, Ark. 72212

TYPE OF SERVICE: Both hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM 4381, shell is 5,000-sq-ft computer-ready space, 12,000-sq-ft office space with programmers' cubicles
Data and Telecommunications: 160 phone lines, two modems; 31 terminals can be sent to client's site
Site Security: 24-hour force, card keys, closed-circuit TV
Test Time: Yes, up to 8 hour/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes, subscription includes disaster recovery plan
Technical Support: Yes
Data Storage: Yes
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $900 to $3,000/mo
Term of Contract: Usually five years, one year and others available
Initiation Fee: $10,000 to $15,000
Per Diem/Usage Charge: $150 to $300/hour/CPU; 15 cents/sq-ft/day for shell

TOTAL SUBSCRIBERS PER CENTER: 32 current — hot, 80 maximum; eight current — shell, 100 maximum

COMMENTS: Proof operator backup and IBM 3890 and 1419 readers, sorter available for standby check processing

CALIFORNIA
Comdisco Disaster Recovery Services, Inc.
6400 Shafer Court
Rosemont, Ill. 60018

TYPE OF SERVICE: Both hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM 3033 and 4341, 5,600-sq-ft office and storage space
Data and Telecommunications: Comline 2, 300 to 9.6K bit/sec. modems, 900 wire pairs
Site Security: Badge access system
Test Time: 32 to 48 hour/year, additional available
ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: No
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $1,450 to $13,000/mo — hot site
Term of Contract: One to five years
Initiation Fee: $10,000 to $60,000 — hot
Per Diem/Usage Charge: $2,500 to $20,000/day — hot site

TOTAL SUBSCRIBERS PER CENTER: 60 current, 100 maximum — hot site

COMMENTS: Contact vendor for cold-site pricing; site will be replaced by San Ramon, Calif., site in mid-1986

COLORADO
Security Pacific Information Systems, Inc.
1401 Del Norte St.
Denver, Colo. 80221

TYPE OF SERVICE: Hot site

SITE CHARACTERISTICS:
Host Computer(s) Supported: [illegible] series, 4300 series; contact vendor for specifics; conference rooms and work space available
Data and Telecommunications: Yes
Site Security: 24-hour personnel, card keys, security cameras
Test Time: Yes, depending on contract

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: No
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $1,600 to $5,000/mo, depending on CPU and contract
Term of Contract: One, two or three years
Initiation Fee: Yes
Per Diem/Usage Charge: Yes
TOTAL SUBSCRIBERS PER CENTER: [illegible] available



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In periods of high grid demand, the utility may initiate a "Voluntary Load Curtailment," in which the customer's diesels are automatically started and paralleled with the utility. The system then shares a pre-determined percentage of the load between the utility and the customer's diesel generators.

Peak Shaving

The automatic "Peak Shaving Mode" allows the customer to share a portion of his load with the standby diesel generators whenever his demand exceeds a pre-set level, thereby reducing demand charges during periods of peak energy use.

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Should utility power fail, the system automatically starts the diesels and transfers the load from the utility to the standby generators. When power is restored, the load is automatically transferred back to the utility. And all transfers are made without interruption of power to the load.

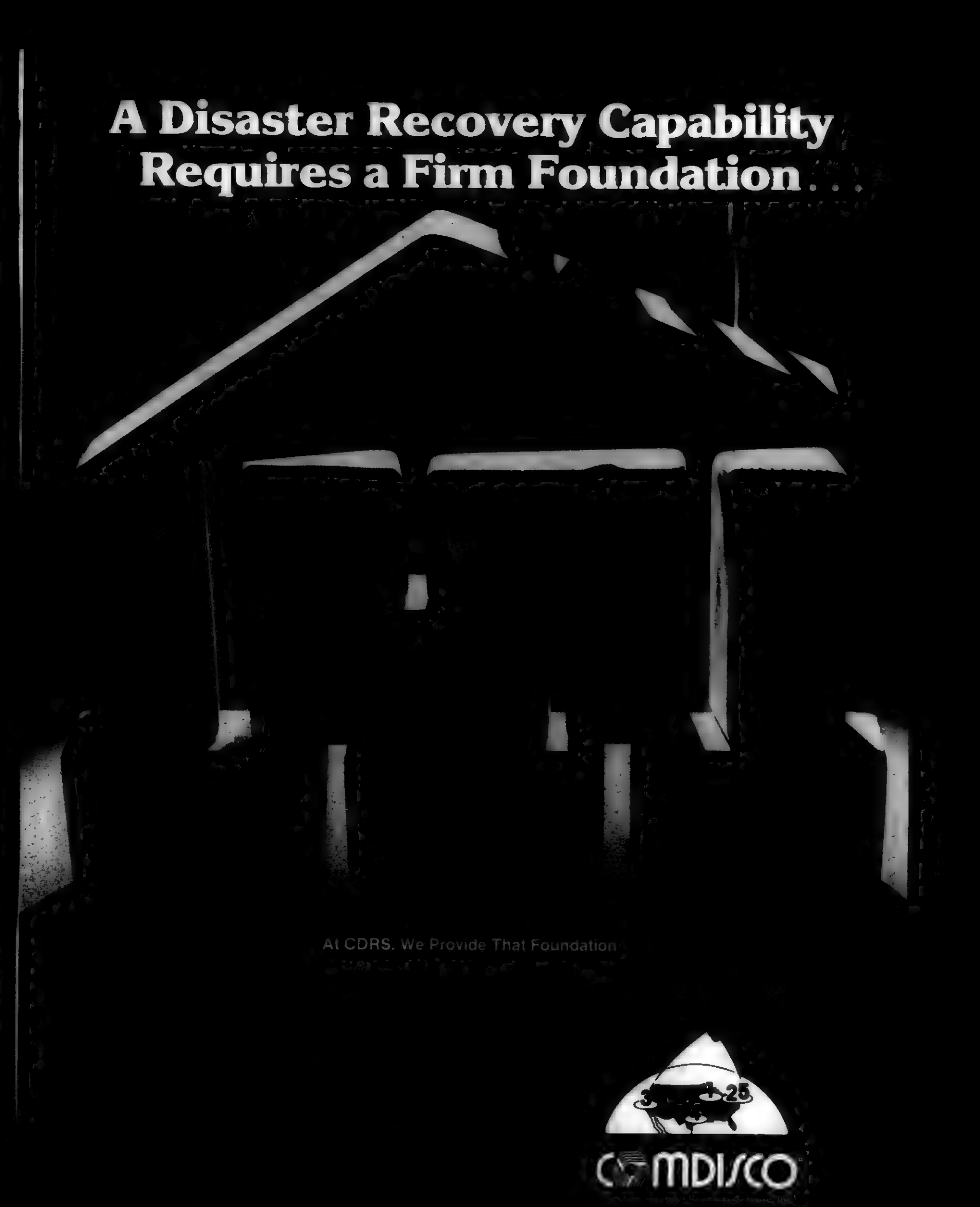
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COMDISCO

Comdisco Disaster Recovery Services

Continued from page 62

SITE CHARACTERISTICS:
Host Computer(s) Supported: 6,000-sq-ft raised floor, 2,000-sq-ft office space, will add IBM 4300 in October 1986
Data and Telecommunications: 300 data pairs
Site Security: Badge controls, alarmed doors, closed-circuit TV, fire protection
Test Time: 24 hour/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: Yes
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $1,750/mo — future hot site, $1,250/mo — cold site
Term of Contract: Three years — hot, seven years — cold
Initiation Fee: No
Per Diem/Usage Charge: $100/hour — future hot site, $1.25/sq ft — cold site

TOTAL SUBSCRIBERS PER CENTER: 130 total at six sites, 100/site maximum

COMMENTS: Members have access to all sites; will open new sites in Georgia, Florida and Illinois in mid-1986 with Univac and IBM CPUs

ILLINOIS (Chicago)

Sungard Recovery Services, Inc.
1285 Drummers Lane
Wayne, Pa. 19087

TYPE OF SERVICE: Both hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM 3083 Model J, 3081 Model K; 4,000-sq-ft office space; facility will be enlarged by June 1987 to double capacity
Data and Telecommunications: 120 dial-up lines; 1,800/2,100 bit/sec. twisted-pair cable
Site Security: Card key access, closed-circuit TV, 24-hour guards
Test Time: 32 to 48 hour/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: No
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $3,100 to $9,200/mo — hot site
Term of Contract: One to five years, four-year average
Initiation Fee: $25,000 declaration fee
Per Diem/Usage Charge: $4,500 to $8,000/day — hot site

TOTAL SUBSCRIBERS PER CENTER: 360 current Pennsylvania and Illinois total, 440 maximum both sites total

COMMENTS: Will be adding site in California; check service available, including magnetic ink character recognition, proof encoding, check transaction, check clearing

ILLINOIS (Schaumburg)

Digital Equipment Corp.
146 Main St.
Maynard, Mass. 01754

TYPE OF SERVICE: Hot site

SITE CHARACTERISTICS:
Host Computer(s) Supported: DEC VAX-11/780, PDP-11
Data and Telecommunications: Tymnet/McDonnell Douglas Network Systems' Tymnet, communications links
Site Security: Electronic access system
Test Time: 32 hour/year, minimum 2 test/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: Yes, separately priced
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $2,500/mo
Term of Contract: Not available
Initiation Fee: $3,000
Per Diem/Usage Charge: $1,000 to $2,500/day, limit 30 days

TOTAL SUBSCRIBERS PER CENTER: Not available

COMMENTS: Special recovery insurance available

ILLINOIS (Wood Dale)

Comdisco Disaster Recovery Services, Inc.
6400 Shafer Court
Rosemont, Ill. 60018

TYPE OF SERVICE: Both hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM 4341, 3083, 3084 and 3081; 13,000-sq-ft office and storage space; standby check processing systems
Data & Telecommunications: Comline 2; 300 to 9.6K bit/sec. modems
Site Security: Yes
Test Time: 32 to 48 hour/year, additional available

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: No
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $1,450 to $13,000/mo — hot site
Term of Contract: One to five years
Initiation Fee: $10,000 to $50,000 — hot
Per Diem/Usage Charge: $2,500 to $20,000/day for hot site

TOTAL SUBSCRIBERS PER CENTER: 150 current total, 100 maximum per hot site

COMMENTS: Contact vendor for cold-site pricing

INDIANA

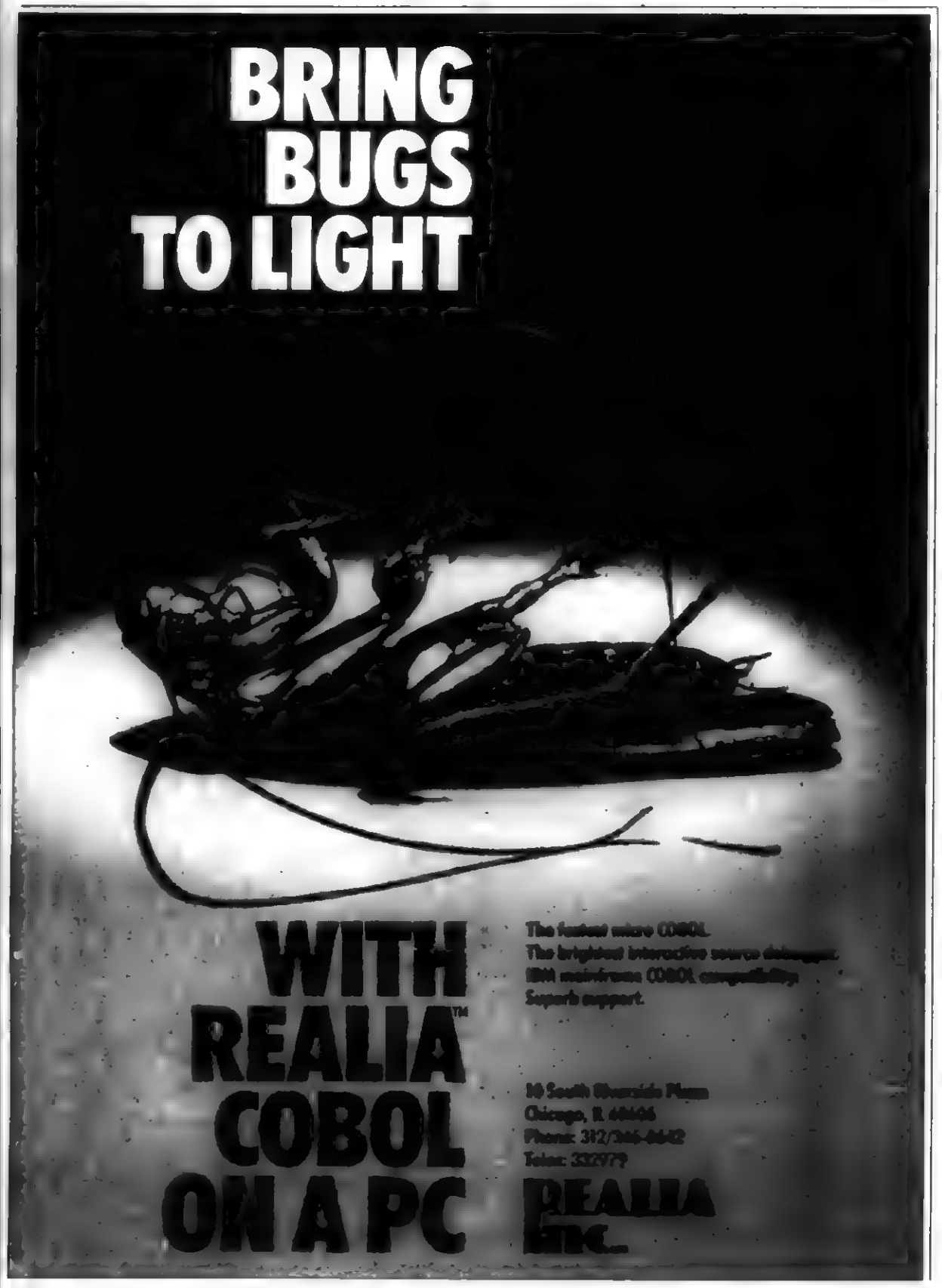
Data Processing Security, Inc.
200 E. Loop 820
Fort Worth, Texas 76112

TYPE OF SERVICE: Hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: Burroughs B1900, IBM 4300; 8,000-sq-ft raised floor, 8,000-sq-ft office space
Data and Telecommunications: 300 data pairs
Site Security: Badge controls, alarmed doors, closed-circuit TV, fire protection system
Test Time: 24 hour/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: Yes
Plan Storage: Yes

PRICING AND AVAILABILITY: Subscription Rates: $1,500/mo — hot site, $1,000/mo — cold site
Term of Contract: Three-year — hot site, seven-year — cold site



PC EXPO®

FOURTH ANNUAL PC EXPO IN NEW YORK

Jacob K. Javits
Convention Center of New York
July 9-11, 1990
10 a.m. to 7 p.m. daily



The largest trade
event for
and resellers of PCs and compatibles

If you want to see everything in IBM compatible systems—in one place at one time—there's only one computer industry trade exposition you can't afford to miss.

THE FOURTH ANNUAL

PC EXPO is *the* microcomputer industry trade show that brings together major vendors of PC-compatible hardware, software and services with corporate volume buyers and resellers. This show is designed to give qualified decision-makers, like yourself, the time to meet with primary vendors and talk business without distraction

PC EXPO provides you with the ease of "salon buying" rather than the havoc of fighting with crowds of literature-collecting non-buyers found at non-focused events Only at PC EXPO are you able to gather the information you need in order to make informed PC buying decisions.

PC EXPO is for corporate buyers who manage, direct and maintain micros in quantity, and all resellers buying in volume. It is the only microcomputer industry trade event that attracts the vast majority of the country's top PC-purchasing firms. PC EXPO attendees know that PC EXPO delivers a group of more than 400 "pre-focused" vendors unlike any other computer trade show in the world.

Buyers from top accounting firms to dealer organizations attend PC EXPO and regard it as the one computer trade show they cannot afford to miss in order to see everything that's new and what works in the PC-compatible industry.

Similarly, third-party resellers who buy in volume don't have to sift through exhibits having nothing to do with the PC-compatible market. PC EXPO is set up to maximize buyer convenience: it's the one PC trade show that doesn't require a dealer to walk miles of aisles to see the products...and the people...that he needs to see. All without having to deal with crowds of hackers and hobbyists. Take your time and cover the entire show at a self-set pace, without using a week to do it!

Who should attend PC EXPO?
The answer is—volume buyers!

PC EXPO is for OEM's, system houses, software developers, dealers, distributors, value added dealers, turnkey systems developers, consultants, office products dealers, manufacturer's reps, and other volume resellers.

PC EXPO IS FOR CORPORATE BUYERS

If your organization uses PCs and your opinion is crucial to the buying process, here's some good news. PC EXPO has been conceived, planned and executed for you. PC EXPO is the volume-market trade show where principal vendors are the *only* exhibitors. You discuss your needs and make your deals with the original producers of the products being sold: no "middle-men" exhibits!

42 of these firms know PC EXPO is tops. Join them in seeing everything you need in the PC universe.*

1. General Motors
2. General Electric
3. Westinghouse
4. Citicorp
5. Du Pont
6. Ford Motor Co.
7. Pacific Bell
8. Chase Manhattan Bank
9. Exxon
10. Peat, Marwick, Mitchell
11. United Technologies
12. McDonnell Douglas
13. Hughes Aircraft
14. Aetna Life & Casualty
15. TRW
16. Boeing
17. Sperry
18. General Dynamics
19. Travelers
20. Merrill Lynch
21. Dun & Bradstreet
22. Touche Ross & Co.
23. 3M
24. Intel
25. Security Pacific
26. Lockheed
27. Allied Products
28. Chevron
29. Union Carbide
30. Mobil
31. PG&E
32. Chemical Bank
33. Time
34. J.P. Morgan & Co.
35. American Can
36. Wells Fargo
37. Upjohn
38. Northwestern Mutual
39. LTV Steel
40. Pillsbury
41. General Mills
42. Nabisco
43. Federal Express
44. R.J. Reynolds
45. Bechtel
46. Teledyne

*list of top 46 PC-purchasing firms compiled by *Infoworld*, 1985, based on number of installed microcomputers.

What kind of corporate buyer attends PC EXPO?
1985 Attendance Breakdown: Company Type and Percentage of Corporate Total

Accounting firm	3.6
Advertising	2.3
Banking	8.3
Communications	5.7
Construction architects	.7
Credit	.4
Education	5.3
Engineering	2.9
Government, Military	5.3
Hospital/Health Care	1.6
Hotel	.2
Industrial Design	.4
Insurance	7.4
Law Office	.8
Management Consultant	1.0
Manufacturing	19.9
Publishing/Television	3.9
Real Estate	1.4
Research/Development	8.1
Retail Sales	1.8
Securities/Brokerage	2.5
Transportation (all)	3.1
Utility	1.5
Wholesale, retail sales	2.7
Other	9.1

PC EXPO IN NEW YORK

If it's worth seeing, it's at PC EXPO
Resellers and corporate volume buyers alike know what to expect at PC EXPO: principal vendors and principal vendors only. For our 1986 New York show, over 400,000 square feet will be dedicated to your PC interests: networking, graphics, printer technology, communications, CAD/CAM, R&D and hundreds of other state-of-the-art applications, as well as maintenance and training. New products? Last year, over 150 new products were introduced at PC EXPO; this year that number will double. You will see and learn more about the PC-compatible market in one day at PC EXPO than you could after months of research elsewhere.

A great conference program just got better
The 1986 PC EXPO Seminar Series is the most comprehensive and informative free computer conference program in the country. Shaped by a 19-member advisory board drawn from the ranks of PC EXPO attendees, the series offers dozens of genuinely high-tech, sophisticated and educational papers, panel discussions and addresses. The details are inside.

"The definitive architectural achievement of the 80s"
That's how critics are describing the Jacob K. Javits Convention Center, the new home of PC EXPO designed by internationally acclaimed architect I.M. Pei. This extraordinary facility offers every conceivable exposition amenity and is a stunning new presence on the New York landscape.

All this and Lady Liberty, too
Finally, PC EXPO opens right on the heels of what will be the country's single most extravagant event of this decade: the rededication and centennial of the Statue of Liberty. The July 4th Liberty Weekend celebration will be going strong after the initial crowds have departed, and PC EXPO attendees will be able to enjoy leisurely visits to many of the OpSail tall ships and the Statue itself before and after the show.

Plan your visit now
The Fourth Annual PC EXPO in New York is the one computer trade show that is meaningful for you as well as a pleasure to attend. Register now. In addition to saving time and money, you'll avoid waiting on long registration lines at the show. If we receive your registration by June 19th, we'll send you your badge in advance. We'll also mail you the first issue of the PC EXPO Show Daily, a valuable and informative planning guide to the show's activities.

We look forward to welcoming you to your show.

40 of these 43 firms know PC EXPO delivers. You, too, will get the attention you deserve.*

Company Name/Rank
1. AT&T Co.
2. General Motors Corp.
3. General Electric Co.
4. GTE Corp.
5. United Technologies Corp
6. ITT Corp.
7. Sears, Roebuck & Co.
8. Westinghouse Electric Corp
9. Ford Motor Co
10. J.C. Penny Co.
11. American Express Co.
12. Prudential Insurance Co
13. McDonnell Douglas Corp.
14. Bankamerica Corp
15. Texaco Inc.
16. Exxon Corp.
17. Atlantic Richfield Co
18. Boeing Co.
19. Travelers Corp.
20. Chevron Corp.
21. Mobil Corp.
22. Citicorp
23. Dun & Bradstreet
24. Xerox Corp.
25. General Dynamics Corp.
26. Rockwell International Corp.
27. Metropolitan Life
28. Tenneco Inc.
29. Household International Corp
30. American General Corp.
31. Amoco
32. Cigna Corp.
33. E.I. du Pont de Nemours & Co.
34. UAL Inc
35. Allied Corp.
36. Lockheed Corp.
37. United Telecommunications Inc.
38. Texas Instruments Inc.
39. TRW Inc.
40. Security Pacific Corp.
41. Goodyear Tire & Rubber Co.
42. Motorola Inc.
43. Automatic Data Processing

*list of top computer-using firms compiled by *Informationweek* based on MIS value of at least $30 million

What kinds of resellers attend PC EXPO? 1985 Attendance Breakdown: Reseller Type and Percentage of Reseller Total

Consultant	15.6
Dealer/Distributor	34.2
OEM	5.6
Office Products	3.1
Service Vendor	2.6
Software Developer	12.0
Systems House	7.1
Turnkey Vendor	3.6
VAD/VAR	7.9
Other	8.3

SEMINAR SERIES at a glance

The most comprehensive free computer conference program in the country!

PC EXPO has given super status to its free conference sessions for 1986. Advised by a 19-member board comprised of industry leaders from the corporate volume buyer market, volume resellers, the media and independent consultants, PC EXPO has put together a Seminar Series acutely responsive to its attendees and second-to-none in the computer trade show industry. Conferences and presentations covering the entire gamut of PC-related topics will be given by acknowledged experts in every conceivable PC field. If there's anything you need to know or learn about what's new and what works, what's hot and what's not, you will find it detailed, demystified, demonstrated and delivered at one program only—the free PC EXPO 1986 Seminar Series.

Advisory Board

Roger Bender, assistant vice president, Citibank, and vice president, Microcomputer Managers Association, Keith Bennett, PC specialist, Skadden Arps, Slate, Meagher & Flom, John Russell, managing editor, *Computer Retail News*, J. Scott Briggs, publisher, *PC Week*; Vincent DiPaola, CPA, systems manager, Rogers and Wells; Esther Dyson, publisher and editor-in-chief, *Release 1.0*; Alan Gross, technology planning specialist, Smith Barney, Harris Upham Company, Inc.; R. Bruce Johnson, manager, PC resource center, Deloitte, Haskins & Sells; Alex Kask, senior manager—computer audit, Ernst & Whinney, and president, Microcomputer Managers Association; Karl Kendall, project manager, information center, Metropolitan Life, Bill Machrone, editor, *PC Magazine*, Paul Marentette, manager of con-

WEDNESDAY

	ROOM A	ROOM B	ROOM C	ROOM D	ROOM E
11:00	PC EXPO Keynote Address				
11:30					
12:00	Compatibility Issues in Enhancement Products		PC Training in Corporate America	The Information Center—A Case History	Avoiding Computer Nightmares
12:30					
1:00	Site Licensing Panel		Multi-Processor Micro-Systems Challenge Minicomputers	The Direct Sales Dilemma	Purchasing Decisions Using LAN Standards & Benchmarks
1:30		A Technical Presentation By IBM, for Independent Hardware and Software Developers, Concerning IBM PC Products and Enhancements			
2:00			Micro-Computer Service and Repair		Managing Personal Computing: What's Hot, What's Not
2:30					
3:00			Voice Recognition: Less Talk and More Action	Choosing a Local Area Network: A Multi-Faceted Decision	Issues and Alternatives Of Micro-To-Mainframe Connections
3:30	Graphics. What's Now, What's Next				
4:00					
4:30					

THURSDAY

	ROOM A	ROOM B
10:30		A Technical Presentation By IBM, for Independent Hardware and Software Developers, Concerning IBM PC Products and Enhancements
11:00	Portable Computers: Solutions Finally Finding Application	
11:30		
12:00		
12:30		
1:00	Information Management for Corporate Decision Makers	
1:30		A Technical Presentation By IBM, for Independent Hardware and Software Developers, Concerning IBM PC Products and Enhancements
2:00		
2:30		
3:00	Multi-User Systems and LANs: How They Fit Into a Company's Plans	
3:30		
4:00		
4:30		

sulting services, Equitable Life; Anthony Morris, chairman and CEO, Morris Decision Systems, Inc.; Tim Scannell, editor-in-chief, *PC Products;* Andrew M. Seybold, president, The Seybold Group, Inc.; Gene Talsky, president, Professional Marketing Management, Inc.; Rich Thoma, president, People & Technology, Inc.; Frank Vulpis, project manager—micros, Merrill Lynch, Pierce, Fenner and Smith, Inc , and Jack Weingarten, manager of micro-services, Shearson Lehman Brothers.

PC EXPO Keynote Address

Wednesday, July 9, 11:00-11:50, Room A

John V. Roach
Chairman of the Board, Chief Executive Officer and President
Tandy Corporation/ Radio Shack



Mr. Roach, who began his career at Tandy as the data processing manager 10 years ago and has been closely associated with its microcomputers since their introduction in 1977, will speak on several key areas concerning the PC's evolution and future in the overall computer industry. He will specifically address timely topics and current trends in the industry and place them in a perspective relevant to PC EXPO's unique focus. Mr. Roach's keynote will emphasize the PC options and directions applicable to corporate volume buyers and large resellers. In addition, he will offer insightful assessments and observations gleaned from his many years as CEO of one of the nation's most visible high-tech corporations.

JULY 10TH

ROOM C	ROOM D	ROOM E
The Role of Management in Securing Computer Systems	Migration Paths and Time Bombs	The Write Stuff: A Word Processing Panel Discussion
Customized Microcomputer-Based Enhancement Products		
The System/ 36 and Networked PCs: A Hands-On Comparison	Electronic Printing: A Demystifying Look at the Options	Forces of Change in the Microcomputer Industry
Automation of the System Development Process		Software Buying Plans of Corporate PC Users
Micro-To-Mainframe Communications: The Industry Catches Up	On-Line Meetings: A Telecommunications Application With a Competitive Edge	Project Management Using Micro-Computers

FRIDAY JULY 11TH

	ROOM A	ROOM B	ROOM C	ROOM D	ROOM E
10:30		A Technical Presentation By IBM, for Independent Hardware and Software Developers, Concerning IBM PC Products and Enhancements			
11:00	Graphics in Word Processing and Database Applications		Presentation on the State of the Industry	Corporate Computer Training: An Integrated Approach	Office Automation From the Bottom Up
11:30					
12:00	Computer Contracts— Upgrades, Support, and Service			PCs And Expert Systems. Costs/ Benefits	Handling Dissimilar Data Using a Chart of Accounts
12:30					
1:00	What Makes an Information Center Tick?		Computer Security: Is Your System Safe and Sound?	LANs: Assessing User Needs	Micro-To Minicomputer Communications An Overview
1:30					
2:00					
2:30	Beyond Keyboard Entry: Options in Data Input		CAD/CAM, Candidly	Memory Storage: Past Dreams/ Future Visions	The Revolution in PC Publishing
3:00					
3:30					
4:00					

Program subject to change without notice.

SEMINARS in depth



Leland Strange
President & Chief Executive Officer
Intelligent Systems Corp

Wednesday, July 9, 12:00-12:50, Room A

Compatibility Issues in Enhancement Products

Enhancement products should all work together, be fully functional and work for future compatibility. These are just some of the many issues that will be addressed by Mr. Strange. Other topics include: development and adherence to microcomputer and peripheral standards, reliability of enhancement products, back up and service, and the competitive cost of enhancement products. Mr. Strange will also discuss how more compatibility testing, greater cooperation between manufacturers, and standardization of products to meet IBM other's specifications are being addressed by manufacturers. He will then illustrate the improved compatibility of new enhancements and point the way to compatibility standards for the future.



Enrique Crespo, Jr.
Manager of Personal Computers
The Torrington Company

Wednesday, July 9, 12:00-12:50, Room C

Personal Computer Training in Corporate America

Mr. Crespo will explore problems arising from the introduction of the personal computer into corporate campuses and the subsequent requirements for managerial computer literacy. One of the keys to increasing utilization of the PC is by training the PC operator to be a more confident and creative individual. The introduction of in-house PC literacy programs in the business world has presented a new series of challenges to the corporate trainer, as well as to the data processing department. Among the key issues that need to be examined and will be discussed are: training requirements of senior managers, motivation in computer training, cost of training resources, in-house training versus outside training, hiring of training staff, and corporate training goals.



Charles J. Luszcz
Manager, Information Center Department
Computer Sciences Corp

Wednesday, July 9, 12:00-12:50, Room D

The Information Center—A Case History.

This case study presentation will address the problems encountered and the solutions implemented in what has been discerned as being two distinct phases within an IC's growth. The first phase involved the selling of the idea to management, starting up, and operating for the first 8 to 10 months. The second phase involved the broadening of areas of responsibility, documentation, employee stress and burnout, and the advent of the knowledgeable end user. This phase continues through at least two years of an IC's existence. For both phases, methods and criteria for measuring success will be presented. Projections as to what the future holds for the IC, its management and staff will conclude the session.



Howard Hillman
Author, Lecturer and Consultant

Wednesday, July 9, 12:00-12:50, Room E

Avoiding Computer Nightmares

"Hillman's Law" is a simple yet often overlooked principle: A fool learns by his own mistakes; a wise man learns from the mistakes of others. Most seasoned PC buyers and managers have learned this wisdom the hard way, making the same costly mistakes previously committed by others. Had they known of the misfortunes of the past, they could have sidestepped headaches, eliminated downtime and saved thousands of dollars. Mr. Hillman helps PC buyers avoid such costly mistakes by describing real life horror stories that cover a broad sweep of topics. Mr. Hillman will conclude his seminar by asking the audience to share their own favorite horror stories.

Moderator:
E. Drake Lundell, Jr.
Publisher, Editor-in-Chief
InformationWeek

Wednesday, July 9, 1:00-2:50, Room A

Site Licensing Panel

Site licensing is an issue whose time has come. As personal computer software suppliers increase sales to the corporate marketplace, they must meet increasing demands to offer site licensing programs. Several users have recently chosen software suppliers based on site licensing policies. This panel—which includes users from several large organizations, vendors who offer site licensing and vendors who do not—will explore the issue from both vendors' and users' viewpoints.

panel members

Karen Orton
Director of Corporate and Commercial Marketing
Ashton-Tate

Theodore Klein
President
Boston Systems Group, Inc.,
President
Society for Management of Professional Computing

Michael Crosno
Vice President of Marketing
Computer Associates

Marty Sahey
Manager of Sales Planning
Lotus Development Corp.

Howard W. Newkirk
President
PowerBase Systems, Inc.

Alan Gross
Technology Planning Specialist
Smith Barney



Charles Grant
Chairman of the Board
North Star Computers, Inc.

Wednesday, July 9, 1:00-1:50, Room C

Multi-Processor Micro-Systems Challenge Minicomputers

Microcomputer and minicomputer systems manufacturers are vying for the multi-user business applications market. The key technical requirement facing these manufacturers is multiple user access to shared information and shared peripherals without causing errors or delays in response times. Historically, this multi-billion dollar market has been the province of minicomputer manufacturers. Mr. Grant will discuss how a number of microcomputer companies are creating significant inroads into this domain. The new multi-processing microcomputer systems — often referred to as "super micros" — are meeting customer expectations in the areas of response times, storage capacity, reliability, system features and applications. In certain areas, notably expandability, price/performance and graphics, these multi-user microcomputer systems are now *surpassing* minicomputer capabilities.



Moderator:
John Russell
Managing Editor
Computer Retail News

Wednesday, July 9, 1:00-2:50, Room D

The Direct-Sales Dilemma

Whenever a manufacturer's strategy involves distributing products to value-added resellers while also employing a direct-sales force, controversy is certain to erupt. VARs will complain that such a marketing plan is contradictory and, ultimately, usurps their ability to compete in high-end business environments. Manufacturers, on the other hand, insist that enough potential revenue exists in the Fortune 1000 community for both their own direct-sales forces and VARs to enjoy attractive sales. This discussion will pull together the key components of this argument. A panel of vendors, VARs and corporate computer managers will exchange their views in this forum, chaired and sponsored by Computer Retail News.

panel members

Ed Ramos
President
Future Information Systems, Division Computone

Anthony Morris
Chairman and CEO
Morris Decision Systems, Inc



Ray Noorda
President
Novell

Wednesday, July 9, 1:00-1:50, Room E

Purchasing Decisions Using LAN Standards and Benchmarks

Local area networks are more powerful, more secure and more flexible than ever before. Although hardware selection is still important in LAN decision-making, perhaps it is no longer a standardization issue. DOS 3.1, however, has become the heart of the LAN standard issue. DOS 3.1 requires a file server environment, and any multi-user software package written for DOS 3.1 will run on any LAN that supports DOS 3.1. This standardization will elicit more multi-user software applications and, probably, swell the ranks of companies who have upgraded to DOS 3.1 compatibility. With this maturity and standardization, LANs are moving into many new areas. Thus, benchmark test results can be an invaluable tool in choosing the right network for your particular situation and application.



Thomas F. Nolan
Vice President Western Region
Sorbus

Wednesday, July 9, 2:00-2:50, Room C

Microcomputer Service and Repair

Microcomputers, no matter how good they are, will eventually require maintenance service. As businesses become more dependent on cost-effective computing, they are recognizing the need for timely and skillful equipment maintenance to avoid unnecessary downtime. Mr. Nolan will discuss three sources for computer maintenance: the OEM, an in-house operation or a third-party service organization. Additionally, he will examine in detail the repair options available such as on-site, carry-in, ship-in, or van pick-up delivery. Mr. Nolan will also discuss the multi-vendor repair dilemma and advise users on how to reduce unnecessary downtime and service calls by following some basic preventive maintenance steps.



Naomi Karten
President
Karten Associates

Wednesday, July 9, 2:00-2:50, Room E

Managing Personal Computing: What's Hot, What's Not

Micro-managers have been swamped by user demands for training and support. User expectations are growing. Technological advances are continuing non-stop. Management is calling for more proof of benefits. The pace is a hectic one. These factors make it a challenge to manage day-to-day operations without losing sight of broader business goals. This session will address strategies which contribute to successful management of personal computing, as well as factors which pose a threat to this success. Examples from the experiences of many companies will be used to illustrate "how to" and "how not to" in such areas as training, standards, vendor relations, application development, support services, and surviving and thriving in the midst of constant change.



Moderator:
Rich Thoma
President
People & Technology, Inc

Wednesday, July 9, 3:00-4:30, Room A

Graphics: What's Now, What's Next

Graphics capabilities on microcomputers have come a long way in a short time, but it appears that a veritable explosion of new technologies will soon take place. The panel will discuss: today's existing industry standards; software drivers of graphics hardware; new graphics hardware, including new display technology and graphic co-processors; and presentation graphics capabilities and techniques.

panel members

Rich Bader
Co-Manager
Personal Computer Enhancement Operation
Intel

Daniel E. Foots
Customer Service Manager
CalComp Corporation

Jerry Cahn
CEO
Brilliant Image, Inc



Moderator:
Debra Bulkeley
Executive Editor
PC Products

Wednesday, July 9, 3:00-4:30, Room C

Voice Recognition: Less Talk and More Action

Speech technology is not new. Production line workers have used voice systems for years to enter data into computers while their eyes and hands were busy elsewhere. But it is only recently that voice recognition systems are beginning to infiltrate the business environment. In this session, some of the leading vendors in the voice recognition market for the personal computer will discuss the current state of this technology, the problems they are facing in terms of business user acceptance, and the new trends and developments they anticipate will evolve in this provocative communications area.

panel members

S.J. "Jackie" Robinson
Plans and Control
Manager-I/O Products
Entry Systems Division
IBM

James R. Moser
Senior Computer
Scientist
Kurzweil Applied Intelligence, Inc

David Greer
Product Manager
ITT

Jim Cook
Director of Marketing
Votan



Moderator:
Dan Spiner
Chief Executive Officer
Management Information Software, Inc.

Wednesday, July 9, 3.00-4.30, Room D

Choosing a Local Area Network: A Multi-Faceted Decision

This seminar will include presentations by corporate users and local area network vendors who will describe their experiences in selecting, installing and supporting LANs. The focus will go beyond a survey of what is available to detail the personal and managerial considerations in LAN installations and usage.

panel members

Rick Winokur
Management Consultant
Project Office Director
Chase Manhattan Bank

Henry L. Kee
Vice President - Personal Computing Architecture
Chemical Bank

Cornelius Peterson
President
Digital Products

Suri Harish
Director of Boardband Product Line
Sytek

David Bryant
Chief Scientist
Waterloo Microsystems, Inc.

Moderator:
Irwin Greenstein
Senior Editor
PC Week

Wednesday, July 9, 3.00-4.30, Room E

Issues and Alternatives of Micro-to-Mainframe Connections

As the demand for distributed processing becomes more intense, MIS managers may find it increasingly difficult to find the right micro-to-mainframe solution. This seminar will establish the issues and alternatives confronting buyers seeking to connect PCs to mainframes. Experts from leading micro-to-mainframe vendors as well as a MIS manager from a major insurance company will offer answers to this complex demanding problem.

panel members

Jack Armstrong
Manager of Product Marketing-Information Center Products
Cullinet Software, Inc

William H Hiller
Product Line Director-Micro Products
Digital Communications Associates, Inc

Paul Marentette
Manager of Consulting Services
Equitable Life

David Feldstein
Vice President of Micro Products Division
Information Builders, Inc



Moderator:
Gene Talsky
President
Professional Marketing Management, Inc.

Thursday, July 10, 11 00-12·50, Room A

Portable Computers: Solutions Finally Finding Application

The session will explore the growing use of portable computer systems, including both laptops and transportables, to meet three different needs: (1) single-computer users, who need to move their computers to and from their offices, to customer locations, and for whom the portable must offer all general purpose functionality and compatibility; (2) multiple-computer users, who have access to desktop systems in their offices but who need portables in field locations and branch offices; and (3) specialized applications, including remote data gathering, maintenance, sales, government, and military needs. Representatives from manufacturers and end users will address each of these types of portable users and define the product characteristics that best meet the needs of each. The panel will provide an update on how advances in technology are enabling portables to meet a wide array of needs.

panel members

Michael S. Swavely
Vice President of Marketing
Compaq Computer Corp.

Sharon D. Cuppett
Product Manager
Datavue

Alan B. Lefkof
Vice President, Marketing
Grid Systems Corp.

Stewart Weinstock
Buyer for Portable and Pocket Computers
Radio Shack

Andrew Czernek
Director of Marketing
Zenith Data Systems



August Bequai, Esquire

Thursday, July 10, 11:00-11:50, Room C

The Role of Management in Securing Computer Systems

Computer-related crimes now account for over $500 million in annual losses; with the proliferation of personal computers, computer networks, electronic message systems, and EFT systems, the problem will only continue to grow. The consensus among experts is that computer security can go a long way in curtailing the problem; by necessity, this means sensitizing management to the problem. Mr. Bequai will address management's role in computer security and will include· the scope/techniques employed by computer criminals, the role/objective of EDP security, and federal/state legislation on computer security and its portents for management.



Moderator:
Scott Briggs
Publisher
PC Week

Thursday, July 10, 11·00-12 50, Room D

Migration Paths and Time Bombs

It's a safe bet that nearly every piece of hardware and software used today will be outmoded within two years, yet there are many present configurations that will offer migration paths to the next generations. Which choices provide these migration paths and which may be future time bombs for the volume buyer will be the subject of this informative and relevant panel discussion. Panelists will be expressing their own, sometimes conflicting views on what is in store in the years to come. Audience participation will be invited.

panel members

John Dodge
Executive Editor/News
PC Week

Richard Duffy
Department Editor, Editorial/Opinion
PC Week

Paul Gillin
Senior Editor
PC Week

Lois Paul
Executive Editor/ Features
PC Week

Sam Whitmore
Senior Editor
PC Week



Moderator:
John Dickinson
Special Projects Editor
PC Magazine

Thursday, July 10, 11:00-12:50, Room E

The Write Stuff: A Word processing Panel Discussion

Word processing has evolved from dedicated large scale equipment to personal computers in a very short time. That evolution has brought with it revolutionary changes in the way word processing software is designed, and in what it can do. Word processing software packages similar to the typewriter-oriented corporate products of the dedicated behemoths are still available, but today's personal computer buyer also has a choice among both faster-running professional programs and personal word processors that are designed with lighter word processing needs. Discussion panelists will look at what might be next in word processing software, from both the vendor and user viewpoints.

panel members

Robert F. Petrie
Vice President
Manufacturers Hanover Trust

Charles Stevens
Group Product Manager, PC Word Processing/ Communications
Microsoft

William Crowell
Vice President - Product Development
MicroPro International

Vincent DiPaola, CPA
Systems Manager
Rogers & Wells

W.E. "Pete" Peterson
Executive Vice President
Satellite Software International



Theodore Klein
President
Boston Systems Group, Inc.,
President
Society for Management of Professional Computing

Thursday, July 10, 12:00-12:50, Room C

Customized Microcomputer-Based Information Systems

As corporate microcomputer applications have grown more powerful, sophisticated and prolific executives are seeking new and better strategies for harnessing, coordinating, and leveraging PC technology to achieve organizational goals. One proven strategy is to consider an applications perspective and identify specific custom information systems which can be effectively delivered using microcomputer technology. This presentation will identify strategies and tactics by which different systems can be quickly identified, isolated, designed, and implemented using a variety of traditional development and prototyping methods.



Arun Gupta
Chief Executive Officer
Software Solutions, Inc

Ashok Ahuja
Chief Operating Officer
Software Solutions, Inc.

Thursday, July 10, 1:00-2:50, Room A

Information Management for Corporate Decision Makers

Developed for the business executive inundated by vendor claims, this session will present approaches to transform general information into a decision support resource. Among the topics that will be reviewed are the requirements of data base management systems in the micro environment, the development of applications with a dbms,and distributing information within an organization using local area networks, micro-mainframe links and other communication methods. Members of this session, sponsored by Software Solutions, Inc., will include corporate users, an independent consultant, an editor of a prestigious trade publication and senior executives of Software Solutions, Inc.



Paul Nicolette
Program Development Specialist
Department of Environmental Protection
State of New Jersey

Thursday, July 10, 1:00-1:50, Room C

The System/36 and Networked PCs: A Hands-On Comparison

This presentation summarizes the continuing education of an information systems group confronted daily by questions such as: what belongs where, and what does experience teach about the relative merits of mini-based, stand-alone, local network and hybrid approaches. You will hear of problems solved and unsolved, of an attempt to find the applications for which each alternative solution is best suited, of benchmarks, pitfalls and future directions. In each case, user-style experience with delivered products is the point of reference.



Moderator:
Rich Thoma
President
People & Technology, Inc

Thursday, July 10, 1:00-2:50, Room D

Electronic Printing: A Demystifying Look at The Options

With the rapid-paced introduction of new products, electronic printing and publishing has evolved from an emerging technology to nearly mature professional composition and production products. This panel discussion will explain such printing terms as "H & J" and WYSIWYG." Additionally, output technologies such as laser, ion-deposit, magnetic drum, electrostatic and thermal transfer printers will be discussed.

panel members

Stefanie Kott
Analyst and Consultant

Rich Treitman
Director of Product Marketing
Lotus Development Corp.

Michael Podanoffsky
President
Modtek, Inc.

Dr. Edward W. Savarese
Chairman and Chief Executive Officer
Personal Computer Products Inc.

Douglas S. Stivison
Director of Production and Technical Support
Scangraphic Dr. Boger, Co.



Andrew Seybold
President
Seybold Group, Inc.

Thursday, July 10, 1:00-1:50, Room E

Forces of Change in the Microcomputer Industry

Mr. Seybold will examine what is actually going on in the industry and try to make sense of it. He believes that through economic and competitive pressures, the microcomputer industry is entering an era of stability, versus an extended period that has been full of innovation and daring new concepts. What will be the impact? Has technology gone too fast? Have we arrived at a plateau? Mr. Seybold will discuss new chip development, directions in mass storage and continuing quests for greater densities, speeds, and miniaturization. He will also examine trends and developments in Asia and Europe, both as markets and as suppliers to U.S. volume buyers.



Conny Wylie
President
Conny Wylie Corp.

Thursday, July 10, 2:00-2:50, Room C

Automation of the System Development Process on the PC

The demand for information resources has become such a dominant concern in business today that software application developers and management are constantly seeking new ways to improve system development productivity by increasing the volume of system development and the quality of the product. The evolution of PC-based programmer analyst workstations, endowed with a software engineering methodology and its related computer-aided software engineering workbench tools, represents a complete framework for addressing the systems development productivity issue. Mr. Wylie will examine the emergence of these new analyst and programmer tools and discuss their wide-ranging applications.



William A. Gannon
Publisher
Software News

Thursday, July 10, 2:00-2:50, Room E

Software Buying Plans of Corporate PC Users

Mr. Gannon will summarize a survey of 2,000 PC users in large American companies. The annual Software User Survey reflects the intentions of mainframe, mini, and microcomputer software buyers. The micro software section presented in this session will include specific packages already installed, applications planned for automation, and vendors under consideration for 1986. User buying criteria (features, price, performance, documentation, etc.) are also explained and given priority order.



Moderator:
Dave Mahoney
President
Banyan Systems, Inc

Thursday, July 10, 3:00-4:30, Room A

Multi-User Systems and LANs: How They Fit Into a Company's Plans

For many buyers at medium-sized companies and at the departmental level in larger corporations, a key PC option centers on implementing multi-user systems or on networking multiple PCs. Such plans often include integrating data resources into total corporate networks and looking at PCs, LANs, multi-user systems and other devices as shared resources. The "glue" that can bind them together is embodied in an emerging technology: network servers. This session will deal with how these sophisticated network servers can interconnect local or remote PCs, LANs, minis, mainframes, public data networks, other data resources and communication services into a unified corporate system.

panel members

Nigel Spicer
Director of Marketing
Alloy Computer Products

Erwin Nobel
Vice President-Operations
Anex Technology, Inc.

Bill Lanfri
Director of Marketing
Corvus Systems, Inc



Moderator:
Bill Machrone
Editor
PC Magazine

Thursday, July 10, 3:00-4:30, Room C

Micro-to-Mainframe Communications: The Industry Catches Up

Micro-to-mainframe communication is a vital area of interest to corporate PC users. Radical changes on the PC side have been slowed by barely perceptible changes on the mainframe side, but there may be dramatic changes on the horizon. The panel will review the state of the art in 3278/3279 emulation, 3274 emulation, high-speed modems, protocol converters and concentrators. Panel members will also take a futuristic look at IBM's token ring, micro-to-mini communications, and the prospects for peer-to-peer communications under SNA. The panel will talk frankly about the abilities and shortcomings of existing products, and the prospects for new products to solve corporate communication and integration problems.

panel members

Charles Morel
Chief Executive Officer
CXI, Inc.

Jack Weingarten
Manager of Micro Services
Shearson Lehman Brothers

Norman Agin
Vice President
Martin Marietta Data Systems

Eric M. Schnek
President
Eric M. Schnek, Inc.



Moderator:
Susanna Opper
Telecommunications Analyst and Consultant

Thursday, July 10, 3:00-4:30, Room D

On-Line Meetings: A Telecommunications Application With a Competitive Edge

The move into the information age is rapidly changing the nature of business communication. Some pace-setting companies are using PCs and modems for on-line meetings about everything from developing new products to planning sales meetings. These rapid communication systems are giving their users an important competitive edge. But group electronic communication systems -- sometimes called computer conferencing -- like face-to-face meetings, require planning and facilitation. Panelists will focus on various applications, from national and global linking of work groups at large organizations to ways any group can assess problems and discuss solutions on-line. Ideal applications, weaknesses and strengths of the technology, and system decisions will also be addressed.



Moderator:
Harvey Levine
President
Project Management Institute

Thursday, July 10, 3:00-4:30, Room E

Project Management Using Microcomputers

This session will provide an opportunity for potential buyers to learn characteristics of project management. Topics to be addressed include: user training; ease-of-use vs. speed vs. functionality, and if all three can coexist in one product; the importance of computer resource leveling, compared with providing a good analysis of the resource loadings and availabilities; and, perhaps the weakest area in most programs, real user-defined report generators, where users can define format and content. Also to be discussed is where the project management industry is going, as well as what vendors interpret as the most desired user needs and how they are being addressed.

panel members

Chris Murray
President
Applied Business Technology Corp.

Robert E. Sculley
Vice President
Diversified Information Services, Inc.

Andrew Layman
President
Breakthrough Software Corp.

E. Richard Artus
Vice President-General Manager, Retail Group
Project Software Development Inc.



Mark Skiba
Vice President Research & Development
American Programmer's Guild, Ltd.

Friday, July 11, 11:00-11:50, Room A

Graphics In Word Processing and Database Applications

This presentation is an exploration of how today's PCs and printers can be used to produce higher informational quality through graphics. In just a few years, the technology has progressed from a choice of either physically cutting and pasting or buying an expensive workstation to a spectrum of PC solutions. Now choices range from specialized integrated hardware/software systems to the use of standard off-the-shelf packages with inexpensive memory-resident graphics and text integration software. Mr. Skiba's discussion will include a number of example applications, as well as a report on the current state of the art in PC hardware and software.



Rich Thoma
President
People & Technology, Inc

Friday, July 11, 11:00-12:50, Room C

Presentation on the State of the Industry

Mr. Thoma will discuss and demonstrate presently available technology and prototype products, some of which will be seen for the first time. Observations of new products and technologies recently released in the United States will be made, as well as a thorough discussion of future products from Japan, Korea and Taiwan which were seen at trade shows and factory visits in those countries. Product areas that will be discussed include: CD-ROM; optical/digital storage; barium-oxide vertical recording; high-capacity disk drives; data-back up; high and ultra-high resolution display systems; the proliferation of the EGA; and thermal transfer, ion deposit and magnetic drum printers.



Ronnie Colfin
President
Edutrends, Inc



Gary Audin
President
Delphi, Inc

Friday, July 11, 11:00-11:50, Room D

Corporate Computer Training: An Integrated Approach

This session will explain in detail the merits of an integrated training curriculum and how this program should include seminars — both in-house and public — videotapes, computer-based training, self-study guides and books. Ms. Colfin and Mr. Audin will discuss the pros and cons of each method. Examples will focus on data communications and personal computer software training.



Steve Malisewski
Marketing Vice President
MicroAge Computer Stores, Inc

Friday, July 11, 11:00-11:50, Room E

Office Automation from the Bottom Up

One challenge facing the computer industry today is to provide connectivity between individual PCs and both department-level PCs and larger systems within the company. With the "bottom-up" desire created by individual users, Mr. Malisewski believes true office automation can be achieved. This means automating such functions as voice, data, image and text processing at the office level. He will discuss the products available in these areas and developments that are on the horizon. Mr. Malisewski will also address micro-to-mainframe communications as neither a "top down" nor "bottom up" link between the office system and the personal systems that requires technical expertise for resellers and high-level support from the vendor.



Mitchell P. Novick, Esquire

Friday, July 11, 12:00-12:50, Room A

Computer Contracts—Upgrades, Support, and Service

Contracts under which computer systems are obtained should address the issues of upgrades, support, and service. Mr. Novick will discuss these issues and consider the required life of the system, the system's capabilities for upgrade and expansion, modular expansion of the system (both hardware and software) during its lifetime, and continued availability of service and organizations to provide this function. Other important issues include ownership of software, in-house improvements to both hardware and software, and upgrade policies in leasing arrangements.



Daniel De Salvo
Senior Systems Analyst and
Senior Project Manager
of Artificial Intelligence and
Expert Systems
American Management Systems, Inc

Friday, July 11, 12:00-12:50, Room D

PCs and Expert Systems: Costs/Benefits

Mr. De Salvo will discuss a technology which is rapidly gaining strength in the market. Many corporate decision makers will, in 1986, be asked to underwrite expert systems projects for thousands of dollars. These requests will be filled with many false ideas about expert systems, some will mistakenly assume that PCs can support the same kind of systems as mainframes and dedicated artificial intelligence workstations. Mr. De Salvo will explain just what expert systems are and describe and compare PC-based expert systems with those that could have been built using more conventional programming techniques. Mr. De Salvo will debunk the myths and set forth the realities about expert systems on PCs and whether they deserve the buyer's investment.

John Petrucci
President
Stanhope Associates Inc.

Friday, July 11, 12:00-12:50, Room E

Handling Dissimilar Data Using a Chart of Accounts

How would you begin to model your organization within the bigger industry view? This requires the merging of internal, external and economic data having both financial and physical (quantity) natures and varying formats. One example: merging Compustat and ADAPSO data with your internal accounting data. The tools used will be comprised of both database and spreadsheet building blocks on a PC; therefore results will be displayed in normal financial formats, such as income statements, balance sheets and flow of funds.



Moderator:
Nancy Weingarten
[redacted]
Information Center Magazine

Friday, July 11, 1:00-2:20, Room A

What Makes an Information Center Tick?

The information center concept has evolved to meet changes and to cope with the frustrations of managing explosive growth of end-user computing. What are the primary roles of and IC? How is it staffed and organized? What should the relationship between the IC and MIS be? How does the IC move from a support unit to a strategic business function? A panel of IC managers and experts will describe how information centers develop, overcome obstacles, and flourish.

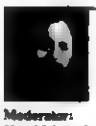
panel members

R. Bruce Johnson, Manager
PC Resource Center
Deloitte Haskins & Sells

Peter Crowell
MIS Marketing Director
Digital Equipment Corp.

Mark A. Hagen
Information Center Supervisor
GTE Government Systems Corp.

Terry Steinberg
President
PC Executive Training Center



Moderator:
Harold Joseph Highland
Editor-in-Chief
Computers & Security

Friday, July 11, 1:00-2:20, Room C

Computer Security: Is Your System Safe and Sound?

A panel of volume buyers, vendors and computer security specialists will discuss mainframe, minicomputer and microcomputer security. Emphasis will be on the security of microcomputer systems, and key areas to be addressed include: system, disk and file access control; data and program protection methods; physical security, especially for portables; micro-mainframe interface and communications, and audit trails of microcomputer operations.

panel members

Belden Menkus
Executive Editor
Journal of Systems Management

Alex Kask
Senior Manager, Computer Audit
Ernst & Whinney,
President
Microcomputer Managers Association

Greg Hagopian
Marketing Manager
On-Line Software

Jeffrey M. Tolk
President and Chief Executive Officer
Software Synergy, Inc



Moderator:
Bill Laberis
Editor
Micro Marketworld

Friday, July 11, 1:00-2:20, Room D

LANs: Assessing User Needs

Whether or not 1986 proves to be the year of the LAN, users are scurrying to see if the technology available now can provide solutions to their increasingly demanding information requirements. The first and most important step in doing so is in assessing what, if any, LAN needs a user site has. Users must then assess what the most appropriate networking solution might be, and do so with a careful eye to future needs as well as present demands. This panel will focus on these pressing issues, and do so from the perspective of users, LAN installers, and, of course, the vendors.

panel members

Roger Bender
Assistant Vice President
Citibank,
Vice President
Microcomputer Managers Association

Jack Grushcow
President
Consumers Software

John Heather
Director of Systems Engineering IOS
Northern Telecom

Henry Seelbinder
Vice President
Network and Communications
Morris Decision Systems, Inc



Moderator:
George Kotelly
Editor
Mini-Micro Systems

Friday, July 11, 1:00-2:20, Room E

Micro-to-Minicomputer Communications: An Overview

Sophisticated personal computer applications have created an increasing need for PC users to access and share minicomputer-based data. Microcomputer-to-minicomputer links satisfy this need by allowing the PC's capabilities to be enhanced by the minicomputer's databases and processing power. This presentation will analyze the micro-to-mini connection and explore the varied methods for evaluating, configuring, integrating and applying this connection. It will also examine the present and future technology, as well as market and product trends.

panel members

Safi Qureshey
President
AST Research

Charles Morel
Chief Executive Officer
CXI, Inc

Robert Zack
Vice President of Corporate Planning
Digital Communications, Inc. Associates

Moderator:
Beth Freedman
Senior Writer
PC Week

Friday, July 11, 2:30-4:00, Room A

Beyond Keyboard Entry: Options in Data Input

This session will cover the emerging technologies for inputing information into PCs as users move away from strict keyboard data entry. Discussions will focus on digital and image scanners, digital tablets, and optical character recognition devices. The session will address how these and other devices have changed data input applications, and consider, as well, what the future portends in this area.

panel members

Linda Worland-Tilander
Wedge Reader Product Manager
INTERMEC Corp.

James R. Moser
Senior Computer Scientist
Kurzweil Applied Intelligence, Inc.

Ray Delisle
Marketing Manager
Kurzweil Computer Products

Val Matula
Manager, Technical Assessment and Support
Tecmar Inc.



Moderator:
J S Cooper
Managing Editor
CAD/CIM ALERT

Friday, July 11, 2:30-4:00, Room C

CAD/CAM, Candidly

Leading suppliers of PC based CAD/CAM systems will discuss the latest developments in this best-selling technology, and a corporate CAD/CAM user will offer a personal assessment of its pros and cons. Find out how 3-D modeling can be done on a PC and why you may not require the power of a mainframe for certain applications. Integration of CAD/CAM technology with other systems and applications will also be addressed.

panel members

Doug Campbell
Technical Manager
Autodesk, Inc.

Gregory L. Bloom
Vice President, Products and Marketing
MEGA CADD, Inc.

Rick McElhinney
President
Micro Concepts Inc.



Moderator:
Rich Thoma
President
People & Technology, Inc

Friday, July 11, 2:30-4:00, Room D

Memory Storage: Past Dreams/Future Visions

Two years ago, 64K of RAM seemed like a lot. Today, 1MB on a RAM chip and a gigabyte of storage are becoming almost commonplace for personal computer users. Disk speeds range from 20 milliseconds to 120 milliseconds, but it is not clear what the difference in speed actually indicates. Should a corporate user always look for the speediest storage medium, or are there other factors that should be considered? Disk caching and ram disks will also be discussed. Other areas to be covered include optical digital recording technologies.

panel members

Benjamin J. Baughman
Vice President of Marketing
Konan Corporation

Stephen Berkley
President
Plus Development Corp.

Michael Goldberg
President
Software Integration, Inc.

Steven B. Volk
Executive Vice President of Sales and Marketing
Tallgrass Technologies Corp.

David Tovey
Marketing Manager
Toshiba America, Inc.



Moderator:
David Bunnell
Publisher
PC World and Macworld

Lock-Note

Friday, July 11, 2:30-4:00, Room E

The Revolution in PC Publishing

The use of personal computers and laser printers to generate publication quality text and graphics in an office environment has opened up a huge new category of PC applications. A panel will discuss the implication this has for corporations publishing documents, presentations, books, and other information.

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IMSL INC
IRWIN MAGNETICS, INC
IVY COMPUTER SYSTEMS
ITT INFORMATION SYSTEMS
INFORMATION WEEK
INFORMATION BUILDERS
INNOVATIVE TECHNOLOGIES
INTEGRATED NETWORK SYSTEM
INTEL CORPORATION
IOMEGA CORP
JACOBS COMPUTER SERVICES
JUKI OFFICE MACHINE CORP
KAMMERMAN LABS
KLS INC
KEY TRONIC
KIMTRON CORPORATION
KRAFT SYSTEMS
KURZWEIL AI
KURZWEIL COMPUTER PRODUCTS, INC.
LEADING EDGE PRODUCTS, INC.
LEXISOFT INC.
LIFETREE SOFTWARE
LOTUS DEVELOPMENT CORP
MARC SOFTWARE INTERNATIONAL
MANNESMANN TALLY
MANSFIELD SOFTWARE GROUP
MARTIN MARIETTA DATA SYSTEMS/ITSOFTWARE
MATRIX INSTRUMENTS
Mc CORMACK & DODGE
MEMOREX, MEDIA PRODUCTS GROUP
MICROCOMPUTER MANAGERS ASSOCIATION
MICRO DATA BASE SYSTEMS, INC
MECA/MICRO EDUCATION CORP OF AMERICA
MICRO RENTALS
MICROCONCEPTS INC
MICROPRO INTERNATIONAL INC
MICROVIDEO LEARNING SYSTEMS
MICRORIM, INC.
MICROSOFT CORP.
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MINI-MICRO SYSTEMS
MINITAB, INC
MITSUBISHI ELECTRONICS AMERICA, INC.
MOUNTAIN COMPUTER
NEC INFORMATION SYSTEMS
N HANCE SYSTEMS
NYPC
NATIONAL MEMORY SYSTEMS CORP.
NESTAR SYSTEMS, INC
NETWORK DEVELOPMENT CORP.
NORTH EDGE SOFTWARE CORP
NOVELL, INC.
OFFICIAL AIRLINE GUIDES
OTC-OUTPUT TECHNOLOGY CORP.
OMNIOFFICES
OASYS/OFFICE AUTOMATION SYSTEMS, INC.
OFFICE SOLUTIONS
OPTICAL COATING LAB, INC.
OUTPUT TECHNOLOGY CORP.
PC EXCHANGE
PC EXECUTIVE TRAINING CENTER
PC MAGAZINE
PC PRODUCTS
PC WEEK
PC WORLD
PARA SYSTEMS, INC
PARAMETER DRIVEN SOFTWARE
PEOPLE & TECHNOLOGY
PERCOM DATA CORP
PHILIPS INFORMATION SYSTEMS, INC
PIVAR COMPUTING SERVICES
POLAROID
PRIAM
PRIMAGES INC
PRIMAVERA SYSTEMS
PRINCETON GRAPHIC SYSTEMS
PRINTRONIX, INC
QUADRAM CORP
QUE CORP
QUINTAR
RT KATEK COMPUTER SERVICE
RACET COMPUTES
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ROLAND DG
ROMULUS PRODUCTIONS, INC
RUBBERMAID COMMERCIAL PRODUCTS INC
SAS INSTITUTE INC
SAMNA CORPORATION
SANYO BUSINESS SYSTEMS CORP.
SATELLITE SOFTWARE INTERNATIONAL
SCITOR CORP
SHARP ELECTRONICS CORP.
SMALL COMPUTER CO , INC
SOFTKEY SOFTWARE PRODUCTS, INC
SOFTEST INC
THE SOFTWARE BOTTLING COMPANY OF NY
SOFTWARE NEWS
SOFTWARE SOLUTIONS, INC
SOFTWARE SYNERGY, INC
SORBUS, A BELL ATLANTIC CO
SOURCE EDP
SOUTHERN COMPUTER SYSTEMS, INC
SPECTRAFAX, CORP
SPECTRUM HOLOBYTE
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STRATEGIC SOFTWARE PLANNING CORP
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TAVA U.S.A INC
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TALLGRASS TECHNOLOGIES CORP
TANDY CORPORATION
TATUNG COMPANY
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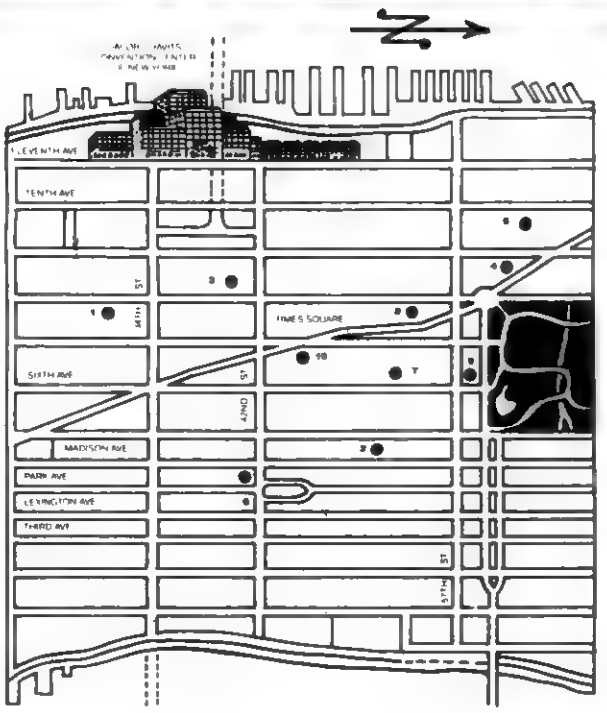
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JACOB K. JAVITS CONVENTION CENTER
JULY 9-11
1986

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3 ☐ Computer OEM
4 ☐ Office products dealer
5 ☐ Service vendor
6 ☐ Software developer
7 ☐ Systems house
8 ☐ Turnkey vendor
9 ☐ Value adder
10 ☐ Other (specify) _____

CORPORATE VOLUME BUYERS—YOUR COMPANY'S MAIN BUSINESS ACTIVITY

II
A ☐ Accounting firm
B ☐ Advertising
C ☐ Banking
D ☐ Communications
E ☐ Construction/Architects
F ☐ Credit
G ☐ Education
H ☐ Engineering
I ☐ Government/Military
J ☐ Hospital
K ☐ Hotel
L ☐ Industrial design
M ☐ Insurance
N ☐ Law office
O ☐ Management consultant
P ☐ Manufacturing
Q ☐ Publishing
R ☐ Real estate
S ☐ Research Development
T ☐ Retail sales
U ☐ Securities broker
V ☐ Transportation (all)
W ☐ Utility
X ☐ Wholesale/Retail sales
Y ☐ Other specify _____

YOUR JOB FUNCTION

III
AA ☐ Accountant
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CC ☐ Consultant
DD ☐ Corporate officer
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FF ☐ Designer (all)
GG ☐ DP/MIS manager operator
HH ☐ Engineer (all)
II ☐ MIS Dir/Mgr
JJ ☐ Programmer
KK ☐ Purchasing
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NN ☐ Securities financial analyst
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PP ☐ Systems analyst
QQ ☐ Other (specify) _____

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MAIL ORDERS must be received by PC EXPO no later than June 19, in which case your show badge will be mailed to you on or before June 25. Mail orders received after June 19 will be processed and the badge held for arrival under the individual's name at the "Will Call" desk in the show lobby. Registration fees must be in U.S. funds. All foreign mail orders, except Canada must be received by June 9, and such badges will not be sent by return mail, but held at the "Will Call" window for pick-up on arrival. All registrations are non-refundable.

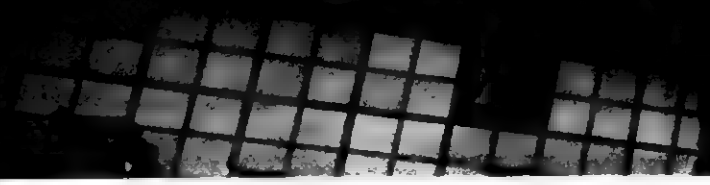
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Volume Buyers
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[illegible]

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(201) 569-8542

Mail Registration Deadline: June 19, 1986

1 2 3 4 5 6

Mailroom: If above person is no longer here, please deliver this to the department, or person with same title.

Product Spotlight/Disaster Recovery Planning

Continued from page 84

Initiation Fee: No
Per Diem/Usage Charge: $100/hour — hot site, $1.25/sq ft — cold site

TOTAL SUBSCRIBERS PER CENTER: 130 total at six sites, 100 per site maximum

COMMENTS: Members have access to all sites; will open sites in Georgia, Florida and Illinois in mid-1986 with Univac and IBM CPUs

KENTUCKY

Datagaard Recovery Services, Inc.
P.O. Box 37144
Louisville, Ky. 40232

TYPE OF SERVICE: Both hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: Honeywell Tandem DPS 6/70, Honeywell DPS 6, 8,600-sq-ft raised floor, 2,500-sq-ft dedicated office space, 400 data lines, 48 2,400 to 9.6K bit/sec. modems
Data and Telecommunications: Tymnet/McDonnell Douglas Network Systems' Public Data Network, AT&T T1 Accunet Reserve, AT&T Switched 56K bit/sec. Accunet
Site Security: 24-hour guard on duty, all doors alarmed to security service, all doors access-secured, closed-circuit TV
Test Time: 48 hours at no additional cost, additional time available

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes, contingency plans and risk analysis
Technical Support: System programming and communications
Data Storage: System software only
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $1,800 to $8,000, depending upon configuration
Term of Contract: One to five years
Initiation Fee: $10,000 to $15,000
Per Diem/Usage Charge: $1,000 to $6,000

TOTAL SUBSCRIBERS PER CENTER: 100

COMMENTS: Not available

MASSACHUSETTS (Burlington)

Digital Equipment Corp.
146 Main St.
Maynard, Mass. 01754

TYPE OF SERVICE: Hot site

SITE CHARACTERISTICS:
Host Computer(s) Supported: DEC VAX-11/780, PDP-11
Data and Telecommunications: Tymnet, communications links
Site Security: Electronic access system
Test Time: 32 hour/year, minimum two test/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: Yes, separately priced
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $2,500/mo
Term of Contract: Not available
Initiation Fee: $3,000
Per Diem/Usage Charge: $1,000 to $2,500/day, limit 30 days

TOTAL SUBSCRIBERS PER CENTER: Not available

COMMENTS: Special recovery insurance available

MASSACHUSETTS (Lexington)

Phoenix Services, Inc.
1762 Massachusetts Ave.
Lexington, Mass. 02173

TYPE OF SERVICE: Hot site

SITE CHARACTERISTICS:
Host Computer(s) Supported: Prime 750
Data and Telecommunications: Dial-up lines, two packet data networks
Site Security: Electronic codes, locked doors to computer
Test Time: Two test/year, each 12 hours; additional available

ADDITIONAL SERVICES AVAILABLE:
Consulting: No
Technical Support: Yes
Data Storage: Yes
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $500 to $1,500/mo
Term of Contract: One year
Initiation Fee: No
Per Diem/Usage Charge: $1,500/day or per system usage

TOTAL SUBSCRIBERS PER CENTER: 14 current, 35 maximum

COMMENTS: Not available

MICHIGAN

Corporate Contingency Services
P.O. Box 805
New Hudson, Mich. 48165

TYPE OF SERVICE: Both hot and cold sites, also offers special replacement services

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM 4341, 3083; shell is 2,000 to 4,500 sq ft; 3,200-sq-ft office space guaranteed
Data and Telecommunications: 200 pair five cable, 30 dial backup units, 24 dial-up lines
Site Security: Yes
Test Time: 48 hour/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: Yes, subscribers only
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $1,800 to $5,000/mo
Term of Contract: One, two and three years
Initiation Fee: $15,000 to $20,000
Per Diem/Usage Charge: $3,000 to $6,000/day — hot site

TOTAL SUBSCRIBERS PER CENTER: 45 current, 60 maximum

COMMENTS: Includes all IBM disk, tape and telecom technologies; IBM 3081 Model K available third-quarter 1986

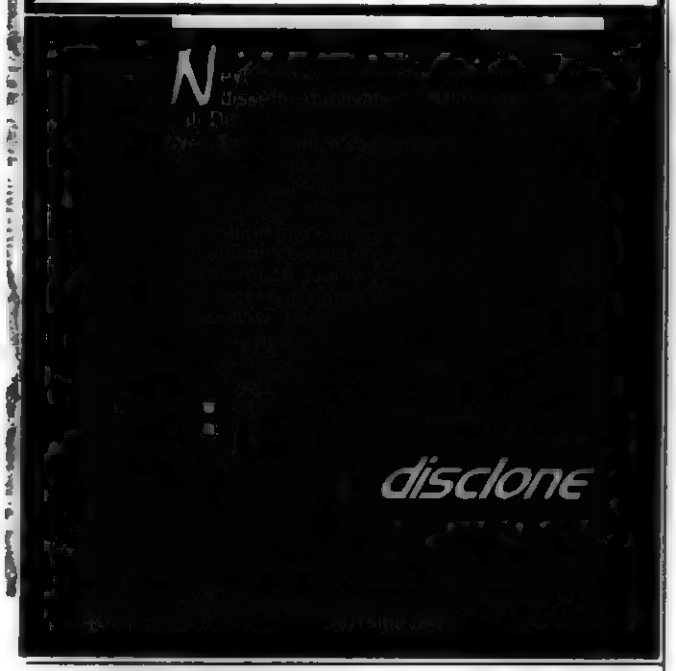
MINNESOTA

Bolgos Corp.
P.O. Box 4707
St. Paul, Minn. 55104

Continued on page 82

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(609) 395-7800

Product Spotlight Disaster Recovery Planning

Continued from page 81

TYPE OF SERVICE: Hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM 3081
Data and Telecommunications: Four-wire leased center
Site Security: Electronic access, clerks, guards when site is in use
Test Time: 96 hour/year — hot site

ADDITIONAL SERVICES AVAILABLE:
Consulting: No
Technical Support: Yes
Data Storage: No
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $1,600 to $5,900/mo — hot, $500 to $1,300/mo — cold
Term of Contract: One-, three- and five-year — hot; one-, three-, five- and seven-year — cold
Initiation Fee: $5,000 to $15,000
Per Diem/Usage Charge: $1,500 to $5,000/day — hot, utilities only — cold

TOTAL SUBSCRIBERS PER CENTER: 60 current for both, 60 maximum for both

COMMENTS: Not available

MISSOURI
Midwest Netsite, Inc.
1905 Manufacturers Drive
St. Louis, Mo. 63026

TYPE OF SERVICE: Hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: Two IBM 370s, IBM 3033 Attached Processor, IBM 4341
Data and Telecommunications: Paradyne PDX and IBM 3705 communications controller, 200 pair communications lines
Site Security: Card key access, radar and motion detectors
Test Time: Four test/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: No
Plan Storage: Yes

PRICING AND AVAILABILITY: Subscription Rates: $900 to $2,150/mo — hot site, $300/mo — cold site
Term of Contract: One, two and three years
Initiation Fee: $5,000
Per Diem/Usage Charge: $1,500/day — hot site; $200/day — cold site

TOTAL SUBSCRIBERS PER CENTER: 10 current; 55 maximum

COMMENTS: Not available

MONTANA
Comserve, Inc.
P.O. Box 2547
Billings, Mont. 59103

TYPE OF SERVICE: Hot site (primary)

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM System/36 Model 5 with one-billion-character on-line storage
Data and Telecommunications: IBM 5251 Model 12 CRT, 4.8K bit/sec. modem, two telephone lines, more available on request
Site Security: Combination lock and password security
Test Time: 36 hour/year, required; additional $125/hour

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: No, minimum storage only
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $800/mo
Term of Contract: Three-year minimum
Initiation Fee: $3,500
Per Diem/Usage Charge: $2,500/day

TOTAL SUBSCRIBERS PER CENTER: 10 current, 50 maximum

COMMENTS: Special System/36 disaster recovery manual, run applications by telephone link or on-site

NEW JERSEY (Carlstadt)
Comdisco Disaster Recovery Services, Inc.
6400 Shafer Court
Rosemont, Ill. 60018

TYPE OF SERVICE: Hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM 3084, 3081, 3083 and 4341; standby check processing systems; 15,000-sq-ft office and storage space
Data and Telecommunications: Comnet 2 and 3 network, 300 to 9.6K bit/sec. modems
Site Security: 24-hour security service
Test Time: 32 to 48 hour/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: No
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $1,600 to $5,900/mo — hot site
Term of Contract: One to five years
Initiation Fee: $10,000 to $60,000 — hot
Per Diem/Usage Charge: $2,500 to $20,000/day — hot site

TOTAL SUBSCRIBERS PER CENTER: 200 current total, 100 maximum per hot site

COMMENTS: Contact vendor for additional services

NEW JERSEY (Teterboro/Paramus)
[illegible]
[illegible]
[illegible]

TYPE OF SERVICE: Hot site

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM 4341
Data and Telecommunications: IBM 3705 communications controller, [illegible]
Site Security: 24-hour [illegible]
Test Time: 40 hour/year

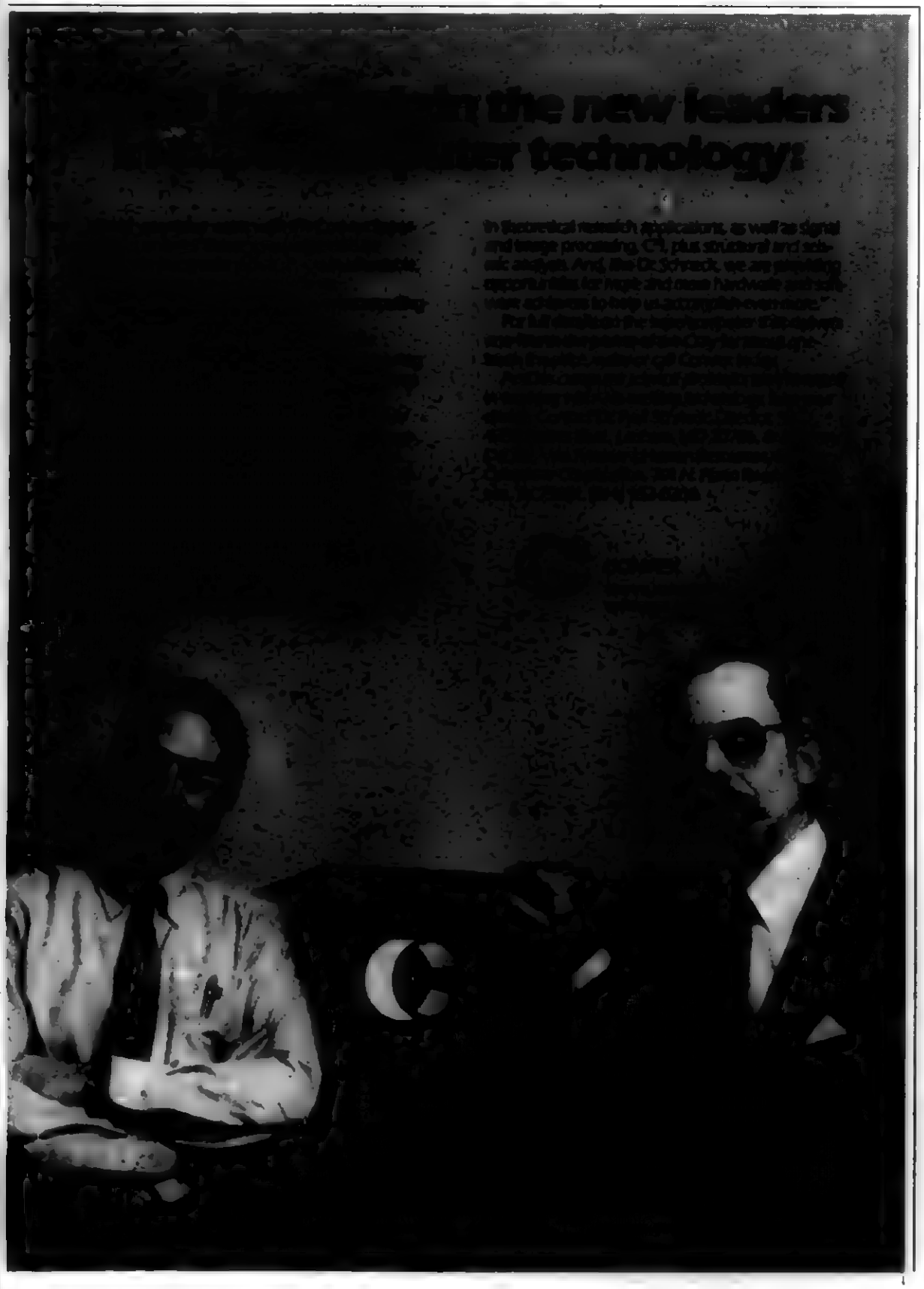
ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: No
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $1,600 to $5,900/mo
Term of Contract: Three to five years
Initiation Fee: No
Per Diem/Usage Charge: $2,500/day, no usage limit

TOTAL SUBSCRIBERS PER CENTER: 20 current, 40 maximum

COMMENTS: Will be opening a hot site in southern New Jersey in mid-1986

Continued on page 84



IRMA isn't getting older. She's just getting better.

Four years ago the first PC talked to a mainframe in the 3270 environment. And it was DCA's IRMA™ that made it happen. Since then over 250,000 IRMA boards have been sold with virtually every Fortune 500 company owning at least one.

But the real success of any technology is whether it can stand the test of time. From the outset we knew that if IRMA was to last, she would have to grow. Users of IBM® PCs, XTs, ATs and compatibles would demand more and more enhancements to the basic IRMA technology. And their demands would have to be satisfied.

Which is exactly what we've done.

Family planning.

Our first concern was to make IRMA's file transfer capability faster. That's why we developed IRMAlink FT/TSO & FT/CMS™.

Bundled together and free with the purchase of an IRMA board, it's flexible enough for the inexperienced user to initiate file transfers easily and the more experienced to customize transfers to the mainframe environment.



IRMA. It made PC-to-mainframe communications possible.

If your PC uses PROFS/PCC, PS/PC or 3270 file transfer you can now use IRMAlink FT/3270™ to send and receive mail and document files.

Some of our customers wanted software that would enable them to view their PC and terminal screens simultaneously.

We gave them IRMAlink Windows™. It increases user productivity dramatically by managing PC, mainframe and notepad applications on the same screen.

Many of our customers who already were accustomed to the keyboard of the 3278 felt awkward with the PC keyboard. And vice versa. We responded with the IRMAkey/3270™. It's a keyboard that places



IRMAlink. Software that extends IRMA's power.

all the 3278 and PC functions together. No matter whether users learned on an IBM PC or 3278, they'll feel comfortable and be more productive with the IRMAkey/3270.

With all these enhancements, IRMA was truly becoming a more powerful business tool.

But what about the PC user who was remote from the mainframe?

Life without IRMA.

The idea was to put IRMA technology in the hands of remote PC users without the unreasonable cost of buying another controller. Enter IRMAcom™.

IRMAcom is a board that gives your remote PC users economical, high-speed access to the front-end processor. Instead of having to buy a controller to handle one or several remote locations, you can now use IRMAcom and a synchronous modem

for communications with the host over switched or leased lines. And it comes with one of four versatile software packages.



IRMAcom. A board that makes remote PCs communicate with the mainframe without the need for a controller.

If you do have a port available on your controller, all you really need for remote communications is IRMAline.™ It provides remote PCs or asynchronous terminals with dial-up access to 3270 controllers.

There is also another extremely useful standalone emulation unit that can be used without IRMA. It's called IRMAprint.™



IRMAprint. It allows just about any printer you want work in the 3270 environment.

IRMAprint quite simply convinces the mainframe that it's talking to a 3287 printer. So now you can buy the printer that best satisfies your needs, workflow and budget instead of being forced to buy the 3287.

IRMA has powerful friends.

One of the most crucial criteria used in deciding on a technology that will be used in your company is also one of the hardest to answer. Does it have staying power?

Others have answered that. Others like Cullinet Software,™ Lotus Development Corporation,™ Information Builders, Inc.,™ MSA,™ McCormack & Dodge,™ On-Line Software International,™ Micro Tempus™ and a host of others. All of these companies have invested their time, expertise and money into developing applications software that extends the power of IRMA and makes it even more productive.



IRMAkey/3270. It combines the best features of IBM PCs and terminals.

Put it all together. The 250,000 IRMAs installed. The continuing development of new product enhancements. Our third-party software vendors. Once you do we think you'll agree that there is no smarter, safer or better choice than the industry standard in 3270 micro-to-mainframe communications. The IRMA family.

Put that family to work for you now. And in the future.

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Product Spotlight Disaster Recovery Planning

Continued from page 82

NEW JERSEY (Princeton)

Mobile Computer Recovery
211 College Road E.
Princeton, N.J. 08540

TYPE OF SERVICE: Both hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM 3070, 4300 series; NCR 8575 II, supports NCR V series. 8500 and 8600 CPUs; shell available for any computer type
Data and Telecommunications: Permanent hot site only — 22 ports, up to 64 available; NCR Model 621 multiplexer
Site Security: Wells Fargo Computer Security
Test Time: Two test/year, eight hours each, additional $150/hour

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: No
Plan Storage: Yes

PRICING AND AVAILABILITY: Subscription Rates: $400 to $1,800/mo — hot; $300/mo — shell
Term of Contract: One, three or five years
Initiation Fee: Equal to three-month subscription
Per Diem/Usage Charge: $1,500/day — hot site; $500/day — shell

TOTAL SUBSCRIBERS PER CENTER: Eight current — hot, 35 maximum

COMMENTS: Mobile hot sites, cold sites and office sites also available

NEW YORK

Hoot Consulting Services, Inc.
595 Getty Road
Ridgewood, N.J. 07450

TYPE OF SERVICE: Hot site

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM 4381, shell space is limited
Data and Telecommunications: IBM 3725 communications controller, 160 phone lines
Site Security: 24-hour base, guards, card access
Test Time: 40 hour/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: Yes, limited
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $1,800 to $3,500/mo
Term of Contract: Three to five years
Initiation Fee: No

Per Diem/Usage Charge: $2,000/day; no usage limit

TOTAL SUBSCRIBERS PER CENTER: 20 current; 40 maximum

COMMENTS: Will be opening a hot site in southern New Jersey in mid-1986

NORTH CAROLINA

Comprecovery
1168 Weston Parkway
Cary, N.C. 27511

TYPE OF SERVICE: Hot site

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM-compatible mainframe running DOS/VSE, MVS, VM plus other operating systems; one idle CPU for recovery use
Data and Telecommunications: 300-1,200 bit/sec. asynchronous dial-up; 2,400-14,4K bit/sec. synchronous dedicated and dial-up lines
Site Security: Outside key access; card and code entry to computer
Test Time: Three test/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: No
Technical Support: Yes
Data Storage: No
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $1,000 to $8,000/mo
Term of Contract: Three to five years
Initiation Fee: $10,000
Per Diem/Usage Charge: $1,500/day

TOTAL SUBSCRIBERS PER CENTER: Five current, 50 maximum

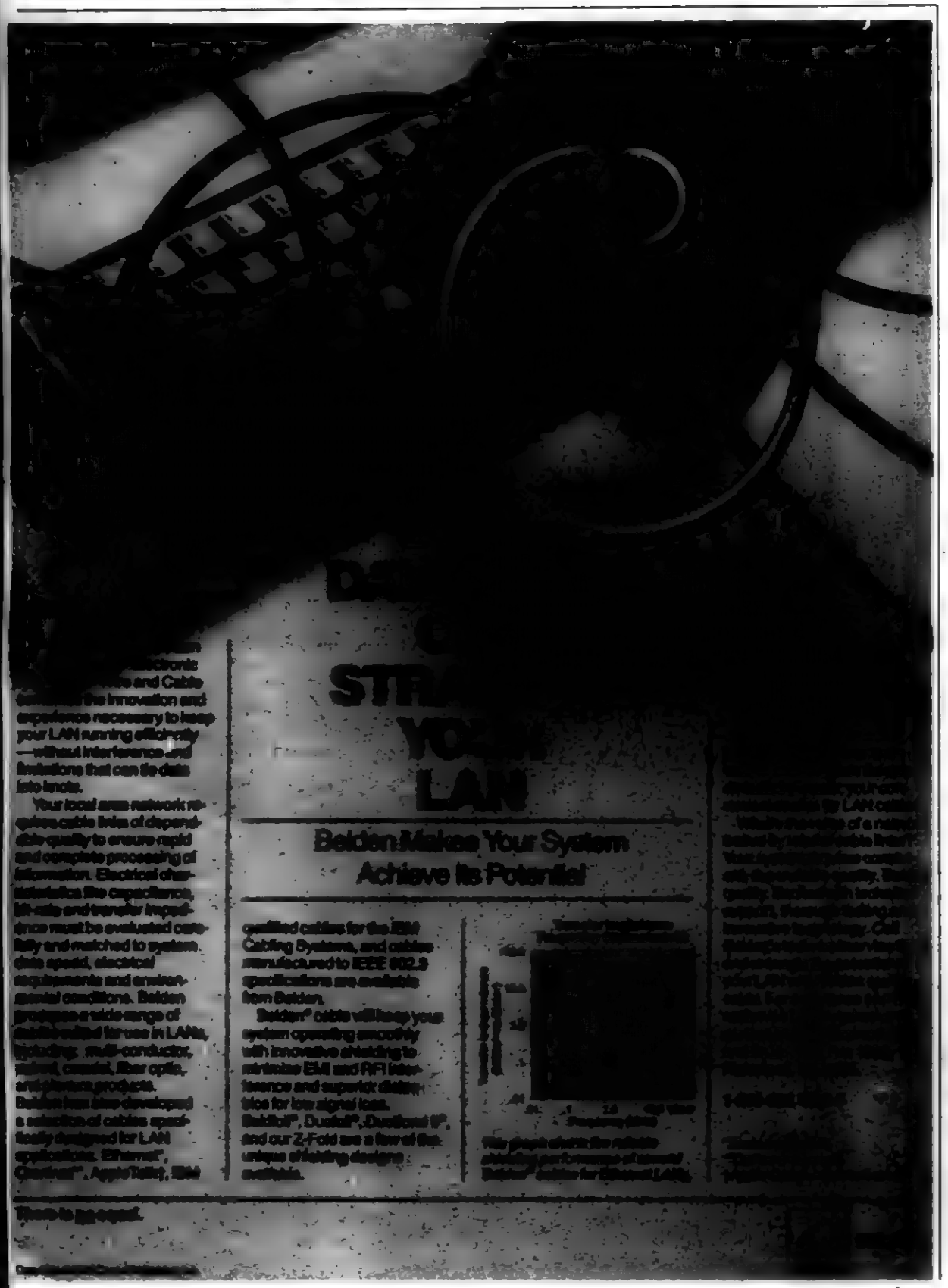
COMMENTS: Vendor also has site providing two CPUs with IBM RACF security software

Ohio (Bagdad)

[illegible]
3700 S. Potomac Blvd.
Dayton, Ohio 45479

TYPE OF SERVICE: Hot site

SITE CHARACTERISTICS:
Host Computer(s) Supported: NCR 8635, 8654 Model 2, portable or running NCR 1955a, 1955b and 8530M CPUs; other models available
[illegible] Telecommunications: 100 lines with modems, modems available
[illegible]: Full-time Alarm Service
[illegible]: Electronic and guards, video-taped CCTV coverage
[illegible]: Two tests/year, usually 48 hours for each test
[illegible]: [illegible]
[illegible]: Yes
[illegible]: Yes, varies [illegible] multi-year plan
[illegible]: [illegible]
[illegible]: $2,000 to $7,200
[illegible]: Yes
[illegible]: One or two years
[illegible]: [illegible]
[illegible]: [illegible]
[illegible]: [illegible]



Belden Makes Your System Achieve Its Potential

[illegible] and Cable [illegible] the innovation and experience necessary to keep your LAN running efficiently —without interference and limitations that can tie data into knots.

Your local area network requires cable links of dependable quality to ensure rapid and complete processing of information. Electrical characteristics like capacitance, bit-rate and transfer impedance must be evaluated carefully and matched to system data speed, electrical requirements and environmental conditions. Belden produces a wide range of data-related [illegible] in LANs, including: multi-conductor, twisted, coaxial, fiber optic, and plenum products. Belden has also developed a selection of cables specifically designed for LAN applications. Ethernet®, Omninet®, AppleTalk®, IBM qualified cables for the IBM Cabling Systems, and cables manufactured to IEEE 802.3 specifications are available from Belden.

Belden® cable will keep your system operating smoothly with innovative shielding to minimize EMI and RFI interference and superior dielectrics for low signal loss. BeldAd®, DuoAd®, DuoBond II®, and our Z-Fold are a few of the unique shielding designs available.

This graph shows the relative shielding performance of Belden® cables for Ethernet LANs.

There is no equal.

Product Spotlight Disaster Recovery Planning

PENNSYLVANIA
(Newtown)
Continental Computer
Assurance Corp.
125 Pheasant Run
Newtown, Penn. 18940

[TYPE OF SERVICE: Both, cold site facility] ...to hot-site subscribers

"Not now, I've got a headache."

—Computer backup excuse #14

It's not a very good excuse.

But when it comes to doing computer backup, any excuse will do. Because backing up, let's be brutally honest, is somewhat short of the thrill-a-minute category.

Not backing up, on the other hand, can really be exciting. Involving some interesting things like travel to other cities (while you're looking for another job), and the fun of even entering a whole new line of work.

After one big failure on disk the night before a big meeting, the programmer (who didn't back up) was so crushed that he hung up his business suit and joined the ministry. No kidding.

And if that doesn't make you want to back up your data religiously, we don't know what will.

To learn more about backup and other applications of the data cartridge, a 3M developed technology whose time has come, contact your local computer products dealer.



When you run out of excuses.™

Continued from page 87

Per Diem/Usage Charge: $150/hour, no maximum usage

TOTAL SUBSCRIBERS PER CENTER: 33 current, 60 maximum

COMMENTS: Not available

PENNSYLVANIA (Philadelphia)

Sungard Recovery Services, Inc.
1285 Drummers Lane
Wayne, Pa. 19087

TYPE OF SERVICE: Hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM 3033, 3081 Model G, 3081 Model KX, and 3083 Model JX; 4,000-sq-ft office space; will add IBM 3090 in mid-1986
Data and Telecommunications: 120 dial-up lines, 1,800/2,100 bit/sec. twisted-pair cable
Site Security: Card key access, closed-circuit TV, 24-hour guard
Test Time: 32 to 48 hour/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: No
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $3,100 to $12,000/mo — hot site
Term of Contract: One to five years, four-year average
Initiation Fee: $25,000 — hot
Per Diem/Usage Charge: $4,500 to $8,000/day — hot site

TOTAL SUBSCRIBERS PER CENTER: 360 current Pennsylvania and Illinois total, 440 maximum both sites total

COMMENTS: Will be adding site in Canton; check service available including magnetic ink character recognition, proof encoding, check transaction, check clearing

PENNSYLVANIA (Warminster)

Disaster Control, Inc.
P.O. Box 2639
Warminster, Pa. 18974

TYPE OF SERVICE: Hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: Burroughs V 380, B7900 Model F
Data and Telecommunications: 150 data lines, modems and test equipment
Site Security: Electronic access controls
Test Time: Two test/year (one day each approximate duration)

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes, limited
Technical Support: Yes
Data Storage: No
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $1,000 to $6,500/mo, based on subscriber configuration
Term of Contract: One year
Initiation Fee: $10,000
Per Diem/Usage Charge: Contact vendor

TOTAL SUBSCRIBERS PER CENTER: 50 current, 75 maximum

COMMENTS: Not available

TEXAS (Fort Worth)

Data Processing Security, Inc.
200 E. Loop 820
Fort Worth, Texas 76112

TYPE OF SERVICE: Hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: Burroughs B7800, 20,000-sq-ft raised floor, 15,000-sq-ft office space
Data and Telecommunications: 1,200 data pairs
Site Security: Badge controls, alarmed doors, closed-circuit TV, Halon fire protection systems
Test Time: 24 hour/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: Yes
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $2,500/mo — hot site, $1,000/mo — cold site
Term of Contract: Three years — hot, seven years — cold
Initiation Fee: No
Per Diem/Usage Charge: $250/hour — hot site, $1.25/sq ft — cold site

TOTAL SUBSCRIBERS PER CENTER: 130 total at six sites, 100 per site maximum

COMMENTS: Members have access to all sites; will open sites in Georgia, Florida and Illinois in mid-1986 with Univac and IBM CPUs

TEXAS (Grand Prairie)

Comdisco Disaster Recovery Services, Inc.
6400 Shafer Court
Rosemont, Ill. 60018

TYPE OF SERVICE: Hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM 3081 and 4341, 8,000-sq-ft office and storage space, standby check processing system available
Data and Telecommunications: Comline 2, 300 to 9.6K bit/sec. modems, 900 wire pairs
Site Security: Badge readers
Test Time: 32 to 48 hour/year, additional available

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: No
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $1,450 to $13,000/mo — hot site
Term of Contract: One to five years
Initiation Fee: $10,000 to $50,000 — hot
Per Diem/Usage Charge: $2,500 to $20,000/day — hot site

TOTAL SUBSCRIBERS PER CENTER: 110 current total, 100 maximum per CPU

COMMENTS: Contact vendor for cold-site pricing

TEXAS (Houston)

Data Processing Security, Inc.
200 E. Loop 820
Fort Worth, Texas 76112

TYPE OF SERVICE: Hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM 3080 series, 15,000-sq-ft raised floor, 12,000-sq-ft office space
Data and Telecommunications: 300 data pairs
Site Security: Badge controls, alarmed doors, closed-circuit TV, fire protection systems
Test Time: 24 hour/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: Yes
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $1,500/mo — hot site, $1,000/mo — cold site
Term of Contract: Three years — hot site, seven years — cold site
Initiation Fee: No
Per Diem/Usage Charge: $250/hour — hot site, $1.25/sq ft — cold site

TOTAL SUBSCRIBERS PER CENTER: 130 total at six sites, 100 per site maximum

COMMENTS: Members have access to all sites; will open sites in Georgia, Florida and Illinois in mid-1986 with Univac and IBM CPUs

UTAH

Data Processing Security, Inc.
200 E. Loop 820
Fort Worth, Texas 76112

TYPE OF SERVICE: Both hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: Amdahl V8, 4,000-sq-ft raised floor, 4,000-sq-ft office space
Data and Telecommunications: 300 data pairs
Site Security: Badge controls, alarmed doors, closed-circuit TV, fire protection systems
Test Time: 24 hour/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: Yes
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $1,500/mo — hot site, $1,000/mo — cold site
Term of Contract: Three years — hot, seven years — cold
Initiation Fee: No
Per Diem/Usage Charge: $100/hour — hot, $1.25/sq ft — cold

TOTAL SUBSCRIBERS PER CENTER: 130 total at six sites, 100 per site maximum

COMMENTS: Members have access to all sites; will open sites in Georgia, Florida and Illinois in mid-1986 with Univac and IBM CPUs

WASHINGTON

Weyerhaeuser Recovery Services
CCB-3C
Tacoma, Wash. 98477

TYPE OF SERVICE: Hot site

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM 3083 and 4341, DEC VAX-11/780, Honeywell DPS 8, Hewlett-Packard HP 3000 Series 58
Data and Telecommunications: 200 voice and data lines, 300 to 56K bit/sec. modems, T1 service
Site Security: Restricted access, card key and passwords
Test Time: 48 hour/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: No
Plan Storage: Yes.

PRICING AND AVAILABILITY:
Subscription Rates: $2,500 to $6,000/mo
Term of Contract: One or three years
Initiation Fee: None, minimum usage four days
Per Diem/Usage Charge: $2,000 to $6,000/day, maximum eight weeks

TOTAL SUBSCRIBERS PER CENTER: Six current/CPU; 48 maximum/CPU

COMMENTS: Laser printers, IBM 3800 Model 3 available

This chart was adapted from a February 1986 report, "Datapro Reports on Information Security," published by Datapro Research Corp., a Delran, N.J.-based market research firm. Further information is available from the site providers.

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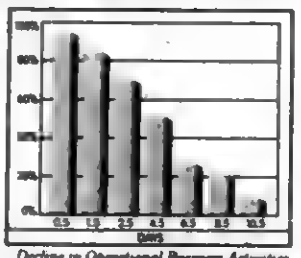
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In Depth

Managing from the bottom up

Tips on becoming a more effective subordinate



CW PHOTO BY R. CHARLES LADOUCEUR

Managing the boss does not mean manipulating, subverting or out-politicking your supervisor. Employees can improve the quality of their work lives by exploring how their styles and their bosses' styles mesh.

By GIL GORDON

Do any of these scenarios sound familiar to you?

● Alex, a systems analyst, can't figure out why his boss grimaces and frowns when told about all the support Alex has been providing to a product manager in one of the company's smaller marketing divisions. Alex has made more headway than anyone else with this product manager, but the boss still seems to be upset about it.

● Lee, a programming manager, squirms in her seat as she sits through yet another meeting during which her boss struggles through his attempt at making a presentation. Talking in front of a group is easy for Lee — if only her boss didn't have such a hard time.

● Steve, a computer operations manager, is action oriented and likes to make decisions fast. His boss drives him crazy — she always has to think things through down to the smallest detail. She's always after Steve to plan things out and consider all the options, but he would rather act on his instincts.

What factor do these three situations have in common? These people are not managing upward effectively. In other words, they are not managing their bosses as well as they could. Managing the boss should not be a taboo subject. Just think about it — we teach people to manage down to their subordinates, and more and more organizations are teaching people to manage across in dealings with users or peers. The next logical step is to teach people to manage upward.

As technology advances and end-user computing grows, most DP personnel find that the old rules about what has to be done to please the boss have changed. Bosses at all levels face new pressures regarding the role of data processing, pressures that translate to new pressures on the boss-subordinate relationship.

People who manage their bosses enjoy two benefits. First, they make life easier for themselves and their bosses. Second, they make themselves more valuable to the organization and to the boss because they are more effective and versatile in their role as subordinates. In the long run, this reflects well on the subordinate as well as on the manager.

The phrase "managing your boss" can conjure up a host of negative images. Far from being Machiavellian in nature, though, managing the boss simply means looking beyond the scope of your own job, carefully assessing how you and the boss get along and working on making yourself more valuable.

Above all, managing the boss does not mean manipulating, subverting or out-politicking the boss. Few people who rely heavily on those tactics are successful over time.

"I've seen people overmanage the boss, and they forget he's the boss," notes Allan Deering, director of management information services at Pepsico, Inc. "They try to manage around the boss; this might work in the short run but fails in the long run."

Some practical strategies are available to help you understand some of

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Gordon is president of Gil Gordon Associates, a human resource consulting firm in Monmouth Junction, N.J. He edits the newsletter "Telecommuting Review" and consults on telecommuting implementation.

the critical aspects of the boss-subordinate relationship, assess and improve the way you are managing your boss and build on the strengths already in the relationship.

Help the boss

Why is it important to manage upward? Why should you be concerned about being a more effective subordinate?

If you can create a mutually satisifying relationship, it's bound to help your career. Your boss can be your biggest supporter — if the two of you work well together. In addition, you both won't be wasting time and energy resolving problems between the two of you; that energy and time instead will be spent on getting the job done.

> ***Managing the boss means looking beyond the scope of your own job, assessing how you and the boss get along and working on making yourself more valuable.***

Being a manager is not an easy job, and many bosses need help being a boss. They may not readily admit this fact, but it is to their advantage — and ultimately to yours — when you help the boss be more effective.

In addition, if you and your boss don't maintain a good working relationship with at least a moderate amount of trust and cooperation, you — not the boss — will suffer.

Don't make the mistake that some people do by putting too much emphasis on managing their bosses and not enough on managing their own jobs. Your boss is most interested in the quality and consistency of your performance.

If you are not doing the job you're expected to do, managing the boss better probably will not help one bit.

Gaining insight

Some of the technologies often used by DP people can help deal with the pressures of the boss-subordinate relationship. Harold Farin, vice-president of information systems at The Prudential in Roseland, N.J., points to the benefits of electronic mail.

"We send a lot of notes to each other via E-mail instead of taking the time to write and send a formal memo. It's a good way to keep the boss posted, and the boss, in turn, can respond quickly when need be," Farin notes.

Two short exercises can help you gain some insight into how well you work with your bosses. First, make a list of all the bosses you've had for at least the past five years.

Divide the names on this first list into three sub-lists: the people with whom you had no problems, those with whom you had some problems and the ones that caused many problems. Then look for patterns or common factors that might help explain the groupings.

Don't look only at the boss' characteristics; look also at your own performance, the type of work and other variables. If you find, for example, that you have never worked well with a boss who is very unstructured and supplies you with only the most general direction, this should tell you that you have to manage that kind of situation by working with the boss to define your job goals and expectations better.

Second, take a few minutes to complete the following sentences. (These are adapted from an excellent book, *How to Manage Your Boss*, by Christopher Hegarty, Ballantine Books, 1985.) The answers will help you focus more on what fuels the relationship between you and your boss.

— My boss and I get along best when . . .

— If I were in my boss' position I would . . .

— My boss could get more out of me by . . .

— The thing about my boss that most upsets me is . . .

— The thing I don't understand about my boss is . . .

— As a boss I would never . . .

— As a boss I would always . . .

Your answers should give you useful information about friction areas with your



> ***Don't make the mistake of putting too much emphasis on managing your boss and not enough on managing your own job. Your boss is most interested in the quality and consistency of your performance. If you are not doing the job you're expected to do, managing the boss better probably won't help one bit.***

boss, how well you understand what the boss is up against and how much you're aware of areas that need improvement.

For instance, if your answer to "My boss could get more out of me by . . ." is "giving me more responsibility for user contracts," ask yourself why this isn't happening now.

If it is because you have not made your wishes clear, you have to take the responsibility to make it happen.

But if it is because your boss is unwilling to entrust that contract to you, take a hard look at what you can do to earn that trust — and then approach your boss with a well-developed plan.

Now, let's look in detail at Alex, Lee and Steve and the three major areas of managing the boss.

In your boss' shoes

The first area involves gaining an understanding of your boss' goals and objectives and being aware of some of the problems and pressures a boss faces.

Alex couldn't figure out why his boss was not more enthusiastic about Alex's accomplishments with the product manager. One explanation — although there could be many — is that Alex did not realize how his boss views that manager and his role. Consider these possibilities:

— Alex's boss and the product manager aren't getting along, and Alex's efforts to make inroads in that area are like rubbing salt in his boss' wounds.

— Alex's boss knows that limited resources mean he must allocate his staff's time carefully. If the company's marketing division does not account for much sales volume, maybe it would make better business sense for Alex to spend his time elsewhere.

If you can stand in your boss' shoes and profile the world from that point of view, you're going to perform your job better.

"When a subordinate tries to see things from the boss' viewpoint, it's an opportunity to learn and grow," explains Mary Alice Johnson, information center manager at Mutual Benefit Life Insurance Co. in Newark.

"If I as the boss feel my subordinates are trying to understand my situation better, our work relationship improves."

To see how well you can stand in your boss' shoes, try answering the following questions. If you have trouble coming up with replies, it might pay to do some digging to uncover what's important to your boss and act accordingly.

- What are my boss' three most important priorities?
- Who are the three managers (in areas we deal with) with whom my boss has a good working relationship — and from which three is he most distant?
- What does my boss' boss expect of my boss — and how does that affect what my boss expects of me?
- What are the one or two things my boss is working on that are can't-fail projects or systems?

"You have to have a clear understanding of what the boss expects of your function," Pepsico's Deering warns. "For example, if the boss doesn't like to get calls from users who are upset when the data center has problems, you'd better make that a top priority."

The answers to the preceding questions can help you improve your relationship with your boss by tailoring your work activities to match what's important to the boss.

Alex, for example, would have been better off spending less time with that one

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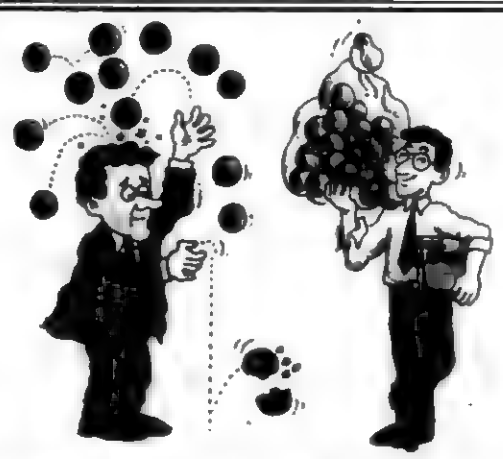
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The boss' style vs. your style

	My Boss's Style	My Style is Like / Unlike
Is the boss a listener (prefers to hear and talk) or a reader (prefers to read and write) when it comes to discussing ideas, problems or plans with you?		
Is the boss a preparer (prefers to plan and organize extensively before meetings or presentations) or an ad libber (prefers to do only minimal preparation and would rather wing it)?		
Is the boss a doer (prefers to decide quickly on action steps and implement them) or a planner (prefers to analyze, review and plan in detail first before taking action)?		
Is the boss an actor (tends to be very energetic, enthusiastic and expressive) or a reactor (tends to be more subdued, calm and show little emotion)?		
Is the boss a teacher (prefers to give out step-by-step instructions and coach in detail) or a resource (prefers to give only general guidelines then be available for help if needed)?		

This list shows five of the more common elements of work style, each characterized by two opposite extremes. Employees can choose the description in each item that best fits their boss, then note if their style matches that of their boss.

division or perhaps just calling less attention to his work there.

Turn skills into assets

The second goal is to look at how your skills compare with those of your boss and find ways to support your boss in areas where your skills complement the boss'.

If you are better at doing something than your boss is, you probably have seen times when you wished you could have stood in for the boss, as Lee did while her boss made the presentation.

Bosses and subordinates short-change themselves if they won't play mix and match with their respective skills vis-a-vis their job requirements.

If you do something better than your boss, try to suggest that the responsibility be delegated to you the next time it comes up. Lee might offer to do part or all of the next presentation or just offer some tips for being more at ease in front of a group.

> ***"When a subordinate tries to see things from the boss' viewpoint, it's an opportunity to grow. If I feel my subordinates are trying to understand my situation better, our relationship improves."***
>
> — Mary Alice Johnson
> Mutual Benefit Life Insurance Co.

Be careful, though, that you don't give the impression of trying to upstage the boss. Stress to your boss the benefits — more time, less trouble, improved department image — of delegating that task as well as what is in it for you.

Make a list of several skill areas in which you perform a task better than the boss or do it as well but enjoy doing it more. These are the areas where you might be able to backstop your boss and make his life easier.

DP professionals must make special considerations when they find they are more knowledgeable than the boss is about the technical details. Deering points out, "People sometimes end up in this field with a boss who doesn't understand some of the technology. The subordinate has to do some training, but it must be done constructively, almost in a subliminal way. You can't act like the know-it-all, nor can you go to the other extreme and spoon-feed the boss."

Analyze differences and adapt

Here, the goal is to become aware of differences in your preferred operating style vs. the boss', and work to close the gap if possible or (more likely) adjust your style to that preferred by the boss.

There's an old cliche about managers' views on different styles: "There are two ways to do the job," the boss says, "my way and the wrong way." While some managers might still act this way, let's hope they are fast becoming the rare exceptions in today's business world.

Nevertheless, the boss does have a preferred way of doing everything from planning and problem solving to writing memos and arranging the top of a desk.

There is no need to mimic the boss; that can make everyone uncomfortable. However, there are certain areas in which major style differences can lead to problems (see chart above).

You will probably find that pinpointing style mismatches helps

explain problems with the boss. However, if you find that these mismatches occur, don't automatically assume you have to change.

Savvy bosses often look for subordinates who are different — they want the synergy that can result from those "Two heads (or styles) are better than one" situations. You only need to consider changing if the style differences are making you or your boss very uncomfortable or less productive.

In Steve's case, his tendency to act on his instincts might be a real plus in the day-to-day operations environment — if his instincts are right. He might tone down the impulse to act on his instincts or, better yet, use them to help sketch out the elements of a plan when dealing with his boss on long-range projects such as capacity planning.

Steve probably is not going to get his boss to shoot from the hip more often and will only create friction if he does not adapt his style.

Achieving a balance

Knowing how much to tell the boss and when to do it are perhaps the most critical skills of all.

"It's important to feed the right amount of information up, and it's all too easy to pass on too much of the nuts and bolts," Prudential's Farin says. "However, the other extreme is to keep the boss in the dark, and that's no good either."

Johnson of Mutual Benefit Life sums this up well: "I know that my people want to solve things themselves, and they don't want to feel like they can't handle certain problems. But they should at least keep me informed and know when to refer a problem that's beyond the scope of their skills or one that's in a sensitive area." ■

> ***There's an old cliche: "There are two ways to do the job," the boss says, "my way and the wrong way." While some bosses might still act this way, let's hope they are becoming the rare exceptions.***

Working hard to be an asset

A topic as important and complex as managing the boss cannot be reduced to a simple checklist. However, some of the highlights of this process are as follows:

- Do [illegible] yourself for your boss' [illegible]
- Do [illegible] yourself how you can [illegible]
- Do [illegible] for clues about the boss' preferred work style — and adjust [illegible] style if possible.
- Do [illegible] to be an asset to your boss by reliable, [illegible] your job well and anticipate your boss' needs.
- Don't [illegible]
- Don't [illegible]

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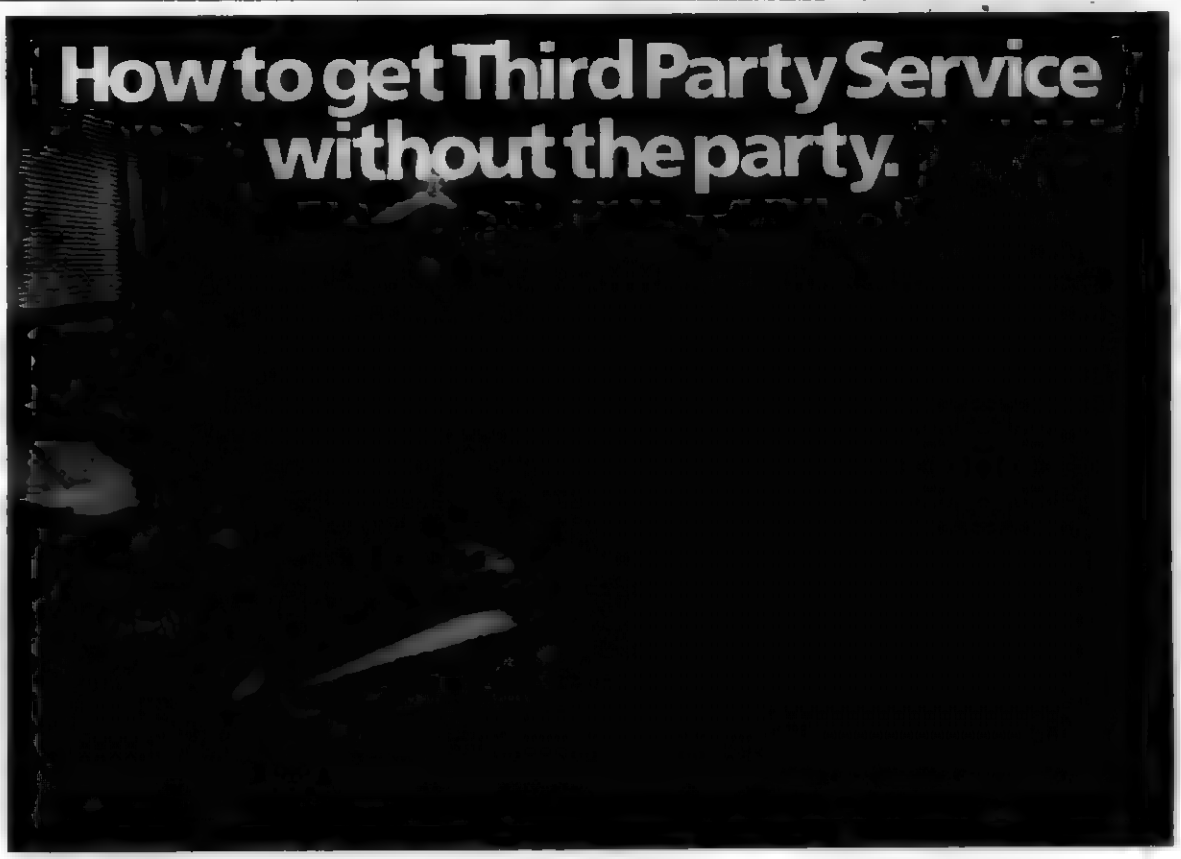
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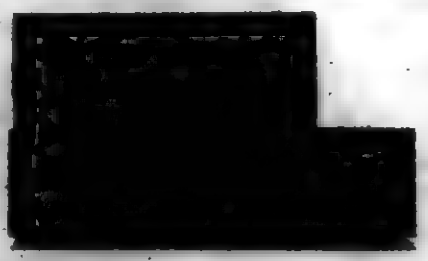
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In Depth

Speeding software delivery

Acceleration can make a large-scale project more costly, but the extra expense may be justified. Bringing a new system "live" one or two years earlier means reaping its benefits — savings, profit increment or market leadership — that much sooner.

By RICHARD LEFKON

One problem with large-scale programming efforts is that by the time the system is finished, the business it serves may have evolved into something distinctly different. Users will not stand by quietly without good cause if their key systems are frozen for a lengthy period to accommodate the programming department.

When time means money, time frame acceleration can make a large-scale project more costly, but the extra expense may be justified by return on investment and other considerations.

Unaccelerated, a typical system plan might call for four professionals to spend four years each to put in the new system or enhancement. But perhaps the business users cannot wait for more than 18 months to receive the working functions. Using a number of simple DP management practices — grouped under the strategy of concurrent phasing — can speed the process to meet the users' schedule, although at a higher cost.

The 16 man-years, originally spread over four years among four people, might appear at first glance to be covered easily in 1½ years by 11 or fewer people (since 1½ x 11 = 16½ man-years). In reality, management and interfacing costs would probably raise the required manpower to 13, 14 or even 15 people to get the job done in the shorter time.

Bringing the new system live significantly earlier means that the resulting benefits in savings, profit increment or marketplace leadership are cumulatively in effect for that much longer. Business users pay attention to this return on investment.

There also are operational benefits:

- Employee salaries and consultant costs will be billed at today's rates rather than increase steadily over time.
- The new system can use state-of-the-art software rather than, for instance, a data base package that has aged several additional years upon system delivery.
- The necessary freezing of present procedures will be shorter and cause correspondingly less disruption to the conduct of business.

Once upper management decides to pay for accelerating the project, the recommended strategy to accomplish this acceleration is concurrent phasing. This umbrella approach unites the concepts of subtasking; ganging, or grouping, and reordering tasks; team separation; data base definition; and modeling. The first three of these are best explained in terms of frequent milestones, ganged labor, checkerboard technique, documented interfaces and the phasing concept itself.

Frequent milestones

Progress should be measured as a count of successive milestones, not as an estimated percentage of work completed. Basic to the other practices discussed here is the need for dividing tasks finely enough. Avoiding any overly long tasks is especially important at project start-up, where it often happens that at least some tasks are inadvertently grossly underestimated.

For instance, consider two similar tasks: X, which is expected to take a week, and Y, which is scheduled for two months. Task X is inherently easier to manage than the longer Task Y. If Task X is running late, management will know by the end of that week and will be able to take action.

Even with the most competent and trusted programmer, no large task such as Y should be allowed to stand as is without negotiating a subdivision into one-week-or-less verifiable milestones. If this practice is new to the programming unit, a staff member may experience discomfort in the first such negotiation. It is up to the manager to persist in getting the programmer to identify and commit to each subtask.

A manager does well to offer supplementary staffing or reasonable added time for subtasks that, once isolated, are discovered to be more complex than originally assumed. This

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Lefkon is an assistant vice-president and a programming manager for Citicorp Investment Bank, New York. He also trains corporate executives in DP management through regular courses and seminars at New York University's School of Continuing Education.

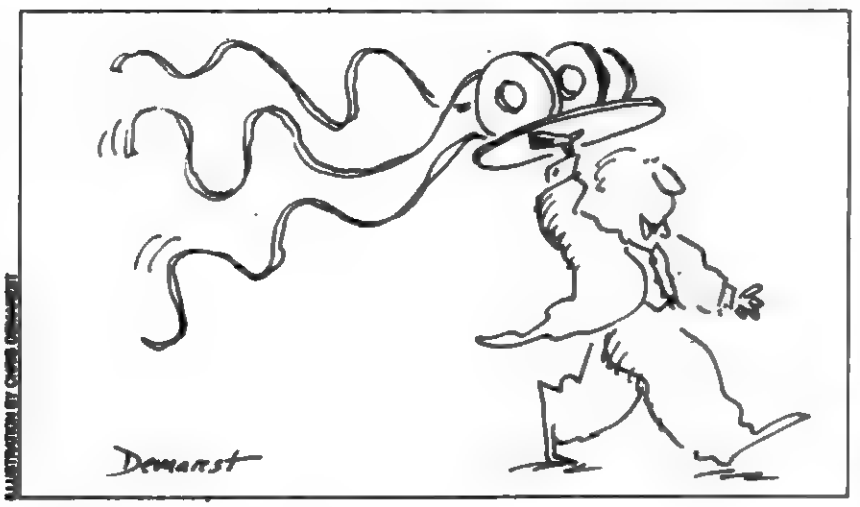


ILLUSTRATION BY CHRIS DEMAREST

> ***Even with the most competent and trusted programmer, no large task should be allowed to stand as is without negotiating a subdivision into one-week-or-less verifiable milestones. It is up to the manager to persist in getting the programmer to identify and commit to each subtask.***

combination of firmness and helpfulness makes the subordinate's next set of estimates more reliable and quickly conveys to all programmer/analysts the key role their own reporting plays in project control.

The manager does not have to inspect all the milestone evidence — or even understand clearly what all the bite-size subtasks entail. Because the potential for management inspection is always there, it is often sufficient to accept the word of the staff member that the subtask has been completed and verified in the standard way.

Thomas Conlon, now working at a large brokerage firm, recalls how subtasking helped solve problems with lateness and quality at Smith Barney, Harris Upham & Co. in New York.

"When I took over front office applications," he explains, "we had a real problem with timing and credibility within the Smith Barney Partners unit."

Conlon hesitated to depend on the close-mouthed senior programmer to start a large new subsystem for subledgers, account maintenance, payouts and unit split ups. Based on that expert's known rate of output, Conlon assigned three staff members to one of his project leaders, along with instructions to construct a schedule that exploded the main tasks into their smallest components and split the components up among the members.

All four staff members were available for fill-in work, but as things turned out, only two were needed at any given time, and the others performed different tasks.

"We got the required job done on schedule, and the user was really impressed with its quality," he relates. "I attribute a lot of that success to the fact that the milestones were small enough to be watched and accounted for."

Ganged labor

The time frame of a large task can be compressed, even though it appears to lie along one irreducible path. After subdividing the task into many pieces, its underlying structure — or lack of it — shows clearly where parallel programming can make use of ganged labor.

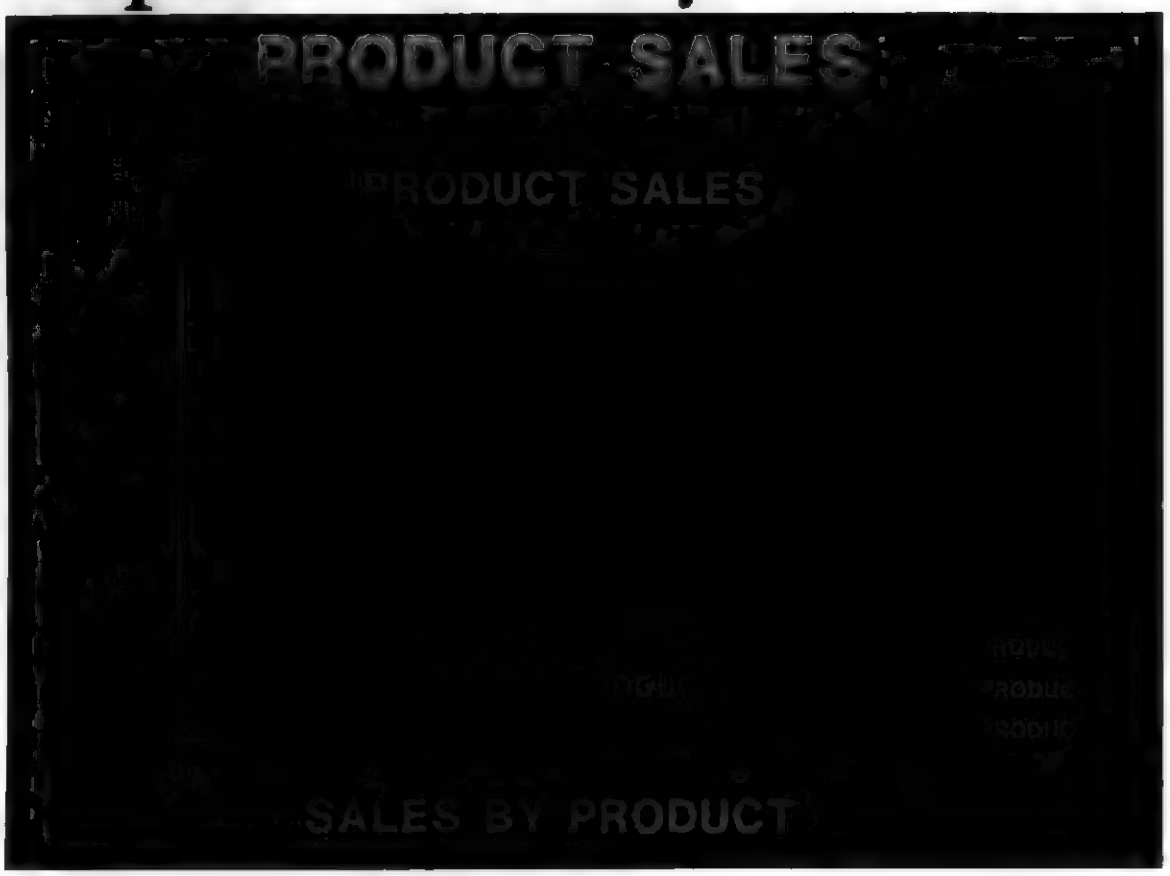
If there are two, three or four mostly independent processes, these can be transformed into the same number of programs that are written and tested simultaneously. A 15% to 30% programming overhead may be necessary to separate and reunite the function. Putting the dollar and resource cost aside, this means that splitting one program in half might reduce the number of days until delivery by 40%; in thirds, by 60%; and in quarters, by 70%.

Brian O'Shea, a consulting programmer at International Paper Co. in Denville, N.J., recounts his experience as a member of a coding gang at Citicorp, NA in New York. They were assigned to subdivide a large program for follow-up processing of complicated orders on a multimillion-dollar real-time system.

The program specification ran 79 pages in length, and O'Shea's coding group had established a rule of thumb of one coding day for any page of specifications received from that author. At 22 workdays per month, this one program would have spanned the entire time period allotted for coding all order entry and follow-up programs.

"This would have been a four-month effort if assigned to one person," O'Shea observes, "and the probability

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of failure would have been appreciably higher" than with a ganged effort.

The specification was divided into eight distinct programs. O'Shea still smiles when thinking about the results: "Four-fifths of the original composite whole was up and running in systems in four to five weeks, and the remaining functions were implemented within two weeks after that."

The checkerboard method

Sometimes, the programmer is justified in insisting that the components of a large program are too interrelated for a clean separation. Even in this case, a complicated program can be subtasked using a two-dimensional, or checkerboard, scheduling method. This is illustrated by a case study of the teleprocessing controller program in a sales processing system.

> ***After subdividing a task into many pieces, its underlying structure — or lack of it — shows clearly where parallel programming can make use of ganged labor.***

The controller program had originally specified and tested successfully for Subsystems A and B. Now was the time to add functionality for Subsystem C, restructure the controller so that common functions fell in a fourth section and modify all the pre-existing programs for Subsystems A and B.

One programmer would need two months to finish the modification and even more time to change the programs that used it — yet the deadline given was five weeks away.

In several negotiations during a two-day period, the manager got the programmer to subdivide the effort into nine tasks, each lasting approximately five days, plus the subsequent modification of old programs. The figure on page 100 shows the checkerboard solution reached. The downward diagonals of the checkerboard show how each subsystem component passed from programmer to programmer.

Programmer 1 did only coding. As soon as he finished a piece of controller code, other people would test it. As soon as the revised functions A, B and C emerged from testing, still other programmers modified the pre-existing programs and tested their own results. As things turned out, all milestones were made, with one exception: The initial version of the Subsystem C screen program was delivered four days late.

Clear interfaces

"Remember that kid's game, 'Telephone'?" asks Terrence Tener, computer operations shift supervisor at Gimbels & Co. in New York. "If the first person whispers unclearly, then all the rest have no chance of getting the message through. To avoid this miscommunication at Gimbels, we try to limit end users' direct access to the programmers."

The users talk instead to the systems leaders, who are more familiar with retailing. This way, a user's request is more definitively documented. "As a result of this," Tener adds, "the user specification is generally right the first time."

This technique of building a documentation wall between the business functional specifications and the rest of development differs greatly from ongoing program maintenance in a stable environment. In the typical programming maintenance department, a programmer/analyst takes his clipboard to the user's office to investigate a new business need and writes and obtains sign-off on functional specifications. Then he writes, discusses and obtains approval on a programming design and codes and unit-tests. Finally, he helps support the user test.

By contrast, a large-scale software development project needs clear interfaces with good documentation to fix responsibility and avoid backsliding. In the Gimbels example, the business analysts know that other hands will design and code the programs, and therefore the analysts must write more clearly and completely.

The practice can be extended to all stages of

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An advanced computer system for air traffic control is being designed to serve the U.S. into the 21st century. The new Advanced Automated System (AAS) will consolidate existing en route facilities and approximately 130 terminal facilities into 23 area control facilities throughout the country. It will automate many routine air traffic control activities now done manually. Computers will monitor and evaluate air traffic patterns and offer solutions to potential conflicts between airplanes in flight. AAS will include work positions and radar display terminals for controllers, powerful modern computers, and new software to run the redesigned system. Hughes Aircraft Company is designing AAS for the Federal Aviation Administration under a competitive contract. Hughes has built air defense systems for more than 20 nations, including the U.S., Canada, and NATO countries.

Programmable software features within a night vision system for helicopters allow new features to be added as needed to meet new threats. The Hughes Night Vision System (HNVS) is a low-cost, forward-looking infrared system that provides excellent imagery and object detection day or night in all weather. It has extensive built-in test and fault isolation test capabilities. Among the features that may be modified to meet specific requirements are flight symbology, navigational data, automatic set-up mode, system status data, and push-buttons around the display face.

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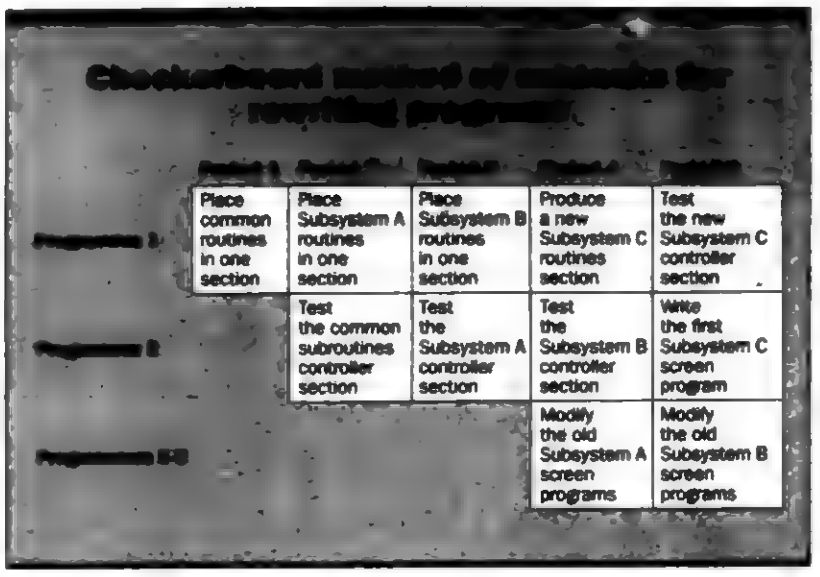
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program development. If the analysts write unduly ambiguous specifications for Subsystem A, this will be known in time for them to be supervised more closely by their team leader during the planning of Subsystem B.

At each stage, a written handoff takes place. It is in each author's personal interest to make that product as complete and self-explanatory as possible; otherwise the originator will have to spend valuable time in face-to-face explanation and eventual rewriting for clarification.

In principle, each successive team should be able to receive a document thrown over a high wall by an anonymous author and to send its own product past the next wall to an equally anonymous recipient. The point is not that project members should not be sociable, only that no real turnover has taken place if sender and recipient must both be present to interpret the product delivered.

Concurrent phasing

Subtasking, ganging and tightly documented handoffs, along with the concepts of data base definition and modeling, can be synthesized into the overall scheduling strategy for larger tasks known as concurrent phasing of subsystems. Concurrent phasing is designed to keep all participants productively busy, permit resource shifts when problems arise and maintain a delivery schedule of highly visible subsystems that the business user can test, critique and ultimately approve for production. This integrated project management approach is at least 10 years old, having been proposed and reported by this writer in a 1975 National Science Foundation study.

Concurrent phasing is successful because of this; for example, it is not necessary to complete programming specifications for a given subsystem in the second project month if coding will not begin until the sixth project month. This fact is largely ignored in traditional development scheduling.

The traditional large development project schedule has fixed sequential phases for creating functional specification, programming design, coding, unit-testing, integration-testing and user-testing. This parallels the behavior of an individual maintenance programmer constrained to making small enhancements on a system that is already stable and settled.

Not only does the new development approach provide the freedom

BASF

to vary traditional scheduling, but common sense and courtesy to the user community may also demand it.

In concurrent phasing, fixed teams are built around documents and programs to be passed downstream, business utility specification, program specification, programs and testing. In systems maintenance, the programmer/analyst moves through these four steps for each business function. In concurrent phasing, it is the business function, not the person, that moves.

The concurrent phasing of subsystems enables staff members to concentrate on doing only what they do well and supports real teamwork in which other staff members are made available as resources if a promise date starts to slip.

In the traditional approach, where all program specifications are written at one stage and so on, the business users suddenly appear in the last time period and are expected to validate and approve, in a brief interval, an entire system on which their livelihoods may depend.

This normal scheduling strategy is no better for the coders, especially consultants hired to implement the project. If taken seriously, traditional project phasing might require that all new programmers be screened (but not working) while business functional specifications are written, be paid to learn the environment while system designers write the coding specifications, work during the official programming phase and move on to other employment at the outset of integration-testing.

> ***"Each team should be able to receive a document thrown over a high wall by an anonymous author and to send its own product over the next wall to an equally anonymous recipient. The point is not that project members should not be sociable, only that no real turnover has taken place if sender and recipient must both be present to interpret the product delivered."***

To say the least, the training time before the programming phase and the missing expertise immediately after it are, respectively, costly and extremely risky. Also, having all these programmers sitting at their desks does not guarantee the desired manpower in case of an emergency. This is because their slack times happen all at once and do not make any of them available to help during each other's busy times.

The use of a specialized coding team is assumed if the project size requires temporary staff expansion. But the constraint on staff members helping each other would be just as true for a slower project in which each subsystem was produced in sequence by programmers who all participated in writing functional specifications, designing programs and coding. Moreover, each programmer would tend to bog down at his weakest skill, while spending less time than planned where the greatest proficiency lay.

In the concurrent phasing approach, each business function rides a conveyor belt past the fixed teams. It receives a well-documented functional design from the business analysts; next, the system specialists read the functional specifications and place an unambiguous programming specification on the conveyor belt. Then, the programmers remove the specification and replace it with unit-tested programs.

The system testers either accept each program or have it improved, then place it back on the belt with a set of successful test cases that match the design documents. Finally, the functioning program drops into the users' laps for further validation.

These steps may sound similar to those of the traditional approach, but there are three striking differences: The conveyor belt is in a steady state; the project teams represent fixed stations at which each distinct business function must stop; and business functions or subsystems are phased in, not done all at once or done in spurts.

In the initial time period, while Business Need A is being analyzed, programmers are brought up to speed technically, and systems analysts can busy themselves analyzing the data elements of the pre-existing manual or automated systems. In the second time period, Business Need B is analyzed, the Business Need A functional specifications are transformed into a coding design for Subsystem A, and programmers experiment with a model system.

By the third period, programmers are working full-time implementing Subsystem A, while Business Needs B and and C are proceeding through analysis and design. In the fourth time period, Subsystem A is integration-tested, while business analysts begin to look at Business Need D.

Note that Subsystem A reaches the user at the start of the fifth period, before analysis of Business Need E has taken place. Each development phase is being done concurrently but for different subsystems.

Representatives of Business Department A, who worked with the business functional analysts at the beginning, return in the fifth time



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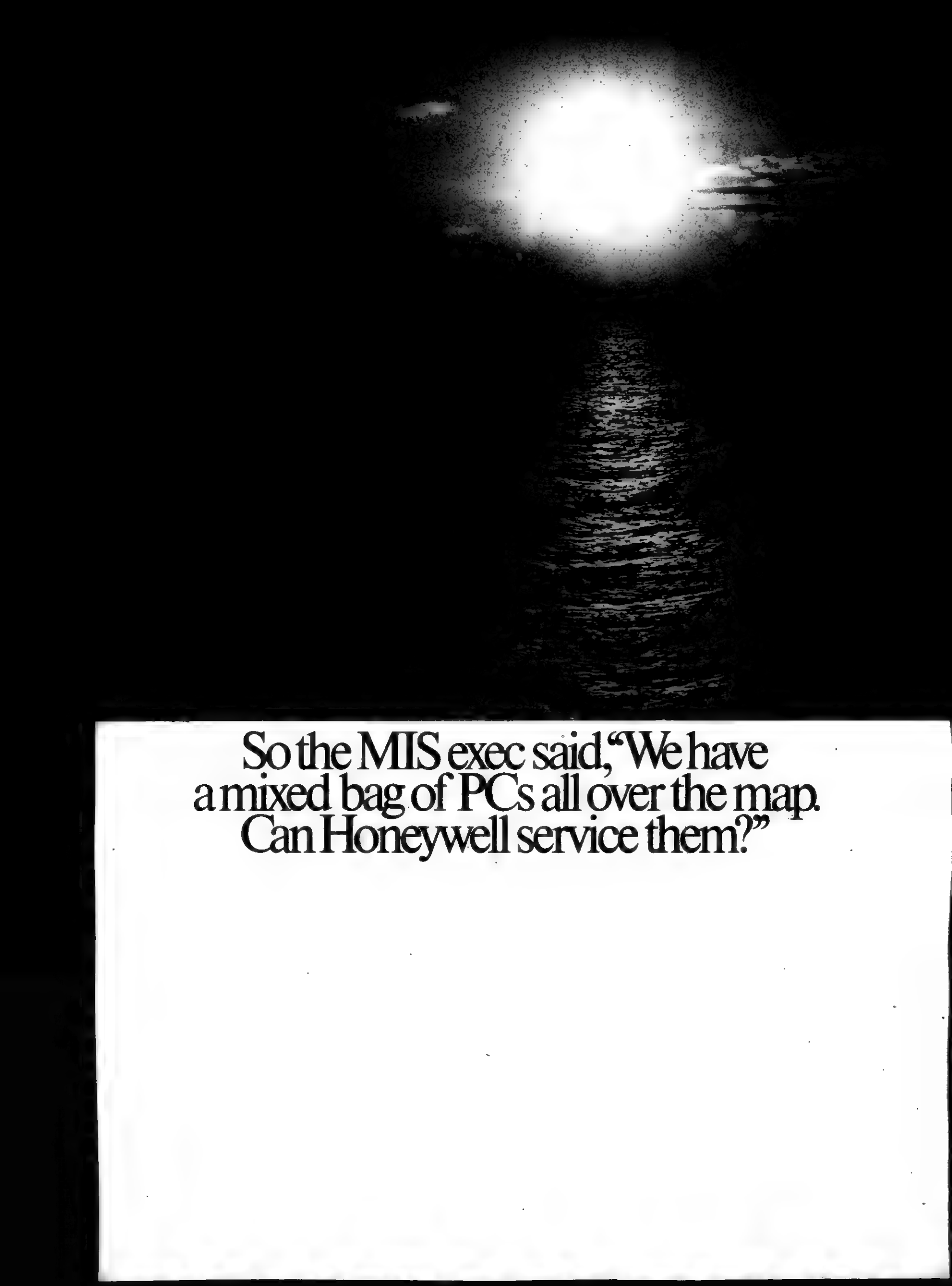
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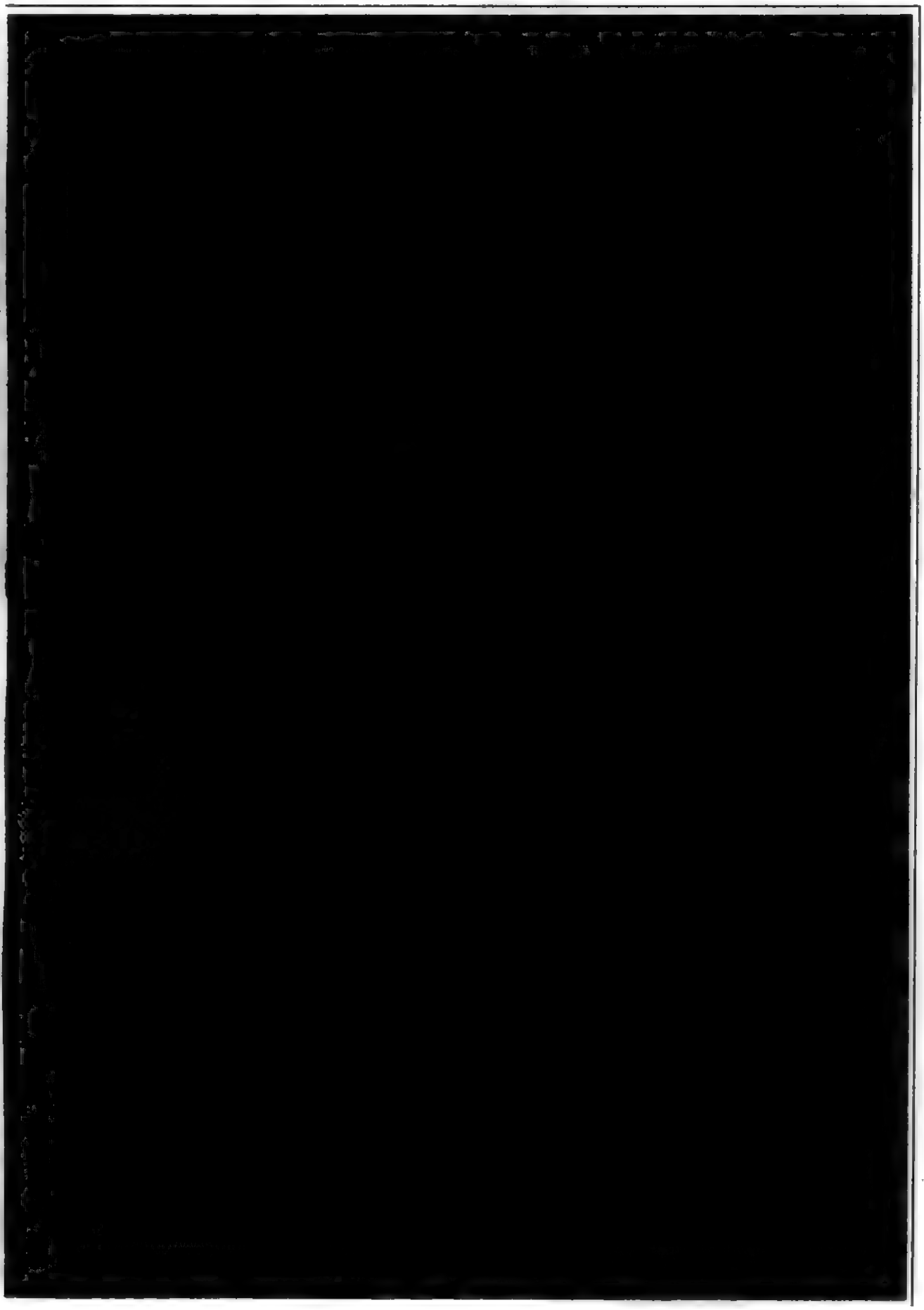
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> ***In systems maintenance, the programmer/analyst moves through four steps for each business function. In concurrent phasing, it is the business function, not the person, that moves.***



period to critique a subsystem that has been demonstrated to hold together technically in accordance with written program specifications representing the original functional specifications.

If the Department A end users pinpoint an urgent fix requiring business analysts, system designers, programmers or testing personnel, these specialists can be assigned to this task because the time period imposes no particular stress on any of the specialized teams.

In concurrent phasing, end users thus become a dependable, regular component of the process, gradually increasing their skills and understanding of the system. They encounter no overwhelming surprise at the end of the project when they are asked to authorize a move to the production environment.

Data base comes first

Bad programming is not irreversible. Bad data planning may be.

For instance, two functioning batch Cobol programs can be combined for controllability by concatenating their respective divisions, recompiling to eliminate redundancies and retesting. One real-time Cobol program can be subdivided for paging efficiency, partial rewrite and so on by dissecting the procedure division, reproducing the other divisions in both places, recompiling to eliminate unused fields and program retesting.

If produced carefully, the combined (or bifurcated) program cannot be distinguished from one originally designed to exist in that final form.

This is definitely not the case with a data base or any systemwide data store, including one or more flat sequential files. Whether the major subcomponents of a system are programmed in sequence or in parallel, an extensive data base should be produced initially, tentatively populated and used uniformly by all system components.

From a design development viewpoint, early implementation of a comprehensive data base has four advantages:

- It facilitates modeling.
- It forces major functional components to communicate properly with each other.
- It prevents data redundancy, which is practically impossible to eliminate when combining two or more subdata bases later in the project.
- It forces the early planning effort to concentrate on and understand the meaning and use of the actual business data fields.

Cornelia Johnson, a programmer/analyst with Columbia Presbyterian Hospital in New York, remembers how this method was applied to patient management and patient accounting. "At Columbia Presbyterian, we were planning a major new subsystem for SWOPS, our social work outpatient system," she recalls.

Before starting any programming design, Johnson's team met several times with the end users and discussed the data elements that would be required to build the data base and write the reports.

Once the team had isolated the essential data elements, it prepared a hierarchical chart showing how many data base levels would be necessary to use and properly classify the required data.

"We finally loaded a small extract containing the segments that were needed in the data base," Johnson continues. "It was only after that happened that the programming phase began."

She points to the gain in

> ***"Many people think of models as something to be reused. But in modeling you rarely intend to run the original programs over and over forever. They are simply there to confirm, or refute, the logic or procedures on which you want to test feasibility or tuning characteristics."***
>
> — John LeKashman
> Chesebrough-Pond's, Inc.

programming efficiency and independence as the major benefit. "The health care programs and the accounting programs could be coded without cross talk since the data base was in the middle."

An additional benefit of sharing with a final data base (including embedded dummy fields for expansion) is that designers and programmers are encouraged to be as imaginative as possible at every stage of development.

Occasional upgrades can be made to the data structure to keep it complete and able to serve the ongoing programming effort.

Skeleton system

Critical as specifications are, it is a mistake to conclude that the programmers' hands must be idle while the first coding specifications are being produced.

All the new hires know the programming software, and each of the old-timers assigned to coding has expertise in the business, automated interfaces or data fields. Based on their collective expertise, the programmers can produce fairly rapidly a makeshift data store and a variety of conveniently coded programs for one or more of the planned subsystems.

"Many people think of models as something to be reused," says John LeKashman, vice-president of operations services for the Stauffer Chemical subsidiary of Chesebrough-Pond's, Inc. in Westport, Conn. "But in modeling you rarely intend to run those original programs over and over forever. They are simply there to confirm, or refute, the logic or procedures on which you want to test feasibility or tuning characteristics."

Formally, a usable prototype or skeleton system helps to start the coders thinking creatively toward the practical use of their work. It facilitates tryouts, modeling and some degree of tuning.

In microcosm, the toy system encourages old and new programmers alike to realize that they can successfully produce a meaningful system for that business.

In practical terms, this free exercise of a programming effort can uncover where supporting software and coding aids do not work. Also, other limitations of the environment and staff can be learned and acted upon before important deadlines appear on the horizon.

Presley Acuna, a systems analysis consultant, recalls his stint as project deputy on CRES, a commercial real estate finance system, at Chase Manhattan Bank NA in New York.

From the outset, his team constructed a skeleton system for prototyping that encompassed small components of the on-line inquiries, graphics subsystem, calculation modules and batch reports.

"The users got to play with the prototype system almost immediately, and as a result they were able to refine their concept of what they wanted," Acuna explains. "Happily for us, they were willing to classify newly added functions as Phase II or a later phase. By the end of Phase I, the system and the users matched. As a result of prototyping, we were able to produce the right system the first time."

Another vital use of such a skeleton system can be to reassure high-level business decision makers early on of the viability and ultimate profitability of a costly project that has just started.

At a major securities brokerage in New York, top management was suitably impressed by real-time prototypes of profit-loss and simulation screens. At that particular time, neither function was even anticipated, and the earliest coding specifications had not yet been finalized.

Management support needed

Represented schematically, a concurrent phasing diagram looks very much like the checkerboard matrix, except that Programmer 1 becomes Functionals Team, Programmer 2 becomes Design Team, Programmer 3 becomes Programming Team and a line is added for Systems Test and for Business Users.

The contents of each box in a concurrent phasing scheme would, of course, be a magnitude larger. The entire process currently illustrated in the checkerboard diagram would be summarized as Code Subsystem C and occupy only the white box on the right side of the third row.

The first column of such a schematic diagram for concurrent phasing would list Business A Functions (for the analysts), Analyze Data Elements, Construct Skeleton System, Set Up Testing Environment and Business A Functions (for the end user).

A two-dimensional checkerboard would be inappropriate to represent the more traditional scheme of large system development, since the main business needs are all to be analyzed at the same time, specified for programming at one subsequent time, coded simultaneously, integration-tested all at once and user-tested at the very end.

An active team

The additional dimension of a concurrent phasing diagram illustrates the need for an active project management team.

Once they understand the rudiments of concurrent phasing, task supervisors should be willing to carry them out, since they have already benefited from them.

The typical 60% decrease in project delivery time has necessitated a tripling of their staff size and may have precipitated their own hiring in



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the first place.

However, more senior management may be unfamiliar with concurrent phasing and at first may have difficulty conceptualizing this management-intensive method. It is important that this accelerated approach be presold to those with systems influences in either the data processing or end-user departments and explained carefully as new individuals enter the management chain.

A simple memorandum format can be used to express the worth of the management practices involved in the concurrent phasing approach in projects with individual budgets set as high as 150 man-years and $10 million. Such a memo, circulated in one's own department and subsequently discussed with key users, can offer the following recommendations:

- A prerequisite starting point is a complete set of known data items.
- The first internal product delivered should be a comprehensive data base — thinly populated but logically complete.
- Before formal specifications, coders should construct a skeleton of the full system for tuning and hands-on feasibility studies.
- Major subsystems should be planned, designed and coded and tested with phased starting points. This will leave the three teams intact throughout, guarantee written team-to-team handoffs and minimize misuse of staff such as coders interviewing users, CICS learners designing systems or user contacts writing code.
- The management and staff of each team should work together to report progress based on the smallest components of each task and to gang labor on critical-path items.
- To facilitate phasing, a list of cumulative features for subsystems should be enclosed.

Limitations

Except for subtasking, the synthesis of techniques discussed here will not produce the projected acceleration with projects of less than four to six man-years. Projects of this duration have insufficient resources present to facilitate ganging; in addition, the complexity of the task is probably not great enough to reap a net time gain from prototyping. Also, the project management team must take an active role, meeting at least weekly to discuss problems and alternative solutions.

Because it runs counter to the traditional linear schedule, concurrent phasing should periodically be discussed with those to whom it has already been explained. A loud "This method will never work!" can decelerate progress if left unanswered enough.

On the other hand, common sense should be applied. Coders should be discouraged from breaking up a program in circumstances where the time lost for component linkage coding and testing is comparable to the time gained by coding in parallel. Subordinates must understand that the deadlines are real and that 80% completion is not good enough.

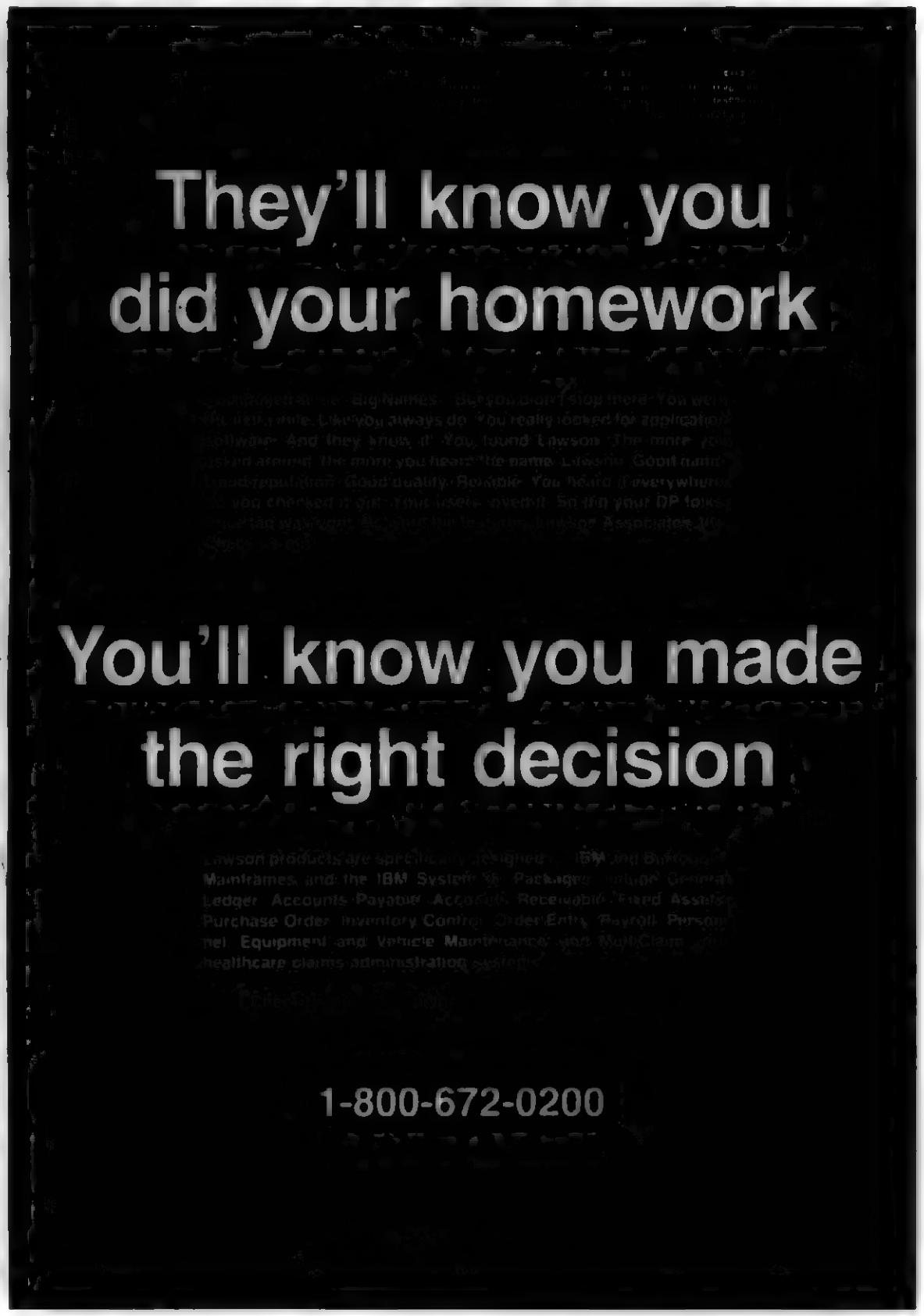
Finally, if a new software technology is used, veteran practitioners of only the old technology should be kept off the program design team. Otherwise, their knowledge of the business, seniority and self-confidence may converge so strongly that they lead the real software experts to come up with the wrong system architecture.

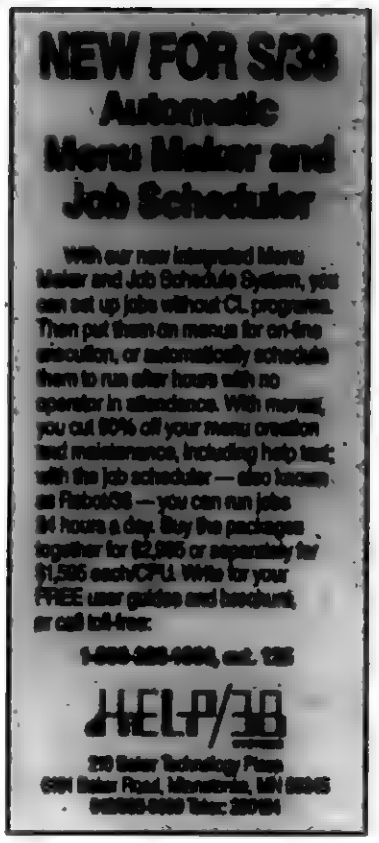
When time means money

Concurrent phasing is a two-dimensional approach that integrates the management practices of task subdivision, subtask ganging and creating checkerboards, functionally distinct development teams, early completion of the common data base and extensive prototyping.

This approach facilitates coordinated delivery of subsystems to the user as integral wholes. It makes testing, fixes and user sign-off much less awkward.

The chief benefit of concurrent phasing is that it smooths and reduces the staff load required to complete a software development project in a greatly accelerated time frame. The final software products delivered are not necessarily any better than those produced with other approaches, and completing a project in 1½ years with this strategy will cost significantly more than permitting the same project to take five years to go live. But when time means money in its impact on the business, this more expensive project management strategy may be just the right one. ■





In Depth

Strategic systems planning shifts to data-oriented approach

A strategic planning methodology provides a framework within which the planning process can occur. But the methodology is not as important as the planning process, which must be molded to the specific structure and needs of each organization.

By ROBERT MOSKOWITZ

The traditional approach toward strategic information systems planning, which remains dominant in most organizations, emphasizes applications. In the last few years, however, a redirected emphasis toward data architecture has shaken strategic planning to its foundations. This new direction forms the basis for using information systems not only as a major element in strategic business planning but also as a source of competitive advantages.

Philip James, chief of the strategic information systems planning (SISP) group for Los Angeles County, observes, "Companies tend to let applications hang on until they're no longer useful. As people start thinking about data instead of applications, they discover ways to improve the old applications. Looking at data is a future-oriented rather than a past-oriented solution."

Strategic information systems planning tries to establish a direction for using and developing information systems resources to support an organization over a five-year time horizon. The applications-oriented approach to SISP looks at the work to be accomplished within the organization and develops a plan for automating all the tasks and procedures. This approach glosses over the potential value of sharing information across separate applications and does little to reduce redundancy of data and data processing resources.

According to James, "The applications approach is prevalent in most organizations today, primarily because it is the easiest to understand. Most departments are oriented toward applications in their everyday work, and they naturally fall into applications-oriented strategic planning almost by default."

The applications-oriented approach historically leaves an organization with a portfolio of slightly different and incompatible applications, even where they use the same data. Users typically find they cannot compare reports across different applications because of slight differences, such as unequal reporting periods, including or not including tax and so on. As a result, organizations generally move from an applications-oriented approach to a data-oriented one that emphasizes data consistency across all applications.

James explains, "Moving toward a data orientation requires a large investment to organize and understand your data, but then your investment in successive applications will be much lower; the applications approach leads to a lower investment now, but you pay for it in spades later."

Revising current applications to conform to a data orientation is an immense undertaking. Organizations normally migrate gradually from applications-oriented to data-oriented strategic planning, implementing new applications according to the requirements and recommendations of the data-oriented plan but retaining current applications where doing so remains cost-effective.

Preliminary steps in planning

SISP requires a detailed analysis of the functions of various departments within the organization, the tasks of employees in these departments and how information processing systems can serve and support their needs. This type of basic understanding of the organization is a foundation common to all strategic planning methodologies.

The next step is to refine and develop the basic understanding of the organization to yield an information model — a simplified sketch of all the information in the organization, where it is

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Moskowitz is a writer based in Woodland Hills, Calif. He is the editor of the "Office Automation Update" newsletter.



collected, where it goes and how it is used.

If an organization is pursuing a data-oriented approach, this information model can be further formalized into a data architecture, a hierarchical picture of information within the organization.

At its lower levels, the data architecture shows greater detail of the organization's various data bases — such as finance and accounting, manufacturing and operations, research and development and personnel and human resources — while at the higher levels it shows more general data characteristics and managerial perspective.

Descriptions of specific data are dependent on both hardware and software. Thus, information systems may be dedicated to sales, production, human resources and finances, but the data itself is conceptually independent of specific information systems.

The data architecture displays the general characteristics of data across the entire organization, omitting applications-specific details based on hardware and software systems currently in use.

Most SISP data architectures ignore nonelectronic information flows but remain important because the process of analyzing data flows within the organization is useful even if the resulting data architecture is somewhat one-sided.

Postplanning efforts

Regardless of what methodologies are followed, the effort required for the first SISP process is enormous. The study can take two years or more, although it is generally targeted for six to nine months. The final planning document contains specifications for applications and systems that should be implemented within five years or more.

Within a few months, the document begins its obsolescence. It requires annual revisions to reflect business and requirements changes both inside and outside the organization.

Revisions are made by repeating the SISP process, but they are typically less complex, less costly, less time-consuming and less cumbersome to formulate than the original strategic plan because much of the groundwork has been laid. Still, revising the complex matrices produced from IBM's Business Systems Planning (BSP) methodology, for example, can be very difficult.

Thus, software support is as important and useful for the SISP process as word processing, graphics packages and electronic spreadsheets have become for other business activities.

The role of methodologies

While there are a variety of methodologies from which to choose, a given methodology describes only part of the planning process and does not by itself determine the success or failure of the strategic planning project or plan.

James explains, "The methodology is chiefly important to provide a framework within which the planning process can operate. But the methodology is not as important as the planning process, which must be molded to the specific structure and needs of the organization."

William Synnott, senior vice-president for information systems at the First National Bank of Boston, agrees.

"We have used virtually all the strategic planning methodologies at one time or another. It isn't what methodology you use; it's whether you do it at all.

"The real problem is trying to get management, product managers and users to work interactively. In many organizations, the business plan is made without involvement of the systems people and then passed down to systems for them to give a reaction to it, Synnott explains.

"Instead, users and systems people should work together. In today's world, strategic business planning must include men, machines, money, of course, and also the information resource."

James observes, "If those who are driving the strategic planning process educate others in their organizations as to what the planning is all about and why it will be a good thing, virtually any methodology will yield a valuable strategic plan.

"But if process management is weak," he adds, "departing from the methodology generally loses whatever

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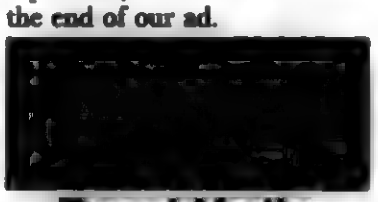
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coherence there is, and the strategic planning process tends to fall apart."

Formal BSP methodologies

Formal BSP methodologies seek to provide a framework and a process within which to accomplish the very difficult task of pulling together all the information systems in a large and often far-flung organization.

Business Systems Planning, developed by IBM in the mid-1970s, was one of the first methodologies to recognize the importance of a data-oriented approach to SISP.

The BSP process centers on a formal study that establishes an information system plan to meet requirements set forth by top management. The study attempts to define the organization's business processes and classes of data and analyze these in comparison with current systems support in an effort to identify relationships, gaps and redundancies.

The final strategy is expressed in complex matrices showing the relationships of business processes to applications, to data and much more.

BSP has significant strengths, including its emphasis on data as an organizational resource, its involvement of top management and its advocacy of a modular shift from existing systems to the new ones. BSP encourages a look at data per se and at a data architecture, because it deals specifically with data classes apart from the applications that use the data.

However, the process is extremely costly and cumbersome to perform. Perhaps reflecting its decade-old origins, it studies the organization exclusively from a top-down perspective. In addition, its product — the matrices and diagrams — tends to be difficult to revise without software.

> ***"Moving toward a data orientation requires a large investment to organize and understand your data, but then your investment in successive applications will be much lower."***
>
> — Philip James
> Los Angeles County

Because BSP studies the length and breadth of the organization, the strategic plan may overlook some specific details or application opportunities that would result from a methodology with a narrower focus.

Critical Success Factors (CSF), developed by John Rockart at MIT in the late 1970s, also requires heavy involvement from top management but puts greater emphasis on specific information needs.

Basically, CSF concentrates on the work done by particular managers or groups within an organization and focuses on identifying the tasks they must accomplish and the data they must monitor for the organization to be successful. CSF then concentrates on automating these tasks and creating reporting systems for the critical data.

One strength of CSF is that it puts most of the planners' energies into finding what is important and supporting that with information systems. Because this methodology emphasizes measurement and reporting on critical factors, it focuses on the quantitative aspects of the factors it identifies. However, certain factors are not amenable to quantitative description or analysis.

Edward McCarthy, vice-president of MIS at American Television and Communication Corp. in Englewood, Colo., recently used the CSF method for his company's SISP effort and observes that people within an organization may have a difficult time identifying its critical success factors with sufficient accuracy. Because CSF is so narrowly focused, he notes, strategic planners lose the comprehensive view and may overlook important elements.

Entity-Relationship Analysis (ERA) is a theoretical approach for building a structure on top of the data architecture or information model. In ERA, an entity is anything about which you collect information, such as a product, an employee, a department or a project. Each piece of information collected is called an attribute: a name, an address, a size, a price and so on. The entities are analyzed in relation to each other, such as an employee working in a certain department, a price belonging to a certain product or a number designating a certain customer.

ERA then tries to map the relationships among the entities in the organization, classifying them as "many to one," "many to many," "one to many" or "one to one" and using formal rules to develop a cohesive picture of organizationwide information flows.

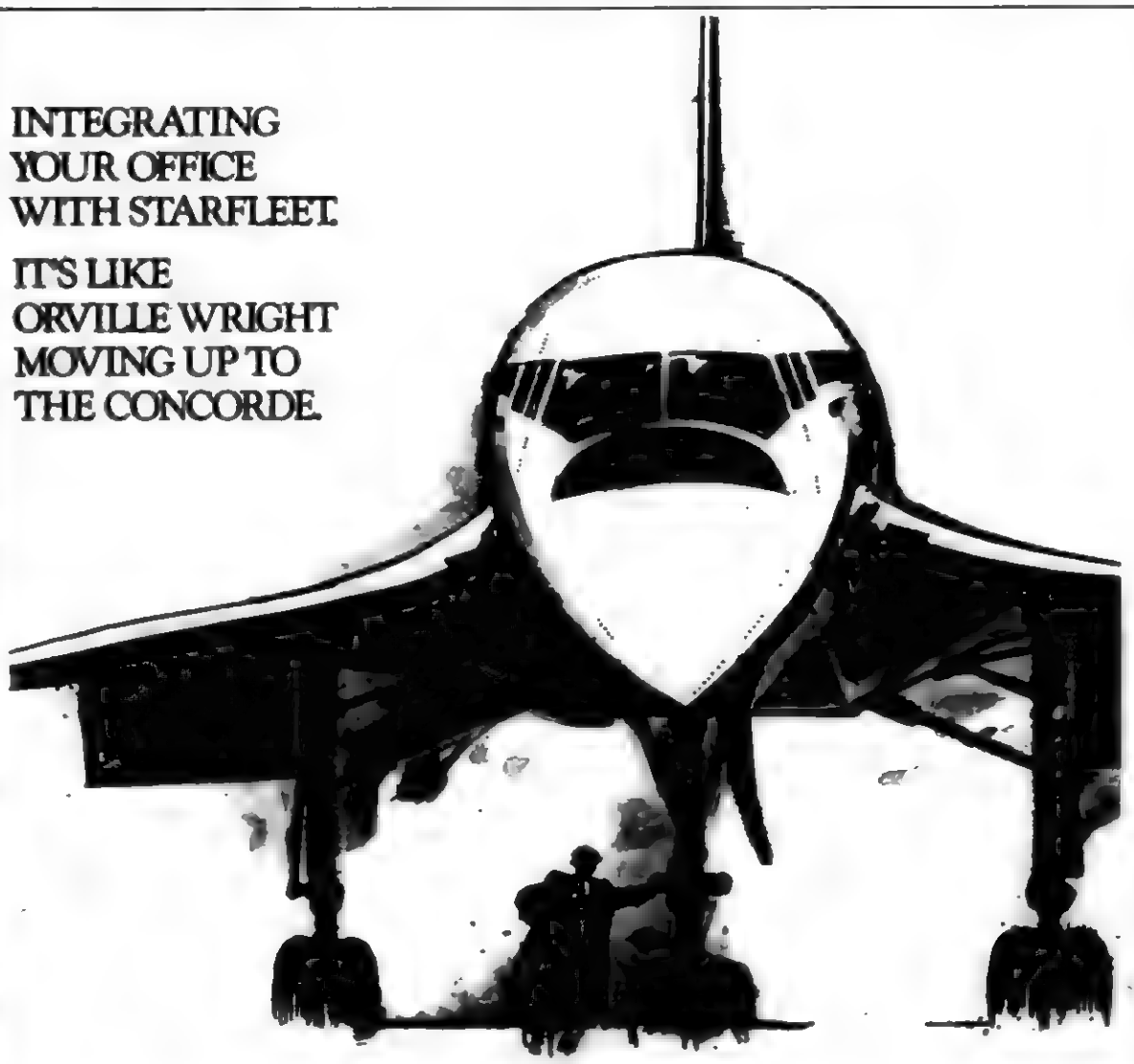
ERA provides a picture of the enterprise that is detailed but not so highly technical that a general business person cannot understand it. It allows the planner to give each department its subset of the model and to show where it fits and how it interfaces with the others. Having defined the entities and relationships, the ERA-derived strategic plan can be converted almost directly to a data dictionary and a data base management system.

Managing an ERA diagram without a computer can be very complicated because of the amount of data that must be synthesized.

ERA nicely complements an established BSP effort because it looks at

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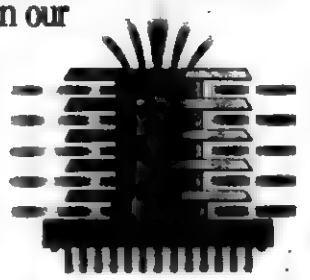
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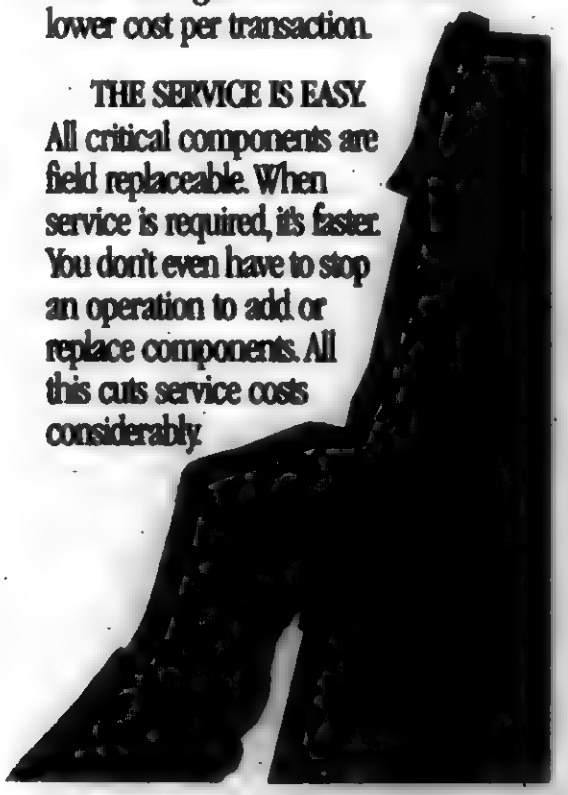
More transactions per second at a lower cost per transaction than any system in the world.

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We designed the system in our own laboratory, right down to our own unique VLSI chips. Some of these gate arrays are designed for high speed, some for high density (2000 circuits per chip) and others for low power. The result is more circuitry in less space. With fewer components than our next largest system, the VLX delivers twice the performance and three times the reliability.



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Large applications require movement of large volumes of data. The VLX processors move transactions in 32-bit chunks. They reach into main memory in 64-bit chunks. Because this happens in parallel, more work gets done in less time at a lower cost per transaction.

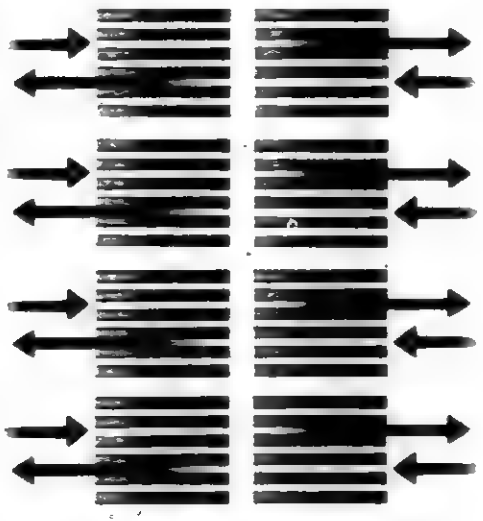
THE SERVICE IS EASY.
All critical components are field replaceable. When service is required, it's faster. You don't even have to stop an operation to add or replace components. All this cuts service costs considerably.



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THE DATA EXPRESSWAY.

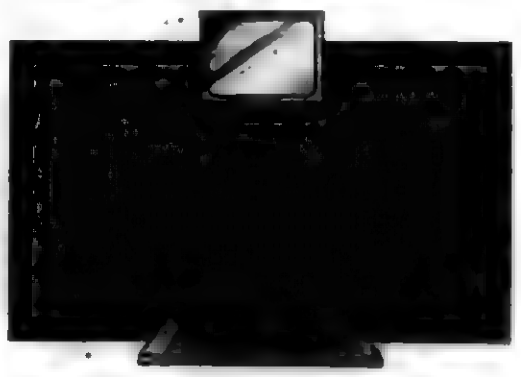
In a conventional database, I/O requests must be handled sequentially. This creates queues that slow response time. In the VLX system, there are multiple



paths to multiple disks. Data enters and leaves the database simultaneously. No time is wasted, and all disk space gets used.

DIAGNOSTICS FROM A DISTANCE.

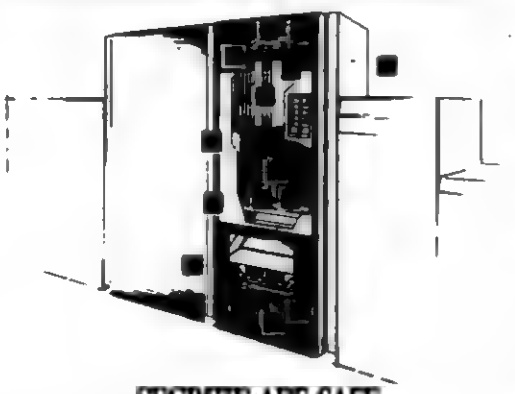
An integrated microprocessor allows us to monitor the system environment. If



there's a change in room temperature, if the tiniest fault in a circuit appears, we can detect and diagnose a problem in its earliest stages. We can even run stress tests remotely. If a failure does occur, the VLX has the capability to automatically dial out to remote centers anywhere in our worldwide network.

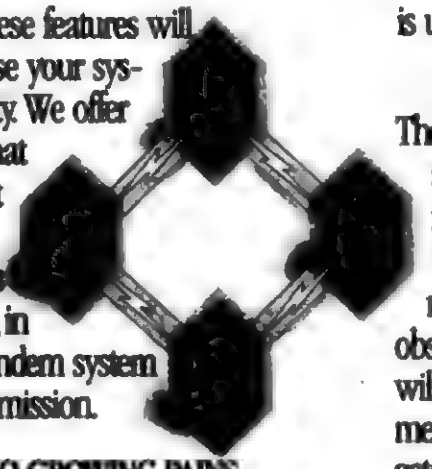
THE SYSTEM KNOWS THE SYMPTOMS.

Expert systems software, using fault analysis, directs the problem diagnosis systematically. It also allows us to analyze it and shorten service time even more.



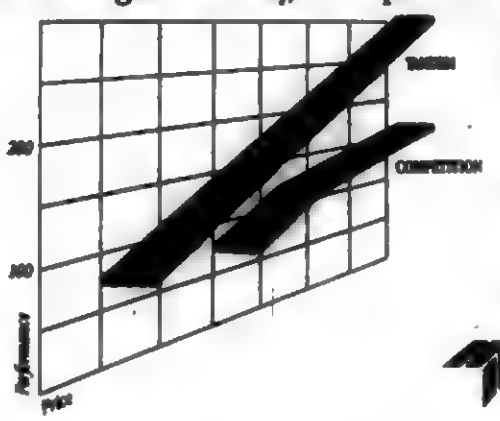
SECRETS ARE SAFE.

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> ***According to Synnott, it is time to stop thinking about information systems as something that runs the back office or fits only a productivity-oriented business strategy and to start thinking of systems as competitive weapons.***

the information somewhat differently. Planners may see problems or opportunities with both methodologies that they would not see with either one of them alone. However, introducing both planning methodologies simultaneously would probably promote a disaster.

The Nolan Norton methodology divides an organization into operational, tactical and strategic control areas and subdivides each of these areas into separate functions or processes. The methodology then deals with the application portfolio — the applications that support each function or process at each control level — and asks, What is the adequacy of support?

It provides graphic output in a colorful triangle that immediately shows where opportunities exist to increase information systems support of critical business functions. A new addition to this methodology tries to apply a CSF approach to determine which opportunities are most important.

The Nolan Norton methodology shares many of BSP's strengths, with the additional benefit of looking at several levels of controls very explicitly, a process that BSP does not do. However, the Nolan Norton process is extremely cumbersome and, like BSP, is comprehensive rather than focused. In addition, organizations generally need an expert to help them run the Nolan Norton strategic planning process.

Information Engineering was developed by James Martin, chairman of Ann Arbor, Mich.-based Knowledgeware, Inc. (formerly Database Design, Inc.) and a well-known speaker on information systems technology.

Martin defines Information Engineering as an interlocking set of formal techniques in which enterprise models, data models and process models are built up in a comprehensive knowledge base and used to create and maintain DP systems. SISP is not a major part of this process.

Information Engineering is often considered an SISP methodology, but Bank of Boston's Synnott contends, "It is more technically oriented, depending upon automated tools and trying to link specific approaches to systems building into an integrated methodology."

Portfolio Management is an even less formal methodology adapted from strategic business planning to SISP by Synnott and others. It attempts to divide an organization's information systems by the business potential of the processes they support and then to design appropriate systems strategies to match the relevant business strategies.

Portfolio Management focuses on three main types of business strategies:

- A strategy of product differentiation that requires the development of technologically innovative information systems.
- A low-cost production and pricing strategy that requires information systems to enhance productivity and keep costs down.
- The niche market strategy that requires comprehensive information systems support, in combination with one or both of the other information strategies.

Portfolio Management requires systems people to work with the strategic planning and marketing staffs. The methodology requires an organization to develop a completely different perspective on where it should place its systems.

The approach works well primarily in service industries; as yet, it does not seem to work as well in manufacturing, where the focus is on the product. However, it could help an organization build information value into its products by helping customers use the products better or provide better inventory control and order entry systems that are closely integrated with customers.

The Portfolio Management methodology embodies the new approaches to SISP, although any methodology can be used in this way. The methodology is already being implemented at Bank of Boston. Synnott and his team are planning to link business strategies to information strategies, a process that requires a different orientation from both management and systems people.

Better product, better service

According to Symnott, who is the primary driving force behind this new direction, it is time to stop thinking about information systems as something that runs the back office or fits only a productivity-oriented business strategy and to start thinking of systems as competitive weapons.

Synnott is not alone in his efforts to use information systems to build better products for customers and to focus on pushing information technology out of the organization to serve customers better. WTC Airfreight, Inc. in Torrance, Calif., for example, recently built a worldwide freight tracking system around the marketing concepts of supporting any systems customers might have and supplying them with the best possible information about any package, inbound or outbound, anywhere in the WTC system.

The same pattern has been followed by other major supply organizations. Banking is particularly active in pushing technology outside the organization — installing automatic teller machines on street corners and transaction terminals in supermarkets and even opening its phone lines to home banking systems. The current effort, clearly, is to use information resources as a strategic competitive advantage.

An evolutionary process

At Bank of New England in Boston, Phil L'Heureux, executive vice-president and corporate information officer, is actively involved in

strategic planning to integrate the systems of four separate banks that merged into Bank of New England last June.

L'Heureux put together what he calls "an evolutionary process" to do information systems planning. Basically, he pulled together groups consisting of major users of the systems — heads of divisions, branch areas, community banking, commercial lending and so on — and chartered them to merge their five-year plans into one comprehensive information plan.

One of L'Heureux's groups identified 18 short-term issues, ranging from payroll processing to ATMs, check processing and other traditional DP areas. It formed a task force of people close to the systems across the four organizations to plan where to consolidate systems and where to maintain separate systems.

Right now, the group is conducting a major planning conference intended to relate the bank's strategic business plan to a strategic information plan, with an emphasis on the 18 areas and on consolidation of the organizations. Already, a priorities committee at the bank has turned one-third of the 18 issues into projects that can be implemented, such as consolidating all trust processing over a three-year period.

L'Heureux notes, "The biggest question remaining is resource allocation among the various operating units and the central corporate structure."

He says his approach to planning is rapidly opening up channels of communication among the different banks. It also eliminates problems of centralizing the resources of all banks and running local information systems in Portland, Maine, or Providence, R.I., on a day-to-day basis from Boston. The decentralized, committee approach allows L'Heureux to use the existing strengths of each bank.

With the focus on applications at the bank level, the planning process emphasizes smoothing out dissimilarities. For example, six different installment loan systems are currently supported by six different sets of programmers; under L'Heureux's guidance, the bank will eventually move to one system, allowing it to double the resources for bank-level installment lending at less cost to the corporation as a whole.

A different strategic planning method is in use at Corning Glass Works in Corning, N.Y. Harvey Shrednick, vice-president of information services, has instituted strategic planning task forces covering the following areas:

- Organizational concerns, such as career path creation and skills training.
- Computer hardware and software.
- Telecommunications and networks for voice, data, image and electronic mail.
- Office automation — tools and services, personal computers, departmental processors and mainframes.
- Applications and applications development.

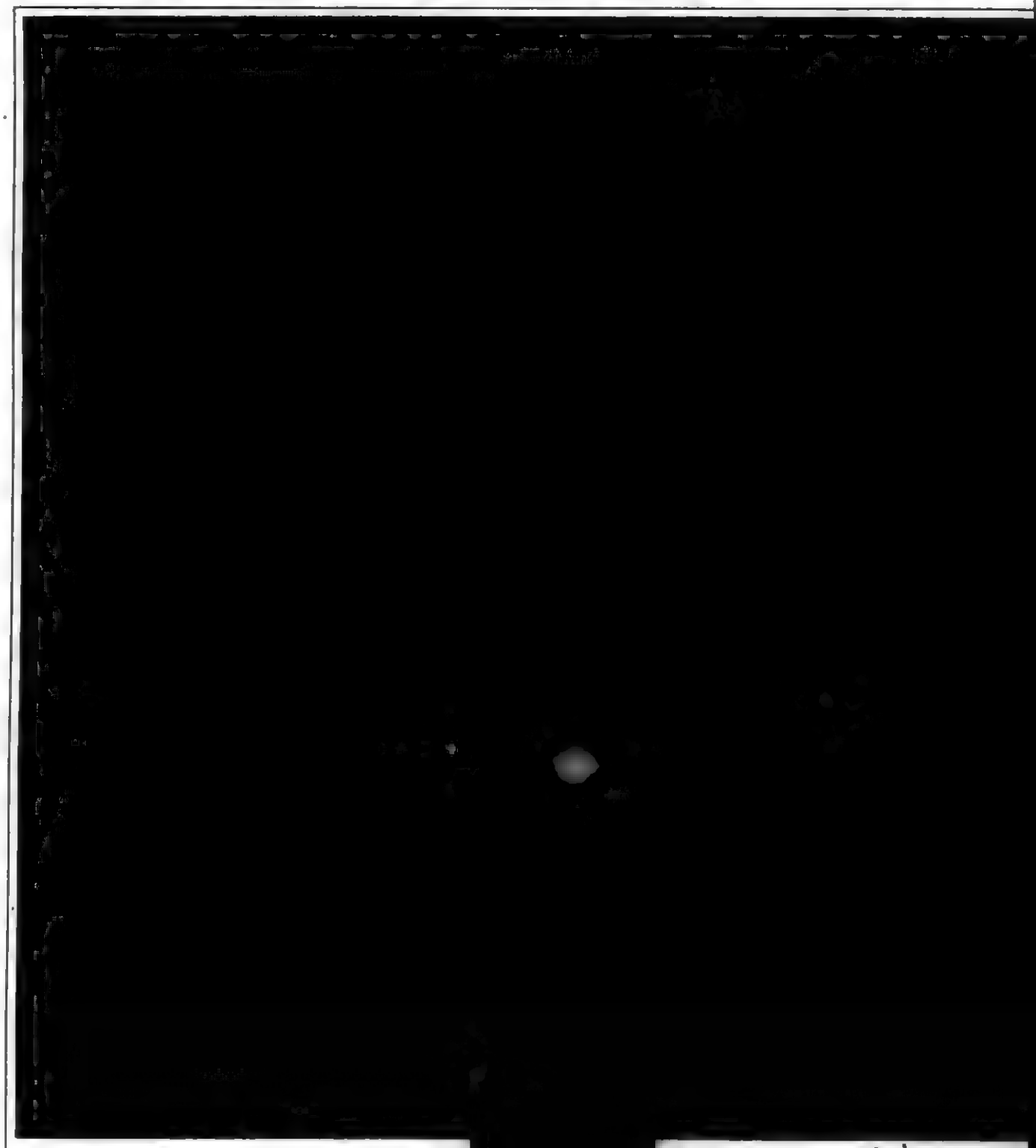
Each task force consists of seven or eight members, representing both staff and operating divisions of Corning, and meets in group sessions first to identify the major concerns and then to address the most vital areas. Members arrive with applications portfolios from their respective divisions and staff groups and try to analyze where Corning should be focusing its resources.

The task forces will make formal recommendations by early summer. According to Shrednick, these recommendations will constitute the key building blocks of Corning's information systems strategy.

Through the planning process, Shrednick's emphasis is on decentralization. He wants to let the task forces reflect the actual desires, information, knowledge and leadership in the divisions and not impose restrictions from the corporate center.

Corning Glass is a diverse and decentralized organization, he observes, and trying to set standards for data architecture for core and common applications would be an extremely difficult first step for strategic planning. "I specifically did not want to use a formal planning technology because people at Corning are not receptive to imposing a planning model. This approach gets our feet wet working as a synergistic team, and we can formalize the methodology later on."

Shrednick is pleased with the results so far. He says people are starting to work together to develop



Boeing Computer Services helped develop and integrate the large-scale information systems that let Boeing introduce the world's most advanced jetliners, the 747, 757, and 767. And helped make Boeing the leading aerospace company in America. What's more, we've applied this home-grown expertise to the complex information needs of large government and commercial customers. So when you're ready to get your big ideas off the ground, we'll know how to make the system work.

> ***"I specifically did not want to use a formal planning technology because people at Corning are not receptive to imposing a planning model. This approach gets our feet wet working as a synergistic team, and we can formalize the methodology later on."***
>
> — Harvey Shrodnick
> Corning Glass Works

applications in common, such as a unique order processing system and a very sophisticated purchasing system. "We can do a hell of a lot more by linking our systems strategy to our business strategy, and by easing them into it this way, people are learning to be responsive to the needs of our business."

An exercise in planning

According to Ephraim McLean, who in cooperation with McKinsey and Co. is the author of a definitive survey on strategic MIS planning, it is usually incorrect to speak of how corporate information systems function as formal SISP methodologies. McLean, who is with the University of California at Los Angeles' Graduate School of Management, says, "Most corporate information systems planning is really an exercise in the application of strategic plans to business information requirements rather than a full-blown information systems planning methodology."

He feels that IBM's BSP is the original SISP methodology and that the others now proliferating in the field are simply specific applications of some or all of that methodology. He lauds BSP as the one approach with the totally integrated and thorough procedures required of a strategic planning methodology.

Not qualifying as true methodologies does not take away from the effectiveness of the other planning approaches when they are used properly, McLean points out. It merely places them one or more steps away from the rigorous world of formal strategic planning.

Why organizations don't plan

Not every organization conducts strategic information systems planning, even though strategic business planning in general has long been an accepted process at the highest levels of organizations.

This is understandable. Planning is frequently given a backseat to operations, and organizations quite often defer strategic planning even when they practice it in the short range. In addition, organizations attempting SISP often find their information systems personnel heavily committed to operational concerns, with little time to gain the perspective or do the groundwork necessary for strategic planning.

Moreover, strategic planning methodologies, while increasingly sophisticated and powerful, provide no ready answers or simple procedures for including the external factors — everything from the economic climate in which the organization operates to the hardware and software trends in business systems technology — with which strategic planning must deal.

SISP, nevertheless, is beginning to come of age in many large organizations. It has evolved not only as a necessary part of supporting an organization but also as a critical and very practical force in determining an organization's level of success, not an esoteric and relatively abstract exercise.

Strategic information planning is a massive undertaking for any organization, and formal methodologies are important to lend direction and purpose to the undertaking. But no methodology is adequate for the job if the organization lacks energetic information systems management with a clear understanding of the role and importance of SISP in modern business success. As one IBM strategic planning specialist has noted: "No SISP methodology solves problems. It simply helps you understand them better." ■



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NEW PRODUCTS

DEC unveils Vaxcluster Console tool

Said to aid management of Vaxcluster systems

Digital Equipment Corp. of Maynard, Mass., has announced the Vaxcluster Console System, designed to provide a centralized management and control facility for its Vaxcluster systems.

The Vaxcluster Console System is said to provide operators and systems managers with management functions that can be executed at a single terminal for control of up to 16 processor or storage controller nodes in a Vaxcluster system.

According to a company spokesman, the console system streamlines management of the Vaxcluster system by making the input from all nodes of the Vaxcluster system available simultaneously.

The console system's resources, such as automatic time-stamping of messages from individual nodes, allows the manager to optimize further Vaxcluster system operations, he added.

Microvax II linked to Vaxcluster

The console system incorporates one of DEC's Microvax II computers linked to Vaxcluster system nodes via fiber optics. It allows system management operations to be performed from any terminal of the Vaxcluster Console System, whether local or remote.

Additionally, individual node console status reports, which previously were printed out in hard copy, are now stored on a local disk at the console system, according to DEC.

A typical Vaxcluster Console System consists of a Microvax II computer with 5M bytes of storage, fiber-optic converters and power supply, fiber-optic cable and associated software.

Prices for the system start at $45,225, including a MicroVMS operating system license. Shipments are expected to begin in July.

Meridian DV-1 upgraded

Voice/data system gets graphics workstations

Northern Telecom, Inc. of Minneapolis has enhanced its Meridian DV-1 data/voice system with graphics workstations and the GEMDOS operating system and applications from Digital Research, Inc.

The Meridian M4100 graphics workstations include the Meridian M4120, with a monochrome monitor, for $1,995; the Meridian M4121, with a gray-scale monitor, for $2,295; and the Meridian M4122, with a color monitor; for $2,695.

The Meridian M4100 hardware includes a standard base controller with a minimum of 1M byte of random-access memory and a two-button mouse pointing device, an optional 5¼-in. disk drive, a 512K-byte memory board and an optional color matrix printer for the Meridian M4122 workstation.

In addition to GEMDOS, the new software includes GEM Draw, a picture editor; GEM Graph, a data graphing application; GEM Wordchart, a word chart editor; and GEM Collection, which consists of GEM Desktop, a graphics shell, GEM Paint, a graphics design tool, and GEM Write, a graphics-based word processing application.

According to a company spokesman, GEMDOS is said to be file-compatible with Intel Corp.'s 8086-based personal computer products.

On a per-user basis, the GEM Collection costs $199, GEM Draw and GEM Graph cost $249 and GEM Wordchart costs $149.



Northern Telecom's Meridian M4100 graphics workstations offer three monitors.

A site license is $1,600 for GEM Collection and $2,000 each for GEM Draw and GEM Graph.

The company also announced the DVIX V.2 operating system, its own version of the AT&T Unix System V Release 2, a 4M-byte Motorola, Inc. 68010 file processor and a 170M-byte storage unit to support DVIX V.2. This reportedly brings the Meridian DV-1 storage capacity up to 250M bytes.

In addition, Northern Telecom announced the X.25 gateway and the X.3 packet assembler/disassembler features that allow the Meridian DV-1 to communicate with packet-switched networks.

The price for DVIX V.2 is $1,700. The X.25 gateway is $1,595, amd the X.3 packet assembler/disassembler is $495.

The Meridian DV-1 is an integrated data processing and communications system. The Meridian M4000 terminals and workstations can access the applications of the Meridian DV-1 at a speed of 2.56M bit/sec., the vendor said.

Multifunction card out for IBM PCs

Omnitel, Inc. of Fremont, Calif., has introduced Omnipak, a single-board, multifunction card integrated with a 1,200/300 bit/sec. modem for the IBM Personal Computer, Personal Computer XT, AT and compatible microcomputers.

According to Omnitel, the card requires only one expansion slot and can be upgraded to 2,400 bit/sec. for future applications.

Omnipak comes packaged with communications and utilities software, such as random-access memory disk and printer spooler, reportedly enabling the PC to function as a communicating workstation.

In addition to the Hayes Microcomputer Products, Inc.-compatible 1,200/300 bit/sec. modem, Omnipak features 384K bytes of memory and parallel and serial ports.

Omnipak costs $499 and includes a two-year warranty.

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SOFTWARE & SERVICES

Systems software

Pilot Systems, Inc. has introduced **Pilot Distribution Software** for value-added distributors.

The Pilot Distribution Software operates on Unix-based systems.

It is composed of eight interactive modular subsystems for customer service, inventory control, purchasing, sales analysis, sales orders, accounting control, general ledger and value- added options, according to Pilot Systems.

Features include menu-selectable Help screens, extended credit system, customer service inquiry capability and duplicate customer purchase-order check.

The cost of individual modules begins at $1,500. The complete system starts at $13,000.

Pilot Systems, Suite 111, 125 Windsor Drive, Oak Brook, Ill. 60521.

■

Abacus Data Systems, Inc. has released **DM/3000**, a wholesale distribution-management software package for use with the Hewlett-Packard Co. HP 3000.

DM/3000 includes modules for sales order processing, inventory control, purchasing, sales analysis and general accounting applications. The software also handles mail orders, phone orders, counter sales and credit memos.

Users can enter miscellaneous and repair-service items for customer orders. On-line inquiry and print reports are available, according to the vendor.

DM/3000 is priced from $24,000 to $48,000.

Abacus Data Systems, 3166 Des Plaines Ave., Des Plaines, Ill. 60018.

■

Technical Software Services has announced the **Logger** system for Burroughs Corp. medium-system users.

Logger, written in Cobol 68, can operate in an on-line inquiry, update and maintenance environment or the batch update environment under MCPVI and MCPIX.

The system provides information of magnetic tape usage within a site's operation, such as library and data tapes as well as tapes created for information transport.

Reports generated include tape number order, tape name order, purge data order, cleaning date order, ownership order and storage vault order, according to Technical Software Services.

The batch-update Logger system costs $2,925. The optional on-line inquiry-update modification costs $1,030.

Technical Software Services, P.O. Box 753, Portland, Maine 04104.

■

Digital Equipment Corp. has introduced the **All-in-1 System for Employment Management**, designed for administering the employment process.

The system is an integrated set of software applications, including electronic mail, word processing, time and desk management and business applications.

Facilities include applicant tracking, job requisition processing, job matching, status reporting and employee self-nomination, according to the vendor.

The All-in-1 System for Employment Management is priced from $32,400 on the Microvax II to $174,000 on the VAX 8800.

DEC, 146 Main St., Maynard, Mass. 01754.

■

SAS Institute, Inc. has announced **Version 5** of the **SAS System** under MicroVMS, designed to support Digital Equipment Corp.'s Microvax II computer.

The SAS System includes base SAS software for data management, statistical analysis and report writing; SAS/AF for application development; and SAS/FSP for full-screen editing, query, letter writing and spreadsheets.

The system also includes SAS/Graph for information and presentation color graphics; SAS/ETS for planning, forecasting, financial modeling and row-and-column reporting; SAS/OR for project management; and SAS/IML for interactive matrix programming.

According to the vendor, the MicroVMS version of the SAS system is distributed via 9-track tape.

Annual licenses for each module range in price from $1,000 to $3,000.

SAS, Box 8000, SAS Circle, Cary, N.C. 27511.

Applications packages

Britz Publishing, Inc. has introduced **Release 2** of its **Bsign** banner and sign printing system for the IBM System/34, 36 and 38 family of computers.

New features of this release include enhanced menu and prompt screens as well as the ability to print banners in four sizes: 10½-in. by 12½-in. and three-quarters, one-half and one-quarter of that size.

According to the vendor, Bsign works with all System/34, 36 and 38 printers.

It is written in RPG II, and complete source code is included.

Bsign is priced at $29.

Users of Bsign Release 1 can upgrade for $19.

Britz Publishing, 1814 Capital Towers, Jackson, Miss. 39201.

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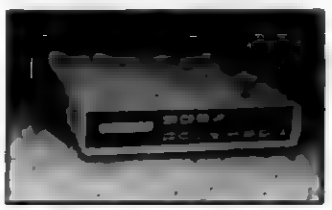
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ADAprint increases printer performance at lower cost.

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NEW PRODUCTS/SOFTWARE & SERVICES

Successful Systems Innovators, Inc. has announced its **Purchasing System** for the IBM System/34 and 36.

System features include automatic purchase order generation, on-line access to vendor performance and item performance, reporting functions, five-decimal cost fields, alpha search capabilities by item or vendor and detail history of past purchase orders.

According to the vendor, all programs are multiuser and include full source code and documentation.

The package is priced at $4,000.

Successful System Innovators, 35-48 172nd St., Flushing, N.Y. 11358.

■

NBI, Inc. has announced **BRS/Search**, a full text keyword search system, and **Lexpert**, software for management of billing, accounting and administrative information in law firms.

BRS/Search is said to accept documents from most personal computer-based word processing programs. Any document from NBI's Oasys products can be stored on the BRS/Search system, which runs on NBI's 500 computer series products.

Lexpert consists of seven integrated applications packages for tasks such as general ledger, accounts payable and docket control. It runs on NBI's 510 and 570 multiuser computers.

BRS/Search will be available in August. It is priced from $18,000. Lexpert costs $18,800.

NBI, P.O. Box 9001, Boulder, Colo. 80301.

■

D&B Computing Services, Inc. unveiled an interface for its Nomad2 fourth-generation language data base management system.

The interface is said to allow users to run applications using Teradata Corp.'s DBC/1012 parallel processing relational data base machine.

It reportedly allows Nomad2 users to store larger sets of data with improved access time and lets a programmer writing or modifying an existing Nomad2 application to store and access data from a Teradata DBC/1012 machine via a simple two-word option.

The interface will allow users of Teradata machines to use Nomad2's fourth-generation language.

The Nomad2 DBC/1012 interface is priced at $10,000.

D&B Computing Services, 187 Danbury Road, Wilton, Conn. 06897.

■

CIS, Inc. has announced that its **Medusa** computer-aided design and manufacturing system will run on Digital Equipment Corp.'s Vaxstation II/ GPX.

Medusa offers two-dimensional design and drafting, parametrics for creating families of parts and a three-dimensional solids modeler.

Medusa on the Vaxstation II/GPX offers the power of the Microvax plus a separate very large-scale integration graphics coprocessor.

Users will be able to run concurrent applications using the product's multiwindowing and multitasking capabilities, the vendor said.

The Medusa Vaxstation II/GPX system is priced from $40,000 to $50,000 for a single-user system.

CIS, 201 Burlington Road, Bedford, Mass. 01730.

■

Control Data Corp. has added **Shazam** from the University of British Columbia, **Premia** from K & H Computer Systems, Ltd. and three **Plot 10** graphics development applications from Tektronix, Inc. to the Control Data Network Operating/Virtual Environment software base for users of its Cyber 180 computer systems.

Shazam is an econometrics software application for performing regression analyses, simultaneous equation estimations and principal components.

Continued on page 124



Some people just ask for trouble.

Isn't it amazing just how many people go around asking for trouble?

Why, we're willing to bet there are people in your DP department this very minute flirting with disaster.

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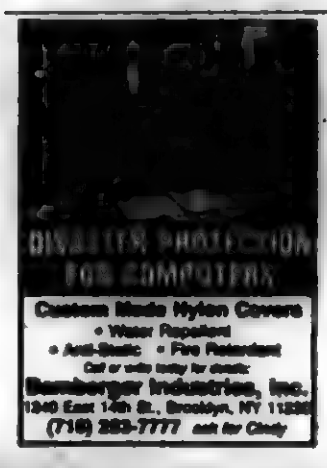
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Return to: Triangle Software Co., 4340 Stevens Creek Blvd., Suite 275, San Jose, CA 95129, (408) 554-8121.

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Continued from page 123

Premini is a project-management application for setting goals and scheduling resources, according to the vendor.

The Plot 10 applications include the Plot 10 Graphical Kernal System, the Plot 10 Interactive Graphics Library and the Plot 10 Terminal Control System.

Shazam costs $900. Premini costs $20,000, and the Plot 10 applications cost from $7,000 to $25,000.

CDC, 8100 34th Ave. S., Minneapolis, Minn. 55440.

Languages

IMSL, Inc. has added the **PDE/Protran** language to its line of Protran software.

PDE/Protran is said to solve systems of linear and nonlinear elliptic or parabolic partial differential equations.

It reportedly handles a large class of time-dependent, steady-state and eigenvalue problems in general two-dimensional regions.

PDE/Protran is for Control Data Corp.'s 6000, 7000, Cyber 70, 170 and 180; Data General Corp.'s 32-bit Eclipse; Digital Equipment Corp.'s Decsystem-10, -20, and VAX-11; and IBM's 360, 370, 4300 and 3000 series.

A license costs $10,800 plus $400 for annual support. An annual license costs $2,000, renewable for $1,500.

IMSL, 2500 Park W. Tower One, 2500 City W. Blvd., Houston, Texas 77042.

Utilities

Sterling Software, Dylakor Division has announced **Dyl-Online under CICS/VSE**, a software product designed to provide CICS users with on-line access to Dyl-280 and Dyl-280 II, the company's mainframe information management products.

Dyl-Online allows users to define report requests on-line, with syntax checking, before submitting them for execution. Output can be viewed at the terminal, printed, purged or left in the output queue, according to the vendor.

Dyl-Online under CICS/VSE costs $6,000. A complete Dyl-Online system including Dyl-280 costs $17,000; including Dyl-280 II, it costs $21,000.

Sterling Software, Dylakor Division, 17418 Chatsworth St., Granada Hills, Calif. 91344.

■

Sterling Software, Dylakor Division has enhanced its **Dyl-260** fixed-form report writer utility.

Release 8.6 allows a virtually unlimited number of branch instructions. The previous limit was 1,024.

Dyl-260 Release 8.6 is available for IBM mainframes running under OS/MVS, DOS/VSE, VM/CMS and SSX/VSE. It is priced at $11,000.

Sterling Software, Dylakor Division, 17418 Chatsworth St., Grenada Hills, Calif. 91344.

■

Battelle, Columbus Division has developed **NLQ**, a natural language software package said to enable users of data base management systems to access information from a terminal by typing questions in English.

Features of NLQ include dialogue capability, retrieval heuristics and data base management system and domain independence. According to the vendor, NLQ is able to process complete, abbreviated or ill-formed queries.

Other functions include Help commands, synonym dictionaries, user prompts and spelling corrections.

NLQ is written in Interlist-D on a Xerox Corp. LISP machine. It costs $3,000.

Battelle, 505 King Ave., Columbus, Ohio 43201.

■

Syncsort, Inc. has announced **Release 7.3** of **Sydoc**, its software maintenance product.

Sydoc analyzes Cobol source code and produces a series of summary reports that break down a Cobol program's internal structure, relationships and logic.

Release 7.3 supports source programs that contain VS Cobol II language extensions. Several formatting options have also been added.

Sydoc supports IBM Systems 370, 3030, 4300, 3080 and equivalents running on OS/VS operating systems, MVS/XA, MVS/SP and VS1.

Release 7.3 costs $22,000 for five years.

Syncsort, 50 Tice Blvd., Woodcliff Lake, N.J. 07675.

■

Computer Associates International, Inc. has announced **Release 4.1** of **CA-Top Secret**, a data access security software package for IBM's MVS and MVS/XA operating systems.

CA-Top Secret Release 4.1 maintains compatibility and security support for recent releases of IBM operating environments such as CICS 1.7 and IMS 2.1. It also offers IMS/DB protection for both batch and CICS environments.

CA-Top Secret is priced at $37,000. A three-year lease costs $25,000.

Computer Associates, 711 Stewart Ave., Garden City, N.Y. 11530.

■

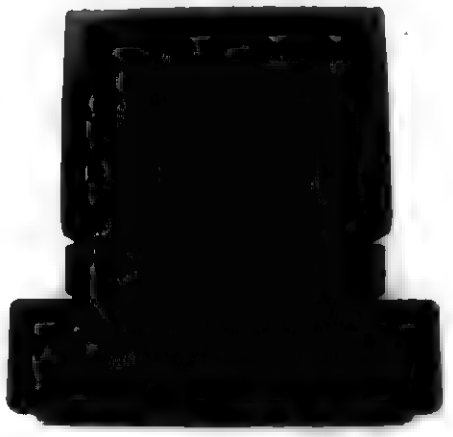
Hewlett-Packard Co. has introduced **HP Graphics Curator/3000**, a business graphics package said to allow users to access files from HP's host computer graphics with HP's Graphics Gallery software running on its Touchscreen personal computers.

HP Graphics Curator/3000 allows PC customers to use already created

Truth in a



(Actual size of our



[illegible] Inc., 29 Dunham Road, Billerica, MA 01821 (617) 663-6878 Telex

NEW PRODUCTS/SOFTWARE & SERVICES

graphics with no redesign required. Conversely, users may transfer picture files from the PC to the HP 3000 for integration into a slide or a word processing document.

HP Graphics Curator/3000 sells for $41,000 for use on the HP 3000 Series 37 and $2,500 for use on the Series 42, 58 and 70.

HP, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

Training software

Giordano Associates, Inc. has announced its **716 C/Atlas** computer-aided instruction (CAI) package.

The package is based on the Joint Service 716 C/Atlas Test Programming Training Course. It was designed to train test programmers and test technicians in the requirements and use of the Atlas language.

The 716 C/Atlas CAI package runs on the IBM Personal Computer, Personal Computer XT or compatibles. It costs $2,500. According to the vendor, on-site licensing is available starting at $10,000.

Giordano Associates, 21 White Deer Plaza, Sparta, N.J. 07871.

Services

Datapro Research Corp. has introduced **Datapro Reports on Software**, a buyer's guide intended to help users select software for mainframe, mini and supermicrocomputers.

The service features reports covering data base management, communications, application development tools, data management, operating systems, performance monitors and security systems, systems enhancements and utilities.

Datapro Reports on Software is priced at $295. It is also available as part of the three-volume Datapro 70 series, priced at $919.

Datapro Research, 1221 Avenue of the Americas, New York, N.Y. 10020.

■

Intra-Systems, Inc. has announced **Systems Development Standard/Guidelines**, a one-volume application development methodology for data processing shops.

The publication is said to separate the systems development activities into manageable phases. It defines what tasks are performed in each phase and what documentation is required in each phase.

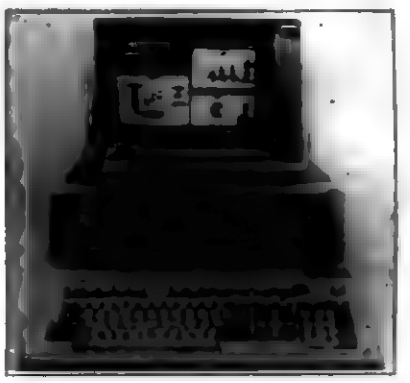
In addition, one section is devoted to standards and guidelines for the personal computer environment.

The volume is priced at $975 for the standard noncustomized format.

Intra-Systems, 13301 Green Valley Drive, Oklahoma City, Okla. 73120.

MICROCOMPUTERS

Systems



American Computer & Peripheral, Inc. has introduced the **American XTSR**, an IBM Personal Computer XT-compatible computer.

The American XTSR has a selectable clock speed of 4.77 MHz to 7.37 MHz. It uses a 16-bit Intel Corp. 8088-2 microprocessor and has up to 640K bytes of random-access memory on a four-layer motherboard.

Other features include eight expansion slots, automatic self-test at power up, Microsoft Corp. MS-DOS 2.11, two 360K-byte disk drives and controller, a color graphics or monochrome card and serial, parallel game port and real-time clock card, according to the vendor.

The American XTSR is priced at $2,560.

American Computer & Peripheral, 2720 S. Croddy Way, Santa Ana, Calif. 92704.

■



American Computer & Peripheral, Inc. has introduced the **American 286** IBM Personal Computer XT- and AT-compatible computer.

It features a keyboard selectable clock speed of 6 MHz to 8 MHz as well as a 16-bit Intel Corp. 80286 microprocessor.

According to the vendor, it is expandable from 512K bytes of memory to 4M bytes and has six expansion slots.

Other features are said to include an automatic self-test at power up, 64K bytes of permanent, read-only memory containing BIOS. Two 360K-byte 5¼-in. floppy drives are also included.

The standard American 286 configuration is priced at $2,800.

American Computer & Peripheral, 2720 S. Croddy Way, Santa Ana, Calif. 92704.

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Diskit 2™ disk drive.)

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NEW PRODUCTS/MICROCOMPUTERS



Canon USA, Inc. has announced the **A-200II Series** of IBM-compatible personal computers.

The floppy disk model includes a monochrome version of CRT, 256K bytes of standard memory, two 5¼-in. floppy disk drives, a Centronics-type parallel interface, serial data interface, six expansion slots and a standard IBM PC-compatible keyboard.

The hard disk model includes the same specifications as the floppy disk model but has one 5¼-in. floppy disk drive and one 20M-byte hard disk drive.

The A-200II Floppy Disk Model is priced at $1,995. The A-200II Hard Disk Model costs $3,595.

Canon USA, Systems Division, One Canon Plaza, Lake Success, N.Y. 11042.

■

Kimtron Corp. has introduced the **KW Series** of diskless personal computer workstations.

The KW-1 workstation contains an Intel Corp. 8088 processor, 4.77 MHz clock and 512K bytes of random-access memory (RAM). The KW-2 workstation has an Intel 8088-2 processor and 8 MHz clock speed. The KW-3 workstation includes an Intel 80286 processor, a 6-MHz or 8-MHz switchable clock speed and 640K bytes of RAM.

All three models include eight expansion bus slots, a monochrome monitor with video adapter card and an IBM Personal Computer AT-style keyboard.

Pricing for the KW-1, KW-2 and KW-3 is $995, $1,195 and $1,995, respectively.

Kimtron, Building 160, 1705 Junction Court, San Jose, Calif. 95112.

■

Tasvir Corp. has enhanced its **Supercads** three-dimensional, mechanical, computer-aided design systems.

The data structure of Supercads has been refined. Improvements to its design capabilities include upgrades to its Autochange features and its construction plane capability.

The turnkey IBM Personal Computer AT Personal Supercads cost $18,900. The Personal Computer-upgrade kit costs $10,000, including Supercads software, a Microsoft Corp. Xenix operating system and graphics board. Supercads Turbo, the Silicon Graphics, Inc. Iris workstation version, costs $44,900 for the turnkey system and $13,500 for software only.

Tasvir, 1091 Stielin Road, Mountain View, Calif. 94043.

■

Kaypro Corp. has enhanced its line of **IBM-compatible 16-bit business computers**.

The Kaypro 2000 laptop now has 768K bytes of internal memory and a larger LCD screen.

The Kaypro 2861 C IBM Personal Computer AT-compatible now has a hard drive that provides 30M bytes of storage. In addition, all Kaypro IBM-compatible units now feature Microsoft Corp. MS-DOS 3.2.

The Kaypro 2000 costs $1,995. The Kaypro 2861 C costs $3,995.

Kaypro, 533 Stevens Ave., Solana Beach, Calif. 92075.

Software applications packages

Usercom Systems, Inc. has introduced **U-Plan**, a business planning system for IBM Personal Computers.

According to the vendor, U-Plan provides a financial framework that supports analysis of various parameters and strategies.

U-Plan is priced at $485.

Usercom Systems, 2200 E. Devon Ave., Des Plaines, Ill. 60018.

■

Infomed Corp. has introduced a **pulmonary module** for industrial and clinical pulmonary screening and analysis for Burroughs Corp. Model B 25 computers with graphics capabilities.

The module provides diagnostic measurement and the ability to generate reports. The operator can perform pulmonary function evaluations including premedication, postmedication and shift tests.

Each module consists of an eight-liter, dry rolling seal spirometer, a separate interface module that connects directly to the RS-232 port of an existing B 25 as well as software.

The module costs $3,500.

Infomed, 13 Inverness Way S., Englewood, Colo. 80112.

■

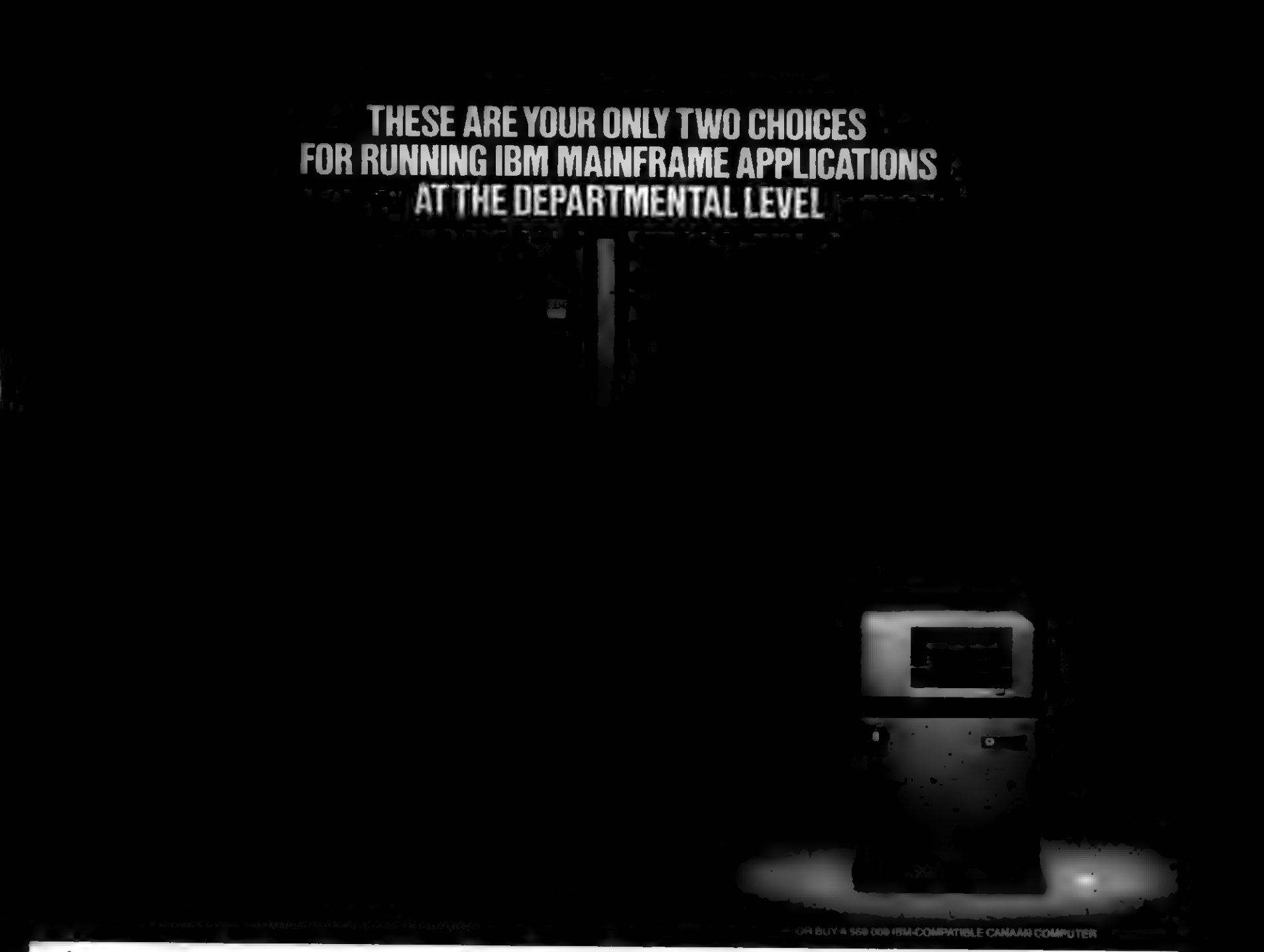
Hewlett-Packard Co. and **Lotus Development Corp.** have announced that HP will offer Lotus' 1-2-3 Release 2 for the HP Touchscreen personal computer family.

The Touchscreen version will incorporate HP's touch technology, allowing users to choose menu items and soft keys by touching the screen.

Other features include a spreadsheet with 8,196 rows by 256 col., direct Microsoft Corp. MS-DOS access, Intel Corp. 8087 coprocessor support and support for HP's Laserjet Plus printers, Thinkjet personal printer, HP2603 dot matrix printer

Continued on page 130

THESE ARE YOUR ONLY TWO CHOICES FOR RUNNING IBM MAINFRAME APPLICATIONS AT THE DEPARTMENTAL LEVEL



The problem is familiar. DP/MIS budgets are already straining while PC users are demanding faster response time and greater access to mainframe data and resources. But Canaan Computer Corporation has a resourceful solution—in fact, the only solution short of installing IBM™ mainframes in each department.

Now, users can run and develop IBM mainframe applications on the industry's most cost-effective departmental computer. The Canaan DCS 5800™ Departmental Computer lets up to 36 users run unmodified IBM 370 VM/CMS mainframe applications department by department, instead of on the mainframe.

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Cost effectiveness also means flexible connectivity. The DCS 5800 connects with the PCs and terminals you already have: IBM PCs, with or without IRMA™ boards, 3178/3278 terminals, DEC VT 100s/VT 220s and many other ASCII terminals.

And, of course, it lets departmental users share printers, disk drives, software and information all within their own work groups.

THE CONVENIENCE OF RUNNING EXISTING APPLICATIONS AND THE POWER OF DEVELOPING NEW ONES

The DCS 5800 won't disrupt users' workstyles—they still run the same mainframe applications they're accustomed to, including IBM's Professional Office System *(PROFS)*, fourth generation languages and decision support applications. Even IBM's *ISPF*, compilers, editors and debuggers.

Without requiring any additional training, MIS staffing or mainframe burden, the DCS 5800 also lets users develop and test *CICS* and *ISPF* applications in each department.

MULTIGATE™ DEPARTMENTALIZES MAINFRAME CAPABILITIES

Multigate, Canaan's family of communications software, integrates users, departments and MIS into a unified corporate information system, sharing information and applications.

Multigate PC "Plus" is an advanced PC communications software package that gives users the advantages of virtual disk capacity, pop-up menus and a complete PC application shell. Multigate 3274 BSC gives them additional transparent passthrough and log-on with simultaneous sessions to VM and MVS mainframes. And Multigate LAN provides Ethernet communications at the departmental level among DCS 5800s and other minicomputers.

THE DCS 5800 DRIVES COSTS DOWN AND PRODUCTIVITY UP

Canaan's DCS 5800 provides immediate productivity with third party software we carefully test and certify for our growing library of commercial IBM 370 packages. Packages like FOCUS, RAMIS II,™ STRATAGEM™ and MODEL.™ All running on the DCS 5800 at a cost as low as 1/10th that of running them on a mainframe.

No other system is like the DCS 5800. It's the solution that users and DP/MIS can finally *agree upon* rather than compromise over.

The benefits are enormous, the cost is minimal.

Let us send you information on the complete story today. And you'll see why Canaan is the first choice of end users and DP/MIS alike to run departmental mainframe applications.

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(In CT, call 203-372-8100.)

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Talk is Cheap.

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Today's system software buying decisions will affect your company for years to come.

Before you select a vendor, talk to people you can trust.

If you're about to invest in system software for your mainframe, here's some free advice that may surprise you:

Go slowly.

The decision you're making will be felt for years to come throughout your entire organization. So don't try to shortcut the selection process.

And in particular, don't make a decision without talking to people with first-hand experience—the users of the products in question.

Naturally, we believe that Software AG products offer the best solutions available to the problems you face. And we'd like to have an opportunity to convince you—not by competitive claims and counterclaims, but by demonstrated performance in real-world customer sites.

In the meantime, we'd like to offer a few thoughts on some factors that contribute to performance.

Needed: integrated, long-term, worldwide solutions.

If you've been involved in data processing for any length of time, you already know more than enough about the dangers of piecemeal "quick fixes". You don't have to be sold on the value of integrated tools that meet a full range of organizational needs through a common syntax and shared procedures.

But while many vendors preach integration, few practice it on the scale of Software AG. From our core products, ADABAS and NATURAL, we have created an entire universe of software products that simultaneously meet the needs of everyone from MIS professionals to end users with no programming experience.

We're also integrated in another way—geographically. As more and more organizations seek to coordinate resources and data on a worldwide basis, they need a caliber of support that is consistent worldwide. Software AG's reach is unique among independent software vendors—with products installed in 52 countries.

Fourth-generation technology: Who needs it? Who's got it?

A lot of vendors have expended a lot of hot air on the subject of fourth-generation languages. And we'd be the last to deny that a well-designed 4GL like NATURAL can be a phenomenal productivity tool—as much as 10 to 20 times more productive than COBOL, for instance.

But the language itself is only part of the story. Because in committing to a fourth generation system, you're really committing to an entire technology for meeting your organization's needs. You'd better be sure that technology includes everything you need—from DBMS, 4GL, and data dictionary to end-user computing tools, office systems, micro/mainframe links, and intersystem communication facilities. If it doesn't, you may be looking at only a partial solution.

In any case, don't evaluate a 4GL by itself. Evaluate it in relation to the other products that are required to satisfy your total information needs. Do they share a common architecture or syntax? Were they designed together, or are they simply marketed together? And most important of all, how do people like working with them?

We *know* how people like working with NATURAL. After all, it's the world's most widely installed, widely experienced fourth-generation language—used by over 75,000 programmers. If you're looking for insights into 4GL technology, you might start by talking with one of them.

Industry surveys repeatedly rate Software AG #1.

It's one thing for a vendor to be proud of its products. It's another for an entire industry to share in that high regard.

Yet that's just what's been happening with Software AG products. For several years, *Datapro* and *Datamation* have both published annual surveys of system software users. And Software AG has repeatedly come out on top by a variety of yardsticks. That's not rhetoric—that's performance.

Software AG: high-performance vendor to over 2000 customers.

Because system software is a long-term investment for most organizations, it inevitably carries with it a long-term relationship with the software vendor.

And for many years, we and our users have recognized the importance of that relationship. In fact, we have worked together to shape it in the interests of delivering the best possible product performance.

But while we're glad our users take the trouble to respond to surveys, we have no control over their comments.

Which makes it all the more gratifying to see the survey results. And all the more imperative that you hear what users have to say—before you buy.

Just give us a call today. Or send in the coupon. We'll be glad to put you in touch with Software AG users in situations comparable to yours, so you can find out for yourself what industry insiders have known all along:

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NEW PRODUCTS/MICROCOMPUTERS

Continued from page 126

and the HP Colorpro plotter.

The software is priced at $495.

HP, 3000 Hanover St., Palo Alto, Calif. 94304.

■

Time Arts, Inc. has released **Environment for Visual Art** (EVA), software designed for art and design creation on the IBM Personal Computer AT.

The system offers 32,000 colors, true-watercolor brushes, wet-on-wet effect, instant full color tinting and multilayering of transparent images.

Other features include a predictive pen, texture rendering and subtle airbrush effects.

Instantaneous capture of video images for manipulation within the system is integral, and a selection of fonts is available.

EVA costs $4,995.

Time Arts, 3436 Mendocino Ave., Santa Rosa, Calif. 95401.

■

PNC Information Systems Corp. has announced **MicroHRIS**, a menu-driven software system for automating human resources information.

MicroHRIS is said to automate benefits, compensation, history, training, payroll and a range of user-defined information. It is also said to feature built-in data verification and provides an interface to payroll systems.

The system builds on three database packages from Microrim, Inc.: R:Base 5000, Extended Report Writer and Clout.

MicroHRIS costs $7,500. A version for Digital Equipment Corp. VAX computers costs $20,000.

PNC, Pittsburgh National Bank Building, 6th Floor Annex, 5th and Wood, Pittsburgh, Pa. 15222.

■

National Management Systems has introduced the **NMS Personnel Manager's Workstation**, a human resources information system.

The system runs on IBM Personal Computers and compatibles. It is menu driven and features candidate searching, ad hoc reporting and automatic linking to Lotus Development Corp.'s 1-2-3.

It also features automatic linking to word processors, automatic electronic mail access via Compuserv, Inc., ad hoc global updating, full password and access-level security and file backup and recovery.

The standard version contains a relational data base structure of 170 data items organized in 19 files. It costs $4,995.

National Management Systems, 3337 Duke St., Alexandria, Va. 22314.

■

Nostradamus, Inc. has introduced **Instant Replay**, a software product for building product demonstrations, prototype sessions, professional presentations and interactive tutorials for the IBM family of personal computers.

According to the vendor, Instant Replay acts as a Microsoft Corp. MS-DOS or IBM PC-DOS shell with an integrated screen painter and prototyper as well as a key stroke memorizer capable of creating any application program directly or through generated menus.

It also features computerized presentation of standard text files.

Instant Replay is priced at $89.95.

Nostradamus, Suite 110, 5320 S. 900 East, Salt Lake City, Utah 84117.

Utilities

Simon & Schuster Software Division has announced **Webster's New World On-Line Thesaurus** for IBM Personal Computers and compatibles.

The program is said to contain 120,000 synonyms and phrases. It is random-access-memory-resident and compatible with more than 30 word processors. It is also compatible with software packages including Micropro International Corp.'s Wordstar, Microsoft Corp.'s Word and Lotus Development Corp.'s Symphony.

According to the vendor, the program recognizes common prefixes and suffixes. Writers can browse, scroll or flip through the software.

The Thesaurus costs $69.95.

Simon & Schuster, c/o Prentice Hall, Englewood Cliffs, N.J. 07632.

■

Softlogic Solutions, Inc. has introduced **Cubit**, a software program for IBM Personal Computers and compatibles designed to compress and decompress data files.

Cubit is composed of four programs: Cubit, the general purpose program; CubitR, a resident Cubit; CubitS, a switch program from resident Cubit; and Filchk, a file check program.

According to the vendor, users do not have to exit a program to pull up a compressed file.

Cubit costs $49.95.

Softlogic Solutions, 530 Chestnut St., Manchester, N.H. 03101.

■

Network Software Associates, Inc. has announced **RJEspool**, a printer spooling software interface product for micro-mainframe communications applications.

The product is said to form a transparent interface between the vendor's Adaptsna RJE micro-to-mainframe communications product for IBM Personal Computers, Personal Computer XTs and ATs and the Software Directions, Inc.'s PrintQ printing spooler for PCs. It allows the mainframe to transfer not only the files to be printed but also complete specifications and parameters.

The RJEspool software costs $185.

Network Software Associates, 22982 Mill Creek, Laguna Hills, Calif. 92653.

■

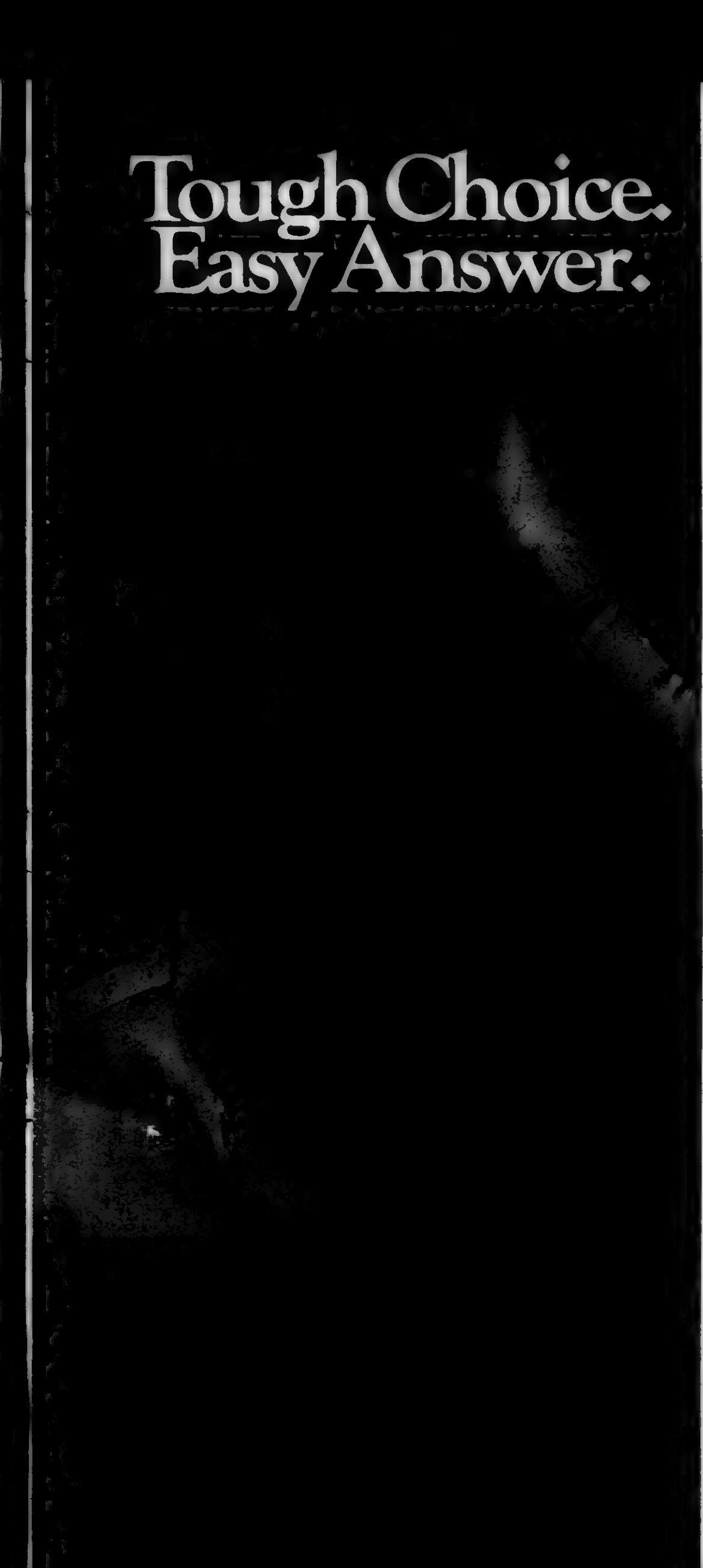
EZ Store has introduced **BackEZ** and **EZ Fix**, storage management products for personal computer-based systems.

BackEZ is a backup utility designed to transfer data from hard disk to any Microsoft Corp. MS-DOS or IBM PC-DOS recognizable storage device. EZ Fix is said to recover 100% of the information after an accidental format. It constantly monitors the activity of the disk, seeking changes in files and updating its own area directory.

Each program costs $99.

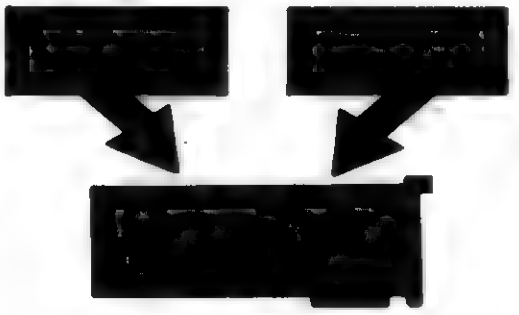
EZ Store, Unit K, 9421 Winnetka, Chatsworth, Calif. 91311.

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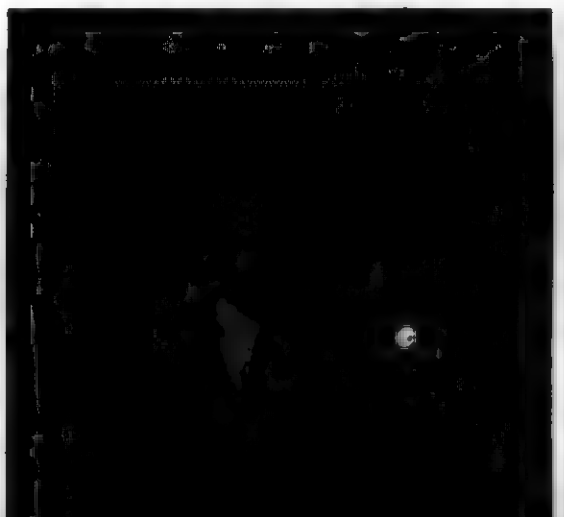
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Available now for your PC-XT and XT work-alikes, QuadEMS+ is easy to use. Just plug it in. It does the rest. It's designed to automatically configure itself to your system requirements. For more information visit the Quadram dealer nearest you. Or contact us at One Quad Way, Norcross, Georgia 30093; 404-564-5566.

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NEW PRODUCTS/MICROCOMPUTERS

Bourbaki, Inc. has released **1 Dir Version 3.5**, an enhanced version of its IBM PC-DOS and Microsoft Corp. MS-DOS shell utility software for IBM Personal Computers, Personal Computer XTs, ATs, 3270-PCs, PCjrs and compatibles.

The new version includes enhanced file management, improved mastery of MS-DOS and PC-DOS commands and operations and an augmented menuing system that includes password security options.

The 1 Dir is priced at $95.

Bourbaki, 431 Main St., Boise, Idaho 83702.

■

Shannon Associates, Inc. has introduced **Metamorphosis**, a utility program for the IBM Personal Computer and compatibles.

Metamorphosis is said to translate any source program from one language to another. It also functions as a custom compiler, assembler, macro processor, query language processor, command languages processor, graphics language processor and report generator.

Metamorphosis is priced at $387.

Shannon Associates, P.O. Box 597, Chapel Hill, N.C. 27514.

■

Mountain Computer, Inc. has announced **Advanced Filesafe 4** tape backup software for disk drives.

The software allows users to back up all files or only those that have been added or changed. It can also restore files to a different directory on the disk or transfer them between tape or hard disk, floppy disk or over local-area network.

Version 4 is now standard on Filesafe Series 7000 hard-disk, tape and combo systems as well as on the TD-4000 40M-byte tape drive.

It is available to all registered owners of Mountain tape backup systems for $149.

Mountain Computer, 360 El Pueblo Road, Scotts Valley, Calif. 95066.

■

Delta Contracting Services, Inc. has announced **Cliplock**, a program said to provide record and file locking capabilities for Nantucket Corp.'s Clipper-compiled Dbase III, from Ashton-Tate, applications.

Cliplock is said to allow up to 10 users to share information on a local-area network, while ensuring that no more than one user can access a specific record at a particular point in time.

Cliplock is said to work with local-area networks from Novell, Inc. and 3Com Corp. as well as with Corvus Systems, Inc. Omninet, AST Research, Inc.'s PC-Net and Multilink.

Cliplock is priced at $99.95.

Delta Contracting Services, 150 Chestnut St., San Francisco, Calif. 94111.

■

Microplot has introduced **Toolkit**, a companion product for its PC-Plot-III graphics emulator software package.

Toolkit includes 11 utility programs that allow the user of PC-Plot-III to modify and draw pictures saved.

Some of the functions include Plotdev, a device driver; Sketchpad, which allows files to be edited and enhanced; Printplot, which produces 1,024 by 780 resolution plots on a dot matrix printer; Casprint, a version of Printplot; Lotustek, for converting graphics to Tektronix, Inc. format; and Hp Plot-III, a file conversion program and plotter driver.

PC-Plot-III and Toolkit cost $295.

Microplot, 659-H Park Meadow Road, Westerville, Ohio 43081.

■

CDI Systems, Inc. has introduced **Autokey/3270**, said to control IBM 3270 Personal Computer interaction from a personal computer command file.

The software accesses the screen-image buffer found on 3270-PC emulator boards and executes the commands in a command file by simulating the actions of a 3270 operator.

According to the vendor, Autokey/3270 users can automate entire logon sequences, repetitive input procedures and other applications requiring interaction with a number of 3270 screens.

The Autokey/3270 programmer's package costs $149.

CDI Systems, 2803 Butterfield, Oak Brook, Ill. 60521.

Software languages

Ryan-McFarland Corp. has announced its **RM/Cobol-8X** compiler for the Texas Instruments, Inc. family of IBM PC-DOS microcomputers.

RM/Cobol-8X is a Cobol compiler for microcomputers that offers portable applications code and high-speed execution. It includes IBM mainframe Cobol extensions and key features and allows virtually unlimited program size.

Applications written in RM/Cobol are source-code-compatible with RM/Cobol-8X.

The RM/Cobol-8X full development system is priced at $1,250. Versions for the IBM PC Network cost $1,500, and runtime systems are priced at $300 and $600.

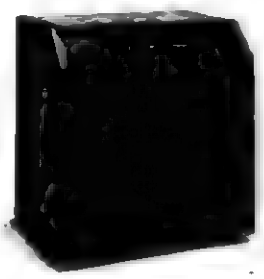
Ryan-McFarland, Rolling Hills Estates, 609 Deep Valley Drive, Calif. 90274.

Software data base management systems

A shareware version of **Instant Recall, Precept's** memory-resident data base for the IBM Personal Computer said to allow free-form entry and retrieval, is now available.



Introducing multiple 3270 host access.



Multiple host access used to mean the expense of multiple controllers. The clutter of multiple displays. And the inconvenience of accessing multiple applications one at a time.

Our solution? Multi-host, multi-lingual network controllers that allow you to access up to four 3270 hosts and 32 Async hosts. And simultaneously view up to four "live" applications on a single Lee Data display.

Lee Data's "single system" approach to multiple host access is your passport to less

Instant Recall indexes every word, so data is not restricted to predefined categories. Users can move data back and forth between Instant Recall and already running programs.

The shareware version is fully functional and handles up to an 80K-byte data base. It is available on Compuserve, Inc.'s Compuserve and bulletin-board systems or from the vendor for $10.

The expanded version handles 2M-bytes and includes a printed manual and telephone support. It costs $69.

Precept, Suite 173, 3790 El Camino Real, Palo Alto, Calif. 94306.

Software enhancements

Hemming Morse, Inc. has released **Focus: ABC Version 2A**, its audit and compilation software to be used with Lotus Development Corp.'s 1-2-3 Version 2.

Worksheets available in Version 2A include trial balance, tax adjustment, ratio graphs, summary trial balance, financial statements, tax forms summaries, adjustments and reclassifications, difference and ratio analyses and consolidations.

According to the vendor, the Audit Version 2A of Focus: ABC costs $495 for a single copy and $1,495 for a site license.

A single copy of Compilation Version 2A is $245. A site license costs $995.

Hemming Morse, 1700 S. El Camino, San Mateo, Calif. 94402.

■

Allen, Emerson & Franklin, Inc. has announced **Version 2** of the **GTP Development System** and the **GTP Professional Model** for the IBM Personal Computer with IBM PC-DOS 2 and Turbo Pascal 3.

GTP is an application generator for producing Turbo Pascal code for screen and data base systems.

Version 2 of the Development System includes the ability to create automatically multiple screen applications.

It also features a context-sensitive Help function, a new data base manager and global search criteria.

The GTP Professional Model reportedly includes all of Version 2 as well as a report generator and a menu generator.

According to the vendor, GTP Version 2 is priced at $150.

GTP Professional Model is priced at $200.

Allen, Emerson & Franklin, P.O. Box 928, Katy, Texas, 77492.

NBI, Inc. has introduced **IWS 4** software designed for its Integrated Workstation (IWS) electronic publishing system.

IWS 4 adds design graphics, equations, an alternate keyboard for scientific and mathematical characters and equations and spelling and print enhancements to current IWS functions.

Pricing for the IWS with 1.5M bytes of memory and 23M bytes of local storage begins at $11,990 and includes document composition software. Design graphics, equations and spelling are optional IWS 4 features, which are priced at $495 each.

NBI, P.O. Box 9001, Boulder, Colo. 80301.

■

Diagonal Data Corp. has enhanced its **Micro Maint** plant maintenance software package for microcomputers.

New features include enhanced labor costing and reporting and equipment identification. Also, Micro Maint now provides four categories of downtime reporting and allows the scheduling of plant maintenance work orders by operating hours as well as by days.

Micro Maint costs $4,950.

Diagonal Data, 2000 E. Edgewood Drive, Lakeland, Fla. 33803.

■

Digitalk, Inc. has introduced **Release 2** of **Methods**, a Smalltalk programming environment for the IBM Personal Computer and compatibles.

The Methods communication interface permits any IBM or compatible PC to act as an intelligent terminal for a Unix computer via a standard RS-232 interface.

It can also be used to automate access to computer bulletin boards via a modem.

Another new feature, an IBM PC-DOS shell capability, permits the execution of PC-DOS commands or programs from within the Methods environment.

Release 2 of Methods is priced at $250.

Digitalk, 5200 W. Century Blvd., Los Angeles, Calif. 90045.

Communications

Universal Data Systems has announced **Sync-Up 201C** and **Sync-Up 208A/B** designed for micro-to-mainframe terminal emulation.

The modems fit in single slots in the IBM Personal Computer, Personal Computer XT and AT.

The Sync-Up 201C operates half duplex at 2,400 bit/sec. via the dial-up public switched telephone network (PSTN). The Sync-Up 208A/B provides two-wire half-duplex operation over the PSTN or four-wire full duplex private line operation at 4.8K bit/sec.

Two software packages are available for each modem: Sync-Up Dial, a synchronous automatic dialing communications package, and Sync-Up BSC, a package that allows IBM 2780, 3780 or 3270 Binary Synchronous Communications terminal emulation.

Sync-Up 201C costs $685 with Sync-Up Dial and $895 with Sync-Up BSC. Sync-Up 208A/B costs $1,200 with Sync-Up Dial and $1,410 with Sync-Up BSC.

Universal Data, 5000 Bradford Drive, Huntsville, Ala. 35805.

Plus Async access in a "single system."

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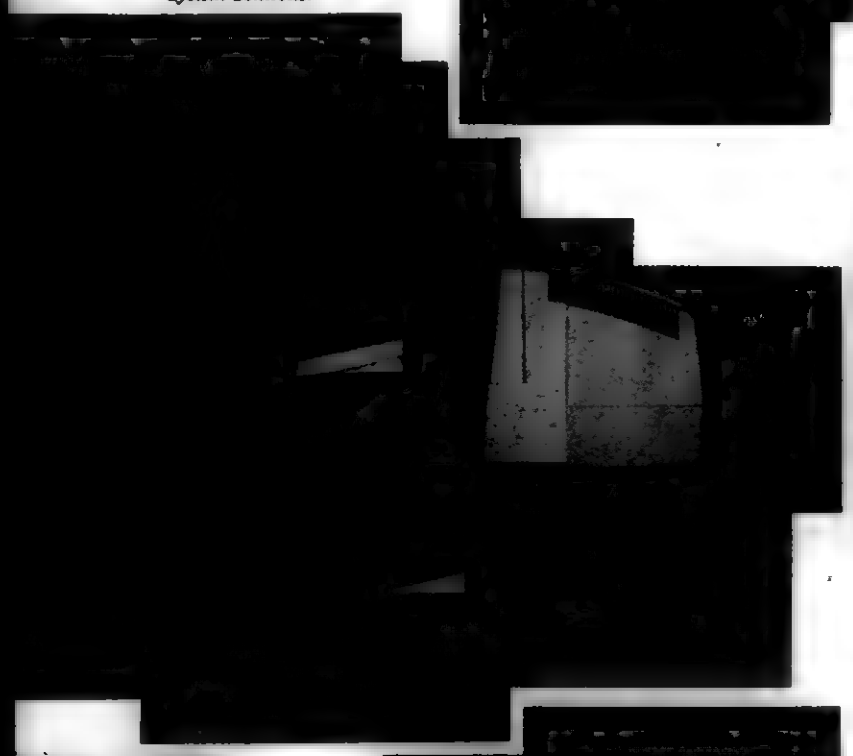
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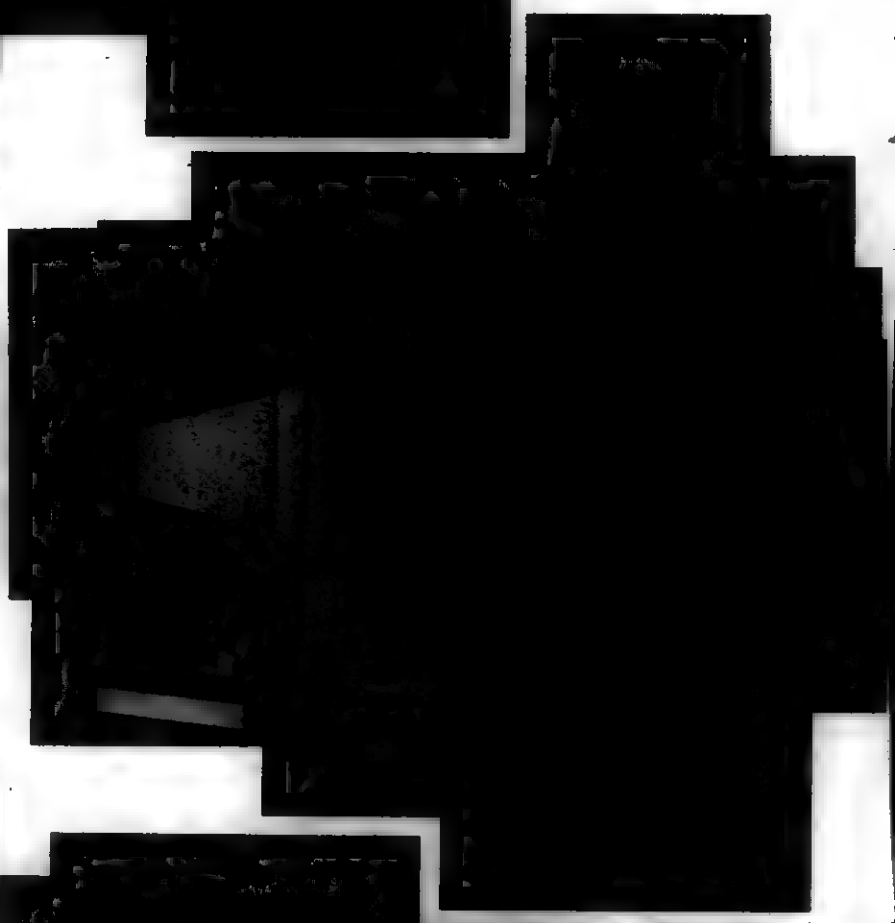
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AT&T 724 Multiplexer

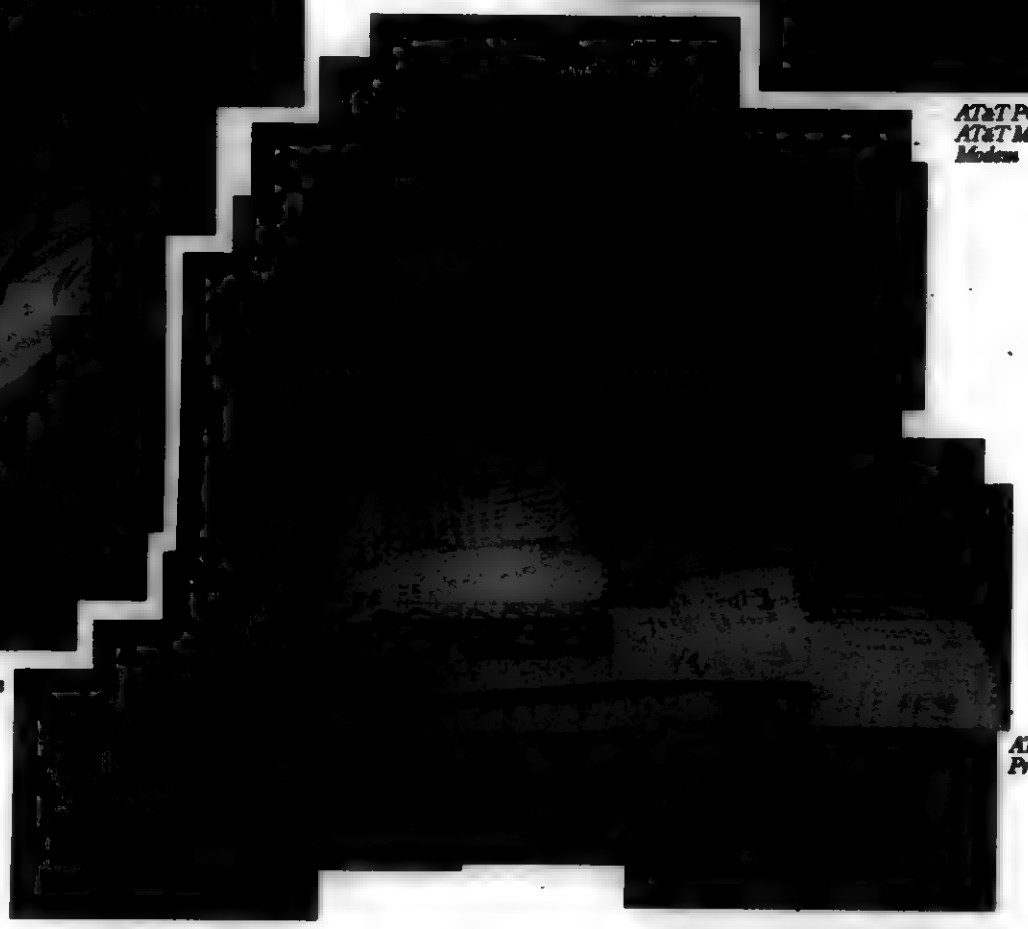
AT&T DATAPHONE II
System Controller







AT&T PC 6300
AT&T Model 4000
Modem



AT&T Multifunction Communication System

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It's a full line of modems, Data Service Units and multiplexers that combine network managing and diagnostic capabilities to deliver maximum uptime from an integrated *system.*

The mainframe connection. When you're in the 3270 environment, the AT&T 6500 Multifunction Communication System makes a lot of sense. Full compatibility, access to multiple synchronous or asynchronous hosts, plus powerful multitasking, put maximum mainframe muscle on the desktop.

AT&T 3B Computers working with our BSC/SNA connectivity software give you departmental processing of mainframe data.

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And with our Information Systems Network (ISN), you can even link your current systems and networks to equipment from other manufacturers.

Computers made to communicate. Both the AT&T PC 6300 line and the AT&T **UNIX**™ PC merge computing with communications. Optional or built-in modems and communications management software make simultaneous voice and data exchanges as simple as a few keystrokes.

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NEW PRODUCTS/MICROCOMPUTERS

Server Technology, Inc. has announced **Com Port Board-6**, an add-in serial communications board said to allow users to interconnect up to six IBM Personal Computers, Personal Computer XTs or ATs using the vendor's Easylan local-area network.

The Com Port Board-6 is configured as a half card with an attached daughterboard and fits into a short slot.

It is based on the RS-232C interface standard and works in conjunction with the DOS-supported COM1 and COM2 ports. Three boards can be accommodated per PC, allowing up to 18 PCs to be interconnected within an Easylan network.

The six-port Com Port Board-6 costs $489.95.

Server Technology, Suite 107, 1095 E. Duane, Sunnyvale, Calif. 94086.

Data storage

Archive Corp. has introduced the **Super Scorpion** Model 5125L-1, a ¼-in. streaming cartridge tape drive for mini and microcomputer systems.

The drive has a capacity of 125M bytes and QIC-120 tape format compatibility.

Data is transferred at a rate of 90K bit/sec. with a tape speed of 72 in./

According to Archive, the ¼-in. tape drive reads and writes any high-performance media cartridge that conforms to the industry ANSI format as well as any tape cartridge that conforms to the QIC-24 data format standard.

The Super Scorpion is priced at $733.

Archive, 1650 Sunflower Ave., Costa Mesa, Calif. 92626.

Extended Systems has announced **Sharedata**, a system said to allow up to four personal computers to concurrently share data on one external 20M-byte hard disk drive.

Sharedata operates as a multitasking storage controller. It can utilize standard RS-232 communications ports with transfer rates up to 19.2K bit/sec. An RS-422 interface is also available that transfers data up to 670K bit/sec.

Sharedata allows volume and file sharing with IBM PC-DOS or Microsoft Corp. MS-DOS. It also works with networks.

Sharedata includes an external package with a 20M-byte hard disk, multiported disk controller, disk driver, utility package, four 50-ft. cables and RS-232 adapters.

It costs $1,995.

Extended Systems, P.O. Box 4937, 6062 Morris Hill Lane, Boise, Idaho 83711.

■

Priam Corp. has introduced the **ID100-PC**, a 100M-byte internal disk add-in kit for the diskless IBM Personal Computer XT and compatible products.

The kit consists of a 103M-byte, 5¼-in. Winchester disk drive, controller, installation and utility software on floppy diskette and interface cables.

The disk drive is a Priam Model V185 5¼-in. disk drive with a controller using the run-length limited method of data encoding.

The ID100-PC is priced at $2,698.

Priam, 20 W. Montague Expwy., San Jose, Calif. 95134.

Printers/Plotters/Peripherals

Oasys, Inc. has introduced the **Laserpro Express** and the **Laserpro 1510** laser printers.

The Laserpro Express is an 8 page/min. printer.

It can control printer output so the page emerges with the printed side either up or down.

It features a 250-sheet paper cassette, a 100-sheet output capacity tray and a 50-sheet adjustable paper stacker.

According to the vendor, the Laserpro 1510 is a 15 page/min. printer designed for graphics and typographic applications.

It is said to print and stack up to 500 sheets at a time.

The Laserpro 1510 has a dual paper-feed system, prints at a resolution of 300 by 300 dot/in. and has 20 bit-mapped fonts.

The Laserpro Express costs $1,895, and the Laserpro 1510 costs $6,995.

Oasys, 8352 Clairemont Mesa Blvd., San Diego, Calif. 92111

■



Toshiba America, Inc. Information Systems Division has introduced the **P351C**, a color version of its 3-in-One 24-pin dot matrix printer.

Features include the ability to print overhead transparencies and emulate Qume Corp. Sprint 11 daisywheel and IBM color printers.

The P351C costs $1,749. Available free to purchasers is a start-up kit that includes Microsoft Corp.'s Chart, a color graphics software program, 25 transparency sheets, a software integration guide and enhancement catalog and color ribbon.

Toshiba America, 2441 Michelle Drive, Tustin, Calif. 92680

■

Lasergraphics, Inc. has added the **UI-100M24**, the **UI-100615** and the **UI-100320** rasterizing computers to its UI-100 series.

The UI-100M24 is for the Mitsubi-

Continued on page 140

The VISUAL language of the future is here !

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- pattern recognition logic eliminates tedious line-by-line programming
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More than user-friendly, its visual and picture-oriented medium makes it truly user-seductive.

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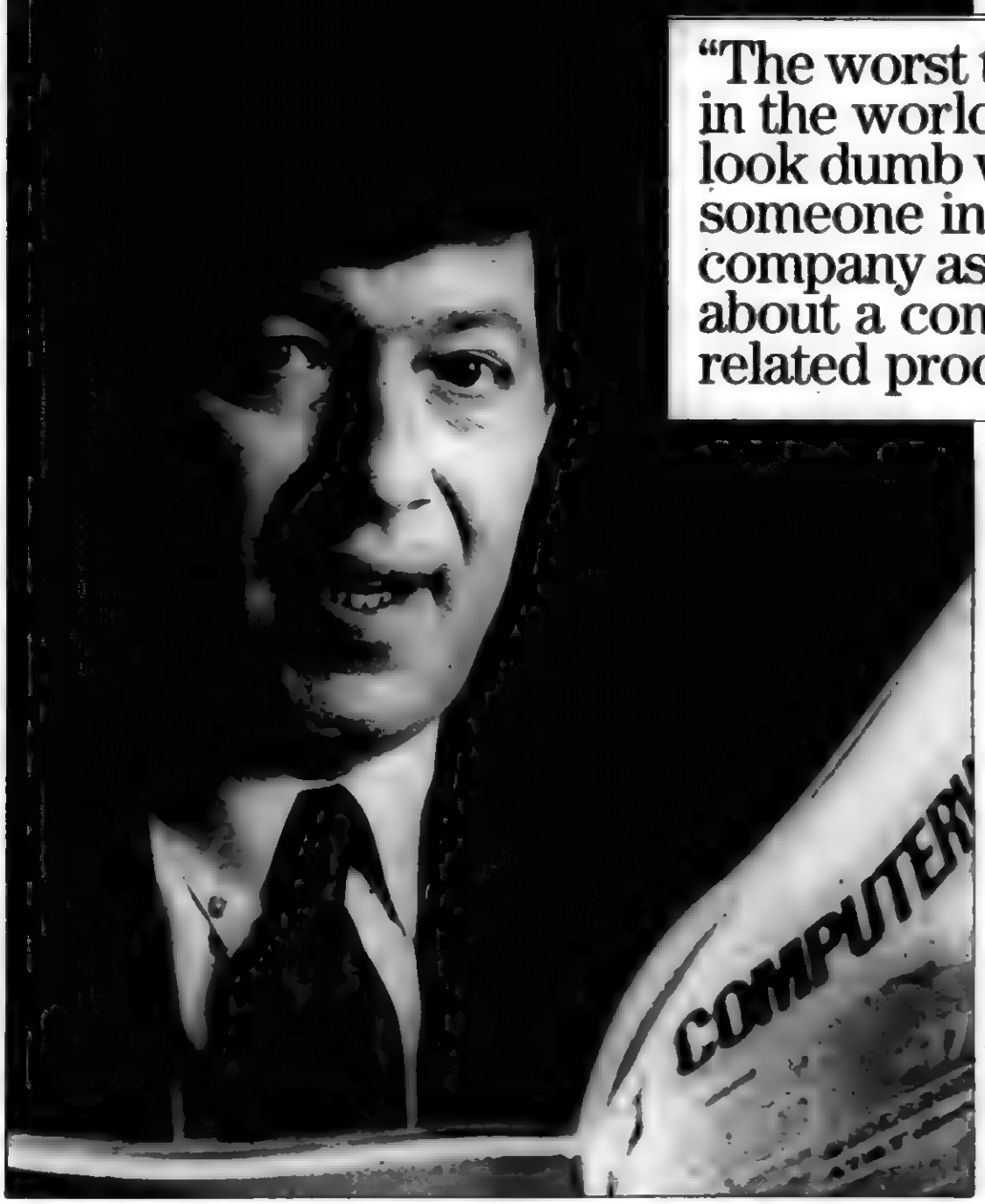
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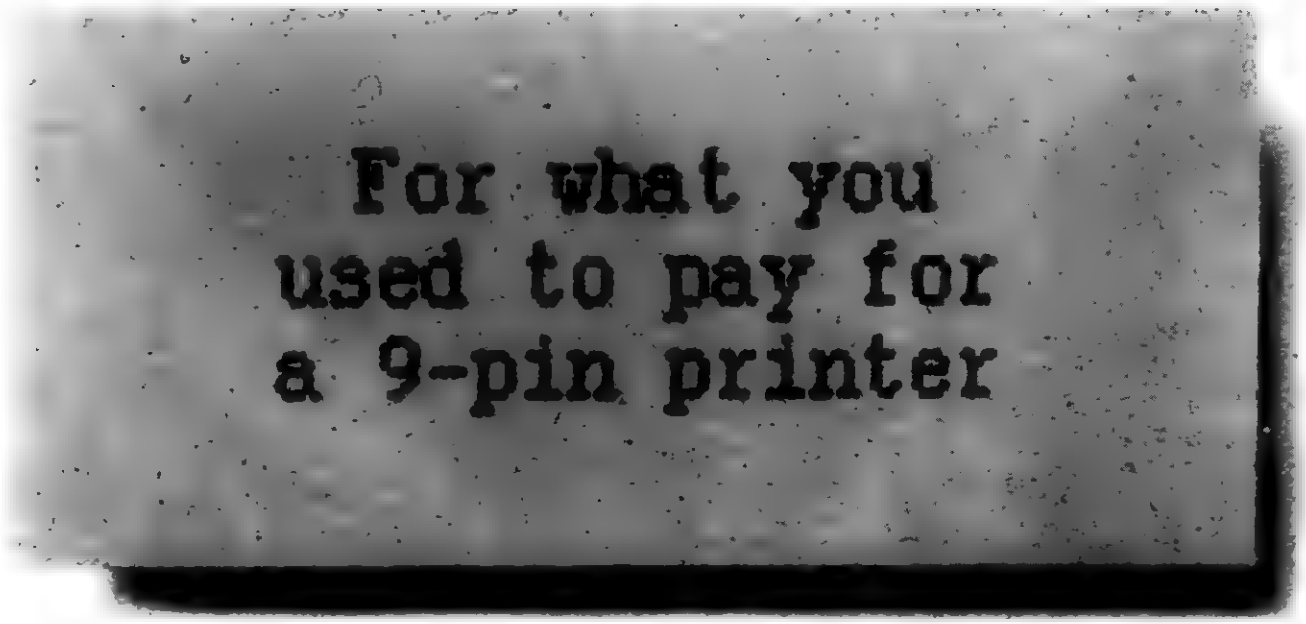
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PRINTERS'



When you see our new Pinwriter™ P6, P7 series dot matrix printers, you'll think you're in a time warp.

These are the first 24-pin printers that list for as little as $699. Or about what you would have paid for an ordinary 9-pin printer a year ago.

Now, that's progress. Especially when you consider our new printers have an advanced 24-pin printhead. And print data at 216 characters per second and crisp, dense letter-quality at up to 65 cps. Which is as fast as most 9-pin printers turn out data quality.

Actually these new Pinwriter dot matrix printers surpass every other printer in their price range. In their combination of speed, graphics resolution, the number of built-in fonts and low noise level.

None of which will surprise you if you know NEC printers. Because nobody does more with 24-pin technology than NEC. In fact, we now have more 24-pin printer models than any other manufacturer.

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If you would like more details about our full line of 24-pin Pinwriter printers, call 1-800-343-4418 (in MA 617-264-8635). Or write: NEC Information Systems, Dept. 1610, 1414 Massachusetts Ave., Boxborough, MA 01719.



NEC PRINTERS. THEY ONLY STOP WHEN YOU WANT THEM TO.

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NEC Information Systems, Inc.

NEW PRODUCTS/MICROCOMPUTERS

Continued from page 136

shi Electronics America, Inc. G-500 color thermal transfer printer. The UI-100S15 and UI-100S20 are for the Seiko Instruments U.S.A., Inc. CH-5301 and CH-5312 color transfer printers. The products produce color and monochrome hard copy on roll stock paper and transparencies.

The UI-100M24 and the UI-100S20 cost $7,495 each. The UI-100S15 costs $4,495.

Lasergraphics, 17671 Cowan Ave., Irvine, Calif. 92714.

■

Alps America has announced the 18-pin **P2100** dot matrix printer.

The P2100 prints at 400 char./sec. in draft mode, 200 char./sec. for memo quality and 80 char./sec. for near-letter quality. It features a 4K-byte buffer expandable to 256K bytes and offers a resolution of 240 by 216 dot/in.

Other features include the ability to emulate both IBM and Epson America, Inc. character sets, interchangeable font cartridges and both push and pull tractor feeders.

The P2100 costs $1,595.

Alps America, 3553 N. First St., San Jose, Calif. 95134.

■

Ampex Corp. has announced its **Ampex 232** IBM Personal Computer AT-compatible terminal.

The Ampex 232 is an ASCII terminal, which can be configured through the host PC software to function in either single or multiuser Personal Computer, Personal Computer XT or AT environments. It can also act as a remote terminal.

The unit emulates the IBM PC scan codes, screen display and video attributes. Users have a choice of either a PC or a PC AT keyboard. Other features include a 25-line by 80- or 132-col. 14-in. green or amber display.

The Ampex 232 is priced at $649.

Ampex, 401 Broadway, Redwood City, Calif. 94063.

■

Summagraphics Corp. has introduced the **Microgrid II** series of computer graphics tablets.

The tablets are available in five active size areas: 17 in. by 14 in., 24 in. by 17 in., 20 in. by 20 in., 36 in. by 48 in. and 42 in. by 60 in.

All five models include power supply and offer options including four- or 16-button cursor and one-button or barrel stylus.

Prices for the Microgrid II series range from $2,585 to $5,085.

Summagraphics, 777 State St. Extension, Fairfield, Conn. 06430.

■

Datadesk International has announced that **Supermacro Keys**, a hardware-software combination including Datadesk's PC 8700 IBM Personal Computer AT-style keyboard and Borland International, Inc.'s Superkey, is now available for a variety of IBM Personal Computer-compatible computers. These include machines from AT&T, Compaq Computer Corp., Sperry Corp., NCR Corp., ITT, Tandy Corp., Corona Data Systems, Inc., Leading Edge Products, Inc. and the IBM family of personal computers.

The keyboard incorporates all features of the AT keyboard, including separate numeric keypad, status lights and extra-wide control and return. The software reportedly allows users to customize and automate software, streamline typing activity and protect files.

Supermacro Keys is priced from $129.95 to $149.95.

Datadesk International, Suite A, 7650 Haskell Ave., Van Nuys, Calif. 91406.

Board-level devices

Omnitronix, Inc. has announced a stand-alone Zilog, Inc. Z80-based **RS-232 micro controller**.

The board provides 8K bytes of erasable programmable read-only memory, one bank of dynamic random-access memory and two bidirectional asynchronous RS-232 serial ports. It comes with a wall power supply and is available either as a complete programmer's kit or customized for programming and development needs.

The programmer's kit costs $349. The technical programming pack is available separately for $14.95.

Omnitronix, P.O. Box 43, Mercer Island, Wash. 98040.

■

Maynard Electronics has announced **Surprise**, an accelerator board for IBM Personal Computers and Personal Computer XTs.

Surprise installs directly onto the system's motherboard. It can be toggled between fast and slow.

According to the vendor, Surprise accelerates the speed of IBM PC-DOS as well as the speed of the hardware.

Surprise is priced at $249.

Maynard Electronic, 460 E. Semoran Blvd., Casselberry, Fla. 32707.

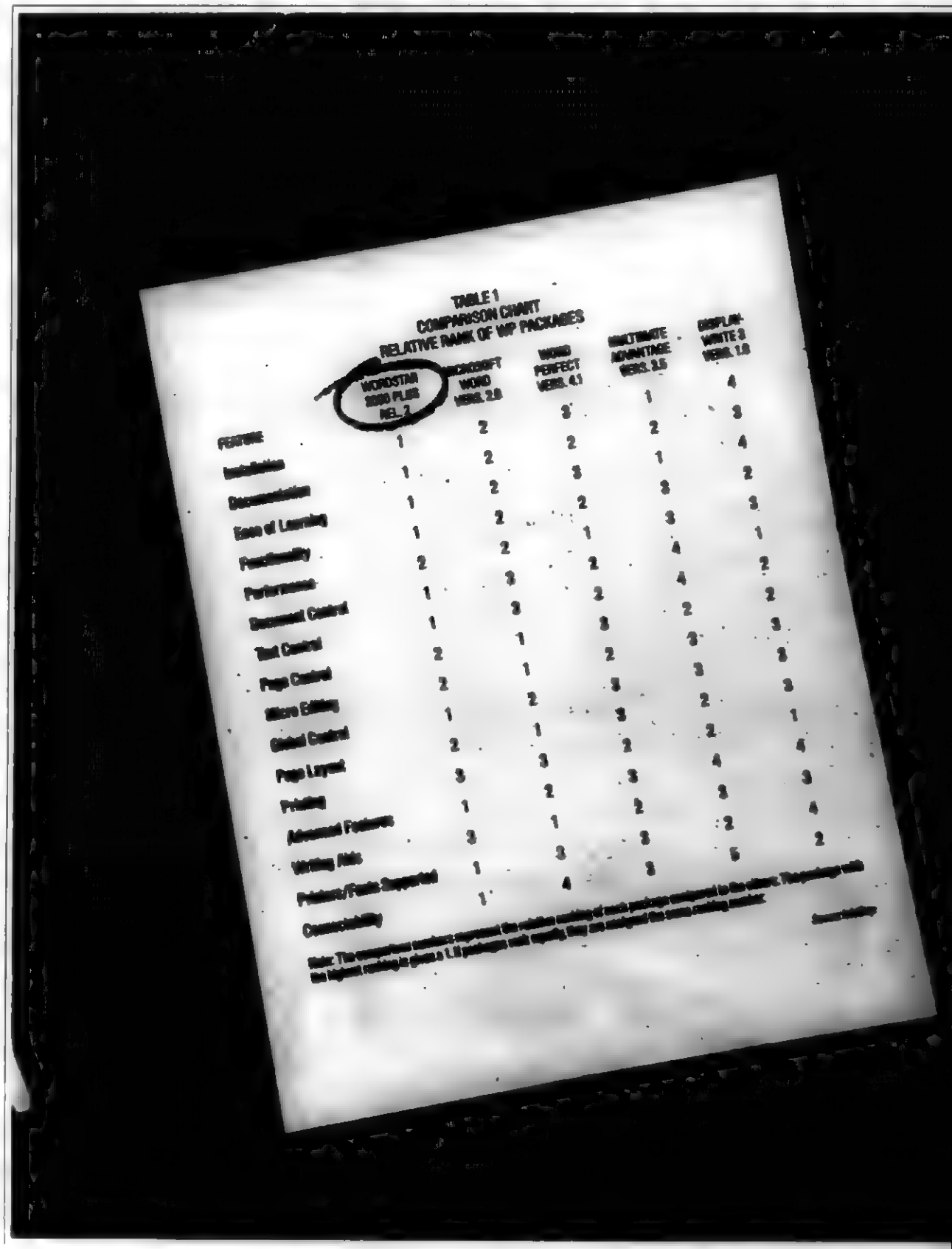
■

Votan has announced a **voice processing system** for IBM Personal Computers and compatibles said to provide speaker-independent recognition.

According to the vendor, the system can recognize voice commands from any user without training. It will recognize digits, "yes" and "no" and customized vocabularies.

The add-on card also provides continuous speech recognition in speaker-dependent mode as well as all voice functions over the telephone.

Speaker-independent recognition capabilities allow the system to accept voice responses from any type



NEW PRODUCTS/MICROCOMPUTERS

of telephone.

The card is priced at $1,350. Without the speaker-independent recognition capability, it costs $1,200. Optional telephone interface costs $350.

Votan, 4487 Technology Drive, Fremont, Calif. 94538.

■

QDP Computer Systems, Inc. has announced the **Viva Card**, a high-resolution graphics card designed for use with the IBM Personal Computer XT and AT.

The Viva Silver Card provides a resolution of 640 by 400 pixels, 16 colors and 128K bytes of on-board video random-access memory (RAM) for use with an IBM color transistor-transistor logic, red-green-blue monitor.

The Viva Gold Card provides a resolution of 1,024 by 1,024 pixels, 16 colors and 512K bytes of on-board video RAM for use with ultrahigh-resolution monitors.

The Silver Card costs $1,295, and the Gold Card costs $2,295.

QDP Computer Systems, 10330 Brecksville Road, Cleveland, Ohio 44141.

■

Micro Way has announced the **Number Smasher/ECM**, an accelerator board for IBM Personal Computers and compatibles.

The board can hold up to 1M byte of random-access memory and an Intel Corp. 8087 coprocessor. It runs in two modes.

In the first, Microsoft Corp. MS-DOS and IBM PC-DOS can be booted with 512K bytes to 704K bytes of memory. Memory above 640K bytes can be turned on with switches.

In the second mode, optional Megaswitch MMU and Megabank software are used to configure the board so that 1M byte of memory is available for MS-DOS and PC-DOS applications.

Number Smasher/ECM costs $599. A 12-MHz 8087 coprocessor costs $250, and Megaswitch MMU costs $100.

Micro Way, P.O. Box 79, Kingston, Mass. 02364.

■

Micro Plus has announced the **Remote Workstation Plus**, an adapter card and software said to transform an IBM Personal Computer, Personal Computer XT or AT into a multisession 3270 Systems Network Architecture or Binary Synchronous Control remote workstation.

The card has an on-board Intel Corp. 80186 processor and 128K bytes of random-access memory that support up to eight host sessions, printer emulation and file transfer at the same time.

The Remote Workstation Plus is priced at $1,195.

Micro Plus, 3200 N. Federal Highway, Boca Raton, Fla. 33431.

■

AST Research, Inc. has announced the **Six Pac Premium** expanded memory board, said to be expandable to 2M bytes of random-access memory.

The board runs on the IBM Personal Computer and compatibles. It includes one serial port, with an optional second serial port; one parallel port; a battery clock and calendar; and optional game-adapter port.

The Six Pac Premium comes with the Desqview multitasking and windowing program from Quarterdeck Office Systems, Inc. of Santa Monica, Calif., and with AST's Super Pak utility software.

Six Pac Premium is priced from $595 to $1,445, depending on memory configuration.

AST Research, 2121 Alton Ave., Irvine, Calif. 92714.

■

Quadram Corp. has introduced the **Quad EMS+** and the **Quad EMS+ I/O** expanded memory boards said to support both the Lotus/Intel/Microsoft Expanded Memory Specification (EMS) and Enhanced Expanded Memory Specification standards on IBM Personal Computer XTs and compatibles.

The Quad EMS+ supports both 64K- and 256K-byte dynamic random-access memory (RAM) chips. It can be stacked with up to 2M bytes of addressable memory. With 256K bytes, it costs $495.

The Quad EMS+ I/O is a multifunction version said to feature a bidirectional parallel port, an asynchronous serial port and a real-time clock calendar with a battery backup.

The multifunction board has up to 2M bytes of addressable memory, with 1M byte on the main board and 1M byte on a daughterboard. A standard configuration with 256K-byte dynamic RAM retails for $545.

Quadram, One Meca Way, Norcross, Ga. 30093.

Services

Micro Support Resource Corp. has introduced the IBM PC-DOS **Cheatsheet** reference guide.

According to the vendor, the Cheatsheet contains simple-to-use, step-by-step instructions on how to use PC-DOS.

Information includes how to format a disk, copy or delete a file and maintain directories and subdirectories of files on a disk.

Other features include an introduction to the personal computer and its components and tips on ways to perform certain tasks on the microcomputer.

The Cheatsheet is priced at $15, the vendor said.

Micro Support Resource, Suite 150, 3355 Northeast Expwy., Atlanta, Ga. 30341.

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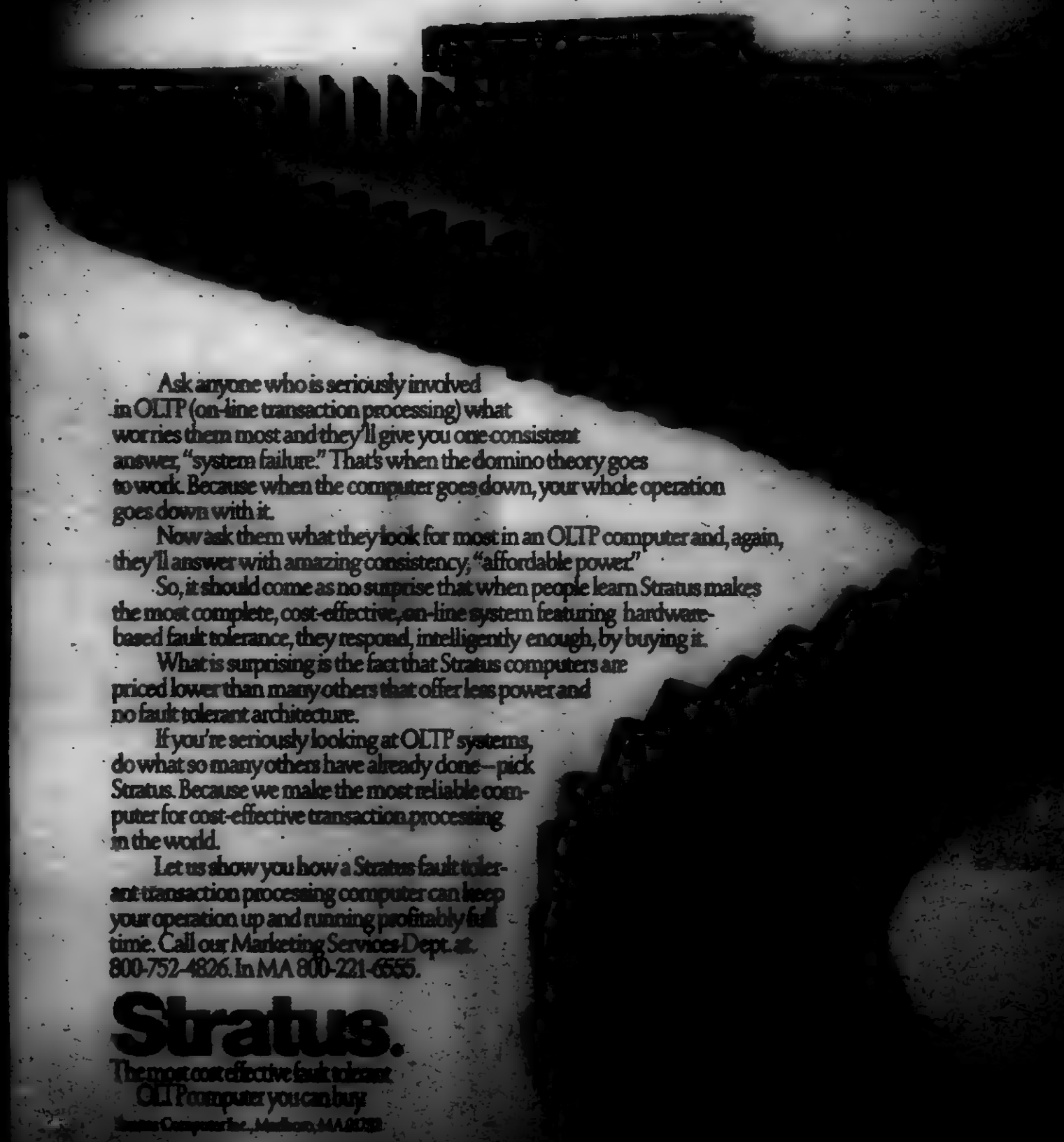
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transaction processing



Ask anyone who is seriously involved in OLTP (on-line transaction processing) what worries them most and they'll give you one consistent answer, "system failure." That's when the domino theory goes to work. Because when the computer goes down, your whole operation goes down with it.

Now ask them what they look for most in an OLTP computer and, again, they'll answer with amazing consistency, "affordable power."

So, it should come as no surprise that when people learn Stratus makes the most complete, cost-effective, on-line system featuring hardware-based fault tolerance, they respond, intelligently enough, by buying it.

What is surprising is the fact that Stratus computers are priced lower than many others that offer less power and no fault tolerant architecture.

If you're seriously looking at OLTP systems, do what so many others have already done—pick Stratus. Because we make the most reliable computer for cost-effective transaction processing in the world.

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Stratus.

The most cost effective fault tolerant OLTP computer you can buy.

Stratus Computer Inc., Marlboro, MA 01752

Auxiliary equipment

Mandrill Corp. has announced **Coldblue**, a ventilation system for IBM Personal Computers and Personal Computer XTs.

The system is said to allow users of add-on boards, internal modems and internal hard disks to lower the operating temperature of the system. Coldblue features two side-by-side fans. It provides forced air ventilation directly into the card area.

Coldblue mounts inside the chassis and is powered directly from the computer power supply. It costs $185.

Mandrill, P.O. Box 33848, San Antonio, Texas 78265.

■

Microcomputer Accessories, Inc. has added the **Plotter Accessory Drawer**, the **Roll-out Printer Shelf**, the utility **Side Shelf** and the **Easel** to its Micromanager System of personal computer accessories.

The Plotter Accessory Drawer installs between Micromanager modules. It costs $79.95. The Roll-out Printer Shelf can also serve as a roll-out keyboard drawer. It costs $49.95.

The Side Shelf creates an extra desk, shelf and storage space. It costs $14.95. The Easel mounts in any front corner channel and revolves and tilts. It costs $29.95.

Microcomputer Accessories, P.O. Box 66911, 5405 Jandy Place, Los Angeles, Calif. 90066.

■

T. S. Microtech, Inc. has upgraded its **Dreamer** intelligent function keyboard for the IBM Personal Computer, Personal Computer XT and AT.

The Dreamer features a full 20-key numeric keypad with independent cursor controls and 30 keys programmed with over 580 commonly used commands from programs such as Lotus Development Corp.'s 1-2-3 Version 2 and Symphony and IBM's Displaywrite 3.

The Dreamer is priced at $259.

T. S. Microtech, 12565 Crenshaw Blvd., Hawthorne, Calif. 90250.

■

Ohm/Electronics has introduced the **Scooter** line of standby power supplies.

The line includes the Model SPS 250XT, the Model SPS 500XT and the Model SPS 500AT. The SPS 250XT, with 250W of backup power, and the SPS 500XT, with 500W of backup power, keep an IBM Personal Computer or Personal Computer XT, Apple Computer, Inc. Apple, Macintosh or compatible running under full load from 10 to 15 minutes after loss of primary power. The 500W SPS 500AT acts as a guard for safe emergency operation of an IBM Personal Computer AT or compatible.

The SPS 250XT is priced at $389.95. The SPS 500XT costs $689.95 and the SPS 500AT $729.95.

Ohm/Electronics, 746 Vermont St., Palatine, Ill. 60067.

■

Safe Power Systems, Inc. has introduced the **ESP 1000**, extended backup power system for personal computers and local-area networking and multiuser systems.

The system is said to provide up to an hour of battery power in the event of AC line failure. According to the vendor, it features less than one msec transfer time, visual and audible warning indicators, true sine-wave output and synchronized transfer from line to standby power.

The ESP 1000 costs $1,995.

Safe Power Systems, 528 W. 21st St., Tempe, Ariz. 85282.

COMMUNICATIONS

Controllers

Able Computer has introduced the **Able QDHU**, a communications controller for Digital Equipment Corp. Microvax II.

According to the vendor, the controller combines emulation of DEC DHV and DHU controllers on a single quad-size board. Interrupts are said to be reduced by a 64-bit silo on each output line and a 256-char. programmable silo display on input.

The board offers a 62K-bit aggregate throughput and auto flow control of both transmit and receive. It connects eight asynchronous lines to the DEC Q-bus and accommodates rates of 50 through 38.4K bit/sec. full duplex.

The Able QDHU costs 41,295.

Able Computer, 3080 Airway Ave., Costa Mesa, Calif. 92626.

■

Advanced Computer Communications has announced that its **ACP 5250** and **ACP 6250** Digital Equipment Corp. interfaces have been certified by the Defense Communications Agency as linking to the Defense Data Network at a rate of 64K bit/sec.

Both interfaces are single-board communications processors with on-board CCITT X.25 firmware. The ACP 5250 attaches to DEC's Microvax II, and the ACP 6250 attaches to the VAX computer line.

The ACP 5250 costs $4,200, and the ACP 6250 costs $6,490.

Advanced Computer Communications, 720 Santa Barbara St., Santa Barbara, Calif. 93101.

■

Communications Analysis Corp. has announced the **Sentinel-232**, a private branch exchange data collection device.

The Sentinel-232 consists of an in-

Continued on page 144

Announcing

Computerworld's New

MICRO DIRECT SHOPPER

An easy way for you to order micro products.

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So be sure to watch for MICRO DIRECT SHOPPER starting May 26 in Computerworld. It's your ticket to truly convenient micro shopping. And it's now available in Computerworld.

COMPUTERWORLD

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NEW PRODUCTS/COMMUNICATIONS

Continued from page 143

tegrated ¼-in. tape drive and specially designed RS-232 interface controller. The controller receives data from the RS-232 output of any PBX, in any format, and ensures that the data, protocol and synchronization match the user's specifications. It then transmits to the tape drive for storage.

The tape drive will accept tape reels from 7 in. to 10½ in. using an automatic load feature.

The Sentinel-232 costs $7,500.

Communications Analysis, 100 Fountain St., Framingham, Mass. 01701.

■

Memorex Corp. has announced the **2274-2A**, a 32-port local cluster controller said to support both Systems Network Architecture (SNA) and non-SNA operating modes.

The controller attaches directly to a byte or block multiplexer selector channel of an IBM 370, 3030, 3080, 3090, 4300 or IBM-compatible CPU. It can also support IBM Personal Computers.

Features include a 5¼-in. floppy diskette drive, support for graphics, seven colors, APL and text programming languages. According to the vendor, additional features include extended highlighting, a light pen and operator entry assist and support for 17 keyboard configurations in 15 different languages.

The 2274-2A is priced at $17,000.

Memorex, San Tomas at Central Expwy., Santa Clara, Calif. 95052.

Standard Microsystems Corp. has announced the **COM9064**, a very large-scale integration controller for the IBM 3274 or 3276 for product-attach protocol.

The COM9064 is a single-chip device designed to implement the IBM 3270 Coax Type A protocol. It establishes the physical link between an IBM 3274 or 3276 controller and peripheral equipment. Each controller uses one mainframe I/O port and interconnects and distributes the data to up to 32 separate devices.

The half-duplex communication takes place at a 2.35-MHz data bit rate.

Pricing in quantities of 100 is $16.95 each.

Standard Microsystems, 35 Marcus Blvd., Hauppauge, N.Y. 11788.

Voice/data communications

Comdesign, Inc. has enhanced its **CX3000 Circuit Exchange** data private branch exchange to include full redundancy.

To provide redundancy, two complete sets of control and switching modules are included in each CX3000, leaving room for 17 asynchronous line cards, each supporting 24 channels.

According to the vendor, the redundant power supply is a hot-spare that is always on-line.

The CX3000 is priced from about $300 per line for a 48-line system to about $100 per line for a fully configured 408-channel unit.

Redundancy is included at no extra charge.

Comdesign, 751 S. Kellogg Ave., Goleta, Calif. 93117.

■

Voice Computer Technologies Corp. has introduced **PAT**, a private branch exchange automated attendant and messaging system for its turnkey voice response system product line, the VCT Series 2000.

PAT was designed to perform the functions of a switchboard operator and message center. It is able to route calls, take messages, screen calls and page parties not at their desks. PAT also provides automated attendant and voice/mail features.

The VCT Series 2000 can handle up to 32 simultaneous transactions with speech storage capacity of up to four 190M-byte disks, or 50 hours.

PAT is priced at $6,500.

Voice Computer Technologies, Suite 175, 5730 Oakbrook Pkwy., Norcross, Va. 30093.

■

Lightwave Communications, Inc. has introduced a **voice channel card** for its Multimux 1000 fiber-optic multiplexer.

The 300Hz to 3-kHz voice interface is available for toll-grade telephone communications. It comes with a standard AT&T RJ-11 socket for connecting a headset or telephone handset.

The voice channel is implemented using a digital continuously variable slope delta- modulation device and transmits the digitized information down one of the 10 high-speed channels.

Each voice channel card costs $350.

Lightwave Communications, 650 Danbury Road, Ridgefield, Conn. 06877.

Software

Endeavors Group, Inc. has announced **Gangnet**, local-area networking software for Hewlett-Packard Co.'s Series 200 and 300 computer systems running under the Pascal operating system.

Gangnet is said to permit up to eight computers to share mass storage devices connected to the computers on a common dedicated HP-IB bus.

Two versions are available. One provides for the workstations to boot from the shared disk, and the other boots from the disks connected to the internal HP-IB, internal disks or HP's Shared Resource Manager.

The Gangnet software costs $895 per cluster of up to eight workstations.

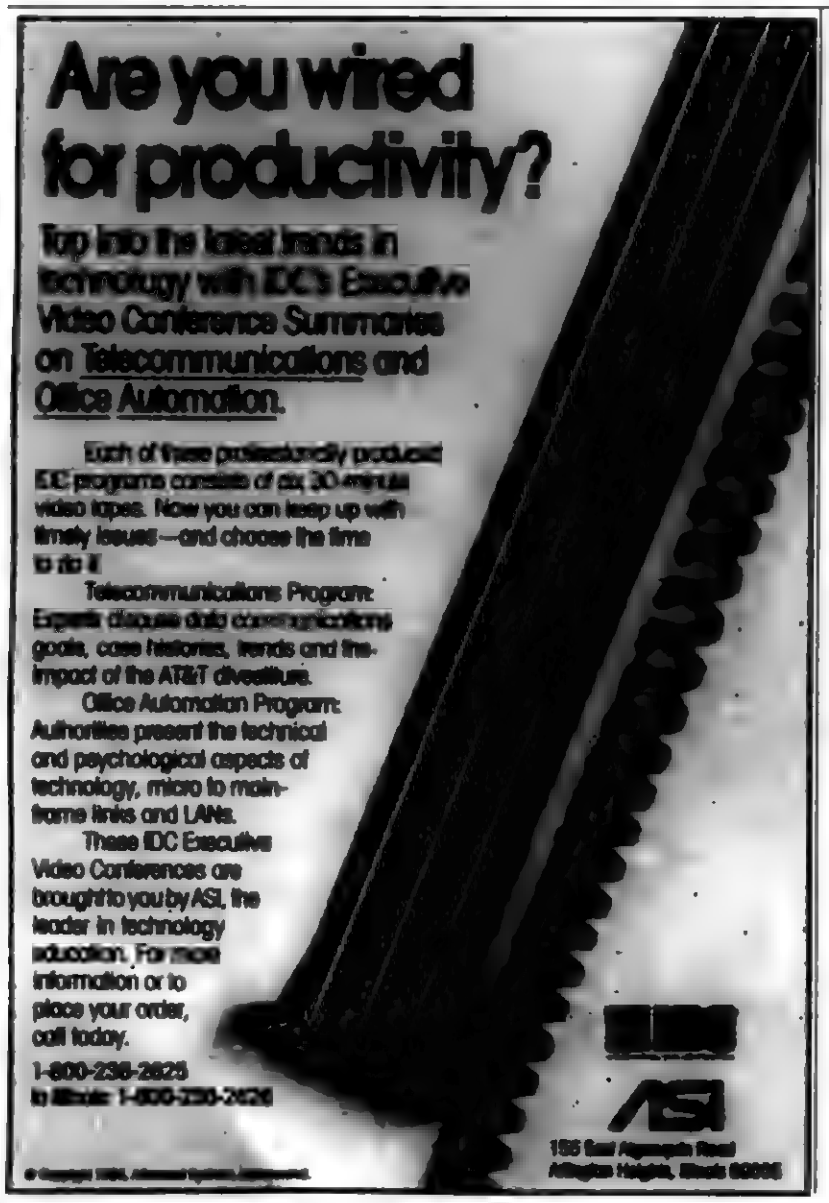
Endeavors Group, P.O. Box 2923, Tulsa, Okla. 74101.

■

Harris Corp. has announced software for the local **Challenger** controller, designed to provide remote communications capability.

The Harris Challenger is an IBM 3270 interactive controller. It has the built-in hardware capability to oper-

Continued on page 148



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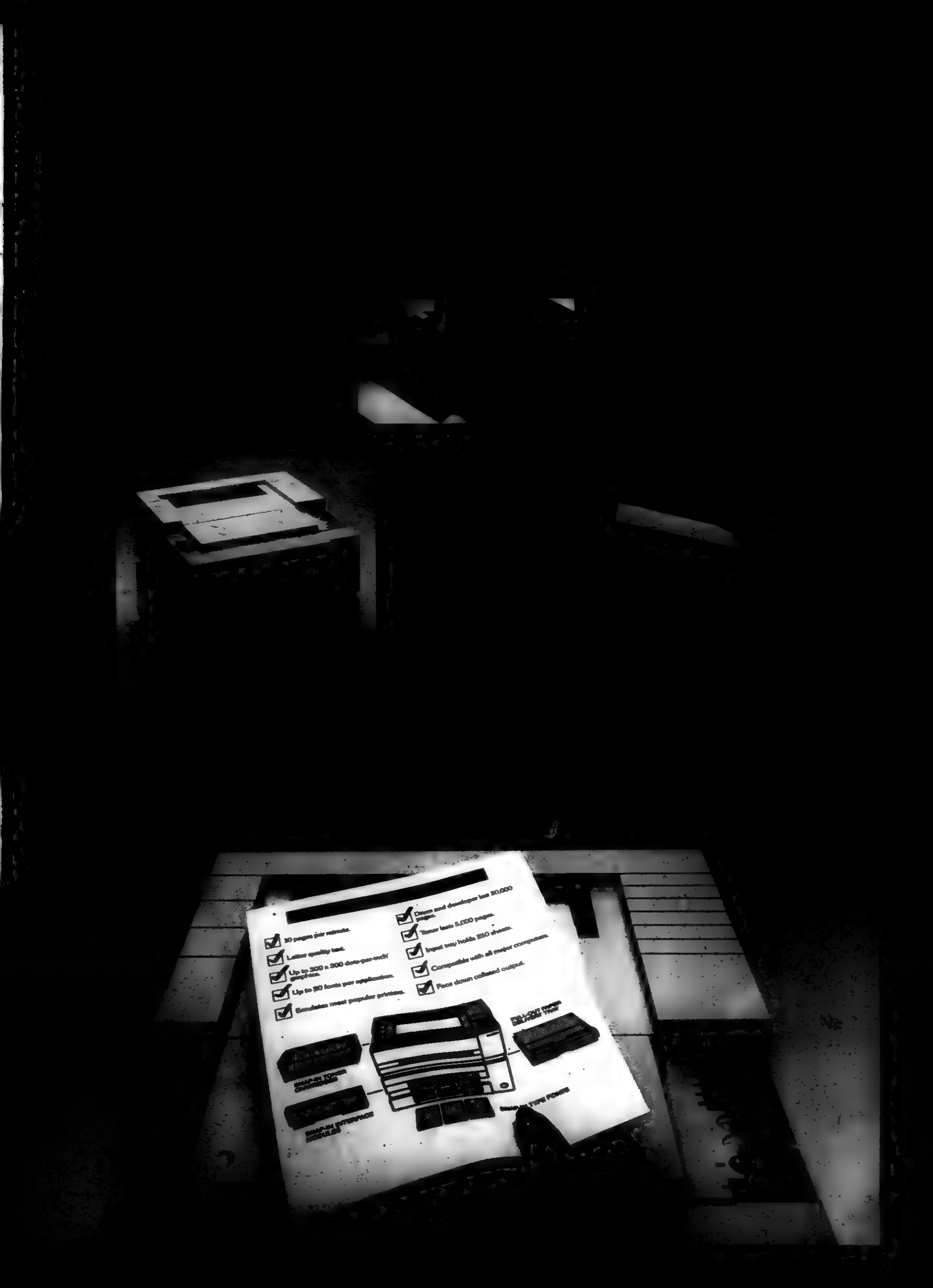


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Someday, our children will be able to share information, anywhere, anytime and in any form as easily as we use the phone today. At Northern Telecom, we call this vision the Intelligent Universe,* and we're already building telecommunications products to make it a reality.

Recently, the global telecommunications industry established a set of standards called Integrated Services Digital Network, to help guide the future of telecommunications.

In concert with you our customer, we're fully committed to applying the principles of ISDN. After all, these principles are but another step on the way to our vision.

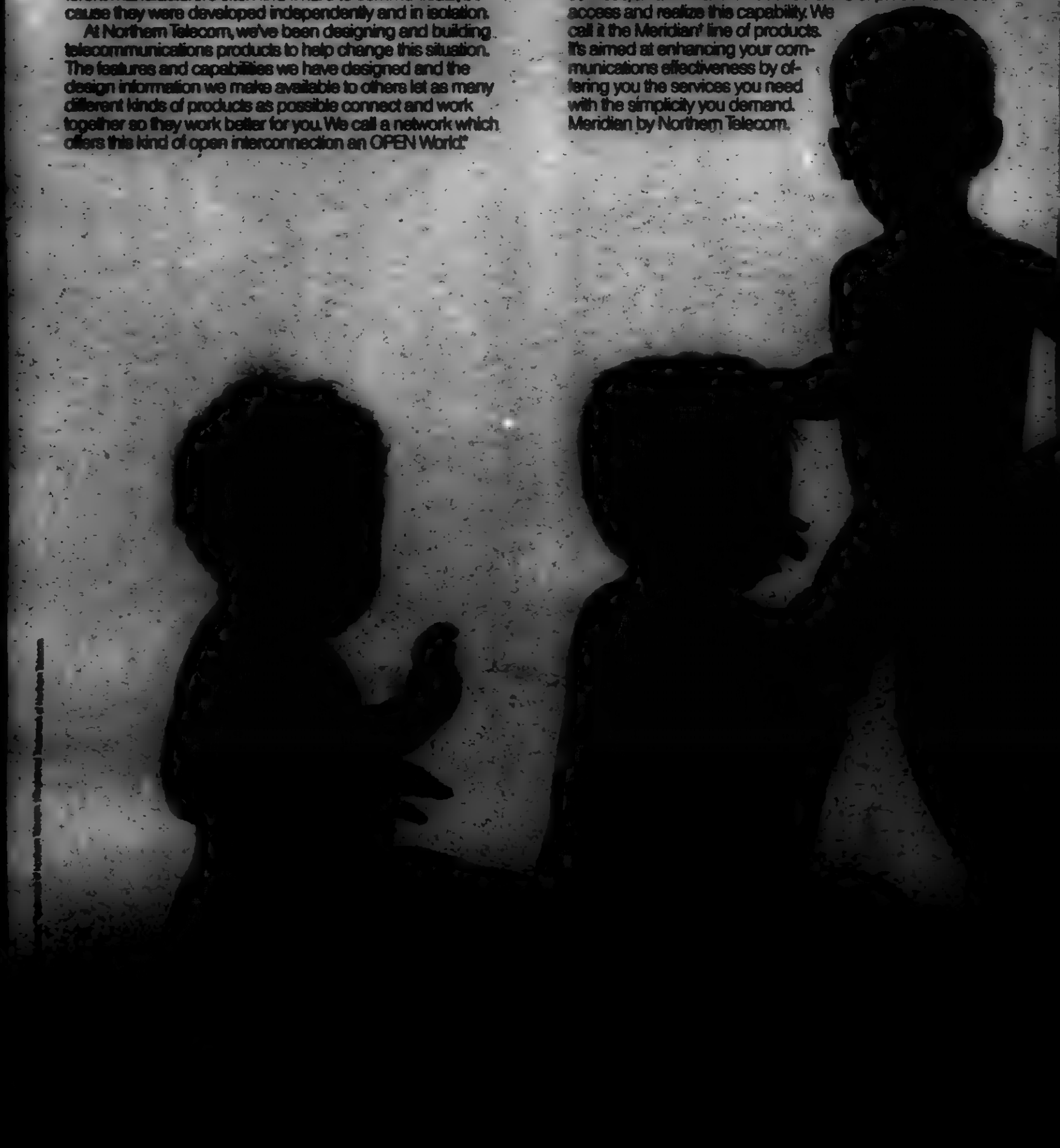
INTEGRATED—People in different parts of the world have different customs and speak different languages. That's because they were relatively isolated, and their cultures developed independently before the days of radio, television, telephones and fast, easy transportation. Sometimes, it's hard to communicate.

Similarly, computers and other equipment made by different manufacturers often find it hard to communicate, because they were developed independently and in isolation.

At Northern Telecom, we've been designing and building telecommunications products to help change this situation. The features and capabilities we have designed and the design information we make available to others let as many different kinds of products as possible connect and work together so they work better for you. We call a network which offers this kind of open interconnection an OPEN World.*

SERVICES—You don't need to understand what makes a telecommunications network tick to use it. For you, the network is just the communications services you need. And of course, the actual telephone or terminal you use is one means of accessing such services.

At Northern Telecom, we have defined and are building into the network a tremendous capability for the provision of services, and we have introduced a line of products to both access and realize this capability. We call it the Meridian* line of products. It's aimed at enhancing your communications effectiveness by offering you the services you need with the simplicity you demand. Meridian by Northern Telecom.



*Trademark of Northern Telecom Registered Trademark of Northern Telecom

DIGITAL—Most people find that the best approach to solving a problem is the simplest approach. In telecommunications, the simplest way of carrying information is to convert it to a series of 1's and 0's—a digital bit stream.

A digital bit stream can mean anything—it can be your voice, a letter, a television picture, or the manufacturing diagrams for a new car.

At Northern Telecom, we've been designing and building telecommunications products based on the simple digital bit stream for two decades. We call a network that handles all information in digital form a Digital World.

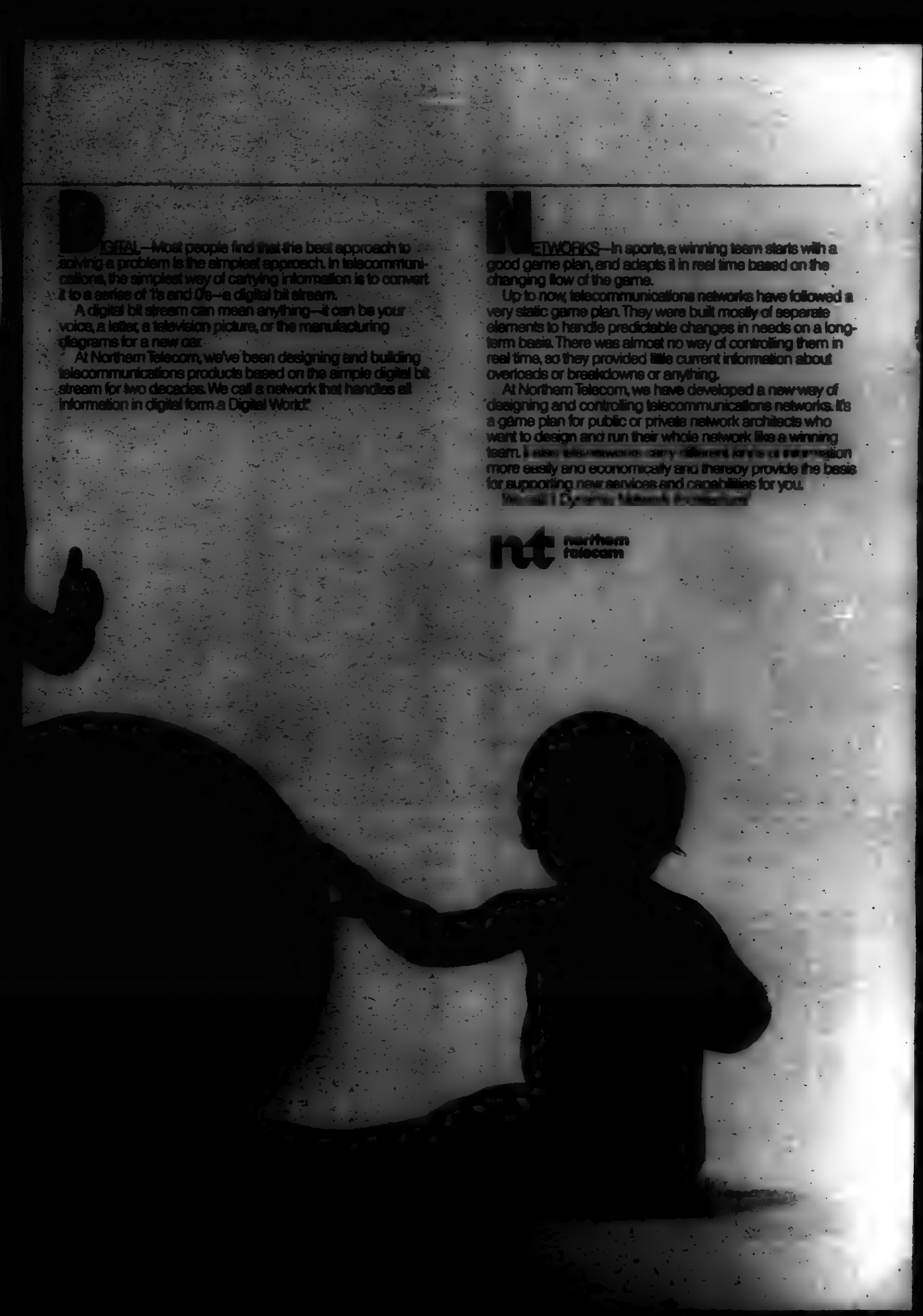
NETWORKS—In sports, a winning team starts with a good game plan, and adapts it in real time based on the changing flow of the game.

Up to now, telecommunications networks have followed a very static game plan. They were built mostly of separate elements to handle predictable changes in needs on a long-term basis. There was almost no way of controlling them in real time, so they provided little current information about overloads or breakdowns or anything.

At Northern Telecom, we have developed a new way of designing and controlling telecommunications networks. It's a game plan for public or private network architects who want to design and run their whole network like a winning team. [redacted] more easily and economically and thereby provide the basis for supporting new services and capabilities for you.

[redacted]

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NEW PRODUCTS/COMMUNICATIONS

Continued from page 144

ate as a remote controller.

The software costs $695.

Harris, Lanier Business Products, 1700 Chantilly Drive N.E., Atlanta, Ga. 30324

■

Systems Strategies, Inc. has announced **CX.25**, a portable data communications software package for connecting computer systems to packet-switched public nets.

CX.25 is said to be a full implementation of the CCITT X.25 protocol. In addition to allowing systems to interface with packet-switched networks, it permits high-speed data transfer by direct communication between data terminal equipment.

Written in C language, CX.25 costs $60,000 for an initial license plus an attached royalty schedule.

Systems Strategies, 225 W. 34th St., New York, N.Y. 10001.

Trax Softworks, Inc. has enhanced its **Terminal Simulation Facility** (TSF) said to allow IBM 3270 terminals to access ASCII-based public data bases, networks and electronic mail.

According to the vendor, TSF now allows users to scroll back and forth through up to 10 pages during an online session with a remote system.

TSF runs in a service virtual machine and requires the companion outboard communication processor Traxlink 1, plus an intelligent modem.

TSF can be leased for $4,000 per year.

Traxlink 1 is priced at $1,250.

Trax Softworks, 10801 National Blvd., Los Angeles, Calif. 90064.

Multiplexers/Modems

Anderson Jacobson, Inc. has announced the **AJ 1212-AD3H** IBM Personal Computer AT-compatible 1,200 bit/sec. modem.

The modem is said to feature a memory dialer, programmable software options, an extended PC AT command set, callback and answerback security and multilevel password security.

It is AT&T 212A/103 CCITT V.22 compatible and communicates over the switched telephone network at data rates up to 1,200 bit/sec.

It handles asynchronous or synchronous data, eight- through 11-bit char. via standard telephone jacks and cables.

The AJ 1212-AD3H costs $499.

Anderson Jacobson, 521 Charcot Ave., San Jose, Calif. 95131.

■

Emulex Corp. has introduced the **CS23** Digital Equipment Corp. DHU11-compatible communications multiplexer.

According to Emulex, the CS23 can handle up to 32 asynchronous lines.

It consists of a single hexadecimal-size controller board plus one or two distribution panels.

Each panel can be either a 12- or 16-line RS-232 panel, a 16-line RS-232/current loop panel or a 16-line RS-232/RS-422 panel.

Features reportedly include DHU11 emulation, 50,000 char./sec. throughput and hardware-level flow control.

The product also has direct memory access operation on output and 256-word input first-in, first-out per 16 lines.

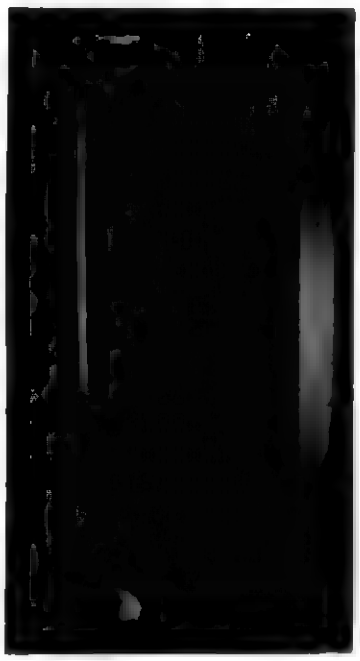
The CS23 is priced at $3,500 for a controller with 32 lines.

Emulex, P.O. Box 6725, 3545 Harbor Blvd., Costa Mesa, Calif. 92626.

T-Bar presents the only 32-channel switch ready for Sierra™ and Apache™.



T-Bar CSM 3200 Series. Presenting the CSM 3200 Series from T-Bar. Two advanced channel switching systems with one enormous advantage—the most capacity available anywhere. The 3200 Series is fully upgradable all the way up to 32x32 or 16x64.



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The Safest. Unlike competitors' products, the CSM 3232 has eliminated the need for synchronous switching–eliminating the fear of bringing your system down.

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Masterpiece

NEW PRODUCTS/COMMUNICATIONS

Lightwave Communications, Inc. has introduced the **FO-232H** full-duplex modem, said to be plug compatible with RS-232 and CCITT V24/28 connectors.

According to the vendor, the FO-232H transmits data up to two kilometers at a rate of 19.2K bit/sec.

The unit draws power from EIA signals such as data terminal ready and can also accept 6V to 15V on pins 9 and 19.

The FO-232H modem costs $89.

Lightwave Communications, 650 Danbury Road, Ridgefield, Conn. 06877.

■

Emulex Corp. has introduced the Digital Equipment Corp. DHV11-compatible **CS04 multiplexer** designed to connect up to 64 asynchronous terminals to DEC's Microvax II.

Each line can run 38.4K bit/sec., and RS-422 devices can be located up to 4,000 ft from the host. The CS04 features asynchronous modem control, switch-selectable RS-232 and RS-422 interfaces, direct memory access on transmit operation and 256-word First In, First Out input. The board can accommodate either full-duplex or half-duplex modems.

The CS04 is priced from $3,000 for 16 lines to $10,500 for 64 lines.

Emulex, P.O. Box 6725, 3545 Harbor Blvd., Costa Mesa, Calif. 92626.

Local-area networks

Kimtron Corp. has introduced **K-Net**, an IBM Netbios-compatible local-area network.

K-Net is said to allow the user to run IBM PC Network and Token-Ring network software-compatible programs without modification.

According to the vendor, any multiuser application software written for use under IBM PC-DOS 3.1 will work with K-Net.

K-Net reportedly transfers data at 1M bit/sec. Up to 255 personal computers can be interconnected within a network.

K-net costs $395, including hardware and software.

Kimtron, Building 160, 1705 Junction Court, San Jose, Calif. 95112.

Network services

Dama Telecommunications Corp. has introduced **Damanet Dedicated Ring-Down**, a service said to provide full-period circuits to securities and related financial industries for dial-free voice applications among selected U.S. cities.

Three local-access arrangements to the Damanet wideband digital long-haul backbone network are available, including a microwave bypass technique.

The service features the company's Fail-Safe module, said to ensure call completion by detecting primary line failures and rerouting calls over the dial-up network.

The fixed monthly usage costs are currently as follows: Chicago to New York, $525; Philadelphia to New York, $200; and San Francisco to New York, $900.

Dama Telecommunciations, 169 Johnson Road, Parsippany, N.J. 07054.

■

American Business Lists, Inc. has enhanced its **Instant Yellow Page** service.

The service allows users to dial in and retrieve business listings on-line from a data base of more than 10 million Yellow Page listings. More than 3,500 different Yellow Page categories are available.

According to the vendor, any personal computer or terminal with a modem can be used to access the Instant Yellow Page service.

Charges for the service are $1 per minute for connect time plus 10 cents per record printed. There is a subscription fee of $95 for the first year and $60 per year for renewals.

American Business Lists, P.O. Box 27347, Omaha, Neb. 68127.

SYSTEMS & PERIPHERALS

Processors

MDB Systems, Inc. has announced two **DR11-W** module configurations said to enhance the system performance of Digital Equipment Corp.'s Microvax II computers.

Both provide direct memory access transfer of 16-bit I/O data between the bus of the computer and an external device. One configuration has just the module supplied, and the other includes a cable cabinet kit.

According to the vendor, all user-developed applications software and peripherals utilized on larger VAX systems can be migrated directly to the Microvax II.

The MV-DR11-W costs $1,100, and the cabinet version, MV-F-DR11-W, costs $1,300.

MDB Systems, 1995 N. Batvia St., Orange, Calif. 92665.

■

Indocomp, Inc. has announced an **industrial computer system** complete with analog, digital and pulse I/O interfaces.

The system consists of an IND-68041 16- or 32-bit single-board computer housed in an IND-68102 dual-processor chassis.

It includes an interactive software package designed to assist engineers in developing prototype evaluation systems for machine control, data acquisition and process monitoring.

Features include 16 analog inputs, two analog outputs, two optical encoder inputs, 40 bidirectional digital I/O points and two counter timers.

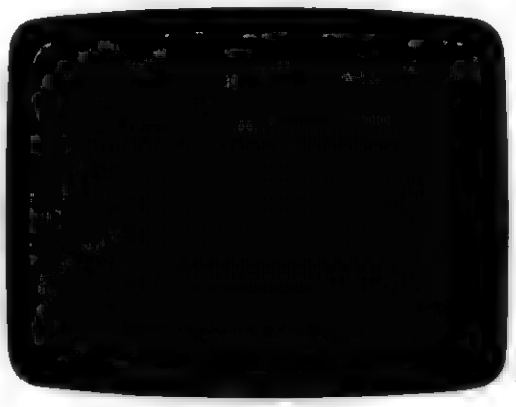
The starter system costs $3,826.

Indocomp, 5409 Perry Drive, Drayton Plains, Mich. 48020.

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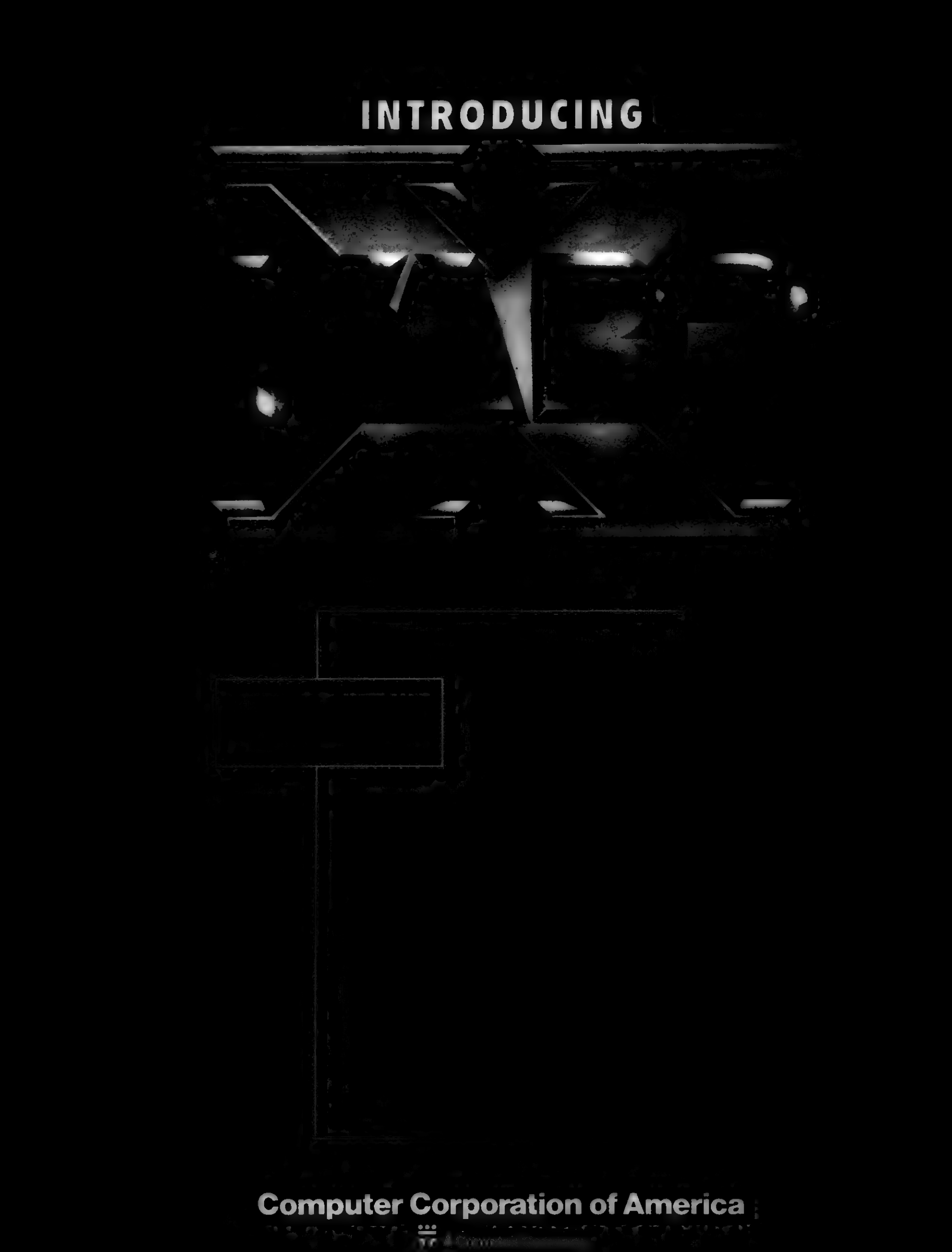


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INTRODUCING
Computer Corporation of America

NEW PRODUCTS/SYSTEMS & PERIPHERALS

National Semiconductor Corp. has introduced the **Series 32000 Designer Kits**, providing the key components needed to build a personal 32-bit, single-board computer.

One kit is based on the vendor's NS32016 microprocessor CPU and one on the NS32032 CPU. They provide the complete computing cluster chip set including CPU, memory management unit, floating-point unit, timing and control unit and interrupt control unit as well as firmware, manuals, application notes and a data book.

The NS32016 kit costs $59, and the NS32032 costs $75.

National Semiconductor, P.O. Box 58090, 2900 Semiconductor Drive, Santa Clara, Calif. 95052.

Data storage

The **MV-DK11-RM** disk controller for Digital Equipment Corp.'s Microvax II has bowed from **MDB Systems, Inc.**

The quad-size, high-speed storage module device disk controller provides data transfer rates from 1.2M to 2.5M bit/sec. It can support two physical drives at one or two logical units per drive.

Disk drive sizes can be from 67M bytes to more than 6G bytes formatted.

DEC-compatible 32-bit error correction code combined with 16-bit cyclic redundancy check are used to generate and check for media defect flagging and header errors.

The MV-DK11-RM costs $2,400.

MDB Systems, 1995 N. Batavia St., Orange, Calif. 92665.

■

North Atlantic Industries, Inc. has added the **Roadrunner II** for backup of hard disks to its line of tape drives.

Roadrunner II is said to combine 125M-byte storage capacity and an intelligent tape formatter in a single, half-height package. Two versions are available: one with a QIC-02 interface and one with an small systems computer interface (SCSI) port.

The device can read and write on the QIC-format, and it can read the QIC-24 format.

Roadrunner II costs $775 for the QIC-02 interface version and $995 for the SCSI interface version.

North Atlantic Industries, 60 Plant Ave., Hauppauge, N.Y. 11788.

Terminals

Conrac Division of **Conrac Corp.** has introduced the **Model 7064** 14-in., 23-MHz video color monitor.

The monitor is compatible with both the IBM Enhanced Graphics Adapter (EGA) card and the IBM Color Graphics Adapter (CGA) card.

With the CGA card, the monitor can display 16 colors with a resolution of 640 by 200 pixels. With the EGA card, the monitor can display 16 colors out of a palette of 64.

The Model 7064 is priced at $735.

Conrac, 600 N. Rimsdale Ave., Covina, Calif. 91722.

■

Intermec Corp. has introduced the **9570 Wedge Reader** for users of IBM terminals and Personal Computers.

According to Intermec, the 9570 emulates manual data entry. It was designed around a 16-bit microprocessor and is able to decode and automatically discriminate among the major symbologies.

The 9570 features two input ports.

The 9570 Wedge Reader is priced at $495, including cable.

Intermec, P.O. Box 36062, 4405 Russell Road, Lynwood, Wash. 98046.

■

Ampex Corp. has introduced the **Ampex 210 Plus** and the **Ampex 230 Plus** terminals.

The 210 Plus is said to offer 132 columns and 14 programmable function keys along with 400 bytes of nonvolatile memory. It features a total of 17 resident emulations as well as a 14-in. CRT, bidirectional printer port and seven resident national character sets.

The 230 Plus offers four 80-column display pages and 6K bytes of nonvolatile memory available to 16 programmable function keys. Other features include programmable editing keys and video attributes.

The 210 Plus costs $469, and the 230 Plus costs $569.

Ampex, 401 Broadway, Redwood City, Calif. 94063.

Printers/plotters

Soltec Corp. has introduced its **6400 series X-Y Recorders.**

The recorders are said to offer high-speed, high-acceleration pen response. They are available in four versions, two DIN A4 X-Y, one DIN A3 X-Y and DIN A3 X-Y-Y. All models feature built-in time base, electronic limiter and remote control functions.

The series offers writing speeds up to 1,500 mm/sec. (X-axis) and 2,000 mm/sec. (Y-axis).

The 6400 series X-Y Recorders are priced from $1,795.

Soltec, 11684 Pendleton St., Sun Valley, Calif. 91352.

■

King Engineering Co. has announced **Model 401 Formstacker**, designed to handle the output of a

Continued on page 154

Ways to Effortlessly Create or Edit Test Data

Without using DLTØ, IDCAMS, IEBGENER, or quick & dirty programs.

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Why does Chase Manhattan Bank on Zeke:



Chase Manhattan Bank cashes in on Zeke's automated scheduling. "Zeke saves you time. Once you've defined a job, you don't have to submit it again and again," says Joseph Williams, Technical Support Manager. "Before, our operators had to put cards in readers, and manually release jobs," adds Assistant Treasurer Rebecca Campbell.

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Continued from page 153

printer running at a rate of up to 2,000 line/min.

All continuous fanfold forms, including 11-lb, single-part paper, are stacked automatically.

It is compatible with high-speed computer printers including those from Data Products Corp., Harris Corp. and the Hewlett-Packard Co. 2500 and 2600 series.

Model 401 Formstacker is priced at $2,175.

King Engineering, 1733 Rancho St., Encino, Calif. 91316.

■

Memorex Corp. has announced the **Memorex 2114-1** dot matrix printer for IBM 3270 users.

The Memorex 2114-1 offers draft-quality printing at 220 char./sec., internal-correspondence quality at 110 char./sec. and near-letter-quality printing at 55 char./sec. It features a choice of font styles and a selection of 21 language sets.

The printer operates in both Binary Synchronous Communications and Synchronous Data Link Control environments.

The 2114-1 is priced at $3,600.

Memorex, San Tomas at Central Expwy., Santa Clara, Calif. 95052.

■

Infoscribe, Inc. has unveiled its **Model 1400** serial dot matrix printer.

The Model 1400 features an 18-wire print head. It offers draft-print quality at 400 char./sec., correspondence quality at 200 char./sec. and near-letter quality at 80 char./sec. It also provides 72 by 72 and 144 by 144 dot/in. resolution for graphics printing.

Other features include IBM, Epson America, Inc. and Diablo Systems, Inc. 630 interface emulations.

The Model 1400 printer costs $1,845.

Infoscribe, 1808 Michael Faraday Court, Reston, Va. 22090.

Power supplies

Nationwide Electronic Systems, Inc. has added 56 meters to its **Slimline** family of power measurement panel meters.

According to the vendor, both instantaneous power and total power can be monitored. The meters allow single or three-phase measurement. Display-only, binary-coded decimal outputs or RS-232, RS-422 or 20/60 mA versions are available.

The meters reportedly offer 0.2% accuracy, and the data may be fed to anything from programmable controllers to mainframe computers.

Prices for the meters range from $295 to $475.

Nationwide Electronic Systems, 3003 Wakefield Drive, Carpentersville, Ill. 60110.

■

The Dickson Co. has announced the **Dickson Temperature/Humidity meter**, a hand-held meter said to give instant temperature and humidity readings.

The LCD readout displays temperatures from 32° F to 160° F. Both the temperature and humidity sensors are contained within a pencil-size probe that connects to the instrument via a 3-ft coiled cord.

The Dickson Temperature/Humidity meter is priced at $495.

Dickson, 930 S. Westwood Drive, Addison, Ill. 60101.

Components

Zoltech Corp. has introduced the VV-11 series of VME system chassis.

The series consists of three standard-size chassis. The VV-11 chassis is intended for integrated VME systems.

The smaller VCV-11 chassis is intended for mass-storage subsystems or card-cage-only requirements.

For very large system configurations, the VLV-11 chassis allows twice the card-cage and mass-storage capacity of the VV-11.

All the VV-11 series chassis can be mounted in a standard 19-in. rack.

According to the vendor, the chassis can be configured in a variety of ways.

All boards and drives are available from Zoltech.

Prices range from $675 to $3,500.

Zoltech, 7023 Valjean Ave., Van Nuys, Calif. 91406.

Auxiliary equipment

Business Security Systems Corp. has announced **Technalock**, a device for securing movable equipment.

Pressure-sensitive adhesive reportedly bonds a securing plate to the equipment. A flexible vinyl-coated steel cable and a lock are also part of the system.

Technalock can be installed at the rear of equipment and desks.

According to Business Security Systems, it takes about 400 lb to dislodge the plates.

The master system is priced at $24.95. Expansion kits are available.

Business Security Systems, 512 S. Hanley, St. Louis, Mo. 63105.

PRICE REDUCTIONS

Astrocom Corp. has reduced the price of its **Squeezipair** units.

Squeezipair is said to enable users to add a terminal or printer to an existing coaxial cable system.

According to the vendor, it also enables two terminals or printers to operate over one RG62A/U coaxial cable.

The Squeezipair works in pairs, one on the controller side and one on the terminal side. It reportedly operates with IBM 3270 Controllers.

The reduced price for Squeezipair is $75 each.

Astrocom, 120 W. Plato Blvd., St. Paul, Minn. 55107.

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Los Angeles: (714) 261-1230

NEWS

WORLD DIGEST
Computerworld News Service

LONDON — British Telecom (BT), Britain's major telecommunications services provider, has dissolved its marketing arm on the eve of further allegations of incompetence and improper activities. British Telecom Enterprises (BTE) is to be split up and folded back into BT, as it was in the days before BT was privatized.

BTE has been plagued by controversy since its inception shortly after BT's privatization in December 1984. BT has been repeatedly accused of abusing its dominant position in the supply of equipment to users.

LONDON — Many UK computer users are only days away from breaking the law as the deadline approaches for registrations under the Data Protection Act. Those who fail to register before May 11 computers that contain personal information on individuals face prosecution and unlimited fines.

But many computer users are still unaware that the act applies to them. One said, "I didn't know I was affected until recently, and that was only through someone mentioning it in conversation. I don't think it's been publicized enough."

PARIS — French and German scientists met last week to lay the groundwork for a European research center for scientific computing. The project's dual objectives are to expand research in parallel processing and to provide European researchers and engineers with advanced training in scientific computing.

The idea to create a European computing center that incorporates both academic and industry researchers was born in 1983.

Called CERFACS (the French acronym for European Center of Research and Advanced Training in Scientific Computing), the project received official backing from the French government in early February 1985.

The meeting represents the first step toward the internationalization of the project.

AMSTERDAM — The Electronic Mail Association (EMA) will meet with European electronic mail vendors at this month's Eurocom conference in an effort to expand its activities internationally.

Michael Cavanagh, director of the Washington, D.C.-based association, said the meeting has been arranged to gauge vendor interest in creating a European chapter of EMA.

Cavanagh said the creation of a European arm of the vendor-sponsored EMA would increase the flow of information about electronic mail technology between North America and Europe. Several prominent European vendors already participate in the U.S. electronic mail organization.

CANBERRA, Australia — Australia needs a national program to convert expert systems research findings into commercial products, said a recent Australian government report. "Australians have an internationally recognized strength in expert systems research and development," but that expertise is largely academic, and academics are often not equipped to commercialize their work, the report said. Private sector commercialization of expert systems has been too slow, the report concluded.

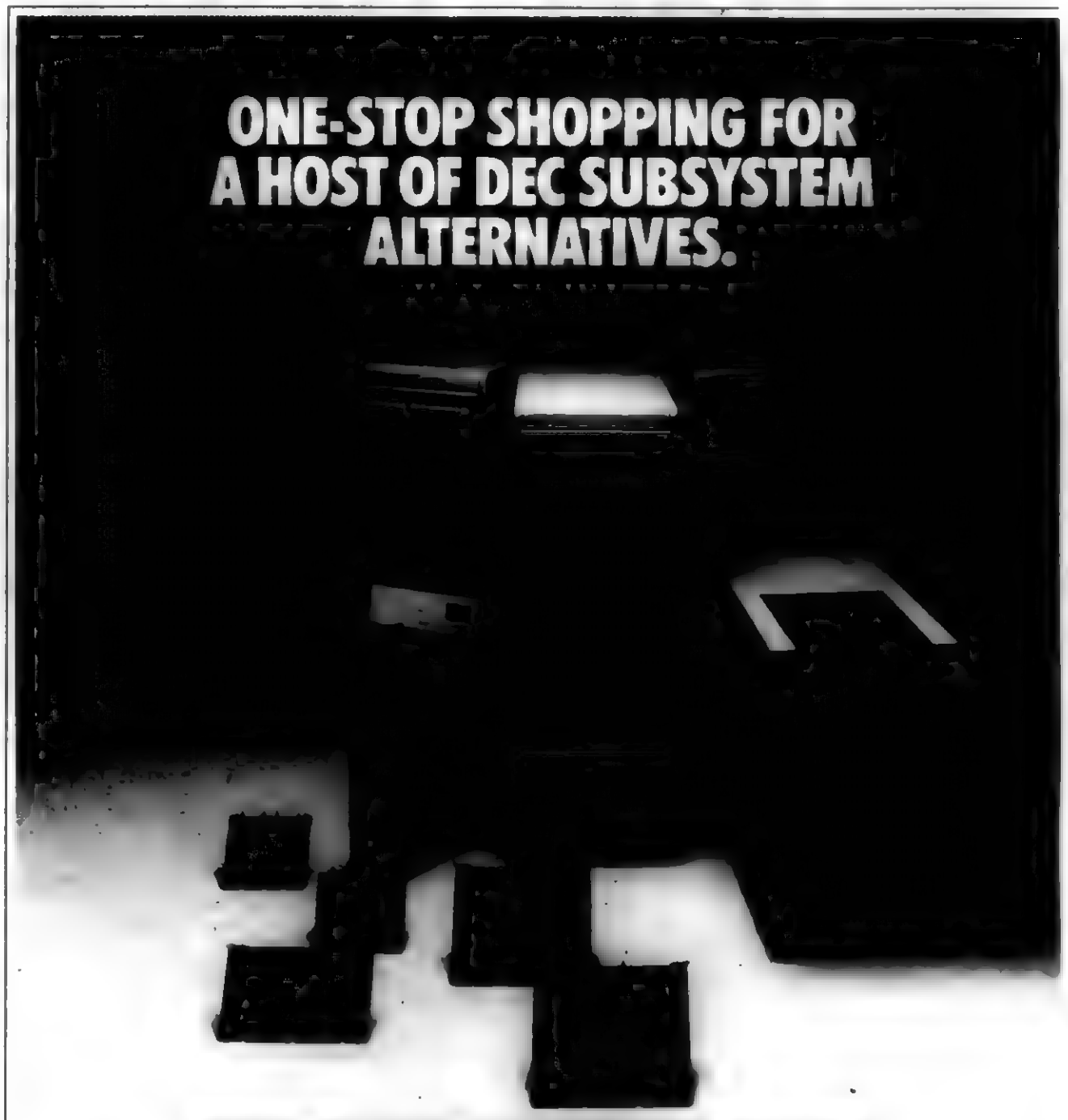
TOKYO — Computer Software Organization, Ltd. (CSO), a Japanese software dealer start-up, has purchased a 50% stake in California-based Foothill Research, Inc. (FRI).

In so doing, CSO acquired exclusive rights to sell FRI's Style G-4 programming language in the Pacific region.

Specific terms of the deal, however, were not disclosed. According to CSO officials, the company hopes the acquisition will help narrow technology gaps with U.S. software vendors. CSO is considering rewriting Foothill's Style in Japanese.

According to CSO, Style is 10 to 20 times more powerful than existing third-generation languages such as Fortran and Cobol.

See DIGEST page 156



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NEWS

DIGEST from page 155

MUNICH — West German data base vendors are buckling under pressure from IBM's DB2, a data base management system launched in early June 1983. Most data base vendors in West Germany say they are stepping up their R&D in an attempt to remain competitive with Big Blue.

Klaus Amann, general manager of West German software house Uccel GmbH, predicted the number of users running non-IBM software will continue to decrease.

Furthermore, if IBM enhances its existing product, other vendors' sales will drastically fall, he noted. Amann expects hard times for independent software houses vis-a-vis IBM's resolve to succeed in the data base market.

TOKYO — Claiming that it holds the patent on a type of flexible manufacturing system, London-based Morins PLC has demanded that some 20 Japanese flexible manufacturing system vendors pay $100,000 for each such system they ship to the U.S. Morins is also seeking a 2% royalty on any flexible manufacturing system sold to the U.S. by the Japanese.

In addition, Morins wants to be paid either $150,000 or 2% of the selling price for any Japanese flexible manufacturing system already purchased or delivered to a U.S. user, said a spokesman for the 111-member Japan Machine Tool Builders' Association. Morins wants a response from the Japanese by the end of June.

BRUSSELS — The Commission of the European Community is urging its 12 member nations to standardize and modernize their national telecommunications networks to enable the creation of a Pan-European integrated services digital network (ISDN). The commission also strongly recommended the members of the European Community adopt a common interface for connecting terminals to their national telecommunication networks.

In Europe, where the ISDN market is estimated to be worth $198 billion, European Community officials argue that a consensus must be developed for joint telecommunications services so those services can begin operation before 1993.

Those services could give telephone users features including automatic redialing of busy lines and memory for storing numbers, as well as a rapid telecopier that sends one four-page document per second and a teletex system that is 10 times faster than conventional telex.

COLOGNE, West Germany — The West German telecommunications industry is suffering from a dearth of qualified personnel, according to sources here.

The number of engineers graduating from the country's universities is too low to fill the industry's staffing needs, which are estimated at about 2,000 communications engineers. Last year, not even half the number of open engineering positions were filled. At present, the state-run postal and telecommunications authority has a large number of open slots for qualified engineers needed to handle critical research and development projects.

EAST BERLIN — Plans to increase the use of computers in East German manufacturing facilities and intentions of expanding trade relations with Western Europe were unveiled by Erich Honnecker, chairman of the East German Communist Party.

Speaking to the party's 11th annual convention, Honnecker said the use of computers in East Germany's state-owned production plants will be greatly expanded during the next five-year economic plan, which extends from 1986 to 1990.

Instead of the 28,000 computer-aided workstations originally planned for, up to 90,000 systems should be installed by 1990, Honnecker declared. The accelerated expansion of computer-aided manufacturing is expected to improve productivity by 100%, he added.

WEST BERLIN — The West German anticartel office, the Bundeskartellamt, has agreed to consider a complaint brought by Eclat, the European association of third-party lessors, against IBM. Eclat alleges that IBM has misused its dominant position in the computer market.

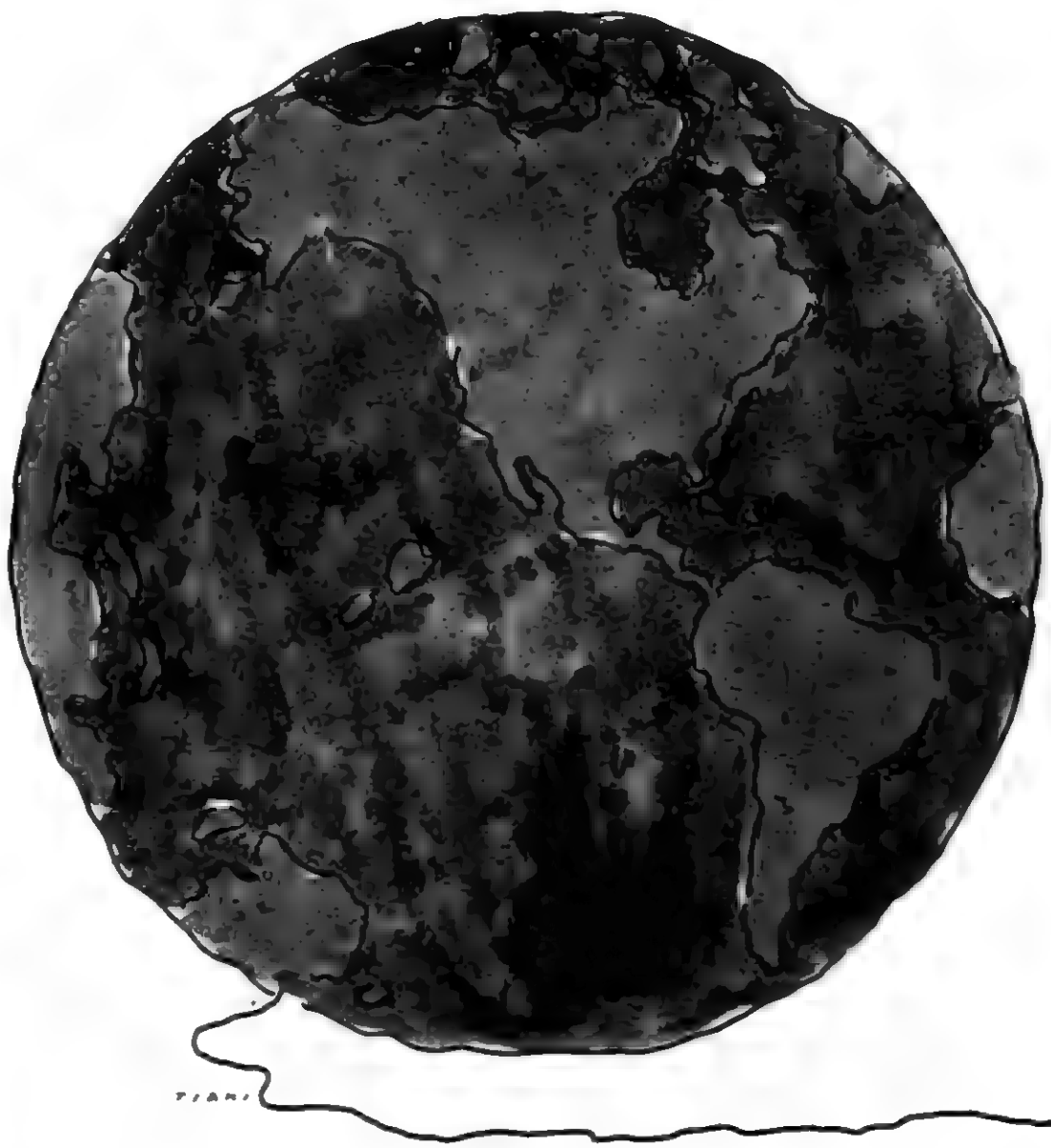
The complaint was lodged last October after individual discussions with IBM failed to gain concessions.

TOKYO — A panel of experts at the Japanese Ministry of Education has urged that enrollment limits be doubled in computer software-related departments at Japanese universities and colleges by 1992. The panel hopes to ensure that more systems engineers and software specialists are trained in order to offset the shortage of Japanese programmers. An estimated 600,000 additional programmers will be needed by 1990, the panel projected.

OSAKA, Japan — The semiconductor manufacturing subsidiary of Britain's Thorn EMI PLC is seeking financial aid from Japan's Matsushita Electric Industrial Co. in an apparent effort to fund research & development associated with its Transputer personal computer. According to Matsushita, a decision has not been reached on the proposal.

The unofficial request from Thorn EMI's Inmos subsidiary was made when a top Inmos manager visited Matsushita headquarters, according to Naomi Haga, an official at Matsushita Electric Trading Co., Matsushita's export and import arm.

NOW IBM PROFS USERS



NEWS

CALENDAR

WEEK OF MAY 18

MAY 19, ANNAPOLIS, MD. — **Mapics Users' Conference.** Contact: Salem Corp., 1654 Poplar Lane, Annapolis, Md. 21401.

MAY 19-21, HILTON HEAD, S.C. — **Audit Managers Symposium VII.** Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

MAY 19-21, SAN FRANCISCO — **Hammer Forum West: Change and Continuity in End-User Computing.** Contact: Michael Hammer, Hammer and Co., Five Cambridge Center, Cambridge, Mass. 02142.

MAY 19-21, SAN FRANCISCO — **ID Expo, The Conference and Exposition of Automatic Identification Systems and Keyless Data Entry.** Contact: Expocon Management Associates, 3695 Post Road, Southport, Conn. 06490.

MAY 19-22, PHILADELPHIA — **Lasers in Manufacturing: SPOT '86 Conference and Exhibits.** Contact: Kathleen Warren, Technical Activities Department, Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

MAY 20-22, ATLANTA — **Eastern Telecommunications Showcase.** Contact: Agnes M. Pavel, Program Director, U.S. Telecommunications Suppliers Association, Suite 1618, 333 N. Michigan Ave., Chicago, Ill. 60601.

MAY 20-23, ORLANDO, FLA. — **Techex '86 Americas: The Annual World Fair for Technology Exchange.** Contact: Anne E. Klenner, Dr. Dvorkovitz & Associates, P.O. Box 1748, Ormond Beach, Fla. 32075.

MAY 21-23, NEW YORK — **Interconnections '86.** Contact: Independent Computer Consultants Association, P.O. Box 27412, St. Louis, Mo. 63141.

MAY 21-23, NEW YORK — **New York University Symposium on Information Technology and Management Strategy.** Contact: Kenneth C. Laudon, Graduate School of Business Administration, New York University, 90 Trinity Place, New York, N.Y. 10006.

WEEK OF MAY 25

MAY 28-29, WASHINGTON, D.C. — **Systems/34, 36 and 38 Users Show.** Contact: Andrew Wahtera, The Producers, 360 Merrimack St., Lawrence, Mass. 01843.

MAY 28-30, WASHINGTON, D.C. — **Stategic Data Planning and Modeling.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

MAY 29-30, SAN FRANCISCO — **Unix In Focus.** Contact: International Data Corp., Suite 201, 3350 W. Bayshore Road, Palo Alto, Calif. 94303.

MAY 29-31, BLACKSBURG, VA. — **Personal Computer Interfacing for Scientific Instrument Automation.** Contact: Linda Leffel, Virginia Polytechnic Institute and State University, Blacksburg, Va. 24061.

MAY 30-JUNE 2, ATLANTA — **Society of Telecommunications Consultants Spring Conference.** Contact: STC Headquarters, Suite 1410, One Rockefeller Plaza, New York, N.Y. 10020.

WEEK OF JUNE 1

JUNE 2-5, DETROIT — **Vision '86 — Applied Machine Vision Conference and Exposition.** Contact: Vision '86 Public Relations, Machine Vision Association of the Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

JUNE 2-5, NASSAU BAY, TEXAS — **International Symposium on Ada Programming Language Applications for Space Station Development.** Contact: University of Houston — Clear Lake, 2700 Bay Area Blvd., Houston, Texas 77058.

JUNE 2-6, BOSTON — **Harmon Associates Seminars and Workshops.** Contact: Harmon Associates, 151 Collingwood, San Francisco, Calif. 94114.

JUNE 4, SAN FRANCISCO — **How to Build Your High Tech Career Network.** Contact: Association for Women in Computing, Bay Area Chapter, Suite 44, 55 Sutter St., San Francisco, Calif. 94104.

JUNE 4-6, BOSTON — **Engineering Expert Systems.** Contact: Harmon Associates, 151 Collingwood, San Francisco, Calif. 94114.

JUNE 4-6, SAN DIEGO — **1986 National Educational Computing Conference.** Contact: Susan M. Zgliczynski, National Educational Computing Conference 1986, School of Education, University of San Diego, Alcala Park, San Diego, Calif. 92110.

JUNE 5-6, CLEVELAND — **North Central Region Data Processing Trainer's Conference.** Contact: Gary Livingston, Livingston & Associates, P.O. Box 30619, Cleveland, Ohio 44130.

JUNE 7, BEIJING — **China-Didacta '86: The International Trade Fair for Educational Equipment.** Contact: Swiss Industries Fair, Secretariat China Didacta '86, P.O. Box CH-4021, Basel, Switzerland.

WEEK OF JUNE 8

JUNE 8-11, NEW ORLEANS — **Ethernet Decision-Makers Group Exchange Conference.** Contact: EDGE International, Inc., Suite 260, 1539 N. China Lake Blvd., Ridgecrest, Calif. 93555.

JUNE 9-10, TEANECK, N.J. — **Machover on Business Graphics.** Contact: Carol Every, Industry Rep-

See CALENDAR page 160

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CALENDAR from page 157

resentative, Frost & Sullivan, Inc., 106 Fulton St., New York, N.Y. 10038.

JUNE 9-11, MYRTLE BEACH, S.C. — **The Association of Small Computer Users in Education 19th Annual Summer Conference.** Contact: Jack Cundiff, Horry-Georgetown Technical College, Conway, S.C. 29526.

JUNE 9-11, NORCROSS, GA. — **Time and Motion Study Fundamentals.** Contact: Institute of Industrial Engineers Registrar, 25 Technology Park/Atlanta, Norcross, Ga. 30092.

JUNE 9-12, BOSTON — **Network Management/Technical Control Conference and Exposition.** Contact: CW/Conference Management Group, 375 Cochituate Road, Framingham, Mass. 01701.

JUNE 9-12, CHICAGO — **Com Lease Spring, The Computer Leasing Conference and Expo.** Contact: Show Management Offices, 3825-I S. George Mason Drive, Falls Church, Va. 22041.

JUNE 9-13, SAN DIEGO — **MUMPS Users' Group 15th Annual Meeting.** Contact: MUMPS Users' Group, Suite 510, 4321 Hartwick Road, College Park, Md. 20740.

JUNE 10-13, ATLANTA — **Summer 1986 Unix Conference and Exhibition.** Contact: The Usenix Association Conference Office, P.O. Box 385, Sunset Beach, Calif. 90742.

JUNE 11, NEW YORK — **The Semiconductor Industry — Its Changing Structure 1986.** Contact: Robert Burton, L. F. Rothschild, Unterberg Towbin, 55 Water St., New York, N.Y. 10041.

JUNE 11-13, MAINZ, WEST GERMANY — **International Tandem Users' Group 1986 Spring Conference.** Contact: ITUG Headquarters, Suite 600, 111 E. Wacker Drive, Chicago, Ill. 60601.

JUNE 11-13, TEANECK, N.J. — **Machover on CAD/CAM.** Contact: Carol Every, Industry Representative, Frost & Sullivan, Inc., 106 Fulton St., New York, N.Y. 10038.

JUNE 13, DETROIT — **James Martin Seminar — The End-User Revolution.** Contact: Thomas J. Bisacquino, Director of Education, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

WEEK OF JUNE 15

JUNE 15-20, LONG BEACH, CALIF. — **1986 Government Management Information Sciences Conference.** Contact: Tom Lang, Assistant Chairman, Data Processing Department, 9150 E. Imperial Highway, Downey, Calif. 90242.

JUNE 16-18, UNIVERSAL CITY, CALIF. — **Synergy '86, Conference on Functional Interfacing for Computer-Integrated Manufacturing.** Contact: Cheri Willetts, Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

JUNE 16-20, CAMBRIDGE, MASS. — **Managing Information Technology: New Responsibilities in a Changing Environment.** Contact: Center for Information Systems Research, Sloan School of Management, MIT, E40-193, 77 Massachusetts Ave., Cambridge, Mass. 02139.

JUNE 17-18, PLYMOUTH, MICH. — **Robotic End Effectors: Design and Applications Seminar.** Contact: Mary Dombrowski, Special Programs Division, Robotics International of the Society of Manufacturing Engineers, One SME Drive, P.O. Box 930, Dearborn, Mich. 48121.

JUNE 17-19, ATLANTIC CITY — **Plas-Tech '86.** Contact: Delia Associates, P.O. Box 338, Delia Marketing Communications Center, Whitehouse, N.J. 08888.

JUNE 18-20, TOKYO — **Marketing Opportunities Seminar.** Contact: Agnes M. Pavel, Program Director, U.S. Telecommunications Suppliers Association, Suite 1618, 333 N. Michigan Ave., Chicago, Ill. 60601.

WEEK OF JUNE 22

JUNE 22-27, PHILADELPHIA — **Management Information Systems for Strategic Advantage.** Contact: The Registrar, Office of Executive Education, 200 Vance Hall, The Wharton School of the University of Pennsylvania, Philadelphia, Pa. 19104.

JUNE 23-25, ALBUQUERQUE, N.M. — **Integrated Fiber-Optic Technology Training.** Contact: Linda Castle, Optoelectronic System Consultants, P.O. Box 35525, Albuquerque, N.M. 87176.

JUNE 23-25, MIAMI — **Electronic Data Processing Auditors Association 14th Annual International Conference.** Contact: EDPAA, P.O. Box 88180, Carol Stream, Ill. 60188.

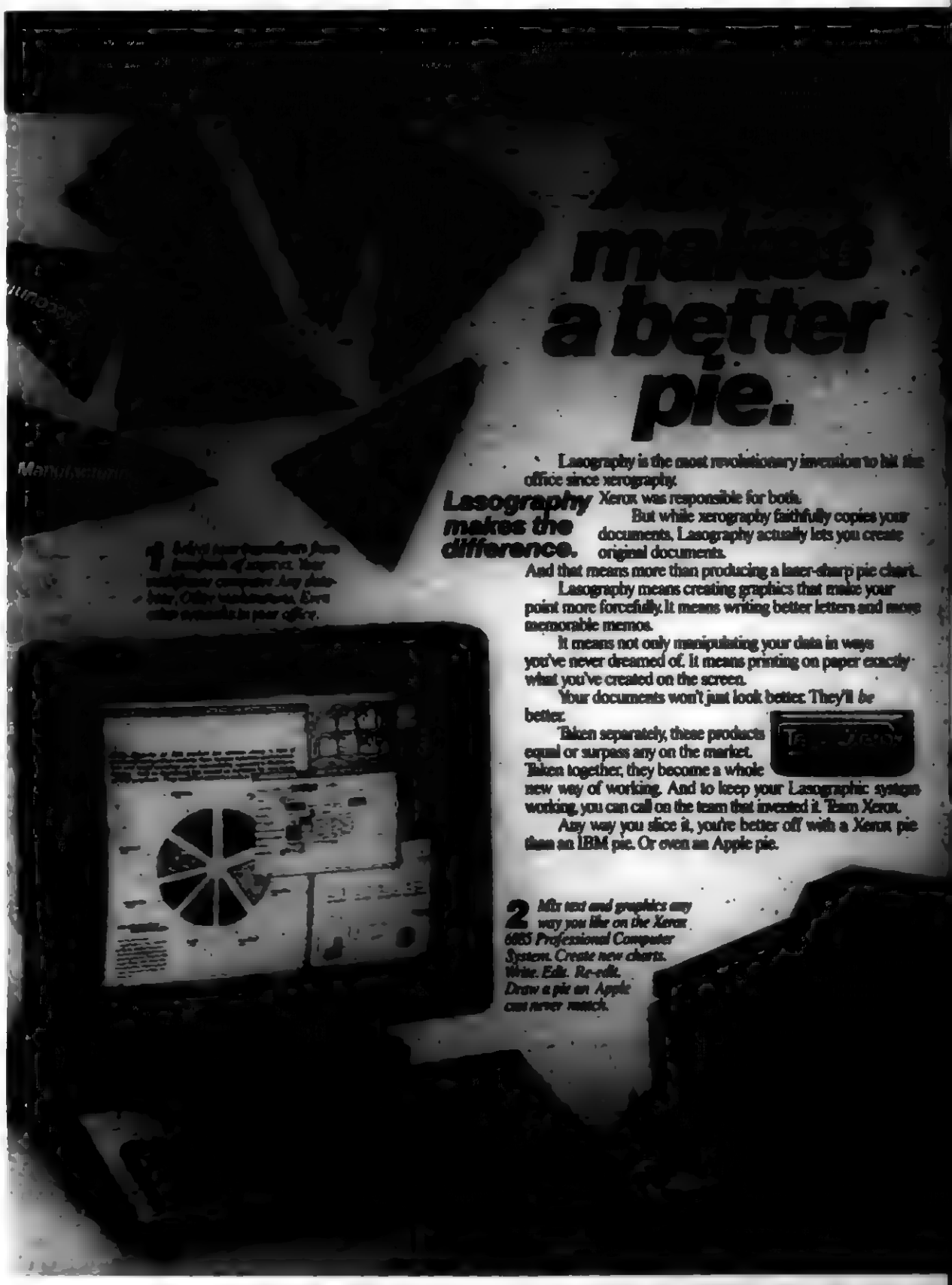
JUNE 23-26, BOSTON — **ATE East '86.** Contact: Registrar, Morgan-Grampian Expositions Group, 1050 Commonwealth Ave., Boston, Mass. 02215.

JUNE 23-27, AMSTERDAM — **Fourth Annual European Fiber-Optic Communications and Local-Area Networks Exposition.** Contact: Cheryl MacDonald, Information Gatekeepers, 214 Harvard Ave., Boston, Mass. 02134.

JUNE 23-27, CHICAGO — **A/E/C Systems '86: The Computer and Management Show for the Design and Construction Industry.** Contact: Conference Director, A/E/C Systems '86, P.O. Box 11318, Newington, Conn. 06111.

JUNE 24-26, CHICAGO — **Structured Techniques Association III/Structured Techniques in the Eighties: Practice and Prospects.** Contact: Mary Anne Gabriel, Heller Financial Corp., 105 W. Adams St., Chicago, Ill. 60603.

JUNE 24-27, CHICAGO — **Autocad Expo '86.** Contact: William Ryan, Autocad Expo '86, Autodesk, Inc., 2320 Marinship Way, Sausalito,



NEWS

Calif. 94965.

JUNE 25, CHICAGO — **International Facility Management Association's Computer Applications for Facility Management.** Contact: IFMA, Suite 1410, 11 Greenway Plaza, Houston, Texas 77046.

JUNE 25-26, COATESVILLE, PA. — **Chester County Expo '86: CAD/CAM Conference from Micro to Mini.** Contact: Lee Smith, Central Chester County Vocational Technical School, 1635 E. Lincoln Highway, Coatesville, Pa. 19320.

WEEK OF JUNE 29

JULY 2-3, LAS VEGAS — **Fall Meeting of the Design Automation Standards Subcommittee.** Contact: Ron Waxman, Design Automation Standards Subcommitee cochairman, IBM FSD, 9500 Godwin Drive, Manassas, Va. 22110.

WEEK OF JULY 27

JULY 28-30, RENO, NEV. — **1986 Summer Computer Simulation Conference.** Contact: The Society for Computer Simulation, P.O. Box 17900, San Diego, Calif. 92117.

WEEK OF AUGUST 3

AUGUST 4-8, ANN ARBOR, MICH. — **Contemporary Data Communication Networks: Planning, Management and Computer-Based Design.** Contact: Engineering Summer Conferences, 300 Chrysler Center/N. Campus, Ann Arbor, Mich. 48109.

WEEK OF AUGUST 10

AUGUST 11-14, SNOWMASS, COLO. — **AM/FM International Ninth Annual Conference.** Contact: AM/FM International, Suite 820, 8775 E. Orchard Road, Englewood, Colo. 80111.

WEEK OF AUGUST 17

AUGUST 18-22, DALLAS — **Thirteenth Annual Conference on Computer Graphics and Interactive Techniques.** Contact: SIGGRAPH '86, Conference Management, Smith, Bucklin & Associates, Inc., 111 E. Wacker Drive, Chicago, Ill. 60601.

AUGUST 19-21, PHILADELPHIA — **Second Annual Physical and Electronic Security Symposium and Exposition.** Contact: Michael C. Otten, Booz, Allen and Hamilton, Inc., 4330 East-West Highway, Bethesda, Md. 20814.



WEEK OF AUGUST 24

AUGUST 26-28, SAN MATEO, CALIF. — **Interconnect '86.** Contact: Agnes M. Pavel, Program Director, U.S. Telecommunications Suppliers Association, Suite 1618, 333 N. Michigan Ave., Chicago, Ill. 60601.

WEEK OF AUGUST 31

SEPTEMBER 1-5, DUBLIN — **International Federation for Information Processing Congress '86.** Contact: IFIP Congress '86, 44 Northumberland Road, Dublin 4, Ireland.

SEPTEMBER 2-5, CHICAGO — **Fourth Annual Office Automation Society International Conference.** Contact: Sue Pickard, OASI, Suite B, 15269 Mimosa Trail, Dumfries, Va. 22026.

SEPTEMBER 3-5, LOS ANGELES — **Telemarketing/West.** Contact: Doug Shreve, The Telemarketing Foundation, Inc., P.O. Box 829, Arnold, Md. 21012.

WEEK OF SEPT. 7

SEPTEMBER 8-10, PHILADELPHIA — **NCC — Telecommunications Conference.** Contact: NCC-Telecommunications, American Federation of Information Processing Societies, Inc., 1899 Preston White Drive, Reston, Va. 22091.

SEPTEMBER 8-18, MONTREAL — **43rd FID Conference and Congress.** Contact: Local Organizing Committee, FID 43rd Conference and Congress, C.P. 1144, Succutrsale Place Desjardins, Montreal, Quebec, Canada H5B 1B3.

SEPTEMBER 9-12, ANTWERP, BELGIUM — **Second European Simulation Congress.** Contact: The Society for Computer Simulation, c/o Ghislain C. Vansteenkiste, University of Ghent, Coupure Links 653, B-9000 Ghent, Belgium.

WEEK OF SEPT. 14

SEPTEMBER 18-19, MONTREAL — **Canadian Office Machine Dealers Association/Candex.** Contact: Roy Whitsed, Candex Conference, Inc., 47 Lakeshore Road E., Mississauga, Ont., Canada L5G 4L7.

WEEK OF SEPT. 21

SEPTEMBER 22-25, ORLANDO, FLA. — **Space Tech '86.** Contact: Society of Manufacturing Engineers Public Relations, Box 930, One SME Drive, Dearborn, Mich. 48121.

SEPTEMBER 23-25, NEW YORK — **International Videotex Industry Exposition and Conference.** Contact: Cahners Exposition Group, P.O. Box 3833, Cahners Plaza, 999 Summer St., Stamford, Conn. 06905.

SEPTEMBER 23-25, WIESBADEN, WEST GERMANY — **Artificial Intelligence and Advanced Computer Technology Conference/Exhibition.** Contact: Tower Conference Management Co., 331 W. Wesley St., Wheaton, Ill. 60187.

Systems vendors scaling back on in-house chip fabrication

Third-party production lets companies focus on semiconductor design

By Maura McEnaney

SUNNYVALE, Calif. — Data General Corp.'s recent closing of its in-house chip manufacturing facility came as no surprise to industry analysts, who have long been predicting market growth for independent application-specific integrated circuit manufacturers.

Last month, DG announced it would reduce its in-house volume chip production to concentrate instead on component design and development (CW, April 28). Seventy-five workers were laid off, and most chip production will be shipped to merchant companies, according to DG.

At first glance, the announcement contradicts the earlier trend of systems vendors taking volume chip production in-house, as evidenced by Digital Equipment Corp.'s new semiconductor plant in Scotland. But DG's announcement is in line with another industry trend, analysts say.

"Developing chip designs is becoming more important than manufacturing," says Andrew Rappaport, president of Technology Research Group in Boston. According to Rappaport, sophisticated design tools allow systems companies to do more and better chip designs, leaving the production of what could be limited designs to chipmakers already equipped with costly manufacturing capabilites. "For companies like DG it is a much cheaper way to build chips," he notes.

Because application-specific integrated circuit manufacturers have weathered the current semiconductor slump fairly well, major commodity vendors, including Intel Corp., have announced their intentions to get into this business. The application-specific integrated circuit business has matured enough to handle volume production runs at cost-effective rates, which could eventually help lower system prices.

Rappaport says he believes that "a lot of companies will be scaling back on the use of their internal fabrications," a trend he says began several years ago when Wang Laboratories, Inc. abandoned its plans to build a chip foundry.

Only companies like IBM and DEC, which have the substantial investments and volumes to support wafer fabrication, will remain in the business, he predicts. Current estimates have IBM producing between 2.5 billion and 3 billion chips a year.

"Anybody who is bringing their fab in-house is either nuts or has more money than they have brains," says Matt Crugnale, a consultant wth Crugnale and Associates.

"Only the military has the luxury of doing in-house fabrication without having the volume to support it, and that is because of the proprietary nature of the product," Crugnale says.

DG does use proprietary chips, but they are not so proprietary that they risk design loss if a third party manufactures them, says Michael Kubiak, analyst at Kidder, Peabody & Co.

Although it recently closed a semiconductor facility in Cupertino, Calif., Hewlet-Packard Co. continues to manufacture its own custom chips. The company now operates four chip fabrication plants in California, Colorado and Oregon. "There is still a major opportunity for circuits made internally," says Fred Schwettmann, general manager of HP's integrated circuit group.

HP's decision to close the Cupertino facility came only because of excess capacity and not because of a switch to the application-specific integrated circuit market, he notes. "I think there is still a great deal of learning to do as far as the application-specific integrated circuit market is concerned," he says.

Mohawk sales clear loan defaults

PARSIPPANY, N.J. — Mohawk Data Sciences Corp. last week finalized the sale of five business units for approximately $90 million, removing itself from default on short-term bank loans.

The units will make up the bulk of a new private firm owned by two New York venture capital firms, J. H. Whitney & Co. and Welsh Carson Anderson & Stowe. Mohawk Data, which agreed to the sale last year, will own 10% of the new company and will hold one seat on its board.

Mohawk Data will use the funds from the transaction to support its one remaining computer business unit, MDS Qantel, Inc. Qantel is a vendor of minicomputers for various vertical markets, with reported sales of about $70 million in the fiscal year ended April 30.

The two venture capital firms purchased the Mohawk Data Service, Systems, Storms and Herkimer (N.Y.) Manufacturing divisions, as well as financial subsidiary MDS Credit Corp. Mohawk Data will receive royalties from the new firm for a 10-year period.

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Industry heirs: Akers, Olson

From page 190

nization will take over and instill a marketing sense similar to IBM's," Fritz Ringling of the Gartner Group, Inc. suggests.

The postdivestiture AT&T, barely 2 years old, is fighting to stave off low-cost competitors in its bread-and-butter long-distance telephone business, while at the same time striving to gain a foothold in the commercial computer market.

It is a $35 billion company still learning the art of marketing after decades of being a monopoly in regulated markets. Analysts say AT&T is a company in need of a take-charge leader with polished management skills who will make the painful but necessary pruning to elevate its competitiveness.

"Hopefully," says Kenneth Leon of L. F. Rothschild, Unterberg Towbin, "Olson will come on the scene like Peter the Great going through Russia."

No-nonsense Olson

Olson is considered a no-nonsense, energetic leader who is said to be better versed than Brown in the sundry businesses in which AT&T competes.

Observers say he has spent the last couple of years learning AT&T's broad array of products and is up to speed on its technology and marketing directions.

"He will be a more proactive leader vs. a reactive one because he's studied the market forces and understands the key markets AT&T is in," Leon says.

Detractors, however, say he is part and parcel of old-line management that has done very little to create the dynamics for AT&T to leverage its technological advantage in almost all of its markets.

Make good on promises

As chairman, Olson will have to make good on promises to trim the bloated corporation, promises analysts say he hasn't kept as president and chief operating officer. Olson pledged to cut expenses at AT&T Technologies by 20%. That objective, analysts say, was not met. And, while lauding his decision to excise 24,000 positions in the Information Systems Division, most analysts say they believe it was a move that should have been made months earlier.

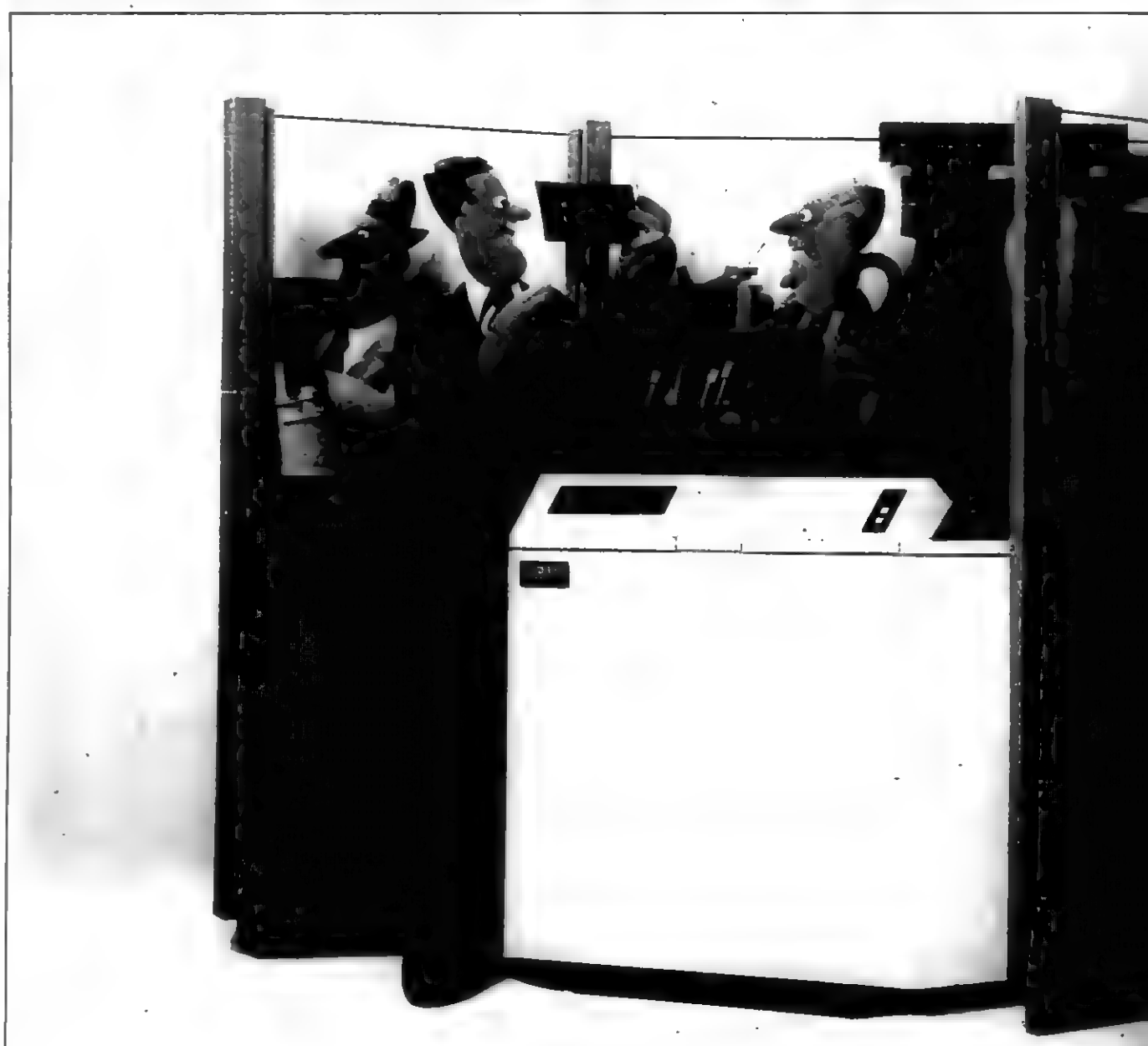
"Under Brown, Olson didn't have the leeway to do what he wanted," Leon suggests. "He was a victim of AT&T's hierarchical management."

Olson will bring costs under control once he consolidates power, Leon says, because it is destined to become his legacy. "Brown will be known as the chairman who gets credit for surviving divestiture. Olson will get credit for focusing on costs and getting the company more competitive," he says.

> ***'Brown will be known as the chairman who gets credit for surviving divestiture. Olson will get credit for focusing on costs and getting the company more competitive.'***
>
> — Kenneth Leon
> L. F. Rothschild, Unterberg Towbin

The Gartner Group's Ringling argues that because of Olson's career-long association with AT&T, he will be caught in conflicting obligations. "Since he was brought up in the Bell tradition, he may feel he has to cater to his employees' needs," Ringling says. "On the other hand, he has to get costs down and reduce product redundancies. The toughest choice he might have to make is to lay off employees." Making it tougher is the fact that approximately 55% of AT&T's 340,000-member work force is unionized.

Despite the computer industry slump, layoffs seem unlikely to occur at IBM un-



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COMPUTER INDUSTRY

der Akers, although he has already stated that hiring, particularly at the entry level, will be reduced significantly [CW, May 5].

"Under Akers there will be a continued emphasis on efficiency within the confines of IBM's larger guidelines," says Smith Barney, Harris Upham & Co. analyst Donald Haback. "There will be no terminations or layoffs; employees will be retrained rather than fired," he says.

Considered by former coworkers and analysts as a consummate manager who has earned his blue stripes within the $50 billion corporation, Akers faces some difficult challenges. After years of sustained growth, IBM is mired in perhaps the most frustrating slump in its history. The firm is struggling to meet its sales and profit objectives, a situation caused by decreasing demand, increased worldwide competition and, according to some analysts, perceptible gaps in its product line, particularly in the minicomputer and communications areas.

Game for the task

Yet, according to former associates, Akers is game for the task. "He's good at understanding problems, how to get at root causes, ferreting out what needs to be done and delegating," notes ex-IBMer Watkins, who left Big Blue in 1985 after a 25-year career.

"He's so quick to get to the root of problems that it seemed as if he studied things for 48 hours before meeting to resolve them," says Tandon Corp. President Dan Wilkie, who worked under Akers as a manager at IBM's Entry Systems Division. "He went at a problem like a radar unit."

Watkins says Akers has special leadership qualities that set him apart from other IBM executives. "Someone once termed it command presence. People look to him for leadership," he says.

"He has the charisma necessary to run an organization as diverse as IBM's," says another former IBM executive who became president of a computer firm.

Outspoken Akers

Akers is more outspoken than Opel, whom analysts always say had been living in the shadow of his predecessor, Frank T. Cary. Despite the pervasive influence of the firm's management committees, Akers' character gives him the potential to leave his imprimatur on the company, industry and general economic conditions permitting. Like Cary, Akers will simultaneously hold the offices of chairman, president and CEO, which Opel never did.

One area in which Akers is sure to have an impact is cost containment. Like Cary, the

> ***Like Cary, the force behind IBM's move to become the low-cost producer, Akers will be known as the chairman who made Big Blue the low-cost marketeer.***

force behind IBM's move to become the low-cost producer in the computer industry, Akers will be known as the chairman who made Big Blue the "low-cost marketeer," Watkins says. "He's going to put a full-court press on marketing expenses," Watkins suggests. "These are expenses that tend to be high, and John understands this."

According to Stephen Dube, a Shearson Lehman Brothers, Inc. analyst, Akers is also bound to be more aggressive. Dube points to a recent press conference in which Entry Systems Division President William Lowe publicly warned Personal Computer clone manufacturers that IBM would be turning the competitive heat one notch higher in the near term. "I'm sure Lowe wouldn't have said that without the blessing of Akers," Dube says.



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COMPUTER INDUSTRY

Sequent signs deal with Amperif

OEM agreement worth $20 million

By Donna Raimondi

BEAVERTON, Ore. — Sequent Computer Systems, Inc. has signed a four-year, $20 million OEM agreement with Amperif Corp. of Chatsworth, Calif.

The contract, which specifies that Sequent will provide its Balance 8000 parallel computer system and various components to Amperif, comes two months after a $50 million deal that Sequent inked with the German firm Siemens AG.

Sequent's total OEM contracts signed during the past 10 months amount to more than $80 million, according to Scott Gibson, Sequent's executive vice-president and chief operating officer.

"Taken all together, the Siemens and Amperif deals, along with several smaller ones Sequent has made, are very impressive evidence of their success," said Omri Serlin, president of research firm Itom International in Los Altos, Calif. "This really puts them way ahead of everyone else in that market, even though other companies, like Encore, get all the attention." Serlin pointed out that Sequent is only in its second year of shipments.



Micro exhibits betray blahs

From page 190

was all business — and a tough business at that.

Take Ability, the integrated micro software program that debuted with a splashy ad campaign and a $495 price tag last year. Its developer, Xanaro Technologies, Inc., is now bankrupt in Canada, and the Ingram Distribution Group, Inc. was hawking Ability at Comdex for $99. "I guess it's worth taking a flyer on at that price," Stinson shrugged. So much for "the next Dbase II."

Granted, the healthy dose of rough economic times in the micro industry has not been all bad for the corporate user. Recent software vendor trends to end copy protection and develop corporate site licensing plans prove that. And even Atari Corp. and Commodore International Corp. are making bids for the corporate dollar.

But on the down side, it doesn't seem to be the season for innovation. The next-generation Intel Corp. 80386-based micros may change that, but the new wave of products will not have the set-the-world-on-fire feel that pervaded Comdexes past. There may be less vaporware, but there will be less excitement as well.

■

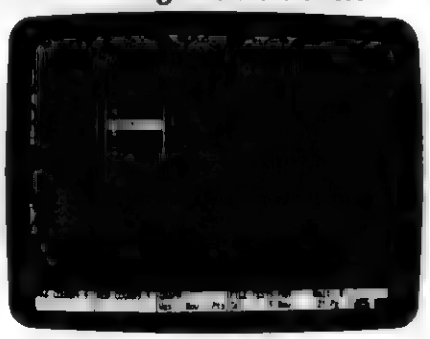
Just a footnote on the demise of Future Computing, Inc.: Jeffrey Tarter, editor of "Softletter," a micro software newsletter in Cambridge, Mass., formerly used market research estimates of vendor sales in compiling the annual "Software 100."

"Unfortunately," Tarter wrote in notes to the 1986 list, "the numbers from analysts often turned out to be ridiculously wrong." Tarter now relies only on data from company sources. Enough said.

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Apple prepares to invest earnings in third-party developers

Applications received for capital, personnel

By Peggy Watt

CUPERTINO, Calif. — Apple Computer, Inc. has begun accepting applications from software and hardware developers for its new Strategic Investment Group, which will give capital and other resources to third-party companies developing Apple-related products.

Apple claims to have received "hundreds of inquiries daily" after Chairman John Sculley announced the group earlier this year. Interested companies are asked to submit business plans to Apple for consideration and review.

Apple plans to help fund a few high-quality and innovative companies whose products can help expand Apple's own market, according to Daniel Eilers, general manager of the new group.

Apple officials will not say how much seed money the company expects to plant, but they indicated personnel and other resources would be available as well. The company declines to call the plan "venture capital," emphasizing that it will invest only in projects that will complement Apple products.

The strategic investment group expects to make its first awards by late summer after a three-month evaluation of business plans, Apple officials said. They expect the investment group to continue indefinitely.

Apple is particularly looking at companies with projects in Apple's own target markets this year: business, education and consumer products, according to a spokeswoman. Among specific areas of interest are communications graphics, artificial intelligence, applications generators, high value-added applications and products integrating software with video and compact disk/read-only memory technology, she added.

Interested companies are asked to submit information on the company history and personnel, product and market information, a proposal for the product development for which it wants Apple's help and a review of the company's financial status.

"The initial response . . . has been tremendous," Eilers said. "There appears to be significant interest in Apple-related product development."

The project is an indication of Apple's stepped-up research and development activity, promised by Apple officials earlier this year. In a recent meeting with securities analysts, Sculley also predicted strong earnings for the rest of the fiscal year, which ends in September. Sculley said the company was willing to invest more heavily in marketing, sales and product development.

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Electronic Data Systems Corp. reported net income for the first quarter ended March 31 of $55.6 million, or 45 cents per share, on revenue of $997 million. This compares with net income of $38 million, or 32 cents per share, on revenue of $689.1 million reported a year ago.

■

Convergent Technologies, Inc. announced revenue for the first quarter ended March 31 of $73.5 million, compared with $92.6 million in the comparable period a year ago. Profits were $1.9 million, or 5 cents per share, compared with $2 million, or 1 cent per share, in the previous year.

■

Software Publishing Corp. reported revenue for the second quarter of $5.7 million, compared with $8.6 million in the previous year. Profits were $365,000, or 5 cents per share, compared with $1.3 million, or 18 cents per share, last year.

■

Computer Task Group, Inc. announced net income for the first quarter ended March 31 of $1.3 million, or 27 cents per share, on revenue of $32.7 million. This compares with net income of $773,000, or 24 cents per share, on revenue of $26 million reported in the previous year.

■

Mentor Graphics Corp. announced revenue for the first quarter ended March 31 of $37.1 million, compared with $32.3 million last year. Profits were $1.9 million, or 12 cents per share, compared with $3.1 million, or 22 cents per share, in the like period a year ago.

■

Data I/O Corp. posted revenue for the first quarter ended March 27 of $16.1 million, compared with $13.9 million a year ago. Profits were $1.2 million, or 12 cents per share, compared with $1.6 million, or 16 cents per share, last year.

■

Intelogic Trace, Inc. posted revenue for the second quarter ended Jan. 25 of $39.6 million, compared with $38.5 million last year. Profits were $5 million, or 32 cents per share, compared with $4.5 million, or 24 cents per share, a year ago.

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NICKELS AND DIMES

Tandon Corp. announced revenue for the second quarter ended March 28 of $58.2 million, compared with $61.1 million in the previous year. Net income was $1.9 million, or 4 cents per share, compared with a net loss of $19.9 million, or 39 cents per share, in the like period a year ago.

■

Wyse Technology, Inc. reported revenue for the fourth quarter ended March 31 of $46.3 million, compared with $35.3 million a year ago. Profits were $3.7 million, or 33 cents per share, compared with $1.6 million, or 18 cents per share, one year ago.

■

Britton Lee, Inc. announced revenue for the first quarter ended March 31 of $7.2 million, compared with $6.5 million in the comparable period a year ago. Profits were $189,000, or 2 cents per share, compared with $938,000, or 12 cents per share, reported in the like quarter one year ago.

■

Intecom, Inc. announced revenue for the first quarter ended March 31 of $20.8 million, compared with $30.5 million a year ago. The company also reported a net loss of $7.9 million, or 24 cents per share, compared with a net loss of $1.1 million, or 3 cents per share, in the same quarter one year ago.

■

Micom Systems, Inc. announced revenue for the quarter ended March 31 of $189.5 million, compared with $193.3 million in the previous year. Profits were $10.8 million, or 62 cents per share, compared with $25.7 million, or $1.48 per share, in the like quarter a year ago.

■

Trilogy Ltd. reported revenue for the first quarter ended March 30 of $6.9 million, compared with $5.2 million in the comparable period a year ago. The company also announced a net loss of $5.2 million, or 8 cents per share, compared with a net loss of $7.7 million, or 14 cents per share, in the previous year.

■

NBI, Inc. reported a loss of $2.4 million, or 25 cents per share, on revenue of $67.6 million for the third quarter ended March 31. This compares with net income of $4 million, or 42 cents per share, on revenue of $54.6 million reported for the comparable period one year earlier.

■

Infotron Systems Corp. announced first-quarter revenues of $19.1 million, compared with $18.3 million a year ago. Profits were $347,000, or 7 cents per share, compared with $1.8 million, or 35 cents per share, in the previous year.

■

Policy Management Systems Corp. reported net income for the first quarter ended March 31 of $3.1 million, or 19 cents per share, on revenue of $32 million. This compares with net income of $3.8 million, or 24 cents per share, on revenue of $25 million in the like period a year ago.

■

Maxtor Corp. announced revenue for the quarter ended March 31 of $26.5 million, a 62% increase over the $16.4 million reported in the like quarter a year ago. Profits were $3.9 million, or 51 cents per share, compared with $1.7 million, or 30 cents per share, in the previous year.

The company also reported revenue for the year ended March 31 of $85.2 million, a 96% increase over last year's $43.5 million. Profits for the year were $10.7 million, or $1.56 per share, compared with $38,000, or 1 cent per share, in the previous year.

■

Alpha Microsystems, Inc. reported a loss for the fourth quarter ended Feb. 23 of $1.5 million, or 47 cents per share, on revenue of $11.4 million. This compares with year-earlier net income of $66,000, or 2 cents per share, on revenue of $12.1 million.

For the year ended Feb. 23, the company reported a loss of $3.5 million, or a $1.10 loss per share, on revenue of $48.2 million. This compares with net income of $2.1 million, or 65 cents per share, on revenue of $51.7 million for the previous year.

■

Teknowledge, Inc. reported revenue for the third quarter ended March 31 of $4 million, compared with $1.6 million in the previous year. Profits for the quarter were $357,700, or 7 cents per share, compared with a net loss of $1.1 million, or 41 cents per share, in the like period a year ago.

■

TIE/Communications, Inc. reported a first-quarter loss of $2.6 million, or 7 cents per share, on revenue of $82.8 million. This figure compares with a net loss of $6.7 million, or 19 cents per share, on the company's revenue of $88.8 million in the previous year.

CPT Corp. announced revenue for the third quarter ended March 31 of $24.1 million, compared with $42 million one year ago. The company reported a net loss of $4.9 million, or a 31 cents loss per share, compared with net income of $152,000, or a 1 cent loss per share, in the comparable period last year.

■

Integrated Software Systems Corp. announced revenue for the first quarter ended March 31 of $8.5 million, compared with $7.7 million a year ago. Profits were $374,000, or 7 cents per share, compared with $420,000, or 8 cents per share, in the like period one year ago.

■

Emulex Corp. announced net income for the third quarter ended March 31 of $2.2 million, or 16 cents

See NICKELS page 171

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COMPUTER INDUSTRY

EXECUTIVE CORNER

Electronic Data Systems Corp. (EDS) announced the following appointments: **Lester M. Alberthal Jr.**, senior vice-president in charge of EDS' North American business operations, will become the company's new president, succeeding **Morton H. Meyerson**, who was named to the new position of vice-chairman. The vice-president in charge of finance and administration, **J. Davis Hamlin**, will become the company's new chief financial officer, succeeding **J. Thomas Walter Jr.**, and **Gary Fernandes**, senior vice-president, has been named chairman of EDS International Ltd. and will oversee all of EDS' international operations.

■

James A. Pitts was named executive vice-president of finance, administration, and strategic planning of Cullinet Software, Inc. Previously with Digital Equipment Corp. in several financial and strategic planning management assignments and with Xerox Corp. as controller and manager of planning and development, Pitts most recently held the position of vice-president, corporate controller with Data General Corp. Pitts will also serve as interim chief financial officer because of the resignation of **Phyllis S. Swersky**, former senior vice-president and chief financial officer.

■

National Semiconductor Corp. has created two new business organizations — the Information Systems Group and the Semiconductor Group — that consolidate all National Semiconductor business operations under two corporate executive vice-presidents: **James Smaha**, who was promoted from head of the company's semiconductor division to executive vice-president of the corporation and the Semiconductor Group; and **David Martin**, who was promoted to executive vice-president of the corporation and the Information Systems Group and also is president of National Advanced Systems Corp., a subsidiary of National Semiconductor. Both men were named to the board of directors.

■

J. Tracy O'Rourke was appointed chief executive officer of Allen-Bradley in addition to his position as the company's president. **C. R. Whitney** will continue to serve as chairman and an officer, but O'Rourke is assuming chief executive officer responsibilities of the Rockwell International Corp. subsidiary.

■

Rexon, Inc. named **Michael O. Preletz** chief executive officer. **Glenn O. Maddalon** was appointed president of Rexon's Wangtek tape drive subsidiary.

■

John A. Lockitt was promoted to president and chief executive officer of Codex Corp. Lockitt formerly served as senior vice-president for Wide Area Network Operations. He succeeds **James W. Storey**, who accepted an assignment reporting to the chief executive officer of Motorola, Inc., Codex's parent company.

■

The Massachusetts Computer Software Council named **Joyce L. Plotkin** to the new position of executive director. Plotkin will be responsible for overall management of the council's activities, including marketing, policy and program development and financial goals.

■

Robert K. Iyobe was appointed president of C. Itoh Electronics, Inc., replacing **Mark M. Takeuchi**, who had held the position since the company was founded in 1973.

■

Scientific Leasing, Inc. replaced its president and chief operating officer, **Leonard S. Cohen**, a founder of the company and president for approximately one year. Cohen, 49, will continue to serve on the board of directors. Succeeding him is **W. Barry Turner**, 35, a director and senior vice-president.

■

Decision Data Computer Corp. appointed **Richard J. Schineller** chairman of the board. Schineller, who joined the company as president in March 1980, bringing prior experience from Management Assistance, Inc., Sorbus, Inc. and IBM, will continue to serve as chief executive officer. He succeeds **Carl W. Sturzberg**, who will remain a director of the company. **Joseph J. Ciasullo** was named president and will continue as chief operating officer.

■

Digital Equipment Corp. promoted three senior managers to vice-presidential positions: **Ilene B. Jacobs**, vice-president, corporate treasurer; **Bruce J. Ryan**, vice-president, corporate controller; and **David L. Stone**, vice-president, international engineering and strategic resources.

NICKELS from page 170

per share, on revenue of $27.2 million. This compares with net income of $1.8 million, or 13 cents per share, on revenue of $27.2 million reported in the previous year.

■

Computer Sciences Corp. announced revenue for the fourth quarter ended March 28 of $236.8 million, compared with $198.8 million in the like period a year ago. Profits were $8.9 million, or 61 cents per share, compared with $7.2 million, or 53 cents per share, one year ago.

For the year, the company's revenue was $838.6 million, up 16% from $72.5 million in the previous year. Profits for the year were $23.9 million, or $1.60 per share, compared with $27.7 million, or $2.02 per share, one year ago.

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VLSI microsensors: The eyes and ears of future computers



OUTSIDE LINES
Bohdan Szuprowicz

Recent breakthroughs in very large-scale integration (VLSI) and semiconductor materials have led to the development of microsensors that many see as the "eyes and ears" of future computers and as having many practical artificial intelligence (AI) applications.

Microsensors are microscopic devices, often developed as part of an integrated circuit microchip, that can provide real-time measurement of changes in their operating environments. These devices exploit the mechanical and electrical properties of silicon microchips "doped" with specific impurities to respond electronically to changes in physical conditions.

They instantaneously measure and transform into digital signals such changing parameters as stress, pressure, temperature, radiation, gas concentration, humidity, vibration, speed, acceleration, light intensity, fluid properties and, more recently, even object shapes using newly developed tactile sensor technologies.

In a typical control system, a microprocessor or computer reacts to input signals that originate in sensors or man-machine interfaces such as a keyboard. Now microsensors can be incorporated into the same microchips containing the electronic circuits of a whole system, thereby greatly reducing the cost and enhancing the operating speeds.

Japanese contribution

Not surprisingly, as a result of their much-touted fifth-generation computer program, the Japanese have been performing extensive sensor research in their quest to devise what they call "the ideal computer." Such a computer includes AI features such as knowledge processing, pattern recognition, learning, inference, self-education, understanding and reasoning capabilities. The Japanese have estimated that such a system would have to have about 100 trillion bits of memory and at least 128-bit word length to accommodate massive streams of data.

Such awesome power seems to be well out of reach of many computer users. Chances are that actual development in the industry will proceed along more specific application lines, where expert systems designed around customized AI microchips with microsensor capabilities will be more than adequate to provide near-ideal solutions.

What is important in either case, however, is the need for sensors that can provide the system with inputs in real-time and permit it to develop expert response and advice faster than a human expert. To operate in a human environment, such systems must include input sensors that can duplicate human senses.

As a result, the Japanese estimate that 60% of sensor inputs for an ideal computer will consist of vision in one form or another, because vision is by far the most useful of human senses.

Voice recognition is the next most important sensor category and is expected to contribute about 20% of sensor inputs to the ideal computer. Voice-activated devices are, in fact, becoming an important element of the information revolution today. Touch is the next category, contributing 15% of sensor inputs, followed by taste accounting for 3% and smell for 2%. All of these estimated contribution percentages closely reflect the importance of human senses.

The small sensors market is already a $1 billion industry, primarily catering to commercial, military and aerospace applications. Microsensors are estimated to account for 25% of that total. If microsensor growth keeps up its current rate of growth, experts say it will become a $1 billion market in its own right as early as the 1990s.

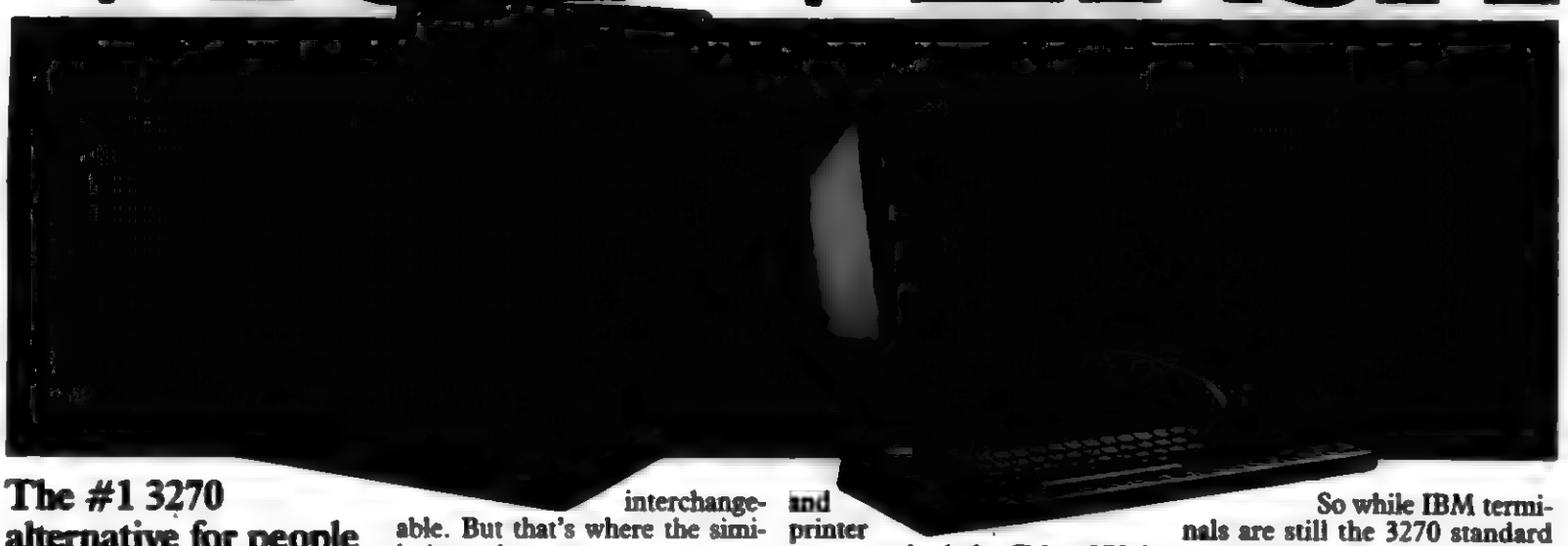
This process may accelerate as availability of expert systems software, powerful new hardware, and customized VLSI microchips combine to create an upsurge in microsensor demand.

Newcomers in the field already compete against some well-established firms like Honeywell, Inc., IBM, Motorola, Inc. and National Semiconductor Corp. as well as the ubiquitous Japanese companies, including Hitachi Ltd., NEC Corp. and Yokogawa Hokushin Electric Corp.

The advent of custom VLSI microchips and AI applications opens up a new era in information processing to innovative specialist firms that know how to package the microsensors into superior products for specific markets.

Szuprowicz is president of 21st Century Research of North Bergen, N.J., and publisher of Supergrowth Technology USA.

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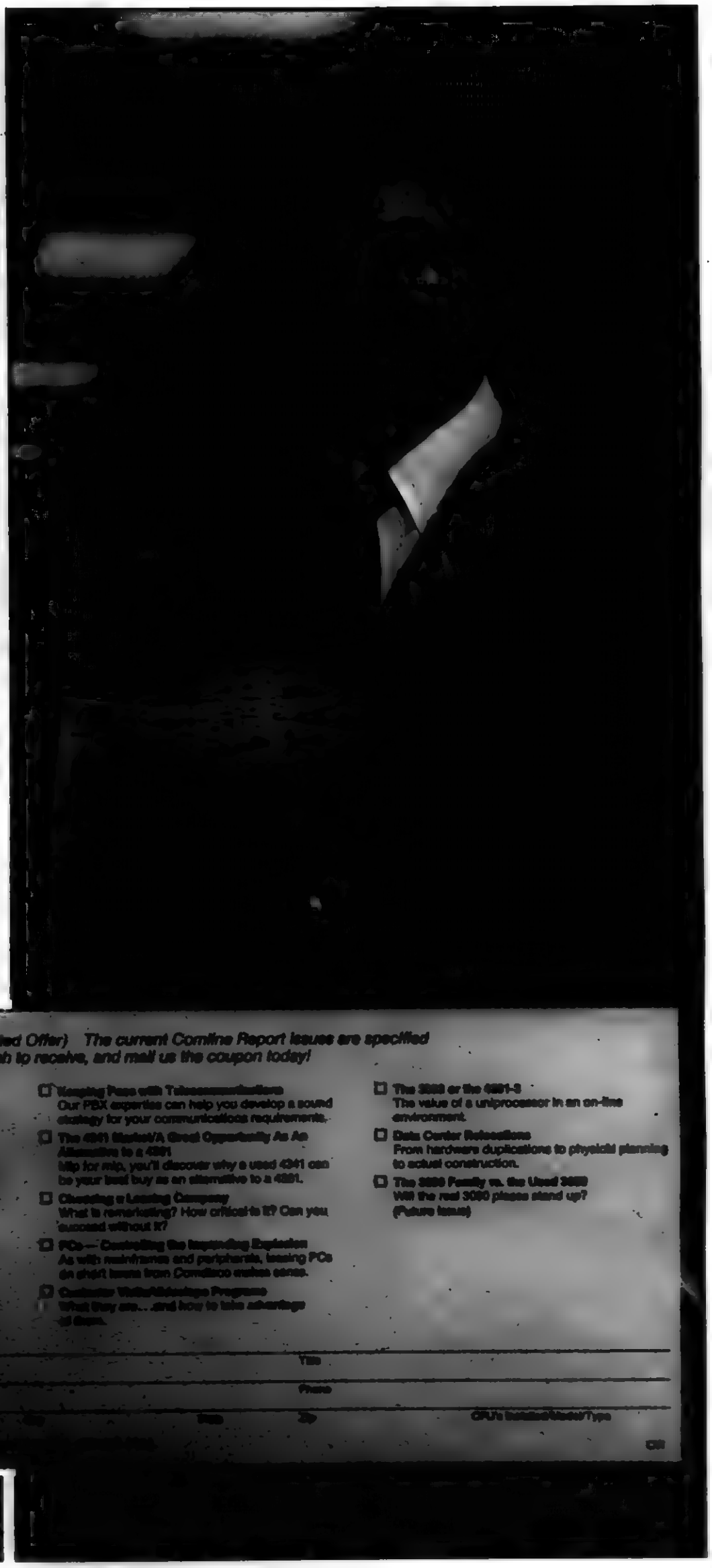
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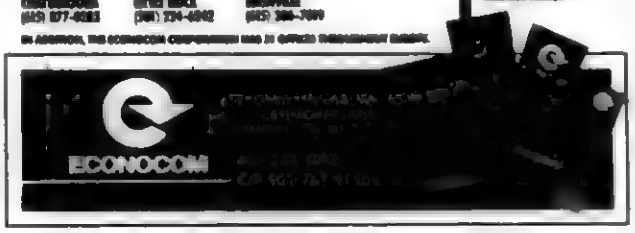
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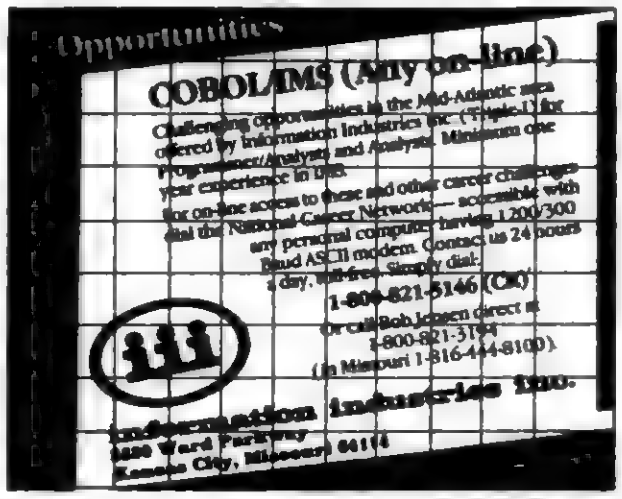
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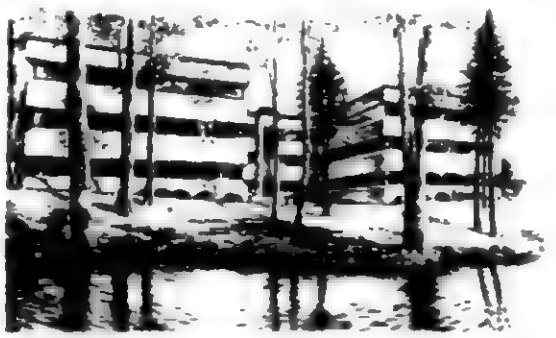
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CDC reassures shareholders

Continues to trim debt with sale of Ticketron

By Stanley Gibson

MINNEAPOLIS — Despite Control Data Corp.'s losses of more than $500 million last year, CDC stockholders were remarkably quiet at last Wednesday's annual meeting. Their silence appeared to give tacit acceptance to the measures taken to reverse CDC's slide and may indicate that, like CDC's management, most shareholders believe that better days lie ahead.

One remedial step, the sale of the firm's Ticketron division, was announced the day before the meeting. CDC signed a definitive agreement for the sale of Ticketron to an investment group led by Allen & Co., a private New York investment banking firm. Though terms were not disclosed, one unsuccesaful bidder reportedly offered $165 million.

In the short term, CDC must repay, by the end of the year, $380 million in bank loans on which it has defaulted or face a stiff penalty. In February, CDC and its creditor banks reached an agreement on repayment terms in which the company's Commercial Credit Co. and Arbitron units were pledged as collateral.

CDC Chairman, President and Chief Executive Officer Robert M. Price said that Commercial Credit, the firm's financial services unit, could be one of the assets sold in the debt refinancing plan.

Some of the proceeds of last week's announced sale of Ticketron will go toward debt repayment, and additional assets will be sold to satisfy the banks. Price said he expects "modestly positive" cash flow for the year but that it will be "nowhere near" sufficient to repay the debt. Some $80 million to $150 million remaining must be repaid, and Price said he was weighing the sale of equity, the acquisition of medium-term debt and the sale of still more assets to fill that gap.

Price sent out the message that his time at the helm will be radically different from founder William C. Norris'. While under Norris, CDC grew by branching in many directions; under Price, many of those branches will be pruned.

"In those areas where we do not have superior market share or do not offer a competitive advantage, we will exit the business," Price said.

Norris was present at the meeting but made no remarks. The founder stepped aside in January 1986 when Price took over the reins of the troubled firm. Norris retains the title of chairman emeritus and will be paid $1.5 million during five years as an independent consultant.

Price said that the company has trimmed its work force from 54,000 employees on Jan. 1, 1985, to a current total of 41,400. Price said he expects the number of employees to be roughly the same by the end of the year.

Datapoint buyout proposal halted

From page 190

million outstanding shares. Datapoint's stock traded at roughly $6.50 per share last week on the New York Stock Exchange.

"We will be announcing our third-quarter results in about two weeks, and we have stated publicly that we anticipate modest profits for that quarter," Gistaro said. "On the basis of that, Edelman has reconsidered his offer."

With a reputation for acquiring troubled companies and liquidating them for their assets, Edelman is currently attempting a similar buyout for the Fruehauf Corp., a Detroit-based trailer manufacturer.

Edelman declined comment on whether that prospect had anything to do with the termination of the Datapoint offer.

Televideo wins $10.4 million in suit

By Maura McEnaney

SAN JOSE, Calif. — Televideo Systems, Inc.'s former Chief Financial Officer Fred Heidenthal has been ordered to pay the terminal manufacturer and its founder, K. Philip Hwang, more than $10.4 million for the misappropriation of company funds that Heidenthal allegedly used in part for gambling in Nevada and Atlantic City.

In a favorable ruling on a civil complaint filed by Televideo in July 1983, U.S. District Court Judge William Ingram also ordered Heidenthal to give up ownership of approximately $3 million in Televideo stock.

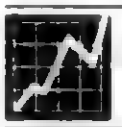
The order is the result of a three-year suit against Heidenthal and two associates over a 1983 scheme that embezzled approximately $3.3 million from both Hwang and Televideo. Damages in the case were tripled in accordance with racketeering charges.

According to Televideo's complaint, Heidenthal, while acting as Televideo's chief financial officer, used approximately $1.2 million in company funds for his own purposes and later convinced Hwang to sell $1.9 million of personal stock to invest in a fictitious entity. Heidenthal used the money to invest in real estate and gamble in Nevada casinos, according to Televideo.

David Van Heosen, an attorney for Heidenthal, said an appeal "was being discussed." Heidenthal is also suing Televideo in attempts to recover pension and profit sharing funds from the firm. That case is pending.

Ingram's order came after Heidenthal admitted to perjuring himself during the legal deposition process, Televideo lawyers said. As a result, the judge denied Heidenthal an opportunity to present his case and entered a default judgment against the defendant.

Software stocks appear ripe for market comeback



ACTIVE ISSUES
Kathy Porteus

After being beaten down to historic lows, companies like Cullinet Software, Inc. (CUL — 13¾) are attracting renewed interest not because of notable fundamental improvements but because of increased investor sentiment that such stocks have been oversold. Micro software companies, such as Lotus Development Corp. (LOTS — 35½), also show budding health.

This activity further benefits systems software stocks like Computer Associates International, Inc. (CASI — 41) and Pansophic Systems, Inc. (PNS — 33½). These firms have fared better than other mainframe software firms partly because systems software products are priced low enough to avoid budget constraints and acquisition procedures. Recently, Computer Associates and Pansophic traded at all-time highs, but some still view these as undervalued stocks.

"If you believe Computer Associates and Pansophic can grow at 30% or better," says W. Christopher Mortenson, analyst with Alex Brown & Sons, "then these stocks are not valued at that much of a premium compared to the rest of the market." Mortenson recommends purchase of both companies.

Rick Sherlund, analyst with Goldman, Sachs & Co., says investors are attracted to Computer Associates and Pansophic because they show effective management, good product flow and continued high rates of growth. "This increases investor comfort levels at a time when many are still nervous about the economy," he says.

Sherlund says Pansophic, which focuses on program-library control systems, retrieval systems and applications development tools, is expanding into other information center tools, such as a query language that is compatible with IBM's DB2 data base management system. Analysts estimate Pansophic will earn $1.70 a share in the fiscal year ended April 30 and $2.05 to $2.10 a share in fiscal 1987.

Timothy McCullom, technology analyst with Dean Witter Reynolds, Inc., says Computer Associates benefits from strong sales in its systems software and international businesses. About 30% of its revenue comes from applications, data base and micro software product areas that analysts say are only breaking even.

"But Computer Associates is very good in controlling costs when it sees some business slowing down," says McCullom, who expects a "pickup this year in their applications and micro software products." McCullom estimates the company will report 1986 earnings per share of $1.65 to $1.75 and will earn $2.10 a share in the current fiscal year ending March 31, 1987.

Should investors jump on the systems software bandwagon?

Alex Brown's Mortenson says he thinks these stocks will continue to do well because of good market conditions and steady demand for utility software. "But because these stocks haven't hurt as much in the downturn, they won't benefit as much from an upturn," he says.

According to Stephen McClellan, vice-president with Merrill Lynch, Pierce, Fenner and Smith, Inc., the investment outlook for the whole software group is gradually improving. Some investors buy Computer Associates because it is viewed as a leader of the group, McClellan says.

"But you can probably make more money with software stocks that have disappointed so when the business outlook improves, there will be a more dramatic change in valuation," he says. For these reasons, McClellan recommended purchase of Cullinet when it recently traded at 11⅛.

Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

INDUSTRY NOTES

IBM signs OEM pact with Hogan

IBM and **Hogan Systems, Inc.** finalized a long-term OEM agreement whereby IBM will exclusively market, support and service Hogan banking software in the U.S. and Canada. The deal represents IBM's most aggressive move to date in marketing mainframe software from an independent applications vendor and will provide the bulk of Hogan's revenue in the current fiscal year. Current Hogan users will continue to receive service and support from Hogan as they make the transition to the IBM versions of Hogan applications, a spokesman said.

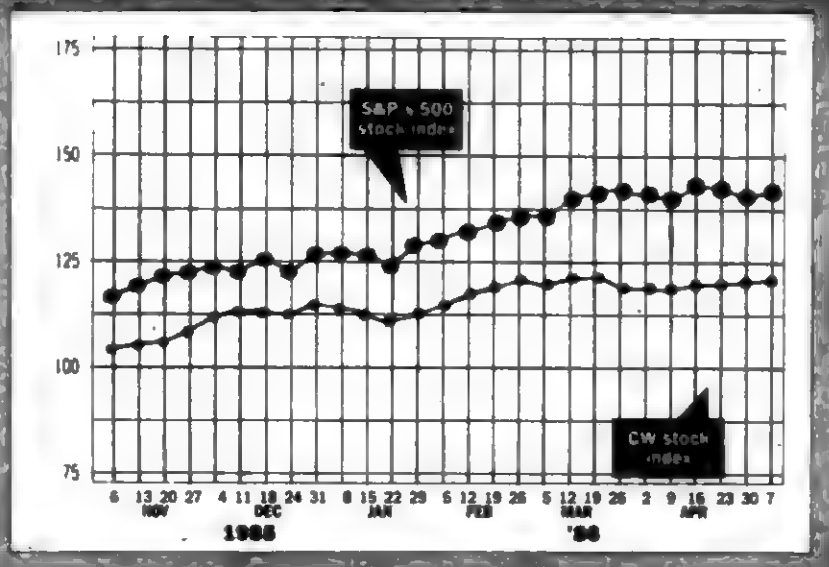
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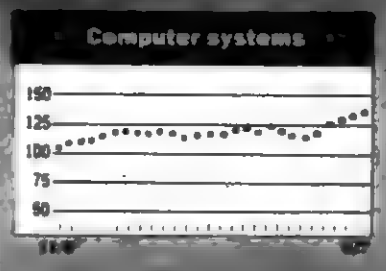
Wyse Technology, Inc. named Phillip White president and chief operating officer, replacing Bernard Tse, who was elected chairman of the board. White is a former senior vice-president of sales and marketing at **Altos Computer Systems, Inc.**, which recently sold off its 26% ownership share in the San Jose, Calif., terminal manufacturer.

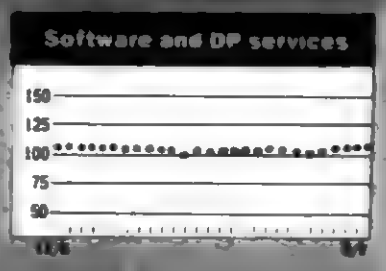
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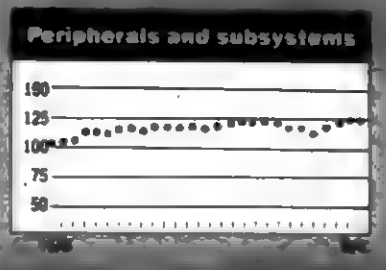
MITCHELL J. HAYES

Computerworld stock trading index

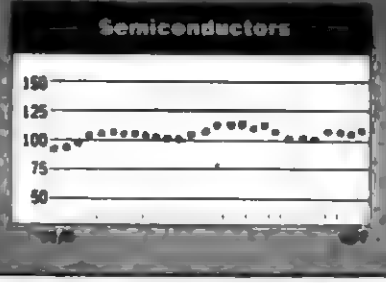


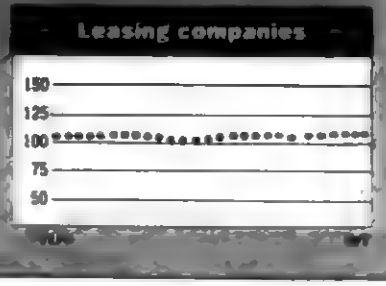












All indexes contain a weighted sum base of 100 on Dec. 31, 1981, and base stock market performance in relation to that base. The CW stock index tracks the aggregated average performance of the 75 publicly held companies in the CW 100 list of computer industry stocks.

	4/30/86	5/7/86
Computer systems	128.7	131.0
Software and DP services	105.8	106.2
Peripherals and subsystems	122.2	123.0
Supplies and accessories	156.3	154.2
Semiconductors	110.5	111.9
Leasing companies	105.0	106.6
CW stock index	121.1	121.9
Standard and Poor's 500 stock index	140.8	141.2

Computerworld stock trading summary

CLOSING PRICES WEDNESDAY, MAY 7, 1986

COMPUTER SYSTEMS

EXCH		52-WEEK RANGE (1)		CLOSE MAY 7 1986	WEEK NET CHNGE	WEEK PCT CHNGE
O	ALPHA MICROSYSTEMS	5-	9	6 5/8	+3/8	+6.0
O	ALTOS COMPUTER SYST	5-	19	17 7/8	-1 3/8	-7.1
A	AMDAHL CORP	10-	18	16	0	0.0
O	APOLLO COMPUTER	9-	31	16 1/4	+1 1/2	+3.1
O	APPLE COMPUTER INC	14-	32	31 1/2	+1 1/4	+4.1
N	AT&T	19-	28	25	+1/4	+1.0
N	BURROUGHS CORP	52-	71	62 7/8	+1 7/8	+3.0
O	COMPAQ COMPUTER CP	5-	18	17 1/2	+3/4	+4.4
O	COMPUTER AUTOMATION	1	9	2 1/4	+1/8	+5.8
A	COMPUTER CONSOLES	5-	14	11 1/8	+1/2	+4.7
N	CONTROL DATA CORP	15-	39	23 7/8	+1	+4.3
O	CONVERGENT TECHNOL	5-	13	9 1/2	-1/4	-2.5
O	CPT CORP	5-	8	4 1/2	0	0.0
N	CRAY RESEARCH INC	25-	82	82	+3 1/8	+3.9
O	DAISY SYSTEMS CORP	11-	38	13	1/2	3.7
N	DATA GENERAL CORP	31	76	40	5/8	-3.9
N	DATAPOINT CORP	5	22	6	1/2	+1 1/4	+23.8
N	DIGITAL EQUIPMENT	85-	181	173	7/8	-2 5/8	-1.4
A	EECO INC	13-	16	15	1/4	+1/4	+1.6
N	ELECTRONIC ASSOC.	3-	7	5	7/8	0	0.0
N	FLOATING POINT SYST	18-	42	38	3/4	-3 1/2	-8.2
N	FOXBORO	22	31	30	3/4	+3 1/2	+12.8
N	GOULD INC	20-	38	26	3/4	+1	+3.8
N	HARRIS CORP	22-	35	32	1/2	+1/4	+0.7
N	HEWLETT-PACKARD CO	29-	45	45	1/8	-1/8	-0.2
N	HONEYWELL INC	54-	87	78		+2 7/8	+3.8
N	IBM	117-	158	151	1/4	-5	-3.1
O	IPL SYSTEMS INC	1-	4	2	3/8	1/8	-5.0
N	ITT CORP	28-	48	47	1/2	+3/8	+0.7
N	M/A-COM INC	13-	24	16	1/4	-5/8	-3.7
N	MANAGEMENT ASSIST	2-	28	2	3/8	+1/8	+5.5
N	MATSUSHITA ELEC(ADR)	49-	98	92	3/8	-6	-6.0
O	MENTOR GRAPHICS	13-	30	18	3/4	+1 1/4	+7.1
N	MODULAR COMPUTER SYS	6-	9	8	7/8	0	0.0
N	MOHAWK DATA SCI	1-	13	3	3/8	+1/4	+8.0
N	NBI INC	11-	20	12	1/4	+1/8	+1.0
N	NCR	25-	52	52		+1 7/8	+3.7
N	PERKIN-ELMER	22-	36	33	1/4	+1 1/8	+3.5
N	PRIME COMPUTER INC	15-	27	21	1/4	-3/8	-1.7
N	SPERRY CORP	38-	70	70	3/8	+15 3/8	+27.9
O	STRATUS COMPUTER INC	9-	25	22	3/4	+1/2	+2.2
O	TANDEM COMPUTERS INC	13-	32	31	7/8	+7/8	+2.8
N	TANDY CORP	24-	44	38		+1/2	+1.2
O	TELEVIDEO SYSTEMS	2-	4	3	3/4	-1/8	-3.2
O	TELXON CORP	10-	32	32	1/4	+1 3/4	+5.7
N	TEXAS INSTRUMENTS	86-	141	136	3/4	-2 1/4	-1.6
A	ULTIMATE CORP	8-	32	30	3/4	-1/8	-0.4
O	VECTOR GRAPHICS INC	1-	1		1/8	0	0.0
A	WANG LABS "B"	15-	29	17	5/8	-1 1/2	-7.8
A	WANG LABS "C"	15-	29	17	3/4	-1/4	-1.3
N	XEROX CORP	37-	72	59	5/8	-3/8	-0.6

SUPPLIES & ACCESSORIES

N	AMERICAN BUS PRODS	21-	36	35	1/4	-1 1/8	-3.0
N	BARRY WRIGHT	17-	29	23	1/2	+1/4	+1.0
A	DUPLEX PRODUCTS INC	13-	22	21	1/4	-1/4	-1.1
N	ENNIS BUS. FORMS	14-	28	23	1/4	0	0.0
N	3M COMPANY	74-	107	101	1/4	-3 1/2	-3.3
N	MOORE CORP LTD	15-	27	25	1/2	-1	-3.7
O	STANDARD REGISTER	22-	46	41	1/4	-1/2	-1.1
N	WALLACE COMP SERVICE	30-	48	47	5/8	+1/4	+0.6

SOFTWARE & DP SERVICES

EXCH		52-WEEK RANGE (1)		CLOSE MAY 7 1986	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	2-	6	5 1/2	+3/8	+7.3
N	ADVANCED SYSTEMS INC	9-	20	16 1/2	1 1/8	-6.3
N	AGS COMPUTERS INC	10	25	20 1/2	1 3/4	7.8
O	AMERICAN SOFTWARE	9-	15	12 3/8	+1 5/8	+15.1
N	ANACOMP INC	2	6	5 5/8	-1/4	-4.2
O	ANALYSTS INTL CORP	5-	11	6 3/4	0	0.0
O	ASHTON TATE	6-	28	28 1/8	+1 5/8	+6.1
O	ASK COMPUTER SYSTEMS	7	25	12 1/4	1 1/4	-9.2
B	ASTRADYNE COMP IND	1-	3	1 3/4	0	0.0
N	AUTOMATIC DATA PROC	35-	71	70 1/2	+2 1/2	+3.6
O	COMPUTER NETWORK	5-	9	8	+1/2	+6.6
O	COMPUTER ASSOC INT'L	18-	42	41 3/4	1/4	-0.5
O	COMPUTER HORIZONS	5-	11	13 3/8	+3/8	+2.8
N	COMPUTER SCIENCES	13-	36	34 1/4	-3/4	-2.1
O	COMPUTER TASK GROUP	10-	28	26 1/2	-1 1/2	-5.3
O	COMPUTER USAGE	1-	3	2 3/4	+1/4	+10.0
O	COMPUTONE SYSTEMS	3-	11	5 1/4	+1/8	+2.4
O	COMSERV CORP	1-	6	3 1/2	-3/8	-9.6
O	COMSHARE	7	12	10 5/8	1/8	1.1
N	CULLINET SOFTWARE	12-	33	14 1/8	+1/8	+0.8
O	CYCARE SYSTEMS INC	13-	27	13 3/8	1/8	-0.9
O	HOGAN SYSTEM INC	4	12	10 3/4	+1/2	+4.8
N	GENERAL ELECTRIC CO	56-	79	77 1/4	-7/8	-1.1
N	GENL MOTORS E (EDS)	20-	48	47 5/8	+1/8	+0.2
N	GTE CORP	38-	54	50 1/8	-1/2	-0.9
O	INFORMATION SCIENCE	1-	5	3 1/8	0	0.0
O	INFOTRON SYSTEMS CP	13-	24	15 1/2	0	0.0
O	KEANE ASSOCIATES	10-	20	14 1/2	-1	-6.4
N	LOGICON	25-	43	35 1/4	-1/2	1.3
O	LOTUS DEVELOPMENT CP	15-	36	35	1/2	1.4
O	MCI COMMUNICATIONS	7	13	10 1/8	0	0.0
O	MINGT SCI AMER INC	7-	16	14	+1/8	+0.9
O	MATHEMATICAL APP GRP	1-	6	5/8	-1/4	-28.5
O	MICOM SYSTEMS INC	12-	35	16 1/4	-3/4	-4.4
O	MICRORRO INT'L CP	2-	4	2 1/2	3/4	-24.5
O	NATIONAL DATA CORP	8-	24	23 3/8	+1/2	+2.1
O	ON-LINE SOFTWARE INT	4-	16	15 3/4	+2	+14.5
N	PANSOPHIC SYSTEMS	14-	34	34	+5/8	+2.9
N	PLANNING RESEARCH	11	23	21 7/8	+5/8	+2.9
O	POLICY MGMT SYSTS CP	16-	35	20 3/4	+2 1/4	+12.1
O	PROGRAMMING & SYS	4-	10	8 3/4	0	0.0
O	REYNOLDS & REYNOLD	30-	66	30	-1/4	-0.8
O	SEI CORP	13-	27	23 1/2	-1	-4.0
O	SHARED MEDICAL SYST	28-	38	37 1/8	0	0.0
O	SCIENTIFIC COMPUTERS	4-	8	4 5/8	0	0.0
O	SOFTWARE AG	12-	22	18	+1 1/8	+6.6
N	URS CORP	10-	18	16 1/8	-3/4	-4.4
N	UCCEL	11-	20	19 7/8	-1/4	-1.2
O	VM SOFTWARE	17-	28	25 1/2	+1/4	+0.9

SEMICONDUCTORS

N	ADVANCED MICRO DEV	22	-3	6 2	8	-3/8	-1
3							
O	ADV'D SEMICONDUCTOR	7-	23	12	3/4	-1/4	-1.9
N	ANALOG DEVICES INC	14-	24	24		+1/4	+1.0
O	ANALOGIC CORP	11-	16	14	1/4	+1 3/4	+14.0
N	APPLIED MAGNETICS CP	9-	19	19		-1/4	-1.2
O	AMANTEK	18-	26	20	1/4	-1 1/2	-6.8
O	MACCO CORP	3-	7	5	1/4	+1/2	+10.5
O	SITEL CORP	21-	33	28	1/2	0	0.0
O	MICRO MASK INC	9-	12	5	7/8	0	0.0
N	MOTOROLA INC	29-	48	46	1/8	-1 1/4	-2.6
N	NAT'L SEMICONDUCTOR	10-	15	14	3/8	0	0.0
N	TERADYNE	17-	33	28	1/2	+1 1/8	+4.1

PERIPHERALS & SUBSYSTEMS

EXCH		52 WEEK RANGE (1)		CLOSE MAY 7 1986	WEEK NET CHNGE	WEEK PCT CHNGE
P	AM INTERNATIONAL	3	8	7 7/8	+1/8	+1.6
A	ANDERSON JACOBSON	2	5	2 1/4	+1/8	+5.8
O	AST RESEARCH INC	7	33	20 1/2	+1/2	-2.5
O	AUTO-TROL TECHNOLOGY	3	13	5 1/2	+1/4	+4.7
O	AVANT GARDE COMPUTNG	3	21	4 3/8	+1/8	+2.9
O	BANCTEC INC	6	12	11 7/8	+3/4	+6.7
O	BEEHIVE INT'L	1	2	1/8	0	0.0
N	BOLT BERANEK & NEW	20	43	42 7/8	+3/4	+1.7
O	CAMBEX CORP	1	3	1 1/2	+1/4	+20.0
N	CENTRONICS DATA COMP	3	11	5 1/2	+1/8	+2.3
A	CETEC CORP	6	9	7 7/8	1/4	3.0
A	COGNITRONICS	4	7	5	1/8	2.4
N	COMPUGRAPHIC CORP	23	36	23 1/2	+3/8	-1.6
O	COMPUTER TRANSCEIVER	0	1	7/8	1/16	-6.2
N	COMPUTERVISION CORP	9	44	17 7/8	+1 1/2	+9.1
N	CONRAC CORP	12	18	16 7/8	5/8	3.5
A	DATAPRODUCTS CORP	11	20	16	+5/8	+4.0
A	DATARAM CORP	4	16	16 1/8	+1	+6.6
O	DATA SWITCH CORP	4	9	7 1/4	-1/4	3.3
O	DATUM INC	5	9	7 1/8	-3/4	-11.7
O	DECISION DATA COMPUT	10	20	11 7/8	1/4	2.0
O	ENDATA INC	2	8	6 1/2	1/8	1.8
O	EVANS & SUTHERLAND	12	27	26 3/8	0	0.0
O	GANDALF TECHNOLOGIES	5	13	6 1/4	1/4	3.8
N	GEN'L DATA COMM IND	8	21	13	+1 1/8	+9.4
N	HAZELTINE CORP	18	30	18	1/8	0.6
O	ICOT CORP	3	12	12 3/8	0	0.0
O	INFORMATION INTL INC	10	17	15	+1 1/4	+9.0
O	INTECOM INC	3	11	3 7/8	1/4	-6.0
O	MEGADATA CORP	3	8	2 7/8	1/8	5.9
A	MSI DATA CORP	7	13	12 3/4	+1/8	+0.9
N	NASHUA CORP	24-	52	50 5/8	1/8	-0.2
O	NETWORK SYSTEMS CORP	11	27	14 5/8	+3/4	+5.4
N	NO AMERICAN PHILIPS	32	47	44	1	2.2
N	NORTHERN TELECOM LTD	26-	41	30 1/4	0	0.0
O	OMEX	1	3	1/4	1/8	33.3
N	PARADYNE CORP	6	18	9 1/4	+3/4	+8.8
A	PENRIL CORP	7	14	7 1/4	3/8	-4.9
N	PLESSEY CO (ADR)	19-	38	34	-3 1/2	9.3
O	PRINTRONIX INC	9	18	13 1/8	1/4	1.8
O	QMS INC	6	16	12 3/8	+1/8	+1.0
N	RAMTEK CORP	2	7	4 5/8	+3/8	+8.8
N	RECOGNITION EQUIP	9	17	14	+1/4	+1.8
N	SANDERS ASSOCIATES	30	44	32	+1/2	+1.5
O	SCAN TRON CORP	9	22	18 1/4	1/2	-2.6
N	SCIENTIFIC ATLANTA	10	15	11 3/8	+3/8	+3.4
O	SEAGATE TECHNOLOGY	5	13	12 3/4	+3/4	+6.2
N	STORAGE TECHNOLOGY	1	5	4	0	0.0
O	SYKES DATATRONICS	0	2	3/8	0	0.0
A	T BAR INC	5	9	8 1/8	-1/8	2.0
A	TAB PRODUCTS CO	14	23	21 1/8	+1/8	+0.5
O	TANDON CORP	3	9	8 5/8	+3/4	+12.7
A	TEC INC	6	13	5 5/8	3/8	-6.2
N	TEKTRONIX INC	47	88	59 3/4	+1 1/4	+2.1
N	TELEX	34	88	63	+2	+3.2
O	TESDATA SYSTEMS CP	0	3	5/8	0	0.0
N	TIMEPLEX INC	15	23	17 1/8	+1/4	+1.4
N	TITAN CORP	4	11	10 1/8	3/8	3.5
O	VISUAL TECHNOLOGY	1	3	5/8	0	0.0

LEASING COMPANIES

N	COMDISCO INC	7	24	23 3/8	+1 1/8	+5.0
N	CONTINENTAL INFO SYS	5	21	21	+3/8	+1.8
O	FINALCO GROUP INC	4	5	4	1/8	3.0
O	PHOENIX AMERICAN INC	2	8	4 5/8	1/4	-5.1
O	SELECTERM INC	6	12	11	+3 1/2	+46.6
N	U.S. LEASING	32	46	41 3/4	1 1/4	-2.9

EXCH: N=NEW YORK; A=AMERICAN; P=PACIFIC; B=BOSTON; I=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER; S=SPLIT

O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Source: Trade Quotes, Inc.

COMPUTER INDUSTRY

INSIDE

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IBM will sell Hogan Systems banking software in a landmark OEM agreement/**188**

INSTANT ANALYSIS

"It has been said that prosperity is a great teacher and that adversity is an even greater teacher. As far as Control Data is concerned, I can vouch for that."

— Robert M. Price, chairman, president and CEO, Control Data Corp.

Akers, Olson: Industry's heirs apparent



Loyal IBM, AT&T executives' climbs end at the top of the corporate ladder

By Alan Alper

As retirement creeps up on AT&T Chairman Charles Brown and IBM Chairman John Opel and new leadership is poised to take the computer and communications behemoths into the next decade, it is clear that each man has selected a successor cut from his firm's corporate cloth.

Both successors, IBM President and Chief Executive Officer John F. Akers and AT&T President and Chief Operating Officer James E. Olson, will inherit the reins of the only corporations for which they have ever worked. Akers, 51, will become IBM chairman June 1; Olson, 60, although not yet officially named by AT&T, is unanimously considered by observers to be the successor when Brown retires in August.

Both men began at the entry level — Olson in 1943 as a splicer's assistant at Northwestern Bell, Akers in 1960 as a sales trainee in IBM's San Francisco office. Both have climbed the corporate ladder rung by rung to reach the top.

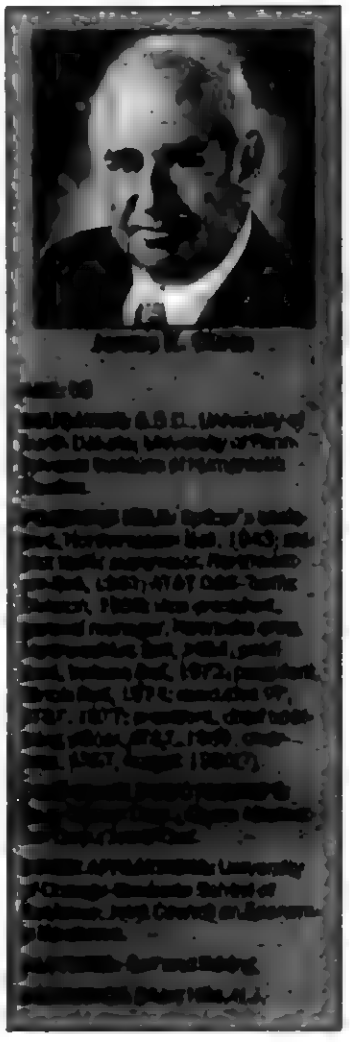
Akers has followed the typical IBM chairman's progression through the sales and marketing ranks, gaining experience in managing a variety of IBM businesses before arriving in the corporate suite. Olson also covered the traditional bases throughout the Bell system, taking the helm of a number of telephone companies before becoming AT&T president and chief operating officer last June.

Few IBM watchers expect dramatic changes to unfold as Akers assumes the chairmanship from Opel, despite the firm's current financial malaise. "Things at IBM are done on more of an evolutionary basis," says ex-Businessland, Inc. President Ronald Watkins, a former IBM executive who worked closely with Akers at several levels.

However, when Olson is chosen by AT&T's board, observers expect massive changes to ensue — and fast. Yet because of his age and AT&T's mandatory retirement age of 65, some analysts view Olson as an interim leader, one who will make AT&T a leaner corporation before making way for a more marketing-oriented chairman.

"Olson will streamline the organization, and then someone from the second tier of the orga-

See **INDUSTRY** page 164



Datapoint's expected return to black halts buyout proposal

By James A. Martin

SAN ANTONIO — The investment group led by New York financier Asher B. Edelman last week terminated its leveraged-buyout proposal for Datapoint Corp. as a result of that company's anticipated return to profitability, Edelman said.

"While the terms of the buyout were found to be fair at the time they were proposed, and although the investment bankers to the buyout group have advised me of their ability to raise the financing for the transaction, recent improvements in Datapoint's results and prospects have caused me to conclude that the proposal should be terminated," Edelman said in a prepared statement.

Edelman will remain chairman of Datapoint, with no changes expected as a result of the buyout termination, President and Chief Executive Officer Edward P. Gistaro said. "The only thing it changes is to remove the uncertainty about whether the company will be private or remain public," Gistaro told *Computerworld*.

Datapoint's customers are most likely pleased to see the company remain public, since public companies are required to provide detailed financial and corporate information, speculated William C. Rosser, a vice-president of the Gartner Group, Inc. in Stamford, Conn.

"If that's the end of the story, then Datapoint can get back to doing what they should be doing and will be less distracted by all that grief," Rosser said.

Edelman became chairman of Datapoint last year after his successful hostile takeover of the computer firm. In September 1985 Edelman's investment group made its leveraged-buyout offer of $6 a share for 17

See **DATAPOINT** page 188

Microcomputer exhibits at Comdex betray signs of middle-age blahs

INDUSTRY INSIGHT
Clinton Wilder

Keynote speaker Robert Dilworth of Zenith Data Systems spoke of succeeding by selling personal computers like commodity TV sets; the consensus prediction was that only firms with significant corporate "muscle" will prosper; and at booth after Comdex booth, the tune was "not much excitement — strictly business."

Welcome to the microcomputer industry, circa spring 1986.

"Micro software is in a holding pattern," Craig Stinson of the Seybold Group, Inc. declared after surveying the first 1½ days of the recent Comdex/Spring '86 extravaganza in Atlanta.

"All the new products are basically accessory — products that make other products run better. Major applications are showing all the signs of a shakeout in a mature industry," he added.

Though you would not know it from reading a curious piece of fiction known as *The Interface Group's Comdex Show Daily*, the micro software, hardware and peripherals industries are growing up. That's no secret, and it was certainly evident well before last month's annual spring pilgrimage to the sunny skies of Georgia.

But that maturity, as inevitable as it might have been, brought a certain blandness to Comdex/Spring that would have been unthinkable at the industry's trade showcases a very short time ago.

Instead of extolling the merits of the latest breakthrough in presentation graphics or microprocessing power, Comdex panelists fought over cutthroat "mail order" pricing of commodity spreadsheet packages and IBM Personal Computer AT clones. Comdex has been known as the show where hype and hot products reign supreme. But in Atlanta, notwithstanding Televideo Systems, Inc.'s live Bengal tiger, it

See **MICRO** page 166

Wilder is Computerworld's *senior editor, computer industry.*

So it's your job to find that one factory management system that will satisfy everyone in the company.



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COMPUTERWORLD

FOCUS

OA: STILL A CLOUDED ISSUE

DEPARTMENTAL COMPUTING

MARKET ANALYSIS

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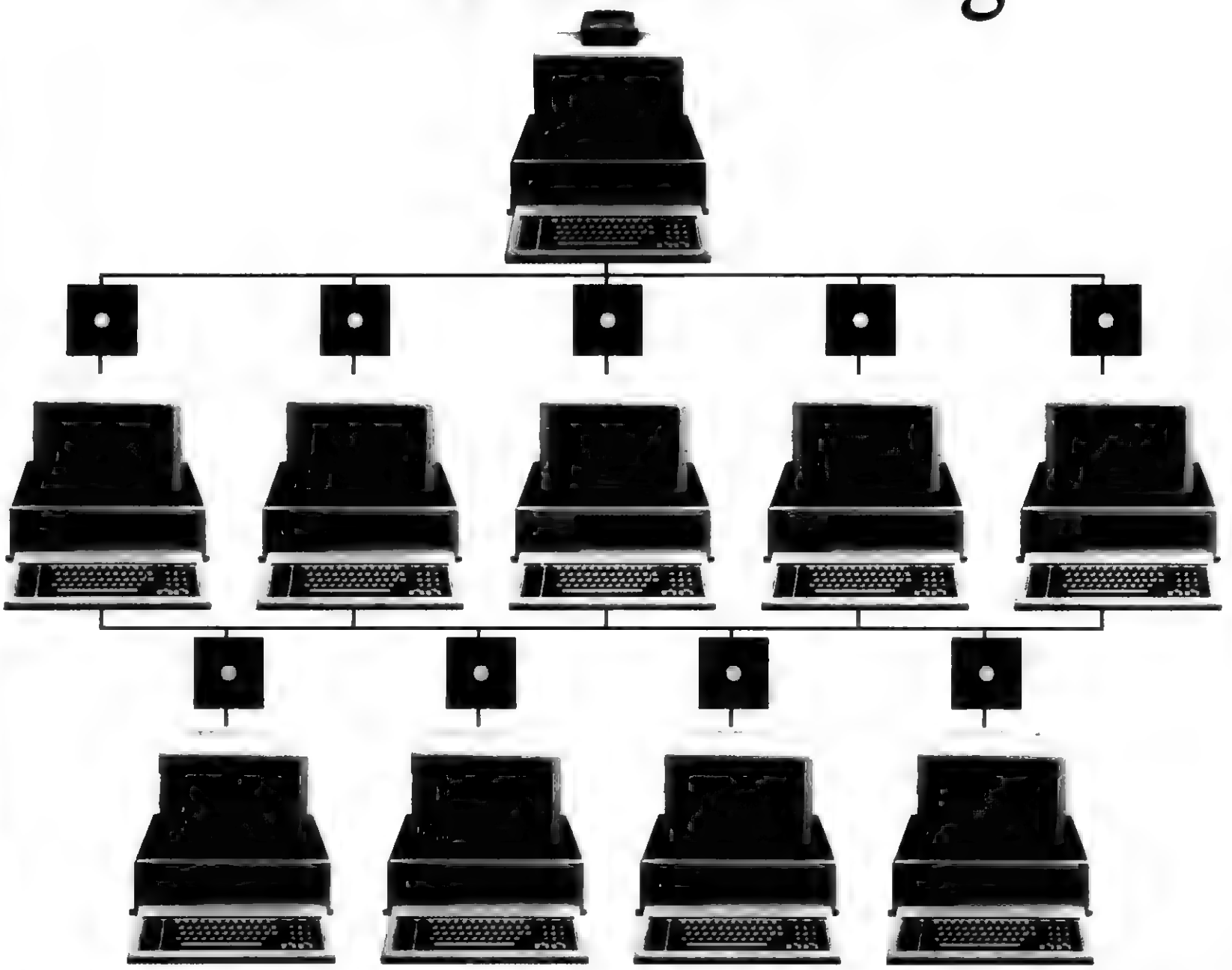
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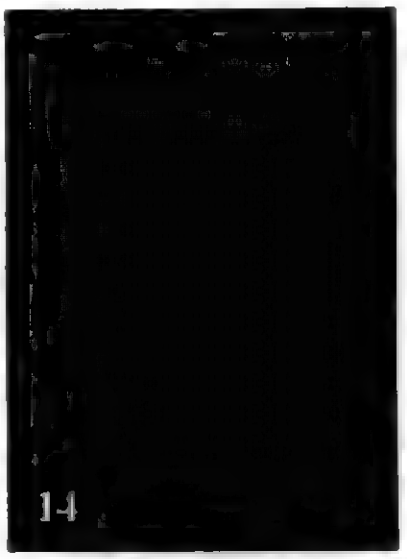
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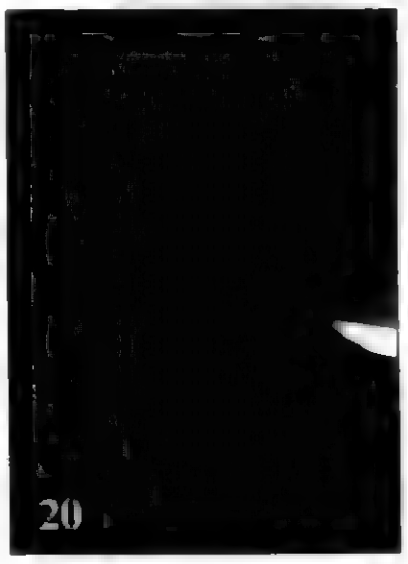
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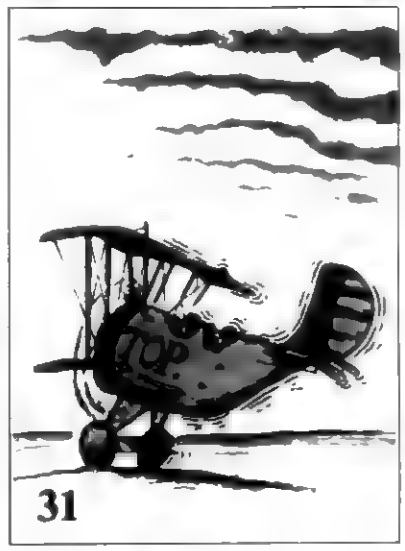
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VIEWPOINT

EDITORIAL

By Any Other Name

We have become victims of the instant gratification syndrome. If it doesn't happen immediately, we lose interest and consider it a failure.

Five years ago, office automation was the hottest technology around. Everyone was talking about OA, but few if any companies were doing anything beyond the very initial steps of word processing. Today, few people want to talk about it, but almost everyone is doing something and is impatient to expand the number and types of applications as well as the user population.

The term itself, "office automation," is what has fallen out of favor. Everyone has his own definition of office automation, and almost no one seems to be willing to admit that what he is doing is, in fact, under this umbrella term. The concept has become at best confused and misunderstood and at worst a real detriment to the introduction of applications and technology to the workplace. "Office systems" and "information systems" are common cover-up terms for office automation. The term "end-user computing" is often substituted for what used to be under the nomenclature of OA.

But just because the term office automation may be on the way out, don't be fooled into thinking that the technology is. The focus has changed from conceptual, overall terminology to specific applications. These applications have become centered on departments or work groups, and the demand for them is continuing and escalating.

Conferences, too, are reflecting this trend of moving from the general to the specific. These meetings are becoming smaller and more topical — relating to one technology such as artificial intelligence rather than to a generalized slate of topics. Even the 7-year-old Office Automation Conference sponsored by the American Federation of Information Processing Societies, Inc. has called it quits due to, for the most part, a lack of interest by both vendors and attendees.

Organizations are stepping back to determine how the landslide of products they have purchased in the last few years are being used. Many are finding the equipment (mostly personal computers) is being underutilized, and top management wants to find out the reasons for this before any more purchases are made. While valid reasons may exist, such as lack of new and more innovative software and the very real and continuing problem of incompatibility, this doesn't mean that these applications will not grow and expand.

As by-products of the age of television, we keep flicking the remote control device to catch the show on the next station. We can also switch from one term to another, but in the end we need to realize that no matter what we call it, we are still talking about the same set of applications and technologies.

Jim Porter

Hitting The Books



MANAGER'S CORNER

By Jim Young

I was recently involved in putting on a computer conference that offered a wide assortment of quality seminars, laboratories and demonstrations. There were interesting vendors and a format that encouraged exchange and interaction. There was only one small problem. Despite extensive promotion, few people attended.

I was astonished. Only a few years ago, keeping up with one's profession was an industry obsession. Trade shows were packed with people hungry to keep pace with technological advancement. No one wanted to commit professional suicide by becoming technically obsolete.

Today I see fewer seminar opportunities. Trade shows report disappointing turnouts, and professional societies are affected by the same malaise. The trend in professional education is clearly downward and shows no signs of resuscitation.

As a data processing professional, I am worried. If we are to continue to call ourselves a profession, we have to remain knowledgeable about the state of technology and how it can assist our organizations. We have to know how to manage and deploy the company DP resource. If our companies entrust us to keep up our skills and knowledge in these areas, why aren't we doing it? Is it that this well-defined, exclusive role is disappearing and new technology is making our skills disbursed and generic? Is this what is indirectly suppressing our drive for professional education?

Because this trend constitutes such a fundamental danger sign, I asked many DP managers what was happening and discovered the following series of excuses that need rebuttal:

• "We can't afford the time." Although the DP staff is typically harried these days, education is not recreation but an investment for the future. Not taking the time is tantamount to "eating the seed corn."

• "We can't afford the costs." The economy is too convenient an alibi. Remember, without developmental training you face the unavoidable costs of turnover, on-the-job training, cost of errors and, certainly, the high cost of lost opportunities.

• "We have in-house education." This usually means in-house training. If this is all you have, then you hazard the possibility of becoming inbred. Every environment needs some way to infuse new ideas, examine alternatives and evaluate solutions for the future.

• "We hire people already trained." Soldiers of fortune have fickle loyalties and a limited useful life. Interestingly, professionals usually migrate to environments where they can learn. If you do not provide that opportunity, your most valuable employees will be those most recently hired. By thus inviting your senior people to leave, you are giving your department the appearance of a revolving door.

• "Training is no longer necessary." I have talked to managers who say technology today is stable with little new to learn. They must also believe the earth is flat and babies are delivered by storks.

• "Educational offerings today are no good." Formal classroom techniques must give way to observation, questioning, gleaning kernels of knowledge from mountains of chaff. If you expect predigested encapsulations, you will always be disappointed.

• "My company won't let me." This is a seemingly unchallengeable obstacle. Hard times mean hard measures that DP as part of the management team must support. However, all too often we fail to lobby for the importance of education. It is our responsibility to apprise management of the risk of deferring professional education and convince it not to look at education as an expense but as a valuable and wise investment.

Much has happened in our profession: crises in confidence, dilution of responsibilities, spending restrictions and stagnation in job mobility. The temptation is to react by timidly entrenching in a turtle-like fashion. But professional paralysis is neither smart nor responsible. To serve our companies better and continue to be personally sharp, we must be aggressive about our need for education and aggressive about obtaining it. I ask you to analyze the status of your education program and not to let excuses get in the way of this challenge.

Young is principal and the director of consulting for Arthur Young & Co., Worcester, Mass. He has worked in the industry for 15 years.



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VIEWPOINT

MIS Continues Rise Through Corporate Ranks



Q&A
Leon Jackson

Leon Jackson is a unit manager and heads the Office Information Practice at Arthur D. Little, Inc., a consulting and market research company located in Cambridge, Mass. Jackson has helped complete a new survey of Fortune 300 MIS managers dealing with integrated office systems. Jackson shared some of these findings with Computerworld Focus.

What do you think is one of the most important findings from the survey?

One of the most important developments we've noticed is the percentage of managers in office systems, telecommunications and MIS who are now reporting directly to the same high-level MIS executive. Fully 81% of the companies surveyed had these managers reporting to the same executive, up from 78% last year in a similar report. Breaking down industry categories, 86% of manufacturing companies surveyed had this arrangement, compared with only 60% of utility companies, mainly, I think, because utilities retain a more conservative or structured arrangement with their information resources. In between were the financial services companies, 77% of which reported to the same executive.

How does MIS fit into these findings?

That's interesting. Of all the companies surveyed, 58% said the executive to whom all these divisions report is from MIS. In 60% of the cases, the companies simply took the office systems and telecommunications functions and moved them under MIS. They didn't change MIS, and they didn't change the organization, but they changed the reporting structure. I think this strengthens the theory that MIS is becoming more involved in office decisions, and it's changing the way office systems vendors approach their marketing. Products that emphasize compatibility with mainframes and are backed by a major vendor will have more weight now in offices and with MIS than a few years ago.

Is the increased set of responsibilities going to put a strain on MIS?

In most cases they will still be retaining an office automation person who will be responsible for office systems and who now reports to MIS instead of someone in the administration department. MIS will have to delegate more responsibility, however.

What else have you found about MIS from the survey?

There is one other major change occurring with MIS. More companies are creating positions under the general title of chief information officer, and these people are in charge of overall corporate information strategies. To date, these positions came with a common philosophy that said that the person who runs all the corporate information management should be more of a businessman than a technocrat, able to understand the value of information and its management within the company from a competitive, strategic as well as operational point of view.

Conversely, although the MIS manager is very good at handling the operational side, he has not necessarily been trained to understand the way that information management can be used for competitive and strategic reasons. The tendency, then, has been to take people from the financial side who understand data processing but are not technocrats, make them chief information officers and have all the others — including MIS — report to them. It's called information resource management, a new buzzword. Although 58% of the companies surveyed have the data processing, office systems and telecommunications functions reporting to MIS, another 21% now have these functions reporting directly to a chief information officer.

What we've found, however, is that a lot of those information officers are now being promoted from the ranks of MIS, not the financial side. That tells us that corporations are placing more stress on computing functions, in many cases equating it in value with corporate financial resources.

Departmental computing seems to be a big concern with many corporations now. Did you touch upon that in your survey?

We asked the companies to rate the obstacles they thought were blocking the way to implementing departmental systems. The inability to distribute data bases properly among departments was listed by [more than] 52% of the respondents as a major obstacle.

Departmental computing in theory involves the sharing of disk storage, peripherals and communications among workstations. Also, to make departmental computing really effective, you need some sort of data base capabilities as well

See Q&A page 12

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VIEWPOINT

Slugging It Out Under The OA Umbrella



INSIDER
By Timothy J. Caffrey

Schizophrenia, not products, stole the show at the March Office Automation Conference in Dallas. Political infighting and semantic tussles produced a decision to call it quits for the once-thriving show. At the heart of the decision lay a growing perception that the term office automation had outlived its usefulness and no longer described a real market or planning agenda.

OA is paying the price of its success. It has been so successful as a driving force in information systems marketing and planning that it now describes a range of markets and issues that is perhaps too big for one conference or appellation to convey adequately. Evidence of that expansion is found in the range of hardware, software and acquisition issues slugging it out under the OA umbrella.

In the area of hardware, OA has expanded from stand-alone word processors to a range of competing options. Networked PCs, multiuser micros and proprietary minis all vie for the position of OA delivery vehicle. In fact, the battle over departmental systems is one of the hottest in the industry today.

Consider, too, the issue of applications. Today, OA is in a real sense applications independent. The increasingly compelling price/performance of personal and departmental computers has instilled a new willingness to move applications off the mainframe. Downsized applications are being merged with personal and departmental applications to create a broad portfolio of OA applications. Momentum to download applications development is also building. As a result, OA is distorting the traditional top-down systems development perspective.

The shift in hardware and software is accompanied by a shift in demand psychology. Justification arguments now focus on departmental and group outputs rather than the concept of personal productivity. Where individual productivity has been measured in pages per minute or quality of presentation, group productivity can be measured in terms of bottom-line dollars.

Demand for OA systems continues unabated, but the moniker itself wallows in semantic muck. The major complaint is that the term still evokes archaic attachments to word processors and dictation equipment.

There is an informal hunt for a new banner for the OA phenomenon. The new name must meet two conditions. For vendors, it must convey a reason for buying systems. OA is such a reason. For buyers, it must reflect real job responsibilities, budgetary authority and planning objectives.

Early tallies indicate that the term "end-user computing" is the leading contender. End-user computing, of course, distinguishes those systems designed to serve end-user needs from those designed to compute for the sake of computation. In a more serious vein, the term redefines and challenges the traditional control of computing systems. OA fell too readily under the control of MIS and DP power structures. End-user computing hints at a decentralized, democratized power structure.

As the definition of OA expands, the search for a new name will intensify. The clear winner is uncertain. We can imagine a keynote address at some future forum where the topic runs the gamut from local nets to end-user computing to business systems planning to decentralization and downsizing to departmental systems and power politics. A listener asks, "What's she talking about?" The whispered response: "OA."

Caffrey is director, strategies for micros and office systems, for International Data Corp. in Framingham, Mass.



VIEWPOINT

Up, Up And OA



ISSUES AND ANSWERS
By Robert D. Gilges

Companies are reexamining their office automation plans and reevaluating their objectives. In doing so, a new set of criteria should be used to weigh the final decision regarding office automation. The impetus should be toward office information systems whose emphasis is on "information." Above all, OA should be viewed as a single phase in the evolution of advanced office systems.

It was the personal computer that focused office systems on information processing. The personal computer could process information in various forms — text, data, image and voice — but more importantly, it provided "personal" processing, a factor missing in earlier office systems.

The personal computer is evolving as the key element in office worker productivity. Individual information processing has become the driving force in the office system architecture. In light of this, new issues have to be examined.

Office automation and cost justification seem to have been in opposite camps since the inception of the office automation concept. The driving force in the justification analysis has been the price of productivity.

A new set of criteria needs to be established that weighs evenly with productivity and cost. Understanding the value of product quality from both a creator's and recipient's perception becomes an ever-increasing factor in the analysis.

The quality factor extends beyond the product level to the work environment. Office systems invariably impact the workplace. The quality of work life becomes a familiar issue as office technology expands to every facet of the office.

The office worker is now equipped with advanced tools that will improve work life by eliminating tedious tasks while allowing for creativity and productivity. This is a subjective factor. Yet this factor may identify problems that previously went undetected. Assuming that the work environment has been enhanced by automation, if productivity remains low and costs remain high, one might reexamine the technology that was implemented.

Therefore, the set of criteria used to cost-justify office systems is at issue. The approach of work measurement will ultimately not provide the total analysis.

Similarly, the focused application of technology to expensive or inefficient tasks to show time improvements may be inaccurate without expanding the analysis to include some subjective factors. To save time by automating but to do so at the expense of quality does not mean having saved very much.

Office system designs may be developed by reviewing the office system from an individual's perspective, with the understanding of information processing's role in the office system more refined, if not simplified. The frequency of information access will be the determining factor, not the need to integrate or interface the whole office system puzzle.

The concept of office automation has changed. The term and its meaning change daily. Emphasis is being placed more on information and its quality rather than on pure automation. Therefore, a redefinition of OA should be a continuous subject, if only to prepare for the next milestone.

Gilges is partner in charge, Information Systems Services Consulting Practice, at Peat Marwick, Mitchell & Co. in New York. This article was written in conjunction with Michael Blum, a senior manager in the Information Systems Services Practice at Peat Marwick's New York office.

VIEWPOINT

Big Blue Struggles To Define Office Automation Plan



BLUE BEAT

By Dale Kutnick

IBM's office automation strategy in 1985 and 1986 continues to revolve around "office anarchy" — Personal Computers, incompatible systems and far-reaching statements of direction. IBM's current and near-term efforts are focused primarily on acquiring real estate at the user desktop and departmental level via the PC family, the 4300 and System 36 and 38 and enveloping them in a larger corporate network — Systems Network Architecture (SNA) and LU 6.2 based, of course — that enables the MIS department increasingly to take control.

This tactical maneuver is a necessary holding action in the face of increasing competition from Digital Equipment Corp., Wang Laboratories, Inc., Data General Corp. and other minicomputer vendors that offer more complete, more scalable OA solutions via software (DEC's All-In-1, Wang's Office and DG's Comprehensive Electronic Office) and hardware (compatible minis from 0.5 million instructions per second [MIPS] to more than 3 MIPS). These vendors also offer IBM PC and SNA connectivity to lure IBM customers who are not true Blue and are demanding departmental processing. IBM's primary solution — the System/36 — offers less integrated OA software (Personal Services), has no local-area network connection (IBM Token-Ring connection won't be available until year-end 1986) and is not upwardly scalable (users must convert different, much more expensive systems like the System/38 or 4300). The 36 is a good departmental server for communications and files but a limited departmental processor, relative to its major competitors.

This situation has put IBM into a quandary because the firm's strategy revolves around creating an infrastructure of sophisticated systems and architectures — physical, logical and applications layers within a single environment — that is not yet fully developed.

The bottom line is that IBM will provide a wide variety of physical devices and systems logically interconnected through various local networks and SNA across office environments. This logical layer (currently supported in a series of subarchitectures and protocols) will provide the information delivery systems that will enable applications to be linked across disparate systems. The logical layer is therefore the most strategic of the three layers because it provides the underlying architectural infrastructure that supports not only the other layers but the many changes that will occur within them such as new PCs, minis, software programs and so on.

This logical layer will enable IBM to unify its various mid-range, departmental and desktop systems (notwithstanding their different operating systems) not only through networking but ultimately via common facilities, end-user interfaces and applications. This will enable users to execute processes across systems, regardless of their origin.

Despite these grand plans, IBM has still done little to implement a coherent, integrated office automation strategy and is unlikely to do so for at least another 12 to 18 months. Clearly, IBM must resolve overlaps and incompatibilities between its VM-based Professional Office System (Profs) world and its MVS- or VSE-based Personal Services/Distributed Office Support Systems (Disoss) office environments. Ultimately, the functional distinctions will disappear, and Profs and Personal Services will coexist comfortably in different application niches — with both being able to take full advantage of Disoss and Systems Network Architecture Distributed Services.

But Disoss itself requires some significant changes before it will be a successful product. There are currently fewer than 1,000 Disoss sites worldwide, and users are resisting the product. Users say the application program interface is complex and requires many hours of system programmer setup, the user interface is cumbersome, recovery from failures is tenuous at best and it is a resource hog. These problems alone will take IBM the better part of 1986 to clean up, and while Disoss will eventually take its place "inside SNA" in most large IBM customers' facilities, many users are widely delaying its implementation.

IBM's office automation strategy is slowly becoming clearer — logical and cooperative processing between different systems — but its implementation efforts are still shrouded in tactical solutions. Refining the software and underlying architectures to integrate its office systems fully will require the remainder of the decade, but many acceptable, interim solutions will emerge during the next three years. Concomitantly, a number of minicomputer vendors will leapfrog IBM and offer their users better office systems solutions that can later be linked into IBM's grand scheme. These alternatives will help drive the OA market and the DP/communications industry in general.

Kutnick is executive vice-president of research at the Gartner Group, Inc., headquartered in Stamford, Conn.

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NEWS

Office Automation Marketplace Experiencing A Lull

One of the most interesting aspects of what's happening in the office automation market is what's not happening.

Stand-alone word processors are, to the surprise of no one, becoming extinct. Lance Brilliantine, director of User Services at Butler Cox Omni, the New York-based information technology management consulting firm, noted that the trend is definitely toward the multifunctional workstation. One of the firm's customers was leaning toward the purchase of an IBM 5520 system for its secretaries but opted for personal computers so users could take advantage of the wide range of software.

Molly Upton, editor of International Data Corp.'s Office Automation Reporting Service, sees increasing interest from OA quarters in decision support tools. She also has seen some excitement on the electronic mail front, specifically from managers being able to access pregenerated reports via electronic mail. "If there is anything that is propelling the traditional office automation function, it's electronic mail," Upton said.

On the less technological front, there's nothing new in copier technology. The screens on terminals are still pretty much green on black, and no one but IBM has entered the glass plasma display arena. Integrated software packages are being used extensively, but very few users are utilizing much in those packages except for the spreadsheet portion. While a great deal has been made of the importance of having the same kind of workstation on the desk of a manager and support personnel, for the most part, managers still do not type, so the work continues to be done exclusively by the support staff. The biggest nonsurprise of all, of course, is the fact that office automation has been pretty much absorbed by MIS.

On the other hand, just because there are no earth-shattering occurrences, doesn't mean nothing is happening.

Wang Laboratories, Inc. continues to make the news. In early April, J. Carl Masi, Jr. resigned as executive vice-president for sales and marketing. Masi's departure follows by less than a year that of John Cunningham who was president of Wang until last July. Masi played a big role in introducing Wang's newest line of computers, the VS 5 and VS 6, which Wang is positioning to take on Digital Equipment Corp.'s Microvax II. However, a noted industry analyst stated that because it is a foregone conclusion that MIS is indeed taking over the OA function in most organizations, Wang will have an even tougher row to hoe because the company has never had much credibility with big-iron managers.

IBM finally announced its long-awaited lap-size unit, the PC Convertible, the existence of which has made monkeys out of industry watchers and journalists for almost two years. The same day Big Blue announced the

OA UPDATE

Convertible, it announced increases in storage capacity for its Personal Computer/XT and a faster model of its Personal Computer/AT. At the same time, IBM announced price changes that brought the costs of the new enhanced models closer to those of the older ones, further fueling speculation that the original Personal Computer and PC XT will drop below the horizon in the not-too-distant future.

DEC is forging ahead on the path toward connectivity. Not only has DEC concentrated on allowing its own proprietary products to talk together, but the company has taken the lead in connecting other vendors' offerings with its own. While most of the industry is in the economic doldrums, DEC announced a two-for-one stock split in March.

While the industry Goliaths try to push departmental computers as the new hardware technology, users armed with powerful slingshots seem determined to link their existing base of personal computers into local-area networks. During a recent user survey conducted by *Computerworld Focus*, a majority of respondents either have or are planning to purchase local-area network technology. Those that are using departmental computers for office automation, primarily word processing, are making sure that their personal computer word processing software can be uploaded and downloaded with ease.

The health risk associated with VDTs seems to be an issue that can't be resolved or proven but won't go away. Most recently, Sweden's National Board of Occupational Safety and Health and the National Institute of Radiation Protection issued a joint statement warning that "low-frequency pulsed magnetic fields of a kind similar to those appearing in VDTs and TV sets seem to have an influence on the pregnancy outcome of mice and rats." The study went on to say that no conclusions about pregnancy outcomes in human operators of VDTs should be assumed and that further research should be conducted. In response to the Swedish study, the Santa Monica, Calif.-based Koffler Group, a consulting firm on information technology and ergonomics, issued a press release stating that the rodents in the Swedish study were not exposed to computer screens, rather, the pregnant mice were actually exposed to pulsed magnetic fields emitted by coils energized with electricity. The Koffler group has taken a stand against legislation that would regulate the use of VDTs in the office. "Instead," explained Richard P. Koffler, president of the Koffler Group, "we encourage management to listen to the concerns of VDT operators. Management should be proactive instead of reactive."

The big news on the graphics front is the announcement of an industrywide graphics interface standard expected to eliminate the incompatibilities of various vendors' graphics adapters. Already a panel of hardware and software manufacturers including Borland International, Inc., Intel Corp., Ashton-Tate, Software Publishing Corp., Lotus Development Corp. and Texas Instruments, Inc. have announced their support of Graphic Software Systems, Inc.'s Direct Graphics Interface Specification (DGIS). According to a spokeswoman at Borland, DGIS frees software publishers from the task of writing a series of device drivers for their programs. The movement of the drivers to silicon saves memory, speeds up graphics processing times and relieves applications developers from having to write drivers for each new device that hits the market.

Microcomputers Pushing Electronic Publishing Systems Into The Office

Seems like the only computer companies doing great business these days are the ones offering systems geared to cut operating costs in companies. A case in point is the corporate electronic publishing system (CEPS) industry, which, according to some market research firms, is ready to go off the sales charts.

CEPS involves firms bringing in their own electronic publishing systems to handle everything from small hard-copy reports to glossy brochures, annual reports and equipment documentation.

The CEPS industry has been around for several years but was slow to grow because the systems offered were big, complicated and very expensive, costing anywhere from $500,000 to several million dollars. Sophisticated in-house staff was also required to run the systems, and the work flow was usually not busy enough to justify going in-house rather than farming the work out to graphics houses. Another problem was the recognition that most publishing jobs required by corporations were not of the glossy, expensive variety; much of the need was for smaller, departmental projects where quality and image were not terribly important.

Trouble was the technology did not exist to make inexpensive, in-house computer-based publishing systems. The microprocessor changed that. Now there is a dynamic, computer-based in-house publishing industry being shaped that takes advantage of both the huge numbers of micros in place in U.S. firms as well as the expertise gained by micro users over the past few years.

The present CEPS industry, according to Paul Lewis, director of Interconsult, Inc., a Cambridge, Mass., research firm, is made up of four markets. At the high end are what Lewis termed the electronic process color systems that create high-resolution, color prepress artwork in the same league as ad agenices and that are priced from hundreds of thousands to several million dollars.

Below this are the presentation color systems used for proposals, slide shows and reports that can run up to $100,000. At the next level are the high-performance, monotone publishing systems priced from $40,000 to $50,000.

The low-level market is also the hottest in sales. The micro or desktop publishing industry delivers micro-based systems — in the $10,000 to $15,000 range — that often can be interfaced directly to typesetters to produce newsletters, reports and documentation for individuals and departments. These PC-based systems can be expanded into multiuser systems by adding more PCs and scanners.

Interconsult's Lewis said the market for PC-based publishing systems hit $500 million in 1985 and predicts a $1 billion market in 1986 that will grow to $3 billion by 1990.

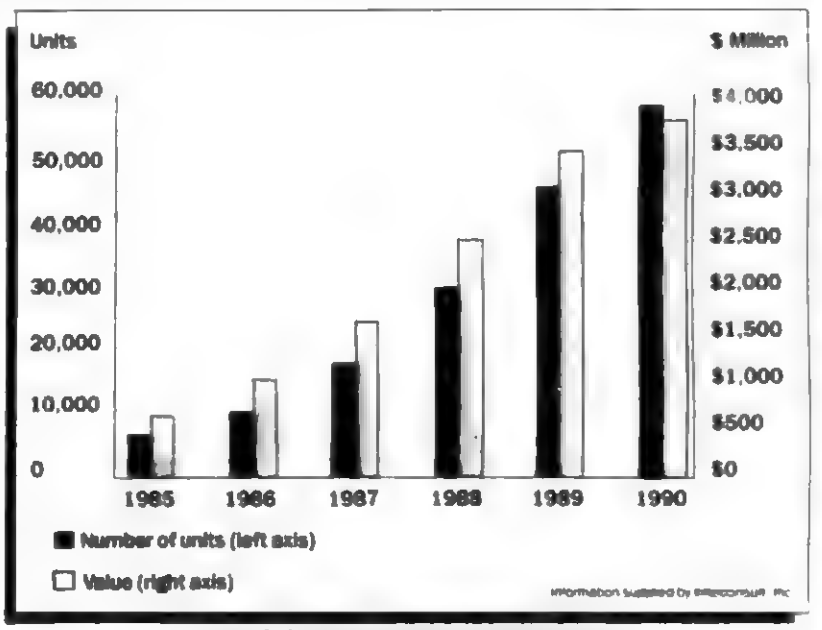


Figure 2. Desktop Publishing Units Shipped

"There are two basic forces driving this market segment," Lewis explained. "The first is the realization that such systems can cut publishing costs in half. The second is ease of use."

Everybody is trying to get into the act at the desktop level. Apple Computer, Inc. has configured a publishing system built around its Macintosh microcomputer, while Xerox Corp. and Eastman Kodak Co. are high-profile companies that have also targeted the field as a high-growth area.

Another set of vendors has come on the market with specialized publishing software and hardware upgrades to make the IBM Personal Computer into a low-cost publishing system. Depending on features, some of these systems can cost well under $10,000.

Commercial printing houses are not standing still, either. Though most of these printing establishments frown on the quality of the products these desktop publishing systems spill out, they are buying such low-end systems and providing software communications links with those users who still think these systems are too exorbitant to buy themselves.

NEWS

AFIPS' OA Show Down But Not Out

In March, Houston was host to the last Office Automation Conference (OAC), which had been an annual affair since 1980.

Despite the critics, OAC's sponsor, the American Federation of Information Processing Societies, Inc. (AFIPS) cited a broadening market definition as the primary reason for ending the annual event in its current form, not the lower vendor and user attendance experienced during the past few years.

"The Houston show had over 17,000 registered attendees and 75 exhibitors," explained Katherine Stormont, publicist at AFIPS, "so we weren't suffering at the gates. The problem has been that the idea of OAC is now too limiting in scope. Office automation as a concept now contains much more than just word processing and micros. What we have to do is recognize that office automation includes telecommunications and expanded business systems."

To that end, Stormont said AFIPS is considering two options. OAC could become incorporated into a new conference called the Business Systems and Applications Conference, which has been scheduled for March 1987 in New York. The other option would have OAC merging into another new AFIPS-sponsored event, the National Computer Conference Telecommunications extravaganza scheduled for Philadelphia this September.

Q&A from page 6

as departmental applications. This means that a good deal of the processing and file management is done in the department, where most of the information is generated and stays. Yet beyond that is the need to distribute data bases because there is information that is seldom simply departmental in scope, without relationship with divisional or corporate information. That's a big concern with people.

What were the reasons given for wanting to implementing departmental systems?

The most critical reason given was to provide better support to end users. Next was the feeling that departmental systems would help firms become more competitive, placing departmental computing within a more strategic corporate approach.

Any other interesting results?

Almost everyone said integrated software was critically important, but only 2% said the Unix operating system was important in the office. There has been an attempt by Unix vendors to push Unix's portability and multiuser capability as the answers to office computing. Leading corporate users feel differently.

The last point is IBM's Systems Network Architecture (SNA). Over 73% of the companies we surveyed said the ability to interface with SNA is now critically important in equipment selection.

— Stan Kolodziej

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CIRCLE READER SERVICE NUMBER 165

LETTERS

A Dynamic Technology

It was a pleasure to see the well-balanced coverage you gave to the subject of computer-aided design and manufacturing in the March issue of *Computerworld Focus*.

As several of your authors noted, engineering computing must increasingly be considered in light of a company's overall information needs.

With respect to my own article in the March issue of *Computerworld Focus*, "Putting CAD/CAM Into Place," an update may be in order. From the time that the article was originally written, the objectives have remained very much the same.

Important advances, however, have been made in such integrating technologies as solid modeling and data bases for computer input microfilm.

A key point from earlier national productivity studies is that our productivity problems would disappear if only we managed to implement the best available technology just one year earlier. With computer-aided design and manufacturing, the basic software technology in use at most companies is more than a decade old. An important service that *Computerworld Focus* can provide is to continue to keep us informed of the latest and most significant advances.

Peter Marks
Vice-President
Product Planning and Marketing
Automation Technology Products

ASRS Article Hits Home

I enjoyed your March 13 issue of *Computerworld Focus*.

I have felt for a long time that *Computerworld* spends too much time on the financial (business) aspects of MIS responsibilities and not enough on the ancillary responsibilities such as manufacturing. Having been involved with automated storage and retrieval systems (ASRS) and other automated materials handling projects for more than 10 years, I have dealt with many MIS departments and their first attempts to become involved in manufacturing activities.

Ms. White's article, "An Imperfect Union," on automated storage and retrieval systems hit home.

James H. Jarvis
S&J Group
Clearwater, Fla.

NEWS

LU6.2 Market Heats Up As Big Name Vendors Unveil Products

IBM has created another hot market. LU 6.2, IBM's peer-to-peer communications protocol, is off and running, with several vendors introducing products based on the LU 6.2 standard.

In the past couple of months, Honeywell, Inc., Tandem Computers, Inc., Systems Strategies, Inc. and Data General Corp. are among the companies that have come out with LU 6.2 products.

Others on the verge of product announcements include Harris Corp., AT&T, Hewlett-Packard Co. and Wang Laboratories, Inc. Apple Computer, Inc. has also been working with a software vendor to produce an LU 6.2 emulation product, which is expected to be announced soon.

Digital Equipment Corp. has been leading the pack, having introduced an LU 6.2 product about one year ago that allows DEC workstations to look like LU 6.2 machines attached, through gateways, to IBM's Systems Network Architecture (SNA). (LU 6.2 resides in the sixth, or presentation layer, of SNA.)

"LU 6.2 has been coming on strong," explained Lee Doyle, senior communications analyst at Framingham, Mass.-based International Data Corp., "because minicomputer vendors like DEC and Wang perceive that they can use it to strengthen their push into the mid-range office computing area, where IBM is weakest."

IBM has been increasing its LU 6.2 product line but not fast enough for many users. While interdepartmental communications has become important in the office, IBM is coping with a legacy of noncommunicating products that has come back to haunt it.

"LU 6.2 is one of IBM's big attempts to reverse a history of introducing a new protocol each time the company introduced a new product to its SNA architecture," Doyle explained. "These products, from microcomputers, minicomputers and mainframes, couldn't talk directly to each other."

With the increased power of microcomputers, Doyle added that IBM has been under more pressure to give users of microcomputers the direct benefits of LU 6.2 peer-to-peer communications with other workstations, minicomputers and mainframes without the hassle of channeling communications through protocol conversion software resident in controllers, file servers and larger computers. IBM to date has been gradually filling the gap with LU 6.2 capability for its System/36, System/38 and Personal Computer plugged into its Token-Ring local-area network, but the pace has been slow for many users and industry observers.

Others are skeptical that the current vendor flurry of LU 6.2/SNA products will be sustained.

"It could very well turn out that LU 6.2 is the foot in the door that IBM needs in order to slip into new customer installations," stated a new report from International Resource Development, Inc. (IRD) of Norwalk, Conn. "The reading and interpretation of the published [LU 6.2/SNA] standards can take up too much of the research and development time and money of all but the most dedicated IBM followers, making compatibility with the changing SNA products an expensive undertaking."

Another drag on the LU 6.2 marketplace is IBM's slowness in getting the final LU 6.2 standard implemented. Part of the problem stems from the fact that LU 6.2 is not a single protocol but a framework for housing several different protocols.

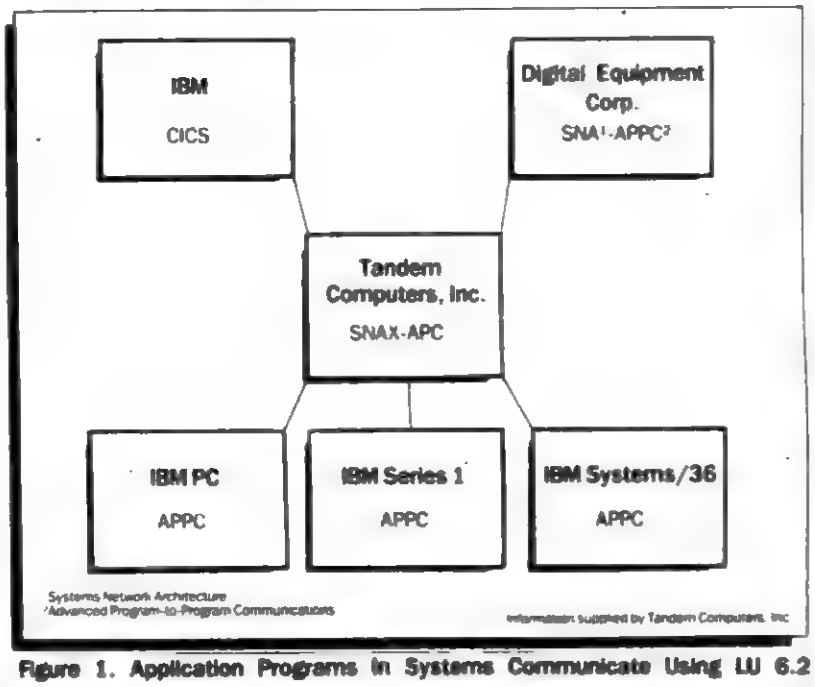


Figure 1. Application Programs in Systems Communicate Using LU 6.2

The protocols within the LU 6.2 framework will support the same basic communications functions, but not all will support advanced LU 6.2 communications. While IBM intends to migrate from incompatible logical unit (LU) types (there are currently eight) within SNA to a single LU type — LU 6.2 — some analysts say it will be a few years yet before IBM comes up with a truly competitive peer-to-peer communications capability.

A big plus for software developers is IBM's Advanced Program-to-Program Communications (APPC/PC) Toolkit, which is now being shipped and will provide vendors of micro-to-mainframe software with the means to build LU 6.2 interfaces.

The Toolkit is expected to help build the LU 6.2 market from what is essentially a standing start to what IRD predicts will be an $800 million market by 1990.

Though LU 6.2 is making strides in North America, the European situation is much different.

Recently the European Computer Manufacturers Association (ECMA) rejected IBM's proposal to have LU 6.2 as one of the bases for the emerging Open Systems Interconnect (OSI) communications standards. Forming a front against IBM, the ECMA members' rejection was ostensibly based on technical considerations, stating that LU 6.2 contradicts existing specifications within the OSI standard.

Some observers, however, have said the true reason for the thumbs down from ECMA was fear that if the LU 6.2 protocol was adopted within OSI, IBM would have a two-year lead in developing and bringing to market products based on LU 6.2.

Corporate Preoccupation With Costs Spurs Telephone Management Sales

Telephone management information systems (TMIS) have been slow off the mark since VMX, Inc. of Dallas introduced the first system several years ago. That might be changing.

The corporate concern for cutting communications bills has generated more interest in these stand-alone messaging systems that, along with switching incoming and outgoing calls, can analyze call traffic patterns within networks, create call accounts and even produce built-in inventory and billing reports.

Most telephone management systems have the ability to interface with several types of private branch exchanges from various vendors, especially from large PBX makers such as AT&T and Northern Telecom, Inc.

Though most private branch exchange makers offer their own telephone management systems, they usually work on a proprietary basis, interfacing with only a specific line of PBXs from those vendors.

Private branch exchange makers use this as leverage to lock in users to their own systems. Independent telephone management information systems vendors, however, give users the ability to buy their TMIS separately and plug them into any number of private branch exchanges, a feature more users are opting for since many large corporations have more than one brand of private branch exchange spread throughout the organization.

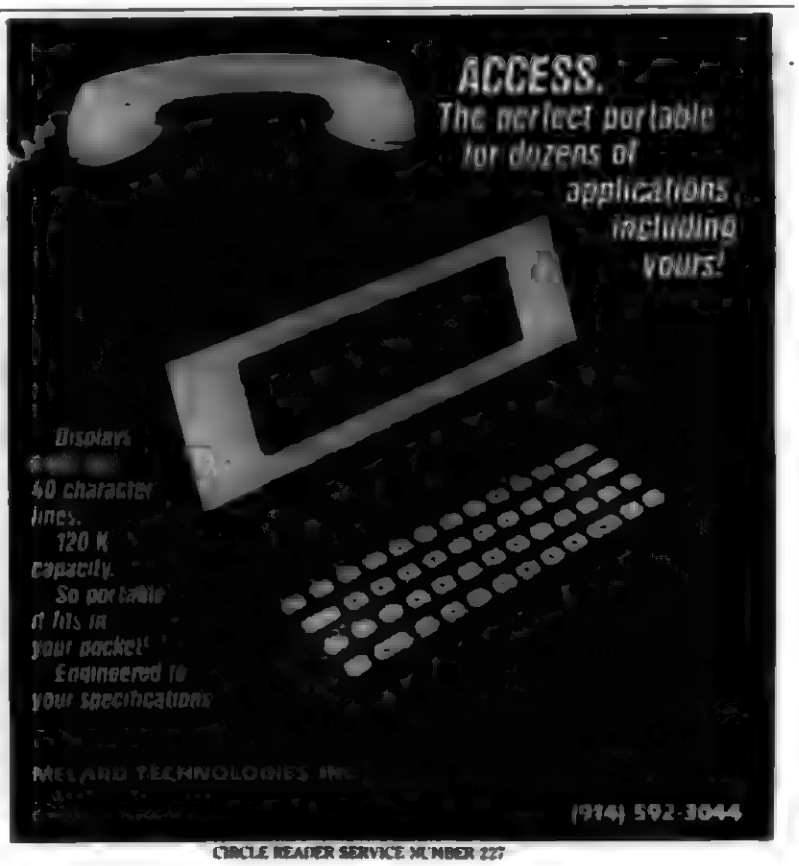
Another sales stimulus has been the drop in TMIS prices over the past year or so.

VMX's first system was big and cost half a million dollars. Now TMIS products, such as the Aspen from Octel Communications Corp., Milpitas, Calif., range from $20,000 to $40,000, depending on features.

"What we're seeing is the third generation of telephone management systems coming into the market," explained Dave Torrey, Octel's marketing manager. "Very large-scale integration technology has helped lower the prices and increase the power of the systems. Also, the lack of standards for intervendor networking has made users look to something that can interface and link PBXs and other equipment."

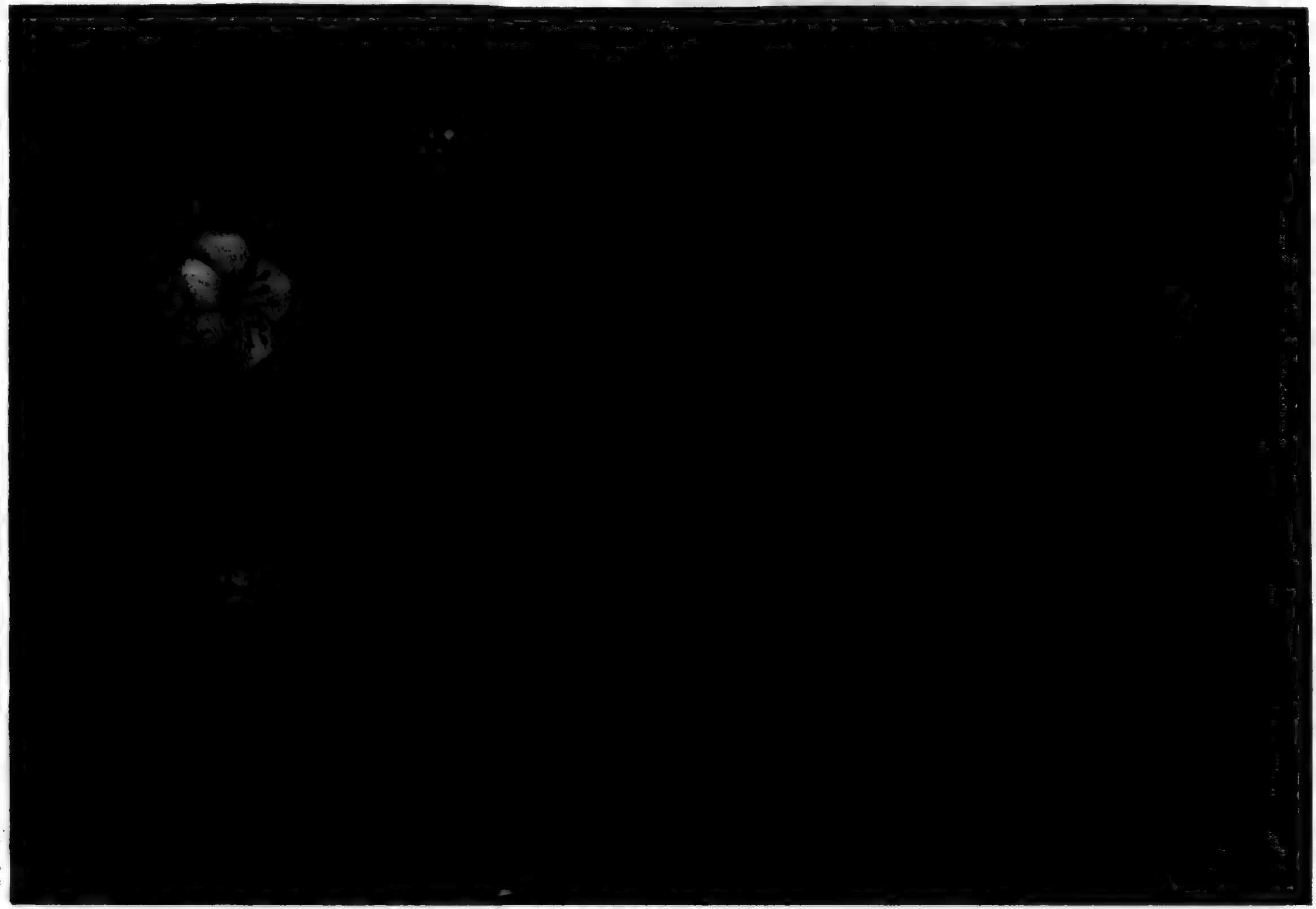
Torrey said Octel's own research outlines a TMIS market that at this stage is only 1% or 2% penetrated. "There are at least 70,000 PBXs and [AT&T] Centrex systems out there," he added. "It's a big market."

Probe Research, Inc., a Morristown, N.J., communications research outfit, calculated that the TMIS market in 1985 reached $142 million and expects that figure to double in 1986.



CIRCLE READER SERVICE NUMBER 227

RALPH MASELLO



USER SURVEY

New Life For The Info Center

·BY·LEE·WHITE·

In 1980, just a few months before IBM announced its Personal Computer, the IBM-created information center concept crossed the border from Canada to the U.S.

Don Cyrog, supervisor of the Information Center for the Salt River Project, the largest electric and water utility in Arizona, remembers hearing about information centers at an IBM Guide users group meeting in 1980. The Salt River Project started its center in January 1981, the first in Arizona to do so and one of the first in the country.

But for most of us in the early years of the decade, the words "information center" meant nothing at all. For that matter, the only people outside MIS who used computers were the people in departments such as order entry, credit or accounting.

How times have changed. At the same time that the invasion of micro hardware took place; so did the growth of support staff charged with teaching everyone how their lives would change once they mastered the nifty little machines.

Sometimes these "teachers" were MIS people; more often than not they were among the avant-garde who had been playing with computers on their own for years. Soon, however, personal computers graduated from oddity to desk fixture. Since that time, training corporate America to make good use of its personal computers and learn to use the friendlier and more sophisticated software on mainframes became a full-time job not only for the part-time techie but also for the thousands of people across the country who had become info center staff members.

Since information centers have become a real fixture in business, *Computerworld Focus* interviewed a number of information center managers to find out how their centers are faring, how their jobs have changed in the past two years and what changes they anticipate in the next few years. The people selected for the survey were culled from a list of randomly selected names of attendees at the 1985 Information Center Conference in New Orleans, supplied by Weingarten Publications, Inc., sponsors of the conference.

What we found out is that information centers have themselves become big businesses. Although staffs are not large (most numbered between three and 10, with only one company of 6,000 having 27 information center staff members), all the centers support both mainframe and personal computer products, and the number of end users range from 10% of the total employee population to a whopping 50%.

Computer literacy, according to those surveyed, is a term of the past. Increasing end-user sophistication is the key word today and, although it would seem that this sophistication would make the day-to-day lives of information center employees easier, most say that servicing the needs of the companies' populations is becoming more difficult.

"We're busier," explaines Penny Peticolas, manager of the Information Center for the Columbus, Ohio-based Ashland Chemical Co. Peticolas has a staff of three consultants and one programmer who support the needs of 200 end users out of a total population of 1,000 at company headquarters. While her staff is able to keep up with the changing technology, they cannot keep up with the expanding needs. "It's not the technology that is the problem; it's simply the growth in the number of people needing our help," Peticolas says.

Pat Engstrom, manager of the Information Support Center at the Pittsburgh National Bank, says that her 10 staff members, who support about 500 end users, are working twice as hard now. "The smarter [the end users] become, the more things they want to do and the harder you have to work to make sure you're one step ahead of them to be able to provide them with the help they need. Things are changing so rapidly, and the environment is changing every day. It's not going to get any easier."

But Robert Gabor, manager of the Information Center at Sunkist Growers, Inc. in Sherman Oaks, Calif., casts something of a dissenting vote in the user sophistication area. "We look at things programmatically and logically and say, 'Well, that shouldn't really work.' But our end users try it, and it does work. That helps us. In our sales area we have one individual who really understands the data, so people kind of migrate to him. When he has things he can't answer, he comes to us. We've developed a couple of buffers from our end-user base to kind of offload our consultants."

User sophistication is only one of the changes these managers are going through. All found that the demands placed upon them have all but slammed the door to hands-on work in the center. Ron Elswick, director of the Information Center and of Office Automation at the Federal Reserve Bank in Dallas, says he did quite a bit of hands-on computer work four years ago. However, now that the center supports 700 end users out of the bank's 1,500 employees, Elswick finds that his information center manager and six consultants have taken over that aspect of the job.

Ashland's Peticolas is currently writing justifications for staff additions and a business plan for her center and has little time for hands-on work. "For the past two years we have been operating at the pleasure of general management. But now I'm interviewing division vice-presidents and revising my budget for the next quarter." Engstrom of Pittsburgh National Bank misses the good old days "to some extent," but makes sure that she sits down and "plays" on a fairly regular basis. "I think it's important that an information center manager keep that touch. How can I be selling tools or working with users who are using tools or talking to management about these tools if I don't understand them?" she asks.

Elswick sees the job of information center manager as a continually evolving one. His own job has not been the same for a one-year period in the past three or four years. "I got a new job description in January 1985, and we're supposed to be evaluated according to the performance criteria in the job description. My vice-president couldn't do it because the job description [one year later] no longer fit," Elswick says.

Reporting status is another change that information center

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CIRCLE READER SERVICE NUMBER 228

USER SURVEY

managers have had to deal with. While most of the managers in the survey report through the traditional MIS department, such is not the case at Hercules, Inc., a 25,000-employee chemical company headquartered in Wilmington, Del. Hercules has a vice-president of information resources, Ross Watson, who reports directly to the president and chief executive officer. According to Joan Ferrara, manager of the Hercules Information Center, three people report to Watson: the head of the computer systems department, the traditional MIS department involved with the machinery and development work for the corporation; the person in charge of the office automation department, which includes communications; and Ferrara.

Stan Leader, manager of the Information Center at Capital Blue Cross in Harrisburg, Pa., reports directly to the vice-president of information services. "We're consolidating our data processing entities. We have a facility called the Shared Services Center, and we have put all our major data processing types within this center. The company wanted to still have a small group of people who could more or less be the liaison between the mainframe and the users," Leader says.

> *'I never wanted to get the group into a position like traditional data processing has been where you take on an assignment and you either can't complete it or it takes forever.'*
>
> — Joan Ferrara
> Hercules Information Center

Management at the Federal Reserve Bank in Dallas has taken different tacks in the evolution of its information center. Three years ago the information center was a separate entity, Elswick explains. At that time, top management wanted to focus attention on the center to show its support. "So they separated us out and permitted me to report directly to a single vice-president as a separate organization. We were able to be right up at the top of the organization, we knew what was going on, knew where to apply the resources to soup up the organization, get the most bang for the buck. And it paid off," Elswick says.

Late in February, the Federal Reserve reorganized and put the information center back with the traditional application development people. Elswick attributes this reorganization to the need for what he calls the second offensive in end-user computing, that of using a development center to hit some quick development applications and also support training DP people so that they can start applying the techniques that have evolved over the past few years. "The objective is not to write every last report that is going to be developed in a system but rather to create a base of data and provide end-user access to that data. That way, hopefully, instead of helping users develop the data bases, which we do now, the information center can concentrate on consulting-type questions," Elswick explains.

All of the surveyed information center managers expect their jobs will change appreciably in the next couple of years. The Salt River Project's Cyrog, who estimates that of his company's 6,000 employees, 2,000 could be considered end users, says he hopes that the next few years are not as hectic as the last two. "Right now we are migrating from an [IBM] MVS environment to VM, so that has caused a lot of retraining, rethinking, new standards and all the peripheral things that go with making a major environment change," he says. In addition, the company is decentralizing from one information center to satellite centers in other buildings, primarily to be closer to the user community.

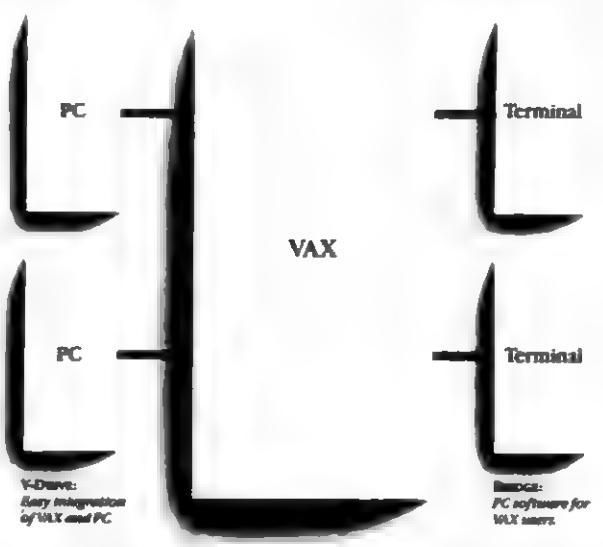
But wishing probably won't make it so for Cyrog. His group is looking at local-area networks that will involve more products, more training and closer supervision. They are also going to be linking personal computers and minicomputers and mainframes. "Our departments usually think of themselves as being pretty isolated — engineers only having engineering applications and accountants having only accounting applications. But now that we are spreading corporate data more widely, we have come into some very large data base applications that are companywide. That will bear a lot of watching," Cyrog says.

Hercules' Ferrara echoes much of what Cyrog says. In the past, her feelings about what an information center staff should and should not do were based in large part on development activities. "I never wanted to get the group into a position like traditional DP has been where you take on an assignment and you either can't complete it or it takes forever. I have always said I'll do anything I have to [in order] to help the users develop their own systems, but I won't develop [the systems] for them," Ferrara insists.

However, she thinks there is a real need, one that is not being addressed, for systems development on personal computers. And this may be the direction in

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CIRCLE READER SERVICE NUMBER 163

which her information center may go next, but she sees it being done in an adjunct group. "It seems logical to me that it would report to the same area that the information center does, mainly because of the tools being used and the closeness the information center has already established with the user. Many times we find traditional DP groups have tunnel vision when it comes to developing imaginative systems using the personal computer," Ferrara adds.

Tunnel vision is not the only epithet gently thrown at the traditional DP types, however. Information centers were created not only because there were new needs that had to be addressed. There was also the realization that a different breed of person was required to bring computing to the masses.

While all of our respondents say that at least half of their information center staff consists of classically trained DP people, they either state or strongly infer that the kinds of people making up information centers are worlds apart from those in the MIS mainstream. As one of the surveyed managers says: "I have something on my wall that says, 'Every organization is in reality the lengthened shadow of its leaders.' You have to stop and realize that your attitude is the attitude that your people are going to give to other people. You can't go too far in trying to convey a helpful type of outlook, a cooperative spirit. I was previously manager of our data base group, but they told me I was the only one in the whole organization who is right for this job [as information center manager]."

Pittsburgh National Bank's Engstrom says members of an information center must be people people. "I don't care how technical you are, if you aren't a people person, you won't make it. If you can smile, listen and try to give people a solution, you can make a mistake. People will accept your mistake as long as you attempt to correct it if you have a good personality. That's what will make or break an information center."

> ”
>
> *'I don't care how technical you are, if you aren't a people person, you won't make it. That's what will make or break an information center.'*
>
> **— Pat Engstrom**
> **Pittsburgh National Bank**

But another make-or-break criterion for information centers has to be how the centers are viewed by traditional MIS people. Of the people surveyed by *Computerworld Focus*, only one says that the relationship has always been excellent. Elswick, whose information center just became part of MIS, feels that MIS acceptance has just begun. "I have spent more time with the managers [in MIS] in the last two weeks than I did in the past two years. That tells me something," he says.

At the risk of having our reader community call journalistic integrity an oxymoron, we have chosen not to ascribe particular comments regarding MIS views of the information center to particular information center managers. But the comments include the following:

"The MIS department was the biggest obstacle to the success of the information center."

"If I were to pick one word, I would say jealousy."

"They felt threatened by the information center."

"I would say we're viewed with skepticism ranging up to distrust and doubt. I asked one manager, who is sympathetic to what we are doing and with whom I have a very good rapport, what we had to do to be taken seriously, and he said, 'Damned if I know!' "

"People are trying to take away some of the functions we have because we do it so well and get such good publicity."

"There is some resentment, because we are more visible, more glamorous and people see what we are doing as kind of fun."

Along with the near unanimity regarding MIS' view of information centers is the unanimous response to users' views of information centers. Just before Ashland Chemical's Peticolas spoke with *Computerworld Focus*, she had spoken with two vice-presidents, both of whom called the center essential. "They said that they would pay for our services if we charged for them, that they expected their use of us to increase by 75% to 300%," she says. Ferrara from Hercules thinks her information center is very highly thought of, and Elswick of the Federal Reserve Bank of Dallas says he is confident that the user community is well satisfied.

Whether the information center concept continues to exist as an entity of its own or whether it becomes just another cog in the MIS wheel might, with any luck, become just a matter of semantics. The user community will not give up what they have come to expect from the information center; if MIS chooses to take over the information center concept and is willing to provide the kind of nurturing for which information centers have become famous, clearly everyone will come out winners. ■

White is a senior writer at Computerworld Focus.

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CIRCLE READER SERVICE NUMBER 162

MARKET ANALYSIS

What Will The Vendors Offer?

·BY·ANDRIA·ROSSI·

Two years ago the industry was struggling to define an integrated office system. Vendors, industry press and consultants all had a different view on what ingredients were necessary to build or evolve an architecture into an integrated office system. Today, all vendors market what they consider to be such a system. What many vendors overlook, however, is that an integrated office system must go beyond the support of office applications to provide a set of integrated business tools in a networked architecture.

The most widely accepted and marketed integrated office software is offered on departmental systems, also known to many as small business computers. The vendors most recognized in this area are Data General Corp., Digital Equipment Corp., Hewlett-Packard Co., IBM and Wang Laboratories, Inc. Each of these vendors approached development of its integrated office system offering from a different angle. The sacrifices these vendors made to produce an integrated solution is what constitutes the differences between their products. Although most vendors would welcome the option to pioneer a new technology, they are also constrained by the widespread demand to conform to industry standards — particularly those set by IBM.

Vendors are juggling their research and development dollars. Should they integrate their existing applications more tightly? Should they enhance their product line by pioneering a new technology? Is interconnectivity to IBM architectures or even competitive products the highest priority?

Some vendor strategies are more attainable than others. There are many intangibles that must be considered prior to announcing an intention to build an integrated office system. Vendors such as IBM and Wang have a very large user base they must secure and consider in new product developments, while others were late in projecting the impact integration would have in the office. So each vendor took the quickest and most strategic avenue to evolve its product line into an integrated office system.

■ *Data General Corp.*

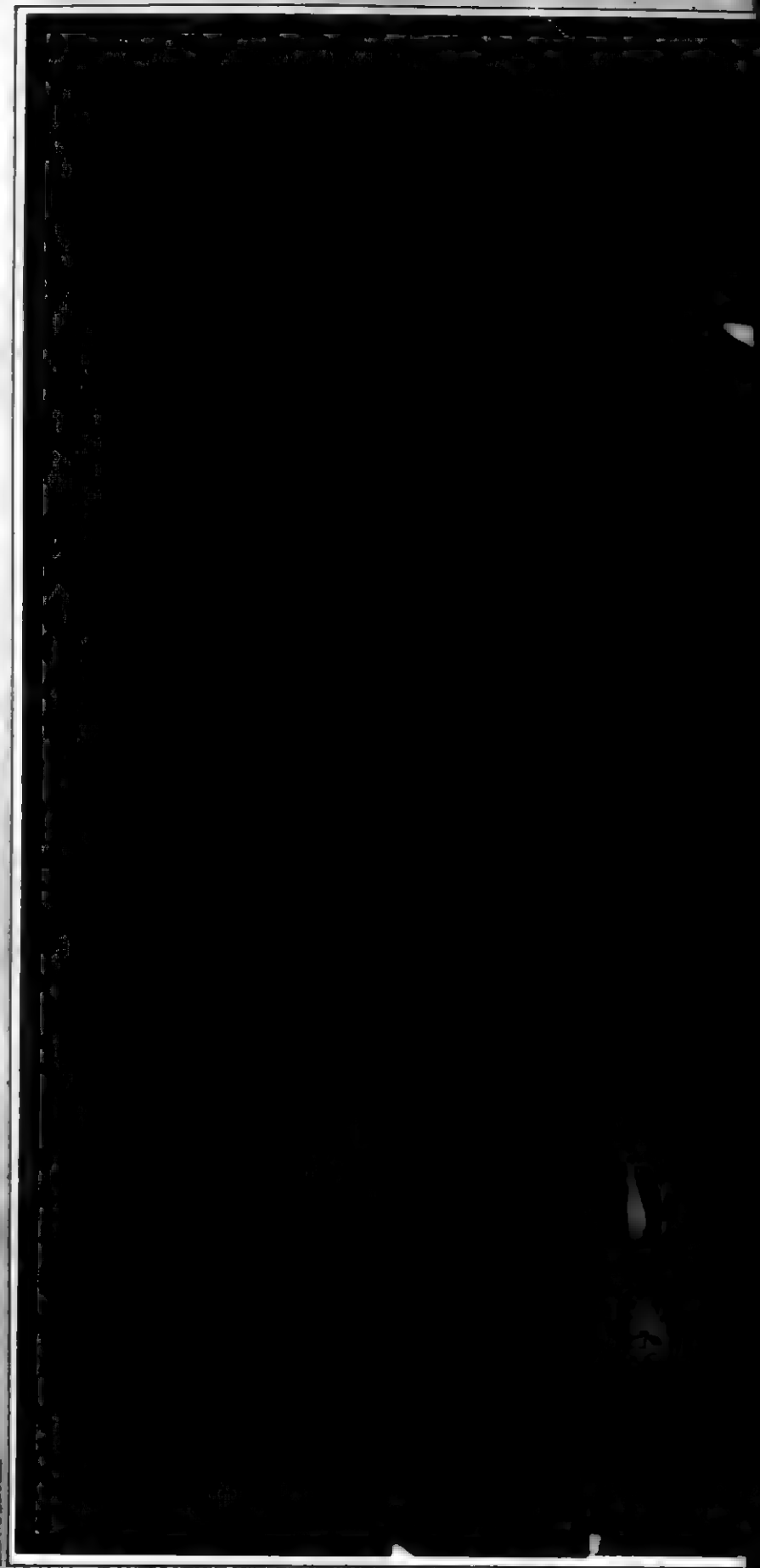
DG built its Comprehensive Electronic Office (CEO) as a tightly linked set of applications. As the products matured, DG placed more emphasis on integrating these applications within the file system and among each other. In the office system marketplace, DG's products earned the reputation for being the furthest ahead in integration at the application and file levels of the hierarchy. The company's recently announced voice products — integrated voice/data terminals and voice store-and-forward software — are examples of DG's thrust to integrate a range of office technologies.

DG managed to keep the user interface consistent among applications supported by CEO. Even in CEO Write (the Microsoft Corp. MS-DOS version of CEO word processing), an experienced CEO user will hardly notice the transition. Unlike many other office system solutions, CEO offers a variety of end-user customization options for each application and in the file system.

A user can customize applications to reflect his working style via a personal profile.

DG's interconnect strategy includes a recently announced IBM Distributed Office Support System (Disoss) gateway to distribute revisable form files to other Disoss users via IBM's Document Distribution Services. CEO Connection is a DG-developed communications link used to connect IBM PCs to DG's departmental processors.

A personal computer user gains access to all CEO applications while having the option to operate in a local mode and store or transfer these files to a departmental system. But DG does not offer an automatic polling process in which the host retrieves data at scheduled time intervals from the personal computers to be processed on the host. For example, if autopolling were made available, a personal computer user could remain in an MS-DOS environment, even to create a mail message or request to schedule a meeting, knowing that the host would take over to process and distribute the mail message.



■ ***Digital Equipment Corp.***

DEC's approach has always been to build an open-ended system architecture. It even launched its All-In-1 as a customizable office solution encouraging third parties to write software that could be integrated under the All-In-1 umbrella. Consequently, DEC focused in on flexibility and hoped others would develop an integrated set of office tools for All-In-1.

All-In-1 Rev. 2 made each solution more customizable. Integrated applications, however, took the form of profession-specific workstation solutions. The links between the programs and the menu screens were tailored to address the needs of specific professions. Currently DEC has announced a solution for sales and marketing and financial professions.

Recently, DEC bridged the gap in its decision support offerings by announcing a program that lets MS-DOS-based spreadsheet data from Lotus Development Corp.'s 1-2-3 be the input to Deccalc, a VAX spreadsheet program. DEC went one step further to include the exchange of spreadsheet attributes and formulas in these transmissions. Prior to this announcement, DEC used the VAX script processor to transfer 1-2-3 data into a DEC Datatrieve file.

All-In-1 applications are feature rich and very flexible but still not integrated. You can interrupt any application to get into another but the combination of files from multiple applications to produce a compound document is only viewed on a printed copy.

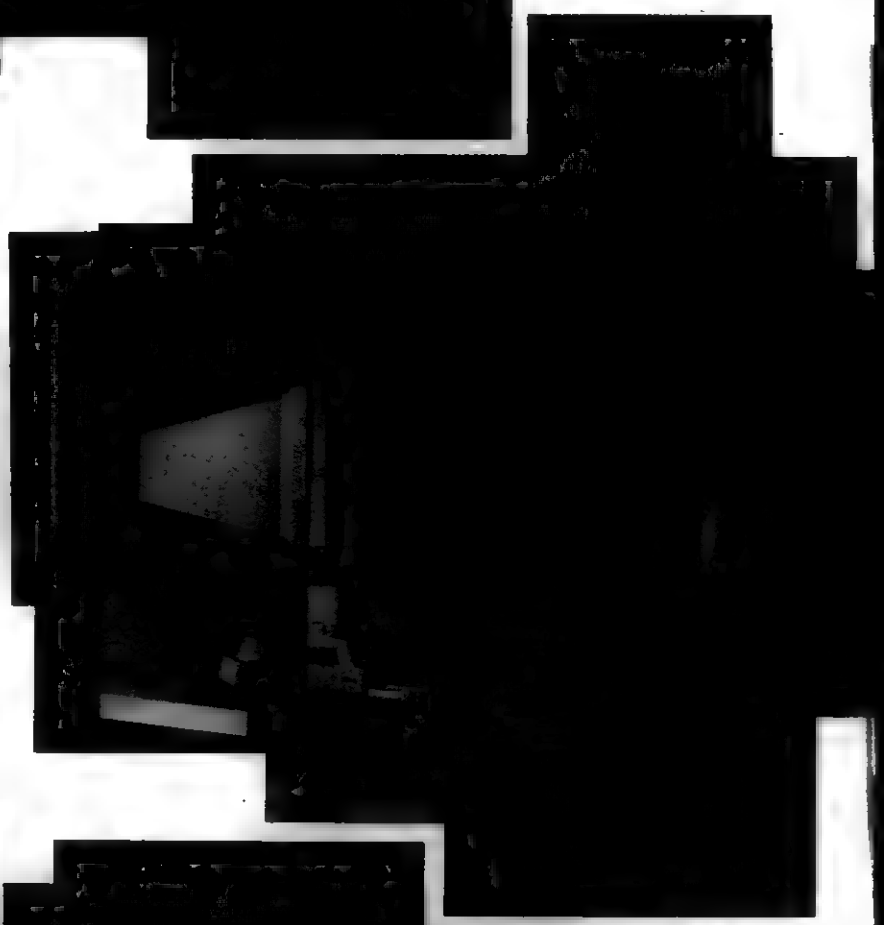
In the past year, DEC has focused developments in the area of network interconnect. Decnet services extend beyond network monitoring and file distribution to include multiple gateways to access IBM hosts for both data and text retrieval. The network directories are an example of the flexibility DEC incorporates into all program and system designs.



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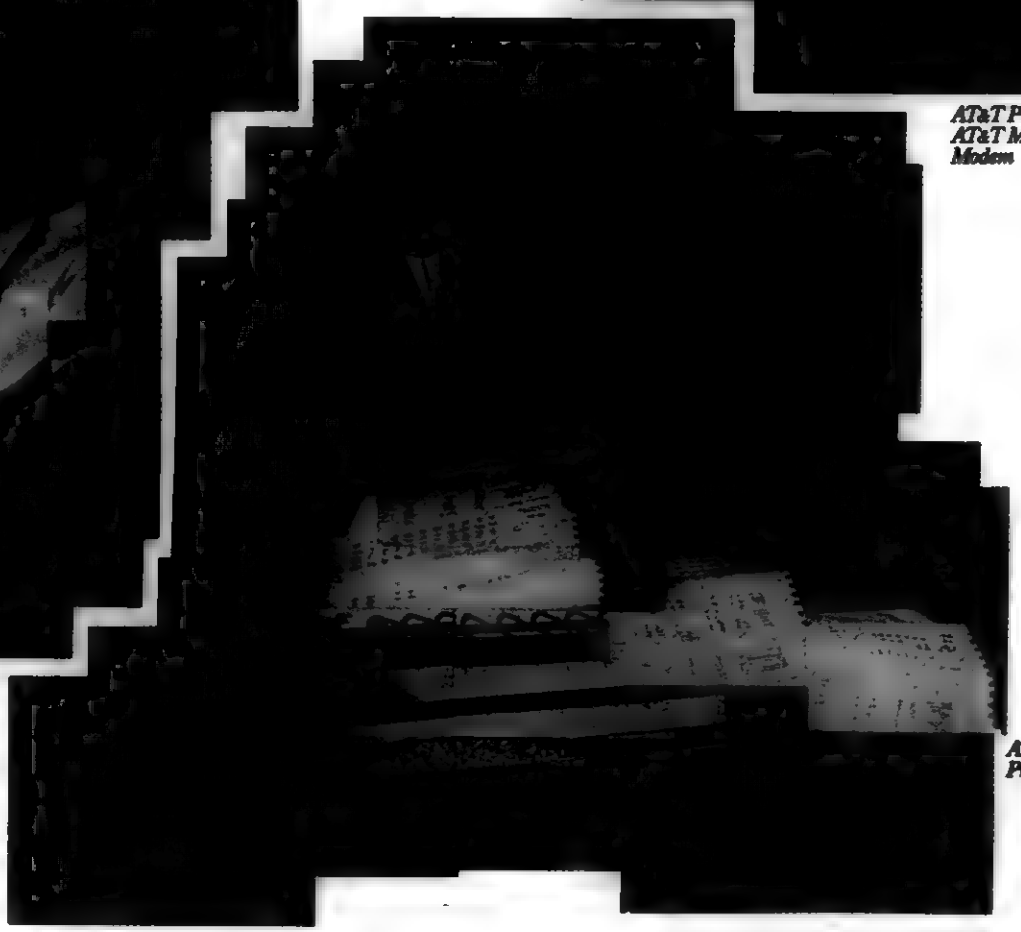


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MARKET ANALYSIS

■ *Hewlett-Packard Co.*

HP's approach to the design of an integrated office system was to start at the desktop level and later evolve these concepts to a work group and departmental system architecture. The hub of its integrated office system is the HP 3000 and the Personal Productivity Center, while its Advancenet and Officeshare networks link hosts and personal computers.

In the past few years, HP has focused on developing integrated office solutions for its personal computers. The Personal Applications Manager (PAM) is the shell that provides a common user interface for all micro-based applications. PAM is customizable, therefore allowing users to rearrange the order of the application entries on the screen, a procedure similar to menu customization. With Executdesk — a prepackaged set of applications — HP also sports a flexible open-ended environment. Executdesk was designed to allow end users to add off-the-shelf MS-DOS programs to those offered under Executdesk, making the interface consistent among all support programs.

> *HP's theory to integrate applications at the desktop level was advanced at the sacrifice of departmental-level integration.*

While other vendors focused developments on departmental-based applications, HP led the way to IBM Personal Computer interconnection. Advancelink was the first such offering that allows two personal computers — either IBM or HP machines — to exchange data files, eliminating the need for a local-area network. And via HP Print Central, PCs can direct the printing of an MS-DOS file to an HP 3000 host printer.

HP's theory to integrate applications at the desktop level was advanced at the sacrifice of departmental-level integration.

Clearly, HP has created a truly integrated solution for individual users. However, HP still does not have a central file system on the HP 3000 to combine personal computer-created files with those created by terminal users on the HP 3000. Nor will the HP 3000 host automatically back up or poll the PC files that are to be stored in the 3000 file system. And while there is consistency among the microcomputer-based applications, there is no consistency between the microcomputer and those supported on the HP 3000.

■ *IBM*

IBM, like Wang, had a number of existing office products to select as its integrated office system solution and had a very large installed base that needed to be secured from obsolescence. The industry's acceptance of departmental processing pushed IBM into marketing its System/36 as its departmental system offering. Although many industry watchers would argue that this machine is IBM's best contender in this spot, others say they believe that IBM's Professional Office System or System/38 are more competitive offerings.

The System/36's ancestry goes back to the System/3 that was introduced in 1969.

IBM's goal for the System/36 was to design a friendly, small business computer. In late 1984, however, IBM clearly positioned the System/36 as its integrated office system offering by announcing Personal Services/36, Query/36 and Displaywrite/36. Couched in with Release 4 of System/36 announcements in January 1986 was IBM's direction for the System/36 — another method to reinforce its 1984 position.

IBM has realized that through the years it has produced a line of incompatible systems. Via IBM Document Interchange Architecture/Document Content Architecture, LU 6.2 and even Displaywrite and Personal Services versions, IBM is attempting to bridge the gap between its product offerings. Yet by doing so, IBM had to pull together programs that were designed for other systems. This led to less than satisfactory performance for System/36 and made the process of integrating applications more difficult.

Thus, integration is minimal on the System/36 nor is there a common interface among its applications.

The System/36's applications are also not as functionally rich as competitive offerings. To compete as a departmental system offering, the System/36 must support more decision support programs than are currently offered. However, the System/36 was modularly designed with a pipeline operating system to accommodate additional hardware and software expansions. The System/36 is IBM's choice offering for the office. With IBM's blessing and its modular architecture, the System/36 could potentially evolve into a competitive offering for the departmental systems arena.

■ *Wang Laboratories, Inc.*

Wang has always been synonymous with office automation — that is, when office automation equaled word processing. But Wang lost its foothold in that market when minicomputers disguised as departmental systems evolved into integrated office systems. Wang had the same problems that plagued IBM. All of its office products were based upon different operating systems, thus requiring a bridge to close the gap between the company's Office Information Systems, Alliance, Wang VS and PCs. Wang Office became the umbrella solution, while Wang Office File Manager became the central file system used for archival storage.

> *Wang has always been synonymous with office automation — that is, when office automation equaled word processing.*

Wang Office is VS based; a PC version is marketed as PC Office. While the product provides a common interface shell for electronic mail, calendar/scheduling and reminder functions, this consistency has not been extended to PC Office applications.

Nor will a user be comfortable switching between Wang Office Applications and WP Plus or the Professional Application Creation Environment (PACE) because all three employ different operational methods.

Wang is another vendor lagging behind in application and file integration. Although Wang was the first vendor to offer a voice store-and-forward program on an office system, the company's program — DVX — has still not been integrated with text mail for a combined delivery of voice and text messages.

Wang, on the other hand, does offer a variety of local-area networks — from its Local Interconnect Option (LIO) (PC network) to Fastlan and Wangnet (its broadband offering). The new single-cable implementation for Wangnet supports the direct linkage of IBM 3270 devices.

And Wang, too, has embraced the IBM PC into its architecture by offering connection to its LIO network, PC Office support and the option of running a version of WP Plus locally, with or without a Wang keyboard.

Although the office applications made available are not integrated, they are functionally rich and competitive offerings. WP Plus maintains Wang's leadership in word processing, while PACE upholds Wang's image to be a leader in easy-to-use systems and programs. The holes in Wang's office solutions are surmountable: Wang needs to develop a strategy to achieve tighter integration among its applications and within the file systems. One way is to make PACE the underlying data base for its network directory services and file management software.

Each vendor approaches the developments of its office solutions from a perspective it deems necessary to secure its installed base while trying to carve a niche as a major player. Every vendor is grappling with which direction will lead it to the ultimate in system integration and interconnectivity — the concept of a virtual system.

While DG's thrust is integration among applications and files, DEC's is flexibility within applications and network interconnectivity. HP, on the other hand, focuses on integration for standalone users that includes IBM Personal Computers. IBM is still struggling with standards, and Wang continues to focus on ease of use.

No two vendors have implemented strategies that are alike. And, in reality, there is no correct strategy to which every vendor must conform. Most of the vendors are cognizant of user and market needs.

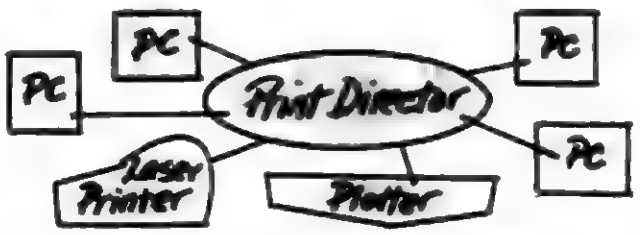
But the vendor must also juggle these requirements with how they can be incorporated into the original design of its products.

It must consider such things as obsolescence, product evolution, future market needs, technological advancements and, most importantly, research and design dollars.

The product development strategy for one vendor is usually not appropriate for another. Yet for the users, this translates to a wider range of options to select from — each vendor's solution solves a different set of problems that exist in the market today. ■

Rossi is principal of Rossi Consultants, Marblehead, Mass., as well as an associate editor for the Seybold Report on Office Systems. *She is author of the book,* Disoss Primer, *and a well-known speaker in the office automation systems marketplace.*

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LINKING STRATEGIES



Looking At Micro-Mainframe Links

·BY·CHARLES·P.·MOREL·

MIS managers have an opportunity to regain control over expanded computer resources now that users are demanding mainframe connection via their PC. Wise managers will plan the integration of future equipment and specify what that equipment will be.

Micro-to-mainframe connections are proliferating in much the same way the personal computer did a few years ago — haphazardly. Just as they did with PCs, some users are buying their own terminal emulation products and bypassing MIS managers for control of DP resources throughout the company. In cases where MIS managers do supervise the micro-to-mainframe purchase, some have been pressured into buying products quickly, without considering how this solution will fit into the company's long-term DP needs.

Both cases illustrate a common problem today: Micro-to-mainframe links are relatively new and evolving so quickly that it is easy to be inadequately informed about the capabilities of the many products on the market. The best way to build a fully functional connection is to consider the company's needs and purchase micro-to-mainframe products that will best meet these needs. With users clamoring for these popular new tools, such a planned approach is not always easy.

MIS managers have an opportunity to regain control over computer resources now that users are demanding mainframe connection via their PC. Wise managers will plan the integration of future equipment and specify what that equipment will be. But first they need to understand and support micro-to-mainframe links. Support should be easy, given the fact that these connections reduce the DP department's workload and enhance overall efficiency. Because of several myths and misconceptions about micro-to-mainframe links, truly understanding them is more difficult.

■ *Myth 1: All connections are created equal.* A simple terminal emulation board is a different animal from a sophisticated micro-to-mainframe connection product. Terminal emulation forces an intelligent microcomputer to act like a dumb terminal. Although it gives the user interactive access to host applications, it is incapable of allowing PC application software to access and manipulate the data. Users need a micro-to-mainframe connection with application program interfaces (API) that are used by PC software to perform file transfer and manipulate data. APIs provide application programs with a formalized method of requesting services from the micro-to-mainframe link. In other words, they let PC and mainframe applications interact.

Between the simplest emulation boards and the most advanced micro-to-mainframe connections are a variety of products with differing capabilities. MIS managers should match these features with the PC user's needs. Important functions like keyboard mapping, windowing, screen presentation, method of operation, installation and customization procedures vary from product to product.

As a firm begins to incorporate these varying products into a network, the issue of uniform APIs becomes critical. Some manufacturers offer different APIs across their product lines. At the very least, MIS managers should choose a manufacturer whose products are compatible and have consistent APIs. This allows the coaxial and remote micro-to-mainframe products to work together

LINKING STRATEGIES

with the micro-to-mainframe application software chosen, whether your products provide graphics, gateway, multiple- or single-session capabilities. Consistent APIs also shorten the time required to develop additional application programs and simplify the upgrading and training tasks.

At the heart of this situation is a lack of standards. Most manufacturers' boards have unique interfaces, locking customers into that particular system. A widely installed interface is on the Digital Communications Associates, Inc.'s Irma board, which was one of the first emulation products in the market. However, IBM's recently released API for the 3270 Personal Computer will probably become the de facto standard. A sensible solution is to invest in a product line that offers multiple and consistent APIs.

Companies with emulation products in place that want broader, more advanced features should also choose vendors that support multiple APIs. This will allow them to take advantage of the broad selection of micro-to-mainframe software on the market today.

In their rush to connect to the mainframe, users have accepted costly temporary solutions that ultimately did not meet their needs. To avoid having to deal with incompatible connections, MIS managers must take stock of their needs and plan before purchasing.

■ *Myth 2: Micro-to-mainframe products are independent from the rest of a company's computer resources.* A micro-to-mainframe connection is more than a board that fits into a PC with some accompanying software. The other important elements of the connection are the application software resident in the host and PC as well as the specific API employed.

And there are more items to consider such as what other PCs are used in the company and what local-area network, if any, exists. Ideally, all computer resources are compatible. In reality, it takes careful planning on the part of the MIS manager to realize this goal.

Surprisingly enough, some buyers do not check to make sure their emulation hardware supports the application software they are likely to use on both ends of the connection. Investigate the compatibility beforehand and also check to see if additional hardware is required to complete the connection.

To help create a family of computer resources that all work together and facilitate office automation, pick your micro-to-mainframe vendor carefully. Make sure the vendor's products are compatible, not only with one another but with the hardware and software in your company. To stay abreast of application software, choose a product line with a consistent and uniform API that is compatible with those being written to by mainframe software developers.

■ *Myth 3: All user needs are the same.* It is doubtful that one micro-to-mainframe product will fill all needs forever. Companies have many types of users, from data entry operators with routine tasks to financial analysts and system programmers with more complex requirements. In addition, the needs and sophistication level of users change over time. For some, a simple terminal emulator will suffice. Others need the comprehensive, interactive features provided by multiple, concurrent host sessions, including concurrent keyboard display sessions and printer sessions.

> *In their rush to connect to the mainframe, users have accepted costly temporary solutions that ultimately did not meet their needs.*

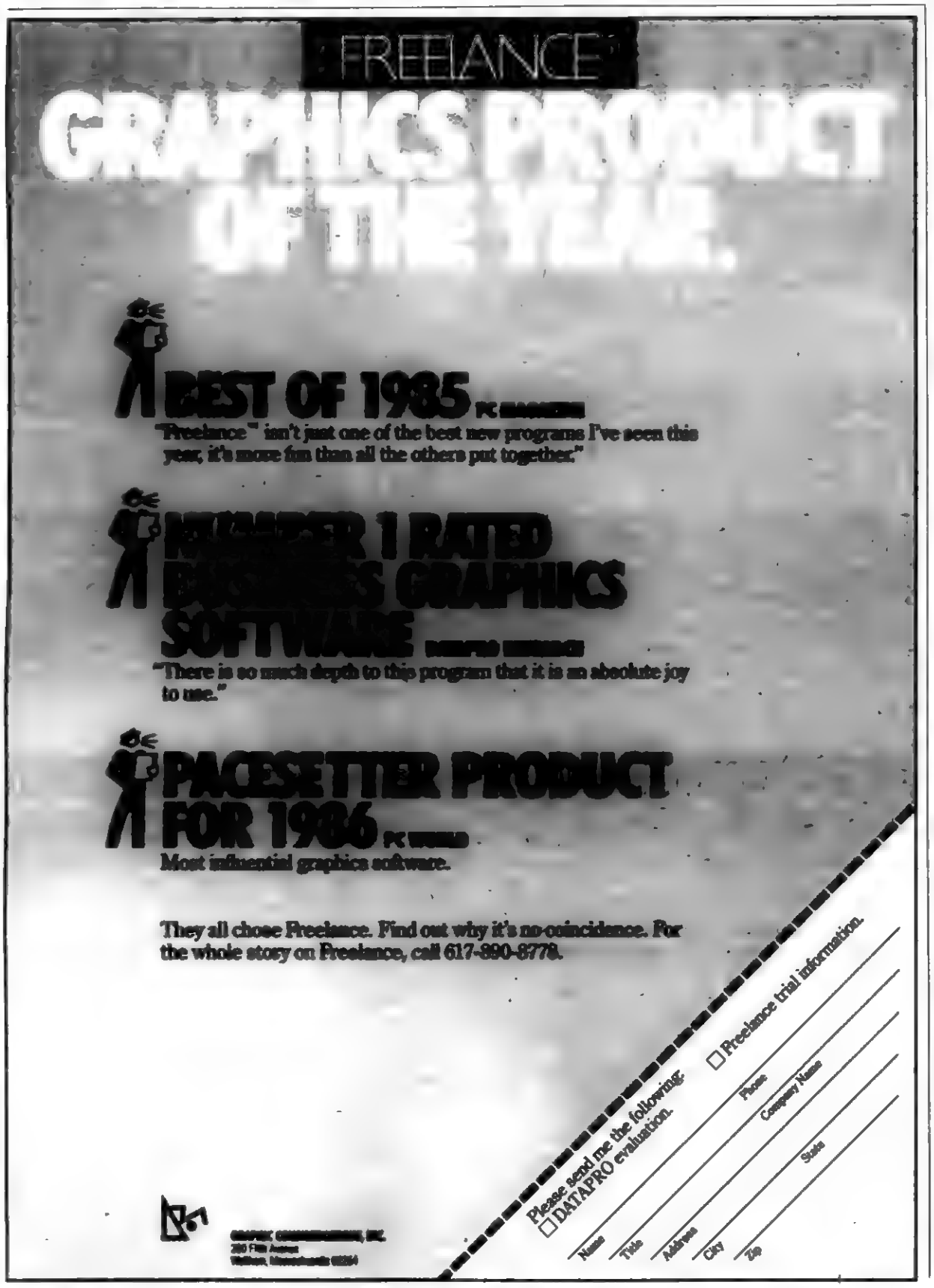
A vendor that provides an upward migration path as well as a variety of compatible products will offer MIS managers a way of protecting their investment in micro-to-mainframe connections as user demands change.

It makes more sense to buy a less complicated product and "grow" it. Look for products that can be upgraded without requiring changes to existing micro-to-mainframe hardware. A complicated product that is well beyond a user's needs will cause frustration and ultimately waste money. Equally wasteful is buying boards that are incompatible with other products and have no add-on features, then throwing them away when it is time to upgrade.

Buying an entirely new product is more expensive than upgrading an existing product. For example, companies whose potential "power users" have IBM PCs or compatibles and a terminal emulator can get the performance — and beyond — of a complex 3270-PC by simply adding software to their micro, saving several thousand dollars.

If accessing and manipulating mainframe graphics and alphanumeric data is likely to become crucial at a later date, choose micro-to-mainframe products that are compatible with existing emulators and micro-to-mainframe connections. Anticipate tomorrow's needs and buy a product line that will take you there.

Just as users needs vary, so do their locations. Users in remote sites who still want connection to the company mainframe are sometimes overlooked just because they are not around. Budgeting for



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remote access to mainframes can be more complicated because of the difficulty of estimating the actual cost of leased telephone lines. However, greater problems can result if the remote connection is purchased from a different manufacturer. Coaxial and remote connections compatible with the same interface eliminate time-consuming changes to host software. To prevent complications, MIS managers should choose one vendor with a consistent product line that includes remote connections as well.

Also at issue in choosing a long-term product is maintenance and future growth, because MIS managers do not want to be left in the dust when technology changes. To upgrade your current products, the easiest and least potentially harmful method is through software upgrades on floppy diskettes rather than on programmable read-only memory disks that necessitate replacing chips on the emulation board.

■ *Myth 4: Multiple sessions are not a practical feature for most users.* One of the most advanced capabilities of a micro-to-mainframe connection — unlike that of a simple terminal emulator — is multisessions. The user can access several host applications concurrently without signing on and off, display the information in windows on the PC screen and manipulate the data in notepads using a spreadsheet or other format.

Despite this impressive capability, some have questioned the need for such a function, believing it is only for power users. As a result, they buy a terminal emulation product that can only access one mainframe application at a time. It is important to remember that multiple host sessions are not only for getting at several applications at once. They can also be used to turn PC printers into host-addressable printers and to run concurrent file transfers, even though they still appear as a terminal emulator to the user. These are important capabilities that significantly increase system functionality.

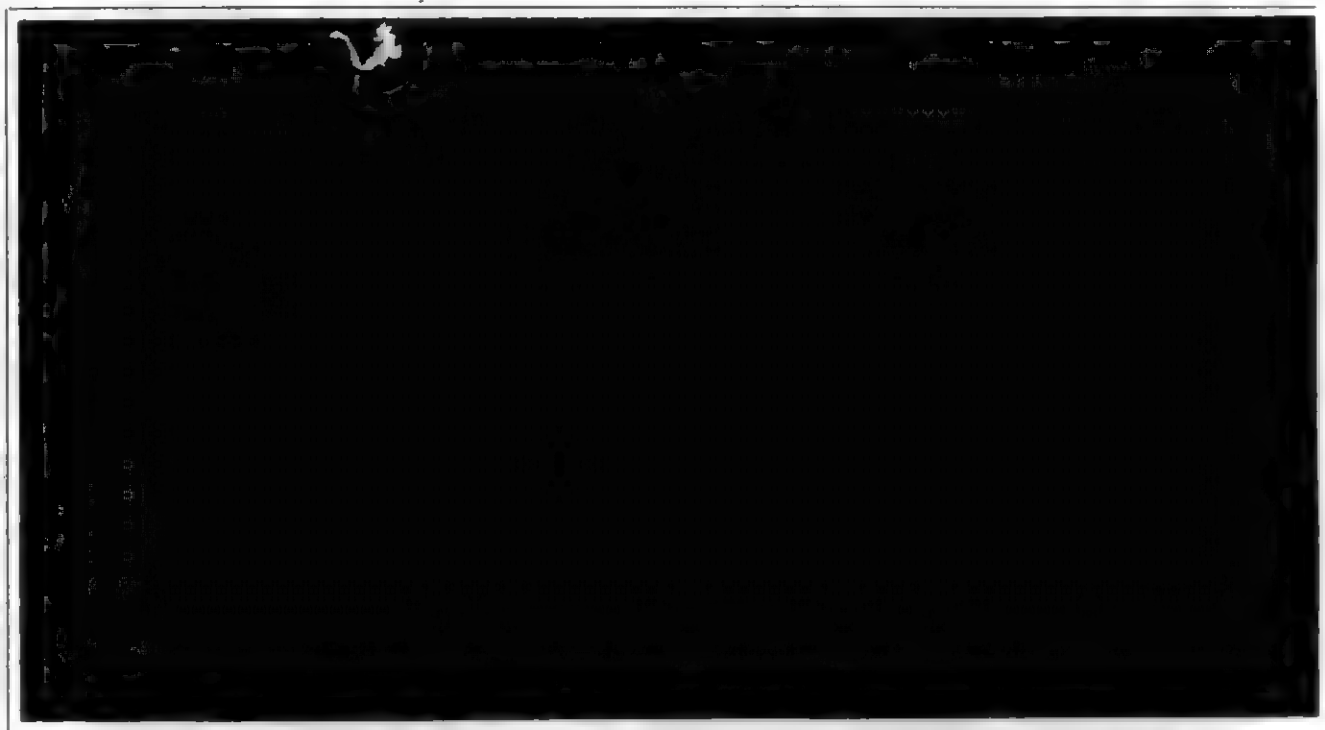
MIS managers who need terminal emulation products now — and who think they might make good use of the multisession capability in the future — should choose a vendor offering both a multisession software upgrade and a broad, compatible product line. Otherwise, there might well be training and compatibility trade-offs. Once again, careful initial vendor selection will avoid difficulties later.

■ *Myth 5: There is no relationship between local-area networks and micro-to-mainframe products.* Until recently, local-area networks and micro-to-mainframe communications products used within an office were separate from one another. Local-area networks connected PCs and peripherals, allowing users to share files and printers as well as offering helpful features like electronic mail. Meanwhile, micro-to-mainframe communications linked PCs with mainframes, enabling users to retrieve mainframe data and manipulate it locally but not share information through local nets.

Obviously, a comprehensive network with the features of local-area networks and micro-to-mainframe connections would allow even greater productivity. What is needed is a physical link that provides 3270 capability to multiple PCs on a local-area network. With the introduction of IBM's PC Network in 1984 and the recent unveiling of its long-awaited Token-Ring local-area network, a de facto standard has finally been created, specifically the Netbios interface. Because about 40% of installed PCs are made by IBM, such a standard has significant weight behind it.

New micro-to-mainframe gateway products compatible with Netbios are now realizing the potential of networking. Companies with local networks have more than one economical option in creating such a connection. They can obtain mainframe access just by adding one card to a PC within the local-area network along with additional software, or some can turn their existing micro-to-mainframe connection into a gateway with software upgrades.

MIS managers should look for gateways that offer uniform APIs and compatibility with other popular APIs. There are gateway products on the market that allow PCs within the local network to emulate powerful machines like the 3270-PC. All these capabilities give local net users a level of access well beyond what they have previously



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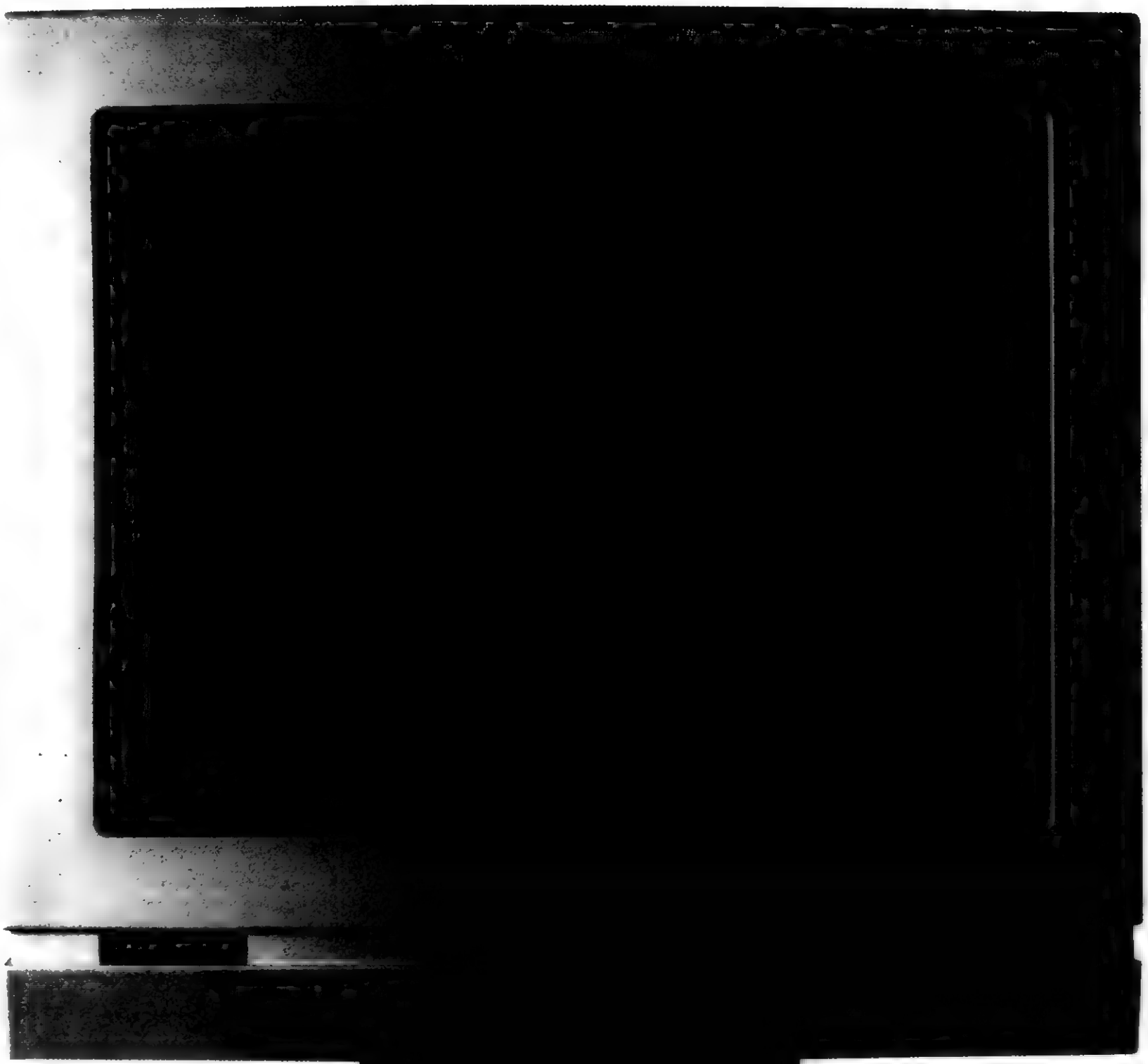
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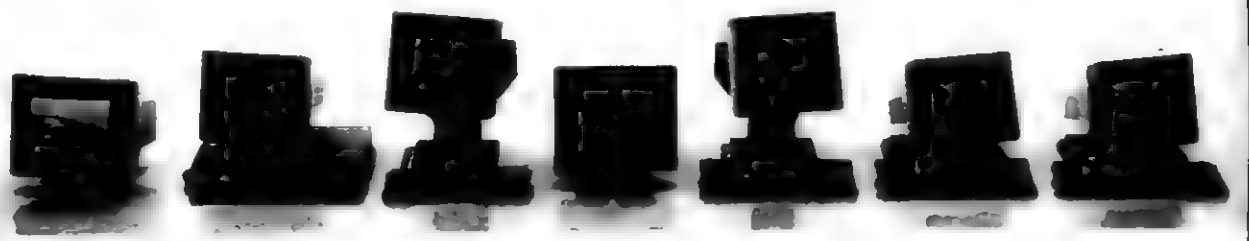
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LINKING STRATEGIES

known. Along with resource and file sharing, they can add the sharing of mainframe data bases, access to powerful host application software and the ability to turn shared, PC-attached printers into host-addressable printers.

■ ***Myth 6: New communications protocols like IBM's LU 6.2 are rendering existing micro-to-mainframe products obsolete.*** Strongly affected by the velocity of technological change, some users and MIS managers slavishly follow new developments and assume recent protocols render existing products obsolete. But often this bandwagon approach to technology is premature. For example, LU 6.2, IBM's new enhancement to System Network Architecture (SNA), is not a panacea nor is it replacing today's micro-to-mainframe products.

Users today need interactive keyboard display sessions and printer sessions supported by current micro-to-mainframe products. The program-to-program API LU 6.2 will be incorporated into use, complementing existing interactive capabilities as applications are developed to take advantage of it. These facilities require SNA software as well as a physical micro-to-mainframe connection, whether it is a coaxial interface or an RS-232/Synchronous Data Link Control one.

LU 6.2 allows application programs to communicate with one another on a peer-to-peer level. As a method of promoting true distributed processing, LU 6.2 will have increasing value in the DP world. However, it is currently available on very few of the many products in IBM's vast line. Implementation is slow, and there is little application software now available that takes advantage of this new protocol.

This emerging standard will enhance the future capabilities of micro-to-mainframe links. An evolutionary protocol like LU 6.2 is really based in software, thus existing hardware need not be sacrificed to accommodate future functions.

A similar upgrade gaining popularity is IBM's Distributed Office Support System (Disoss), which has actually been around since 1978. Disoss is a mainframe application package that provides an integrated office environment with a standardized software solution to storing and distributing documents. Like LU 6.2, Disoss represents IBM's efforts to integrate and standardize the many different architectures within its products.

To prepare for the changes that could be wrought by new standards like LU 6.2, MIS managers need to look for micro-to-mainframe vendors that demonstrate a commitment to supporting these emerging standards.

The user's insatiable thirst for information can now be satisfied through utilizing modern networking equipment like local-area networks, micro-to-mainframe links and the new gateway products. By planning an intelligent scheme that takes into account the company's need for local and remote connections as well as linking to its local-area network, MIS managers can create an effective vehicle for assuming command over their companies' expanding computer resources. ■

Morel is founder and chairman of CXI, Inc., Palo Alto, Calif. The company was incorporated in 1982 and specializes in micro-to-mainframe computer products.

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Your Checklist

The following checklist will help you choose a micro-to-mainframe vendor.

☑ **Multiple and uniform application program interfaces** — Micro-to-mainframe products should be compatible with one another and with other interfaces such as the IBM 3270 Personal Computer application program interface.

☑ **Migration path** — Look for products with software upgrades that allow you to move from low-entry products to complex products.

☑ **Multiple session support** — Multiple concurrent sessions provide access to several host applications, enabling you to combine multisourced information and allow simultaneous use of keyboard display sessions and printer sessions.

☑ **Product breadth** — Choose a vendor with a full line of micro-to-mainframe connections, including 3270 coaxial and remote connections, graphics, gateway and multisession capabilities and 5250 products for System/34, 36 and 38 connections.

☑ **IBM compatibility** — Look for a vendor that responds with products with relevant IBM offerings such as Send and Receive commands, the Distributed Office Support System transfer program and Advanced Program-to-Program Communications LU 6.2. Vendors that have developed Systems Network Architecture components in-house can respond quickest to IBM developments.

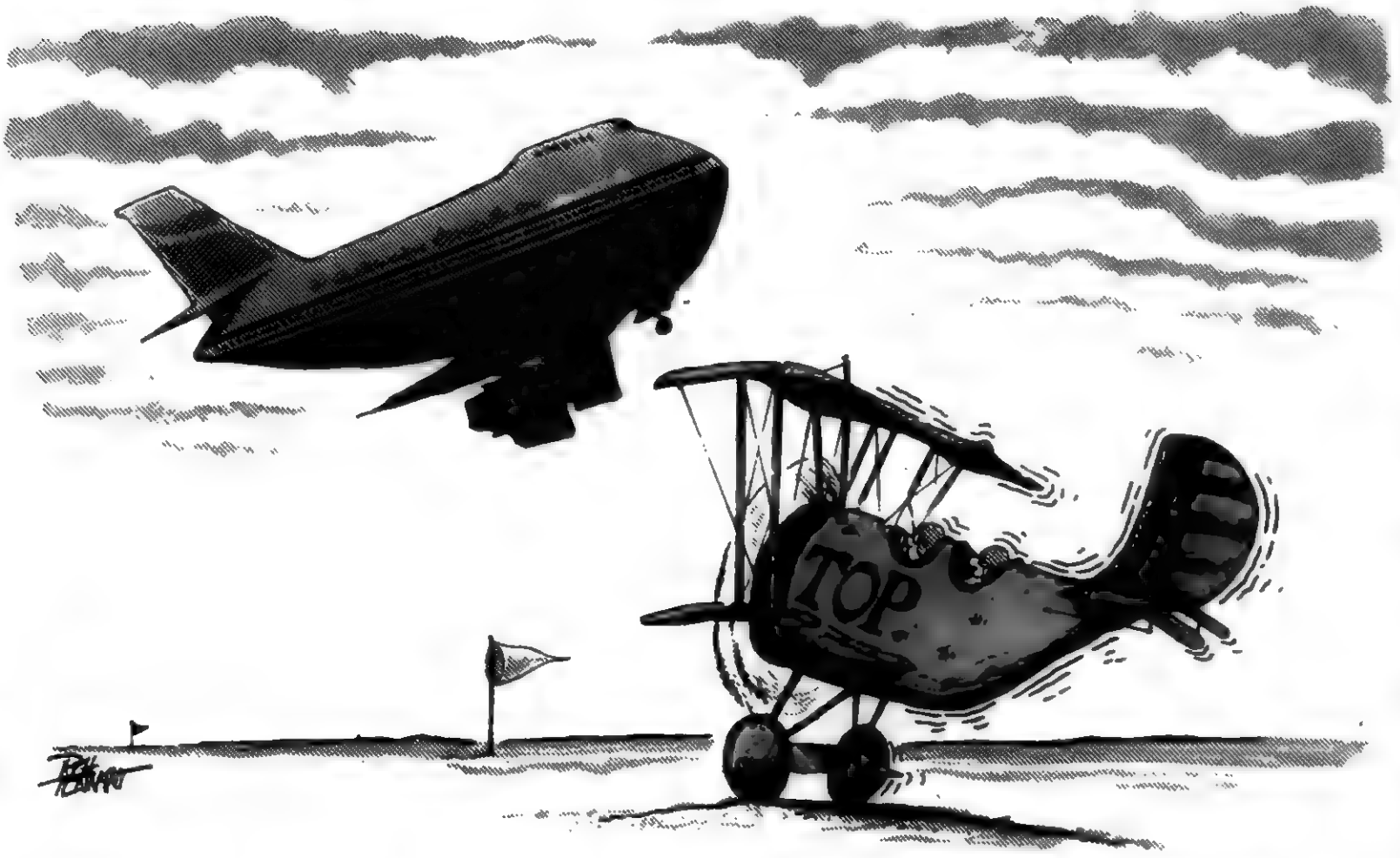
☑ **Mainframe applications supported** — Vendors offering multiple and consistent application program interfaces open the door to the broad selection of available mainframe applications.

☑ **Easy use** — Micro-to-mainframe products should be usable immediately after installation. Software upgrades will provide additional features without relearning a new product. Documentation should be easy to read, use and understand.

☑ **Support** — The micro-to-mainframe products you choose should be backed by a strong technical support team.

☑ **Maintenance** — For fast, easy upgrades, enhancements and revisions to your products should be diskette based rather than programmable read-only memory based.

TECHNOLOGY INSIGHT



Will TOP Take Off?

·BY·STAN·KOLODZIEJ·

Since Boeing Co. of Seattle began promoting its Technical and Office Protocol (TOP) networking standard last year, it has been struggling to be more than a voice in the wilderness but with mixed results.

Whatever publicity TOP has garnered to date has been caught on the rebound from General Motors Corp., which has been making the manufacturing industry and press sit up and take notice of its own Manufacturing Automation Protocol (MAP) networking standard. TOP has been riding the publicity coattails of GM for two good reasons.

The first reason is technical. Both MAP and TOP are based on the seven-layer Open Systems Interconnect (OSI) networking model sanctioned by the Geneva-based International Standards Organization (ISO). In fact, of the seven layers in the OSI model, TOP and MAP diverge in only the first and seventh layers. (The seventh layer, dealing with actual applications, is still unformulated.) Otherwise, they are compatible.

The other reason is a lack of marketing punch. Though Boeing is a large, high-profile manufacturer and prolific user of computers, it still cannot exact the kind of commitments from computer vendors that a company like GM can exact, especially in light of GM's long-range intention to spend $5 billion in upgrading companywide computer operations.

Further weakening Boeing's position is the makeup of the office market. The U.S. manufacturing industry, because of its relatively recent foray into plant-based computers, is still open territory for computer vendors to grab substantial market shares. Unlike office computing where IBM holds sway, no single vendor or group of vendors has gained enough market share in the manufacturing industries to be able to impose proprietary, de facto standards.

This has left room for a big company like GM to wield clout, creating enough interest and momentum around MAP and undermining any efforts from computer and communications vendors to try and create other de facto networking standards.

The office market, where TOP is aimed, however, is another story. IBM's monolithic presence (and brand name) is everywhere. Of more direct concern for Boeing, however, is the growing pervasiveness of IBM's Systems Network Architecture (SNA), IBM's major way of tying their machines together in the office.

Stacked up beside SNA, Boeing's TOP seems hopelessly outmatched. Against the estimated 20,000 SNA installations in the U.S., TOP to date can boast of none outside Boeing itself. In fact, most of those vendors that have promised future products under the TOP standard are themselves using SNA in-house. SNA and TOP are further kept apart by the fact that both models are incompatible at most levels of connectivity.

Despite the temptation to position TOP and SNA as bitter rivals in office networking, the more likely play of events will see them coexisting uneasily with each other, used separately to handle specific applications. Also, through gateways and interfaces, SNA and TOP will overlap to form hybrid networks.

Boeing itself certainly has no illusions as to how far TOP can travel in an IBM universe. "We're not daydreaming," said Laurie Bride, manager of advanced data communications technology at Boeing Computer Services Co. in Bellevue, Wash. "We have to live with IBM, but if we can also create enough user interest in the OSI standard and [consequently] in TOP, IBM is going to have to include us [TOP] in their world."

Bride also pointed out what she thought was a high card in TOP's hand: The fact that TOP is geared more toward the distributed processing environment, as opposed to what she termed is IBM's traditional strong marketing slant toward centralized, mainframe processing sites. "We're starting at the workstation and minicomputer level and tying in mainframes. Going from the bottom up, we understand the need for more interactive processing, not just linking dumb terminals to mainframes," Bride explained.

TECHNOLOGY INSIGHT

For TOP to make any sort of impact in office networking, though, most industry observers agree it will have to stay close and take advantage of the momentum gaining around MAP. For one thing, those corporate users installing MAP networks will be able to link them to OSI-based office networks like TOP with few problems. The only hurdle at this stage will be the transport mechanism used at the first level. At this level, MAP has opted for a broadband cable using IEEE 802.4 token-passing technology, while TOP uses the IEEE 802.3, a carrier-sense multiple access with collision detection (CSMA/CD) baseband bus standard.

The difference in network transmission techniques results from the different requirements in the TOP and MAP processing environments. In manufacturing, fast throughput for many operations such as process control is essential. CSMA/CD technology is not as efficient a method as token passing for handling large, real-time data processing. Also, broadband, with its capability of being split into numerous frequency channels, can accommodate more data capacity and speed than baseband and is better prepared to handle different types of media such as video and graphics.

Bride said that network transmission speed is not really the big issue right now. That distinction, Bride maintained, rests with the current lack of functions available for the TOP network. That problem is being addressed at the seventh layer, the level dealing with applications.

Work within TOP is under way on proposed standards such as FTAM for the exchange of electronic mail, text and graphics. This work is being handled in tandem with the National Bureau of Standards and other work is under way to coordinate MAP, TOP and OSI within existing standards bodies. For example, the Office Document Architecture (ODA) standard has been approved by the European Computer Manufacturers Association and is now serving as the basis for an ISO standard that could eventually find its way into the TOP format.

Against this background stands the Industrial Technology Institute (ITI), a facility in Ann Arbor, Mich., entrusted with the task of providing testing and certification for vendors coming out with MAP- and TOP-based products. Though ITI has already begun testing MAP products, it will not be providing the same services for TOP vendors until later this year, when more TOP products are expected to start appearing on the market. When TOP testing begins, the ITI certification will act as an important product channel for the networking industry.

While IBM has given its nod to the OSI standard, Big Blue has also been aggressively attempting to forestall more criticism of its present inability to network SNA users into some of IBM's other operating environments such as CICS and the IMS data base management system.

Within SNA, for example, IBM is ahead of schedule in offering peer-to-peer communications ability between IBM Personal Computers and minicomputers through its LU 6.2 and PU 2.1 networking protocols. IBM is also tying in its Document Interchange Architecture (DIA) and Document Content Architecture (DCA) formats for electronic messaging. This gives IBM users the ability to transfer files directly from one SNA workstation to another without the direction of a cluster controller or file server.

> ”
> *For TOP to make an impact in office networking, it will have to stay close and take advantage of the momentum gaining around MAP.*

IBM is also expected to announce an interface between its Token-Ring network and SNA. Beyond this, many industry observers see 1987 as the year IBM begins tying its other mainframe operating system environments directly with SNA. Such communications universality within the SNA world is expected to undermine a large part of the appeal that OSI has gained in the U.S. from IBM users unhappy with the company's history of building proprietary blocks of processing environments unable to talk to each other.

In spite of this, TOP will probably find its market niche within what Hal Folts, president of Omnicom, Inc., a consulting firm in Vienna, Va., termed "communities of interest": those companies such as airlines, power utilities and manufacturing concerns requiring contained, specialized applications and where a de facto industry standard such as SNA would lose much of its appeal.

"Airline reservations systems, for example, are not sold on the premise that they will also be compatible with an outside bank's system or any other system for that matter," according to Folts. "The same is true with manufacturing industries. Their requirements are specific and geographically limited within the company.

"MAP will be the standard on the manufacturing floor. As there is a need to link data from the floor into the office, it makes sense to plug a TOP network into



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the existing MAP network because they are basically compatible, rather than trying to graft SNA onto MAP, layer by layer," Folts concluded.

At this stage, TOP is being driven by various user/vendor groups. These groups have a vested interest in having an alternative to SNA available in manufacturing, a point borne out by Charles Gardner, corporate systems standards coordinator of information systems at Eastman Kodak Co. in Rochester, N.Y.

Gardner explained that TOP working groups handle separate questions dealing with the various layers of the OSI model. Different vendors are sponsoring work at each level: Lockheed Corp. has graphics, McDonnell Douglas Corp. sponsors work on the product data exchange syntax, Boeing has virtual terminal messaging, and Motorola, Inc. handles work on the physical layer links. All of these vendor-supported groups have also been working hard to get MAP moving.

TOP's affiliation with MAP has also become tighter with the recent decision to consolidate MAP and TOP meetings under one roof, the first of which is scheduled this month. The Society of Manufacturing Engineers (SME) is now combining TOP and MAP memberships under single-membership fees. Though MAP and TOP have separate users groups, they now have a common steering committee.

If anything, there probably will not be a single OSI implementation existing in most TOP installations but rather a number of hybrid products integrating SNA and OSI models and aimed at the specialized applications in the communities of interest mentioned earlier. "IBM might say, 'We'll take three of the layers of OSI, mix in some SNA layers for certain applications and tie it all together.' We'll see more customization like that," Omnicom's Folts said.

For now, there's more discussion about TOP than actual product. One of the few firms that has actually come out with a TOP product is Charles River Data Systems, Inc. of Framingham, Mass. In 1985, the company came out with a physical link router that connected MAP and TOP networks and is set to introduce a dedicated TOP software tool this summer. Reversing the usual trend, Charles River Data Systems started with TOP and is now "working its way backwards" into MAP, according to Eric Spiewak, the company's director of networking.

Spiewak downplays TOP's overall reliance on GM and MAP. "Boeing probably has the biggest installed computer base in the U.S. outside the federal government," Spiewak explained. "What they want to put across is the idea that OSI and TOP have legitimate places in the office."

David Sohm, vice-president of marketing at Ask Computer Systems, Inc. of Los Altos, Calif., said his company is monitoring TOP developments closely, keeping track of the market and receiving TOP committee literature through SME memberships. For the past several years, Ask Computer Systems has marketed a manufacturing resource planning system called Manman, composed of a number of separate software modules.

"Our software fits in the center of the manufacturing process, between the shop floor and the financial applications," Sohm explained. "What we'd like to do is layer our software into TOP products when they become available."

IBM for its part is using its major presence in Europe as a testing ground for its commitment to OSI. OSI enjoys a much higher profile in Europe because of its backing by the European Community and the willingness of the various national governments to push for standards that would cut across regional market limitations and create a uniform front against IBM. European vendors are quickly coalescing around OSI and forcing IBM into scrambling to produce OSI products to prevent being frozen out of this potentially huge market. Many analysts predict IBM will create its first OSI products in Europe then import them into the U.S. market as OSI comes up to speed.

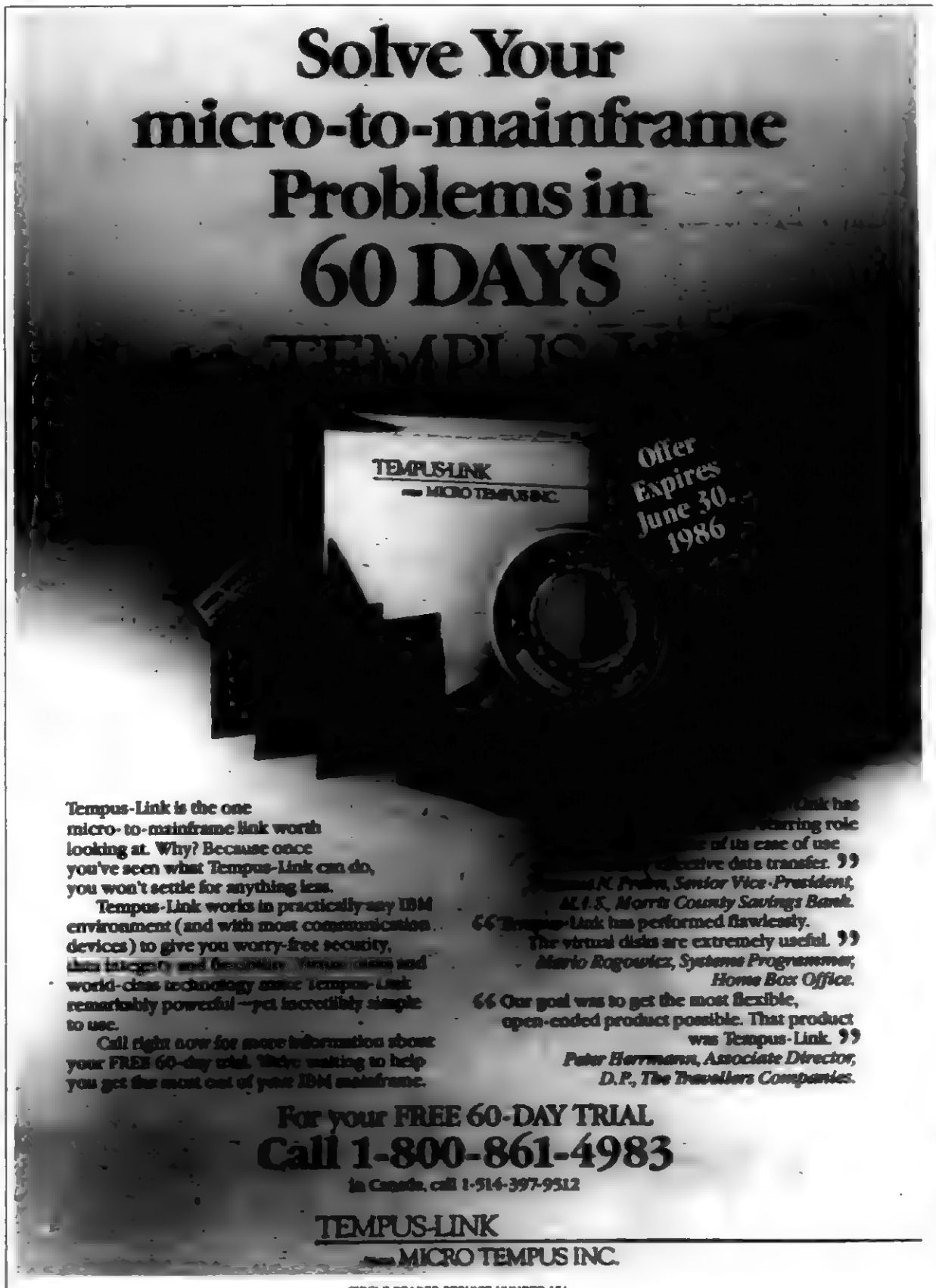
> *"There's more discussion about TOP than actual product."*

In the meantime, IBM recently joined the Corporation for Open Systems (COS), a North American organization composed of several leading computer manufacturers and with a mandate to help quicken the pace with which communications between equipment from various vendors can be connected in the same office.

Bride does not see IBM's COS affiliation as merely another cosmetic move by the company to keep its options open both in SNA and OSI. "Membership to COS is expensive and ties up some key personnel from member companies," she explained. "The fact that COS already has $6 million in the coffer and is well on the way to its $10 million goal of 1987 says the group means business."

Alex Nedzel, managing associate at Index Systems, Inc., in Cambridge, Mass., said he thinks OSI will be competitive in the North American market in five to 10 years, but that doesn't necessarily include TOP. "SNA and the DIA/DCA architectures will dominate the U.S. market, but TOP won't go away. It'll find its place beside SNA and MAP."

Kolodziej is a senior writer at Computerworld Focus.



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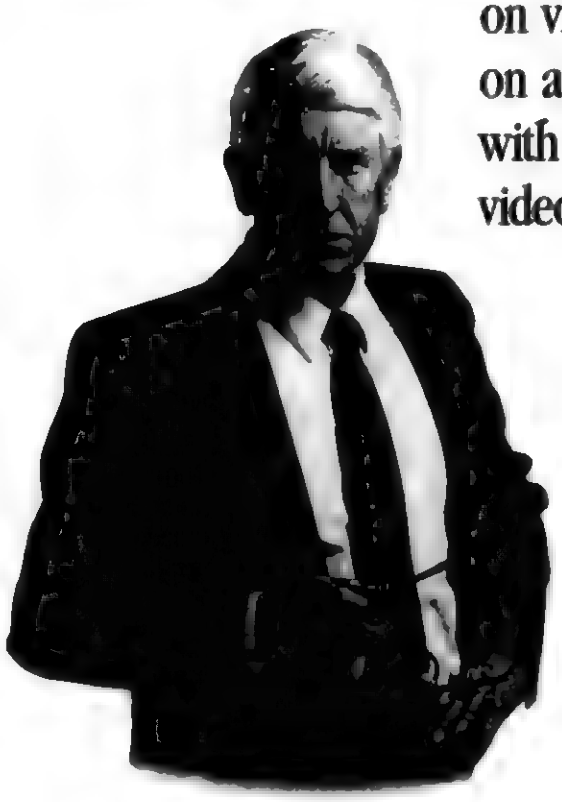
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SPECIAL SECTION:
BUSINESS GRAPHICS

Predicting Trends For '86



DAVE RIDLEY

·BY·ALAN·PALLER·

The winds of change are sweeping through the entire computer industry, and the computer graphics arena will not remain immune.

Nearly two-thirds of personal computer and minicomputer graphics software vendors will disappear by the end of 1986, most ink-jet printer vendors will turn to other technologies, and manufacturers of the venerable digital plotter will begin to look to other, faster technologies for growth.

As choices begin to narrow, end users and MIS are breathing a sigh of relief. They no longer fear that the products they buy will soon become obsolete. In addition, most trends shaping computer graphics are no longer independent of the trends shaping other areas of information processing. Communications, cooperative processing, integrated text, data and graphics, standards and the concerns of new users now affect graphics just as much as they affect other software and hardware decisions.

The following outline illuminates the trends that will be important to computer graphics users during 1986 and describes what users can do to anticipate the trends and take advantage of the opportunities they offer.

Hardware Trends

■ *Graphics resolution in displays will improve.* The screens on PCs and terminals used to preview graphics are getting better, allowing for more detailed graphics with more varied lettering to be displayed clearly. The biggest change will be seen in PC displays as most PC buyers begin to acquire the IBM Enhanced Graphics Adapter (EGA) expansion card, which offers a much greater resolution than the standard IBM color card. Third-party vendors of add-on equipment will also announce EGA-compatible display controllers. By year-end 1986, EGA compatibility will be the standard for PC graphics.

In the graphics terminal market, IBM 3179 graphics terminals, Tektronix, Inc. 4100 series terminals and Digital Equipment Corp. VT241 terminals will continue to be the most popular machines. However, they will get competition from IBM and compatible PCs with EGA cards. The PC is beginning to be perceived as the graphics terminal of the future because it can serve either as a stand-alone micro or, with a higher resolution graphics card, as a graphics terminal.

Also during 1986, very high-resolution color graphics terminals and PC expansion cards will become available, offering up to 2,000 lines of resolution on the screen. The higher prices of such products will limit their use to applications such as computer-aided design and computer-assisted publishing where precise visualization is worth the extra cost.

■ *Lasers and thermal color printers with more speed, better quality and lower costs will be available.* The traditional graphics hard-copy systems, plotters and matrix printers raise barriers to effective use of graphics: They are either too slow or their output resolution is too low. Lasers and thermal transfer printers solve those problems. Lasers offer 300 dot/in. black-and-white charts at rates ranging from one to 100 chart/min. New thermal transfer printers provide 200, 300 or 400 dot/in. color charts or overhead transparencies at the rate of one per minute. These higher speeds with good quality make high-value graphics applications feasible as long as the graphics printers are connected correctly to computer systems — namely, as shared printers on a network.

During 1986, users will be buying a large number of laser printers and thermal transfer printers. The cost of these graphics printers dictates that they be connected to networks rather than individually attached to every workstation. PC networks, minicomputer networks and mainframe networks will all be used to give both PC and terminal users access to graphics printers.

By mid-1986, the most visible indication of an advanced, cost-effective computer graphics hardware installation will be a laser printer connected to a network. In organizations implementing this configuration, every user of a terminal or communicating PC will

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be able to get high-quality charts simply by asking for them on the keyboard on the desk.

For color charting, users will continue to purchase small, inexpensive digital plotters in large numbers as personal graphics devices; however, economic growth in the plotter market has ended. Thermal transfer machines are already eroding the market for larger, higher cost plotters. Furthermore, firms will announce late in 1986 new color laser printers offering even higher speeds than those of thermal tranfer printers. However, users who purchase thermal color transfer printers during 1986 will not be embarrassed by the color laser announcements. Thermal transfer printers will cost about $6,000 compared with a cost of more than $15,000 for color laser printers.

■ *New graphics workstations will bring mainframe power to the desktops of professionals.* This year, a large number of powerful personal workstations will be purchased by professionals whose work requires software that has traditionally run only on minis and mainframes. These personal workstations use Unix, VM and VMS, which are the operating systems under which important applications software packages already operate.

The workstations will allow users to off-load those applications to desktop machines that cost $12,000 to $25,000. For users whose current monthly mainframe or minicomputer time-sharing bills exceed $500 or $600, the workstations offer two- to four-year paybacks and promise extensive additional computing at no additional cost.

The machines in this category include Sun Microsystems, Inc. and Apollo Computer, Inc. units and will soon include similarly powerful machines from AT&T, IBM and DEC. Entry of big-name players, especially IBM, will induce large corporations to acquire significant numbers of these workstations. Many will become network servers for PC networks, and many more will become personal workstations.

Cooperative Processing Trend

■ *Microcomputer-mainframe cooperation will bring powerful graphics to PC users.* Cooperative processing is an emerging trend in the graphics field. One area in which it is valuable is in helping PC users get access to graphics hardware such as laser printers, film recorders and thermal transfer printers. Cooperative processing makes it possible for users of PC packages such as Lotus Development Corp.'s 1-2-3 to get very high-quality graphics output without buying individual graphics plotters or printers and without waiting for those printers to work.

Here is how cooperative graphics processing works: The 1-2-3 user previews a chart in 1-2-3. When the data and chart look right, the user invokes a function that translates the 1-2-3 WKS file into a compact Issco Graphics, Inc. Tell-A-Graf command file, for instance. That compact command file is transferred to a mainframe, mini or workstation where the software and high-quality graphics hardcopy devices reside. Charts, overheads or 35mm slides are produced automatically and delivered back to the 1-2-3 user. In essence, the mainframe or minicomputer has become a network peripheral to the personal computer.

Demands for improved productivity are driving this trend. The high cost of fast graphics output equipment relegates most PC users to low-speed plotters. Those users do not have time to wait for the plotter so they use charts sparingly, even though they would like to produce many more charts. Cooperative processing allows them to produce all the charts they need without wasting time.

■ *Cooperation among proprietary software packages will improve access to data and the payoff from graphics.* The biggest barrier to high payoff graphics applications is the lack of high-speed, high-quality graphics hard-copy equipment. The second biggest barrier is the difficulty of getting the right data into the right chart. Data base packages and fourth-generation languages have excellent access to data and analytical functions, but, for the most part, their graphics components lack capabilities that are essential.

In the past, the latter barrier was removed circuitously by forcing the data reporting packages to generate reports in formats that powerful graphics packages could read. During 1986, a new solution will emerge in which more effective graphics software operates as an embedded function inside the reporting software.

> *MIS is demanding that graphics affect the bottom line by reducing manpower requirements, saving money, improving product quality or increasing sales.*

Software Trends

■ *Packaged solutions will bring in a large number of new users.* Graphics-software vendors are delivering a new class of product, called application-intelligent software, that offers users immediate improvements in productivity. Application-intelligent software combines chart-making tools with a knowledge base about what types of charts users need. The software releases the user from the job of trying to force a general-purpose graphics package to create a special-purpose chart when that special-purpose chart is one commonly needed by many users.

Three popular examples are maps, project management Gantt charts and financial analysis charts.

Project management applications will affect large numbers of graphics users because nearly every organization manages projects. Macproject, the project management application on the Apple Computer, Inc. Macintosh, is one of the most common uses of that computer. Similarly, Issco's Tell-A-Plan project management graphics software for IBM mainframes and DEC VAXs is used more often than general-purpose graphics tools in several organizations even though the general-purpose tools have been available much longer.

The largest impact of graphics applications during 1986 will be in the financial management area. New management chart books that provide instant complete financial management charts are coming on the market. A single compound chart in the chart book, for example, includes a time series line chart comparing budget with actual spending, a variance bar chart and a table providing detailed data. Chart books offer 20:1 productivity improvements. Without the management chart book, users would have to spend several hours making that chart; with it, they spend 10 minutes.

■ *Integrated text and graphics will change the look of internal documents.* The combination of higher resolution printer, higher resolution screens and upgraded word processing software is changing the way memos and reports are produced. Most word processing programs announced in 1986 will allow diagrams and charts to be embedded in the page. They will also include many more text fonts and sizes to facilitate publication-like appearances.

Although complete computer-aided publishing packages will be used for some of the integration, a much larger user base will develop when new versions of the most popular word processing packages — Multimate International Corp.'s Multimate, Micropro International Corp.'s Wordstar, IBM's Displaywrite and Satellite Software International's Word Perfect — are announced with built-in text and graphics integration.

■ *New graphics user interfaces will prosper when they are free.* Microsoft Corp.'s Windows and Digital Research, Inc.'s Graphics Environment Manager (GEM) claim to offer Macintosh-like ease of use on IBM-compatible PCs. The marketplace has shown that pop-up menus, graphics symbols, windows and mouse input are all valuable capabilities, but they will not be bought in volume until they are embedded in application packages and their price is included in the application package price.

The trend for graphics user interfaces during 1986 will be toward OEM contracts. GEM and Windows will compete against each other on price for OEM contracts with software and hardware vendors that want to make their software or hardware products stand out as modern looking.

Beyond 1986, Microsoft's graphics user interface capabilities are likely to become an integrated part of its own MS-DOS operating system and will be included in OEM sales of future versions of MS-DOS.

Once graphics capabilities are built into the operating system, by Microsoft or IBM, application software vendors will take advantage of those capabilities, and many users of PC-compatible computers will begin to use them.

■ *New training programs begin to improve the effectiveness of graphics users.* In the past, traditional training programs in computer graphics focused on how to use the hardware and software. Organizations rapidly discovered that mangers who knew what chart they should make were far more productive users of graphics than were people who had no such training. During 1986, dozens of large organizations will hold in-house classes to describe how to choose the right chart.

■ *Executive graphics decision support systems will spread.* The final trend in graphics is toward the rapid spread of senior management information systems that use graphics. These systems are distinguished by their unique delivery vehicles rather than by the charts they include. Delivery options include pocket chart books, full-size chart books, graphics terminals, PCs and large-screen projectors.

Pocket chart books may include as many as 100 pages of charts and tables with two or three charts on every page. They fit in the breast pocket of a suit and are especially well liked by mobile executives who need answers at the tip of their fingers.

PC delivery of charts also is becoming popular. At the U.S. Air Force Electronic Systems Division, for example, a system being used by a commander will soon be extended to more than 1,000 PCs. Every PC will get access to central libraries of management charts. The Air Force system, developed by Booz, Allen & Hamilton, Inc., uses VAX minicomputers to gather, analyze and chart key management data. It downloads the charts to PCs that can each store up to 1,000 charts on a hard disk. Executives and managers see a menu of available charts on their PC screens and can view any of the charts in less than 10 seconds. High-resolution graphics screens and large-screen projectors are added when the system is to be used for briefings. Ink-jet and thermal transfer printers are available for hard copy.

The bottom line is that the aforementioned graphics trends are part of an overall trend in computer graphics: the shift toward high payoff applications. MIS is demanding that graphics affect the bottom line by reducing manpower requirements, saving money, improving product quality or increasing sales. Managers are pressing their information center staff and application developers to focus on applications that meet this requirement.

These applications have had a common characteristic: They involve the creation of a large number of charts. The growth in high-volume charting helps explain the trend away from plotters and toward fast laser printers and thermal transfer printers. This growth also helps support the need for cooperation between data reporting packages and graphics packages because manual data entry is tedious and error prone when large numbers of charts are needed. It also explains the need for micro-mainframe links required to give PC users access to higher volume hard-copy devices and access to the better quality software that resides only on minis and mainframes. And this growth supports the need for graphics workstations because high-volume charting applications generate large time-sharing bills.

Finally, demand for high payoff applications explains the trend toward graphics application software packages. Graphics application software facilitates prototyping and experimentation, which are the prerequisites of successful computer applications.‡

Poller is president of AUI Data Graphics, an education and consulting firm for computer graphics, located in Arlington, Va. He is also on Issco Graphics, Inc.'s Board of Directors.

SPECIAL SECTION:
BUSINESS GRAPHICS

Getting The Most For Your Dollar



·BY·MARK·G.·RAWLINS·

Increased productivity through graphics clearly is achievable. Unfortunately, the decision-making process, buying guidelines, implementation and application integration of graphics are related in such a way that an incorrect decision in one area can have catastrophic results in the others.

As with any computer-based productivity tool, getting people to use software is the most significant hurdle to overcome before addressing productivity enhancements. It is imperative to secure that the basic building blocks are in place.

The four primary concerns in ensuring the access and availability of the appropriate tools and resources for a productive graphics investment are as follows:

- Implementing a budgeting and justification process.
- Choosing the right software.
- Choosing the right hardware.
- Getting the software and hardware to work together.

The budgeting and justifications process. The cost of graphics hardware and software has plummeted. Less than seven years ago a high-resolution film recorder for storing computer graphics on 35mm slides cost $200,000. Today a film recorder of comparable quality costs less than $10,000. If a user is willing to sacrifice half the resolution and produce slides with roughly the acuity of the human eye, a slide recorder can be found for $7,000. But many companies and individuals investing in computer graphics do not fully anticipate the hidden cost. These costs cover such things as training, support, printer and plotter supplies, documentation, graphics hardware upgrades, software additions and general computer resources costs. To some, these additional unexpected expenses make that initial graphics investment lose all significance. However, these are realistic productivity expenses that can be managed and justified.

Figure 1, page 39, is a partial list of fixed and variable costs associated with a computer graphics investment. Associated with each line item is an approximate expense level that can be used as a reference point. Each item is specific to each organization and need, but the list demonstrates some of the thinking and planning that is required in the justification process.

The costs in Figure 1 are not inclusive but rather areas of consideration. Once a rough handle on the cost of computer graphics is available, the productivity gains should be evaluated. Gains are more difficult to measure than costs because expenses appear on the books fairly soon after a decision is made. Productivity gains, on the other hand, may not be felt for a number of months. It is important to look at short-term productivity gains because the ineffective use of computer graphics from the outset may never allow you to achieve your objectives in the long term.

An outline of some productivity gains that might be expected in a large organization or department is shown in Figure 2, page 39. Again, these need to be modified for specific requirements.

A small department or organization could realistically experience a cost or productivity savings at the management level of about $50,000 a year.

Choosing the right software. When considering investing in computer graphics, many buyers initially look at hardware requirements and then try to find software to complement these requirements. Because hardware is more tangible than software, there is a natural gravitation (and ease of selection and justification) toward specifying the hardware first. Do not fall into this trap. Software offers solutions and solves problems; hardware is the medium through which the user takes advantage of the solution.

Choosing areas where graphics can have a major impact on productivity can help drive the justification process. The most obvious areas of impact are those in which graphics are being produced by hand. These areas include engineering, research and drafting as well as graphics arts departments.

When the reasons for choosing a certain graphics option are considered, cost savings and expenses can be evaluated. Again, do not be

SPECIAL SECTION: BUSINESS GRAPHICS

fooled by looking merely at dollar figures. A project selected as being highly leveraged through computer graphics might prove a failure due to poor corporate visibility, lack of user support or the amount of time it takes for it to come up to speed.

The software selected can be easily modeled after the work that is currently being done by hand. Users can specify features they require to the software buyer who then can begin the selection and evaluation process.

Another area where graphics can impact productivity is within a department that is not using graphics at all. However, justifying the replacement of hand-drawn graphics with computer-drawn ones through a simple analysis will not easily work with new users.

Each group should consider the following ways in which graphics can have an impact:

- Shortening the process from data gathering to information understanding.
- Expediting trend spotting.
- Aiding the training process for new employees.
- Monitoring production output or manufacturing quality control.
- Seeing the results of "what if" questions.

Again, it is important to select those areas where graphics will have more than just a monetary impact. Select graphics projects that have high visibility and strong user support.

Specifying software for new applications where graphics is currently not used is more difficult than replacing hand-drawn graphics with computer graphics. The users need to be able to articulate those processes that would be optimized by graphics.

With an understanding of these general requirements, a set of software features can be created. Defining the scope of the software offering from this bottom-up approach always brings out the same question: "What if I don't find one software package that handles all my requirements?"

This question can be answered empirically with two steps. The first is to select two or three software products that come close to solving your needs. The second step is to create a list of features that are not supported by all the selected software products but are supported by at least one, ignoring all features that are satisfied by all the selected software. This list should be kept short because the subsequent ranking of the features grows as the square of the number of features being ranked.

Compare feature one with feature two and determine which of the two is the more important. Put a check mark next to that feature. Do the same with feature one and feature three. Continue the process until feature one has been compared against all features.

Repeat the process with feature two. Compare it with feature three and place a check mark next to the most important. When the entire list has been exhausted, add up the check marks for each feature. All features might not be offered by the winner, but the most important ones will be.

As a last note when selecting software, do not ignore the subtle make-or-break issues. These include "nonfeature" obstacles that can slow down or stop the productive use of your investment. The following are of specific concern:

- Who installs the software?
- What training is required, and who will do it?
- When will the software be updated, and who reinstalls it?
- How does the software support graphics devices?
- How do I support new devices?
- What upgrade path do I have available when our needs grow?
- Is the software portable so it can be moved to a new computer?

Selecting the right hardware is quite often the easiest part of the graphics investment. This double-headed coin covers the computing requirements for graphics as well as the peripheral requirements. Assume that the decision maker has already selected a computer. Nonetheless, application migration might require that the software and hardware decisions take into account issues of portability, networking and newer operating environments such as Unix.

Putting these aside, choosing the right hardware devices plays an important role in graphics productivity. The first step is



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deciding which of two graphics categories your application requires. The first category is production charting and the second is ad hoc charting. Production charting is predominantly hard copy oriented.

The regular mass production of charts or unattended graphics falls into this category. A data base that uses a graphics report writer to produce chart output instead of data listings is one example and nontechnical computer users who have a simple one-button graphics system that produces hassle-free output is another.

Ad hoc charting is also called demand charting. Users who want spontaneously to visualize their data or produce one-of-a-kind originals perform ad hoc charting.

General classes of devices that reflect the requirements of the application and the user can be selected. Different manufacturers can be chosen based on product breadth, availability, cost, complexity of operation, software device driver requirements and vendor relationship.

The nonfeature obstacles already mentioned in the software selection section are also applicable to the hardware decision.

The integration process of connecting the data gathering and manipulation software to the graphics software to the hardware is the next significant barrier to overcome. Since this is the single path of information flow, if there is one bottleneck or problem, the entire process suffers.

By choosing the software first, the integration of graphics and the data source should have already been considered and resolved. Graphics programs should not be considered in a void but rather as part of the entire information processing environment.

If you are dealing with the IBM world of EBCDIC, consider the few devices that appear as native peripherals. They include the following:

- IBM 3279 and other IBM graphics displays and printers.
- Tektronix, Inc. CX4100 series for IBM computers.
- Nicolet Zeta Corp. graphics plotters and cameras with a protocol converter.

Though other devices might be connected with special hardware or modifications to the operating system, this path is not for the inexperienced. War stories abound about the inability to transmit all the required graphics control characters on IBM computers. Users talk about charts with stray vectors caused by improperly converted control characters.

For non-EBCDIC machines (which are almost all other computers), communication issues are almost nonexistent. The most serious concern turns toward which graphics peripherals are supported by the selected software.

Try not to have the hardware decision forced by the software's device support. By decoupling the hardware and software decisions, you leave plenty of flexibility for future device selection and upgrades. This can be accomplished by two mechanisms. The first is to use a vendor that utilizes either pure Tektronix or pure HP Graphics Language protocols. The second is to choose a software manufacturer that gives you full control over device interfaces and drivers.

By choosing de facto standard protocols, you have the option of using major manufacturer's devices or other products that emulate the de facto standard technology.

Though this is not a foolproof option, it heavily weights the choice in the direction of success. Specifically, emulators may replicate the formal specifications of the de facto standard but fail to replicate the undocumented subtleties. For example, intercharacter spacing (not documented) might differ from one terminal to another just enough so that the last character in a long title might be clipped off the page.

The old adage of "you get what you pay for" is almost a law when it comes to graphics hardware. Consider more than cost when investing in peripherals. Consider support, installation, ease of use, maintenance, compatibility and functionality.

Have your hardware and software vendors talk to one another to determine who is responsible for what and how they both can help you get the hardware and software to work together.

With all the tools in place, there is still no guarantee that the use of graphics will be an immediate success. One bad experience with graphics can keep a user from trying it again.

A successful graphics implementation should follow the same scenario. The pivotal point is convincing someone to try graphics and then act as the internal promoter.

The first step is to find a highly visible application that when shown to be a success, will broadcast the success for you. This application should have users that are not adverse to change and willing to invest their personal time to learn a new system. Likely targets might be areas where a lot of paperwork can be replaced or where a lot of data needs to be analyzed and condensed into more workable groups.

The second step is to ensure that the user is protected from hardware, communications or operating systems issues that are not important to his application. Do not try to turn the user into a graphics expert. Remember that he is an expert already in regard to his current application and job requirement. Graphics will simply make his job easier and more productive.

Graphics should be an extension of the existing computing environment and should be a logical and intuitive enhancement to application software that already is familiar to the user. If the user utilizes the system editor for data entry in one application, it also should be used for the graphics application. If the user is used to just typing in PRINT to get a listing of data, he should be able to type in CHART to get a graph.

Do a lot of hand-holding. Initial training is a requirement and should be budgeted.

The user should be educated on both the use and production of graphics. It is not enough to know that a certain set of commands will product a chart. Remember that graphics is a means of increasing understanding and expediting communication, and the user needs to be trained on what charts best show his data and how to select the proper layout to express his ideas. Offering graphics capabilities without the appropriate training will have a result similar to giving an expensive camera to someone who has never before taken a picture. Anyone can push a button, but this does not mean success or productivity.

Assistance can also be offered in the form of on-line Help, a function which allows the user to get as much help as he needs but on an on-demand basis. Why learn about logarithmic charts if they are never used.

Fixed	Cost
General-purpose software for small computers	<$1,000
Specific application on mainframe computer	>$50,000
35mm camera system	<$10,000
Full graphics laser printer	<$10,000
Commercial-quality dot matrix printer	<$6,000
Medium-resolution color CRT	<$2,500
Medium-resolution black-and-white CRT	<$1,500
Alphanumeric CRT with graphics characters	<$600
Ongoing annual maintenance	10% of purchase price
Device drivers	Should be free
Software and hardware installation	Self-installing
Variable	
Software training	$250 per person
User support	Split between vendor and buyer
Computer resources	See data processing manager
Materials	Minimal
Application integration	$10 per line of code

Figure 1. Some Fixed And Variable Costs For Computer Graphics Investments

Visuals cut meeting times by 30% (Wharton Study)

Average manager's salary	$60,000 per year
Overhead factor	x1.2
Number of hours in year	1,920
Time savings of 30%	0.30
Hours spent in meetings	350 per year
Savings per person = $60,000 * 1.2 / 1,920 * 0.30 * 350	= $3,937.50
Average of five people per meeting saves	$20,000

Twice the comprehension with visuals (Wharton Study)

Decision maker's time spent in analysis	25%
Savings in understanding = $60,000 * 1.2 * 12.5% =	$9,000

Cost of presentation slides drops by factor of 13

Cost per slide by outside vendor	$50
Average manager's salary	$60,000 per year
Overhead factor	x1.2
Number of hours in year	1,920
Time to design one slide	5 min or 0.083 hr
Cost for 36 exposure roll of film	$16
Cost of 3-hour developing	$7
In-house slide cost = $60,000 * 1.2 / 1,920 * 0.083 + ($16 + $7) / 36 =	$3.76
Savings at 12 rolls per year = ($50 - $3.76) * 36 * 12 =	$19,975.68

Electronic mailing of charts cuts down on paper handling

Copying and distributing reports	$4 per report
Number of reports manager sees per day	1
Handling cost per year = $4 * 5 * 4 * 12 =	$960

Figure 2. Some Expected Productivity Gains In Large Organizations

Improving productivity means making hard things easy. Those things that were easy should be trivial. With graphics, one sure way to success and productivity is to create application-specific chart stencils. These chart stencils are templates that have been predesigned to fit the needs of the user and application best. The stencils can be placed in a chart book for reference.

Producing meaningful information requires no more than selecting the proper stencil, adding the appropriate data and producing a hard copy. This three-step process can be done in less than a minute. That is productivity!

Take the graphics successes and try to quantify the benefits. Look for trends as well as areas for improvements. Promote both word of mouth and formal presentations spreading the word. Refine those areas that offer a clear and successful path to graphics productivity and produce a department or company guide that can be used by others to define their graphics needs.

Computer graphics has been around for a long time. Bypass areas that have been known to fail (for example, real-time graphics on a mainframe supporting 200 users) and focus on the proven. Use your vendors.

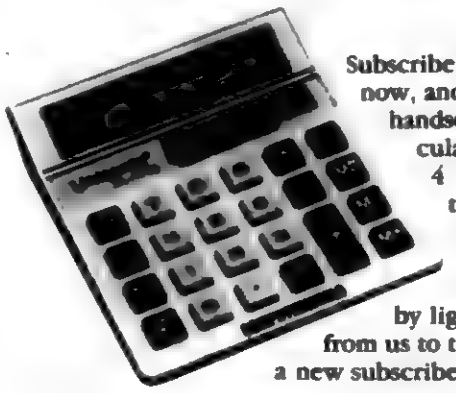
Make them be responsible for their hardware or software and have them prove to you that their systems are installed and working properly.

Lastly, make sure that both you and your users have realistic expectations. Set goals that can be achieved. Once the basics are in place and people are committed to the productivity offered by graphics, you will be able to extend the proven value of graphics into other areas with even greater productivity.

Rawlins is vice-president of marketing at Visual Engineering, Inc. of San Jose, Calif. He has been in the graphics industry for 15 years.

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SPECIAL SECTION:
BUSINESS GRAPHICS

Evaluating Your Graphics Needs



DAVE RIDLEY

·BY·GARY·LAROFF·

Rapid advances in computer graphics output device technology have produced inconsistent reactions by organizations using graphics. Most organizations have moved forward, using available technology, learning from it and adopting the high payoff applications. Others have delayed making further investments, waiting for the day when they hope choices are fewer and more certain. It may be a long wait.

A good guide when shopping for peripherals is match the medium (slide, transparency, paper) to the application, then match the graphics device to the medium. But more than a maxim is required to make informed decisions about graphics devices. The base level of knowledge stems from the intended graphics application: analysis, presentation or publication. The variety of media suited to these applications is divided into soft copy on display screens and hard copy on flip charts, transparencies and slides. Once you understand the graphics applications, arming yourself with some knowledge about devices will aid your hunt for more productive peripherals.

Graphics terminals are the most popular devices for entering textual and graphics data commands, interacting with graphic development and previewing output. The terminal is truly one of a kind. Terminals let the user design charts and graphs economically before expending time, effort and expense generating hard copy.

Business and management graphics applications usually rely upon desktop, medium-performance terminals using raster refresh technology. Check out the following seven features in a raster refresh terminal: display refresh rate, resolution, screen size, number of colors, computer overhead, on-demand hard-copy capability and price.

• The display refresh rate is literally how fast the terminal screen is redrawn. The general rule has been for raster terminals to rewrite (or refresh) half the screen (every other line) every 1/60 of a second, therefore rewriting the entire screen every 1/30 of a second. This scheme is known as a 30Hz interlaced refresh mode. While this way is the least expensive one in which to design and build a raster refresh terminal, the result is screen flicker. The alternative is noninterlaced mode, which rewrites the entire display at one time. When noninterlaced displays are refreshed at a frequency over 50Hz, the display is rock solid without a hint of flicker. When possible, use a noninterlaced display. For example, the newer Tektronix, Inc. 4100 series machines have noninterlaced displays, but the older 4020 series units do not. The newer IBM 3179 Model G and 3270-PC/G series have noninterlaced displays, but the older Model 3279 does not. Almost every PC color monitor is interlaced and presents potential eye-fatiguing flicker problems. A noninterlaced color display may be well worth the extra $2,000.

• Resolution is essentially the number of rows and columns of dots (called pixels for picture elements) on the terminal screen. For most people, the minimum resolution that seems comfortable is 640 by 480 pixels on a 15-in. screen and 1,024 by 780 pixels on a 19-in. screen. For noninterlaced, 13-in. displays such as that found on the Tektronix 4105, a lower resolution such as 480 by 360 pixels is acceptable for all day viewing. The price differential for increased resolution is minor and reasonable.

• Screen size falls into two varieties: either about 13 or 14 in. or about 19 in. Screens under 12 in. are a little small, and 25-in. screens may be difficult to look at. Higher resolution helps viewers on screens larger than 17 in. The logic is simple: If your home television screen is too large, you simply sit back. Moving more than an arm's length from a terminal screen too large for the resolution, however, is impractical.

• The number of colors a terminal inherently supports is critical. Large palettes supply the potential to produce shaded backgrounds and multiple shades of a given color. The number of simultaneously viewable colors specifies how many of the shades can be displayed at one time. Some PCs and low-end terminals support

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only three or four colors on the screen at one time. A realistic minimum specification for business graphics applications is eight simultaneously viewable pure colors from a palette of 64. Certain terminals support 16 simultaneously viewable colors out of a palette of 4,096. High-end, color stand-alone terminals include the Tektronix 4125 and the Advanced Electronics Design, Inc. 1024, which support 256 simultaneous colors out of a palette of about 16.5 million; and Seiko Instruments U.S.A., Inc. 2414 supporting 1,024 out of a 32,768-color palette.

• The computer overhead required by a terminal should be minimized. Local terminal intelligence and memory are smoothing out differences in terminals and generally producing graphics faster. The terminal should support the concept of "hardware characters" and polygon fill of any random shape without limit to the number of vectors and crossover points. The IBM 3179 Model G, 3270-PC/G and 3270-PC/GX are more efficient than the older 3279. The Tektronix 4107 is somewhat more efficient and flexible than the previous Model 4027.

• An on-demand, hard-copy capability enables the user to press a key on the terminal keyboard and have a nearby hard-copy unit generate a full color copy of the screen. In the IBM Graphical Data Display Manager environment, a single terminal function key instructs mainframe-based software to produce a hard copy of the same graphics on a designated device. The demand hard-copy capability usually has no effect on the price of the terminal, and color copy units are now available for under $2,000. A few combinations include the IBM 3179 Model G with Model 3852 ink-jet plotter; the Seiko 1104 with Model CH-5201-B thermal transfer plotter; the Tektronix 4107 with Model 4695 ink-jet plotter; and the Tektronix 4111 with Model 4692 ink-jet plotter.

• Price is based on the preceding features. Higher resolution for a given screen size generally raises the terminal price. Passing other thresholds such as refresh rate and supporting some intelligent features such as zoom, pan, transforms and graphics input adds to cost.

Memory affects terminal price. For terminals that support the same number of colors on the screen, doubling the resolution on each axis multiplies the memory requirements by four; quadrupling the resolution multiplies memory requirements by 16. The minimal number of colors is two (black and white). For every twofold increase in the number of viewable colors you have to add yet another memory plane. Memory is not free but reasonable. Adding more power (speed), segment handling capability and local intelligence further adds to the price of a terminal with more capability.

High-quality color raster refresh terminals will rarely cost under $4,000. The IBM 3179 Model G, at $2,995, is a refreshing exception. Today $20,000 buys a stripped-down, very high-powered terminal. Adding options and memory planes can run its price up to $35,000.

The soft copy of the terminal display is ideal for perusing formats or making decisions based on previously stored graphics. Rarely is it the final output in business and data representation graphics applications. More often than not, the professional now places the choice of a hard-copy device over the choice of terminal, and the copy device selected usually provides color output.

Five major variables are used to evaluate color or high-resolution monochromatic hard-copy units: image quality, resolution, speed, equipment cost and cost per copy.

Pen plotters, the workhorses of computer graphics, produce continuous lines and not the dot structure that results from the use of various raster print technologies. The newer pen plotters are intended for remote on-line use and a few are capable of continuous output on a number of different media.

Features that differentiate pen plotters are pen speed, pen acceleration, the manner pens are changed, accuracy, continuous roll or sheet feed and price. The main performance difference usually comes down to speed.

> *More often than not, the professional now places the choice of a hard-copy device over the choice of terminal, and the copy device selected usually provides color output.*

Today, at the low price end ($599) is the Epson America, Inc. HI-80 with four pens and a 9 in./sec. pen speed. (The fastest plotter in our discussion is the Hewlett-Packard Co. 7550A, which operates at 31.5 in./sec.) The Epson unit is positioned in the PC marketplace. Other low-end plotters include the Enter Computer, Inc. Sweet-P with one pen and speed of 6 in./sec. ($695); the four-pen Houston Instruments 695 that operates at 4.2 in./sec. ($799); and the eight-pen Strobe M260 ($595). The undisputed high-volume leader in the PC arena has been the two-pen HP 7470A with a speed of 15 in./sec., an acceleration of 2G ($1,095). HP has recently replaced it with the new Colorpro Model 7440 with eight pens that are capped automatically to prevent dry out, a resolution of 0.001 in., speed of 15.7 in./sec. ($1,295).

Plotters supporting mainframe business and data presentation graphics offer slightly more performance and generally a slightly higher price tag than PC-attached devices. Acceleration data is vital considering that the plotter often is accelerating from zero (after changing pens or finishing a character). The HP 7475A is a six-pen, 15 in./sec. plotter with an acceleration of 2G and a reproducibility of 0.001 in. for $1,895. Nicolet Zeta's Zeta Sprint is a six-pen, 14 in./sec., 0.004-in. resolution plotter for $1,549. The Enter Sweet-P 600 Six-Shooter is a six-pen, 14 in./sec., 3G acceleration, 0.004-in. resolution plotter at the low price end of $1,095.

Slightly more expensive production plotters will run all day unattended because they change the paper themselves. The HP 7550 feeds itself sheets of paper, and Nicolet Zeta's Zeta 8 has a continuous scroll of paper. The Zeta 8 eight-pen carriage carries all eight pens simultaneously, which proves faster than most other methods of sending the pen carriage over to the side of the plotter to change pens. It runs at a very respectable 20 in./sec. with a somewhat unbelievable acceleration of 4G and produces plots with a resolution of 0.001 in. The speed, acceleration, eight-pen carriage, internal "smarts" — such as an internal circle generator — and high-volume continous-roll paper make the Zeta 8 ideally suited to a production graphics environment. It costs $5,950. The HP 7550A with eight pens, 31.5 in./sec. plotting speed, high-speed acceleration, 0.001-in. resolution and a paper sheet feeder is $3,900.

Larger size plotters by Benson, Inc., Calcomp, HP, IBM, Nicolet and Tektronix are often supported by software that supports the smaller plotters.

Electrostatic printer plotters, a nonimpact technology, have traditionally produced black-and-white copies with images produced by electrodes placing charges on dielectric paper, which is then passed through a toner.

The major breakthrough for A- and B-size plotting has come with the new Versatec, Inc. Spectrum C2552 11-in.-wide color electrostatic plotter that costs $11,950. The unit produces black-and-white plots in 5 sec. for A size and 10 sec. for B size. Full color takes 72 sec. The flexibility of the plotter makes it ideal for unattended shared operation. It offers roll-fed paper with an automatic paper cutter and can switch automatically between color and black and white, A-size and B-size and text pages and graphics by remote control from the computer.

Thermal transfer plotters, also a nonimpact technology, are getting more reliable and less costly. Most use a low-melting-point wax transfer ink. The products hold the promise of simplicity, reliability, quietness and low-cost hardware.

Most of the newer thermal transfer plotters produce full color plots in about a minute with resolutions equal to or exceeding 200 dot/in. Representative U.S. products include the new 200 dot/in. Seiko CH-5300 series and the Toshiba Ltd. TN-5400, which produces 200 dot/in. A-size plots in a minute. Benson's CTP-10, which makes 300 dot/in. A- and B-size plots, costs $8,950, and Calcomp's Colormaster 5902 makes 200 dot/in. A-size plots and costs $4,490. Panasonic Co. has a 400 dot/in. thermal transfer plotter that is sold by Matrix Instruments, Inc. combined with their QVP rasterizer as the Model TT-200. Thermal transfer plotters are also available from Mitsubishi Electronics Corp., Hitachi Ltd., Ricoh Corp. and others.

Ink-jet plotters, another major nonimpact technology, output high-quality color paper and transparency graphics. At the low price end, the Tektronix 4695 has a resolution of 120 dot/in., a copy time of about 2 to 3 minutes, a price of $1,595 and is supported as a demand screen copier of selected Tektronix terminals via vector-to-raster conversion software. Toward the higher resolution end are the Tektronix 4692 and Benson Colorscan 800. The Tektronix Model 4692 makes A-size copies with a resolution of 154 dot/in. at a price of $5,995. The high-resolution winner, with 203 dot/in., is the Benson Colorscan 800, which makes A-size copies in 3½ minutes, can also produce B-size plots and costs approximately $17,500.

Desktop direct-drive film recorders, or slide composition systems, are becoming popular and available in the lower price ranges. Most require vector-to-raster conversion, usually via a separate hardware module or option. Matrix supplies the QCR D4/2 (with a resolution of 4,096 by 2,732 pixels) and the PCR, now available with a 4,000-line resolution. The Polaroid Corp. Palette is supported by the Lasergraphics MPS-2000 that produces slides with a resolution of 2,048 by 1,366 pixels. The Calcomp Samurai, at about $10,000, produces antialiased slides with a resolution of about 4,096 by 2,732 lines and is driven by a standard host-resident software interface through an IBM PC containing necessary Samurai interace components. The self-contained Bell & Howell Co. Color Digital Imager IV film recorder, at $7,500, has a resolution of 832 by 630 lines and doesn't require additional rasterization. The most recent announcement is the HP 7510 color film recorder with an addressable resolution of 16,344 by 10,896 points per frame. HP 7510 is vector driven, doesn't require a rasterizer and costs $13,900.

Today's business graphics environment is almost not possible without laser printers. The heart of these systems is found in the new generation of high-volume, hard-copy devices that have introduced applications previously unthinkable to anyone who has fed paper and changed pens at a two-pen plotter. Common device features required by most companies using high-volume production graphics devices include:

• Real graphics throughput in excess of one copy per minute of A-size black-and-white copy.

• A cost per A-size, black-and-white copy of less than 2 cents for obvious consummables and less than 5 cents when all maintenance costs are factored in.

• Resolution of more than 240 dot/in.

• Good image quality from both software and the hard-copy device so charts do not appear generated by a computer.

• Device costs that fit the departmental budget. Moderate speed laser printers (eight to 24 pages per minute) range from $5,000 to $30,000. Very high-speed laser printers (from 70 to 300 pages per minute) cost between $200,000 and $400,000.

Thoughput, or copy speed, is the factor that most differentiates today's A-size black-and-white printers. Laser printers run the gamut from eight to 300 pages per minute. Printers such as the Imagen Corp. 12/300 ($17,500) and QMS, Inc. Lasergrafix 1200 ($20,000), both rated at 12 pages per minute, will usually produce one to two different complex plots per minute in normal corporate environments due to computer overhead and data transmission times. Devices with more efficient on-board rasterization such as the Minolta Corp. SP 50B printer with KMW VP-10 rasterizer (20 pages per minute, $19,000) can sometimes double this throughput.

While devices and applications continue to become more sophisticated, a basic understanding of terms and capabilities can carry a user a long way in effective purchasing and productive use of graphics peripherals. ■

Laroff is director, international marketing, for Issco Graphics, Inc. and author of Choosing Hard Copy Devices for Visual Information Systems.

TECHNOLOGY TRENDS

Getting Around In



Departmental Computing

·BY·LEE·W.·DOYLE·

Departmental office systems are playing an increasingly important role in distributing processing power and corporate information to the end user.

The data center environment today has stabilized on the IBM mainframe, while the workstation arena is dominated by IBM Personal Computers and Microsoft Corp. MS-DOS compatibles. However, most organizations have yet to link these two environments through a cohesive processing system. A key planning challenge for large organizations is the development of a cost-competitive departmental system that provides communications among the scattered personal computer population, drives multiuser departmental applications and supplies access to host data base information.

Departmental or mid-range systems are combinations of hardware and software that fill the application and communications needs of departments (typically 30 to 100 employees). The four major hardware configurations are minicomputers, supermicros (multiuser systems based on microprocessor technology), local-area networks and file servers and micro-mainframe links.

Faced with the proliferation of stand-alone PCs — research firm International Data Corp. estimates 80% to 85% of all PCs in large organizations remain stand-alone today — and the increasing demands to access mainframe data, the departmental level of the organization needs three primary services: discrete departmental applications, file server functions to link stand-alone PCs and communications links to the mainframe and outside data bases.

Every large department has the need to computerize specific applications. These may include budgeting, a generalized departmental data base, a correspondence tracking system or an accounting system, just to name a few. These applications may have been started on a PC but have grown too large for a single-user, micro-based system. In this case, a multiuser system or a PC network will provide increased access, increased processing power and increased storage.

Many potential powerful and beneficial applications remain largely unexplored at the departmental level. The absence of available processing power and a user base unwilling to wait months for a MIS-designed mainframe application has created an invisible backlog of departmental applications. The availability of multiuser processing at a local level will unleash the development of many innovative, hidden applications.

File server capabilities increase communication between stand-alone PCs. Stand-alone PCs are islands of information and processing power that remain relatively untapped by most organizations. Today, information transfer is largely accomplished through "sneakernet" — the swapping of floppy diskettes between PCs. File server capabilities would allow PCs to transfer files and share expensive peripherals like laser printers, 3270 emulation, modems and plotters. The addition of a file server also addresses a major security problem inherent with stand-alone PCs: The file server can be equipped by tape backup and automatically store all departmental files.

Increasing demands by end users have forced the MIS department to allow PC users access to the mainframe. Typically, this has been accomplished through products like the Digital Communications Associates, Inc.'s Irma board, which allows a PC to emulate a 3270 machine and attach to a 3274 cluster controller. In addition to being expensive ($1,000 and up per PC), terminal emulation links to the mainframe have not lived up to user expectations. Most end users are frustrated by the complexity of logging on to the mainframe, not to mention the trauma of trying to select specific fields of data from enormous mainframe data bases.

A potential role for the departmental processor is that of mediation between PC and mainframe. The departmental machine can economize on communications links and allow for the creation of a departmental data base containing downloaded mainframe data. This allows for much tighter MIS control over sensitive data and enables departmental programmers to customize specific applications for the end user.

The departmental level is also the logical place to concentrate protocol conversion and gateway functions. Connections to dissimilar systems and networks and links to public networks like

TECHNOLOGY TRENDS

CCITT X.25 can be effectively handled by the departmental processor without having to provide each workstation with a modem and conversion software.

To become a successful part of the information processing structure, the departmental processor must be accepted by both MIS and end users. Three critical end-user concerns are local application development, PC-like response time and availability of a nontechnical (easy-to-learn and -use) interface to network functions and host data bases.

Through the use of industry-standard workstations (PCs and compatibles), the first two challenges can be met. Powerful workstations based on Intel Corp.'s 80286 (and in the future 80386 processors) can allow for rapid, local response time when combined with high-speed local-area networks. The ability to run standard MS-DOS applications at the workstation level and Unix (or another multiuser operating system) at the departmental level enables the end user to choose from a wide variety of single-user software or take advantage of powerful multiuser applications at the departmental level.

Capability	Departmental Processor Type			
	Minicomputers	Supermicros	File Servers/ Local-Area Networks	Micro-Mainframe Links
Multiuser applications	8	5	3	2
File server functions	5	5	7	4
Communications to the mainframe	7	4	3	7
User interface/ Ease of use	4	5	7	2

Ratings are based on scale of 1 to 10 in comparison to other departmental systems.

Figure 1. Rating The Capabilities Of Departmental Systems

The most difficult challenge is the development of software to give the user transparent access to network resources and departmental or host data. Today most users are confused as to how they can access data not local to their workstation. An ideal solution would be a PC-based front end that would interpret the user request for data, access the network and retrieve the data requested — without the user needing to know the structure of the data and where the data resides. Unfortunately, systems with these capabilities are still years away.

The competition to provide departmental computing has been heating up in 1985 and 1986. The four leading options to provide departmental processing are minis, local-area networks, micro-mainframe links and supermicros. Traditional mini vendors (Digital Equipment Corp., Data General Corp. and Hewlett-Packard Co.) are extending from their strength in technical/scientific computing toward providing integrated office software, file serving for PCs and links to IBM mainframes.

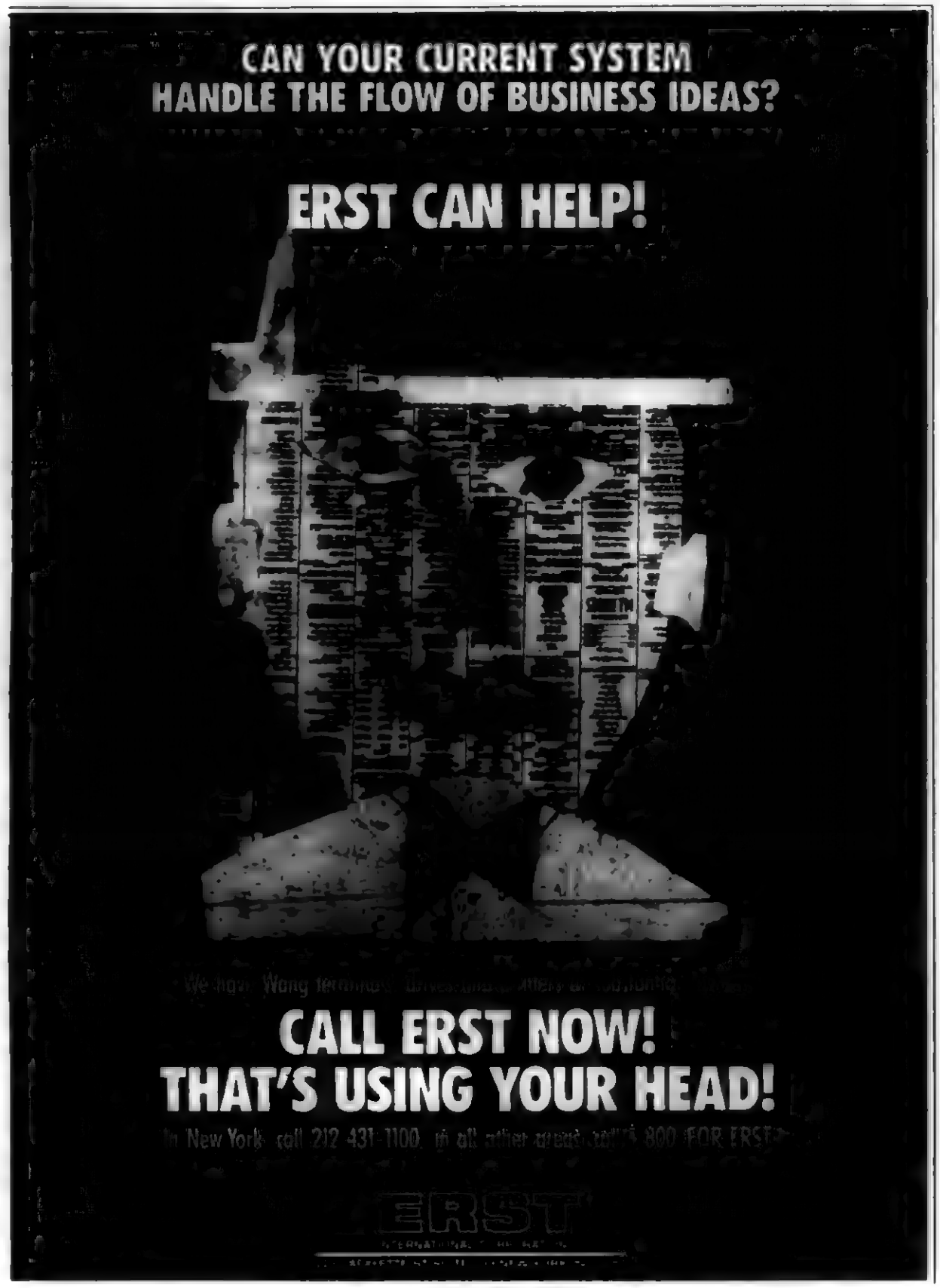
Local net vendors (Novell, Inc., 3Com Corp. and Nestar Systems, Inc.) have standardized on IBM protocols and are beginning to offer multiuser net applications for sites with stand-alone PCs. Supermicro vendors (Altos Computer Systems, Inc.; Sun Microsystems, Inc.; Apollo Computer, Inc.; and Intel) are positioned to provide low-cost, Unix-based computers for the department.

Although not traditionally thought of as a departmental option, micro-mainframe links can offer many departmental functions including data distribution from the mainframe to the workstation, file serving and electronic mail. Micro-mainframe links are the leading option for organizations wishing to implement a two-tiered information processing structure (mainframe and workstation).

Organizations shopping for departmental systems are faced with numerous trade-offs when deciding which type of system to acquire. For example, file server/local-area network systems offer the advantage of good local communications functions and an IBM PC-DOS user interface but offer limited communications to the mainframe (terminal emulation only) and only a few multiuser applications. On the other hand, micro-mainframe links offer customized access to information on the mainframe but fall short in offering multiuser departmental applications and have complex user interfaces. Figure 1 evaluates the strengths and weaknesses of departmental systems.

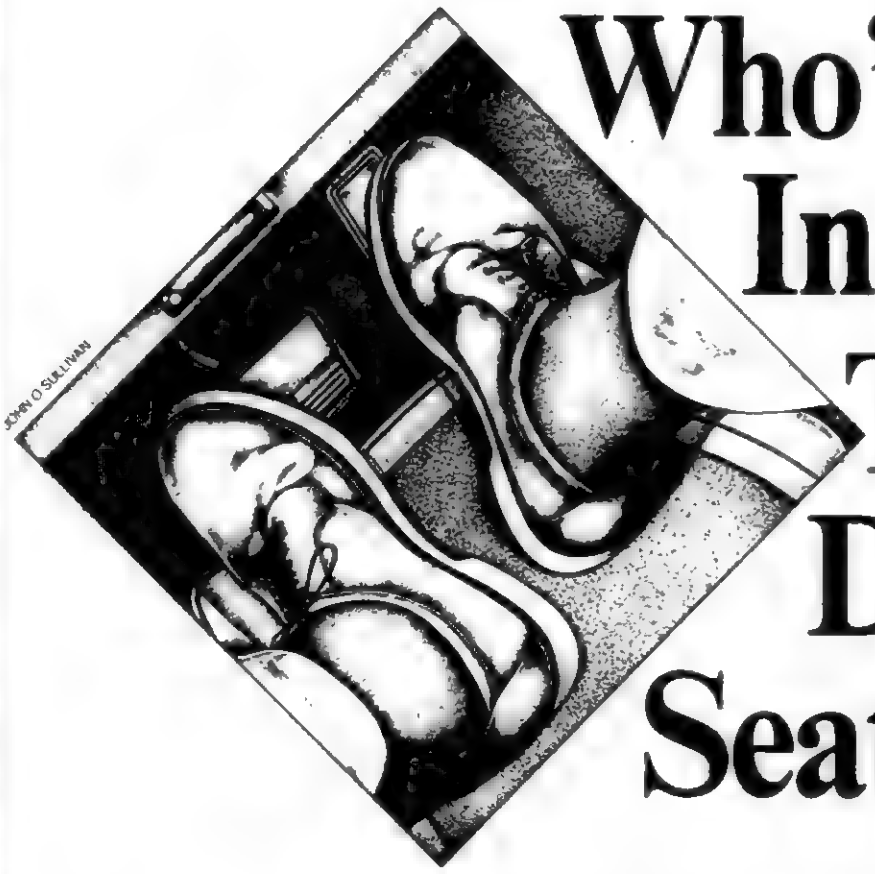
Designing and implementing departmental computing will continue to be a challenge for large organizations for at least the next three to five years. Organizations must pay attention to user needs while also designing an organizationwide architecture for distributed processing and information transfer. Existing departmental system options have unique strengths and weaknesses. It is likely that ad hoc solutions will fail. Organizations that plan for departmental processing and offer customized systems will have the best success. ■

Doyle is a senior analyst, communications strategies for microcomputers and office systems, at International Data Corp., a research and consulting firm headquartered in Framingham, Mass.



CIRCLE READER SERVICE NUMBER 226

MIS STRATEGIES



Who's In The Driver's Seat?

·BY·STAN·KOLODZIEJ·

MIS responsibilities and clout appear to be increasing with top management, end users and even vendors in their product planning and market strategies, according to a recent *Computerworld Focus* survey of MIS managers from a sampling of large corporations.

We caught up with these managers at a time when MIS is assuming more responsibility in shaping the future direction of office systems in corporate America. Our survey indicated MIS has been putting pressure on IBM to shore up its mid-range departmental computing offerings, while some MIS managers are expressing more interest in new departmental machines being introduced by vendors such as Digital Equipment Corp., Maynard, Mass., and Data General Corp., Westboro, Mass.

Another finding has MIS clamoring for peer-to-peer communications within IBM's Systems Network Architecture (SNA) communications environment. MIS is also looking critically at IBM's new line of 3090 series mainframes and concluding that it doesn't always have to dance to IBM's tune.

MIS has been flexing its muscles in other areas. A new survey of MIS managers from the Cambridge, Mass.-based market research firm Arthur D. Little, Inc. concluded that MIS is playing a leading role in two concurrent computing trends at U.S. corporations. The research firm sees MIS behind the continued push to decentralize corporate computing resources, distributing equipment and applications within various departments. The flip side of the report also has MIS assuming added administrative power, with more telecommunications and office systems managers reporting directly to MIS. A related development has a greater number of corporate information officers being hired from the ranks of MIS, lowering the percentage of information officers taken from corporate business ranks.

With this consolidation of administrative power has followed a tighter MIS hold on corporate data processing purse strings. MIS is using this power to pull in the reins of users groups that are being perceived as having gained too much autonomy regarding equipment selection and purchases. As a result, MIS has found itself in the uncharacteristic role of trying to walk the fine line between imposing purchasing and other standards on users while also providing them with broader scope in the types of applications, training and support they want.

Why the change toward greater MIS control? Surveyed MIS managers listed various causes.

One major cause can be traced to some of the negative reactions to the great influx two years ago of PCs in offices. As more PCs spread throughout organizations, MIS began to lose some control, having to rely on users groups and departmental managers to handle much of the purchasing coordination and placement of the micros throughout offices. At first MIS welcomed the trend, believing it would off-load some of the terminal/mainframe application demands users were exerting on heavily burdened, centralized DP centers. Few corporations, however, had the kind of infrastructure in place outside the MIS department to coordinate wholesale purchasing and placement beyond the immediate needs of individual users. The result was confusion.

"Once the micros were in place at our company," explained Gary Banks, director of information services at Clairol, Inc. of Stamford, Conn., "we had users coming to us [MIS] for help. Many didn't know what to do with the computers. It was different than having terminals tied into mainframes. Many of these people were suddenly working on their own."

Banks explained that Clairol, like many organizations, began to pull back on more PC purchases, while at the same time trying to come up with a clear picture of how these micros could fit into the corporate computing scheme of things. Clairol has since established what Banks termed an "evolutionary" program, introducing PCs gradually in line with true departmental needs, at the same time building an adequate training and support structure and standardizing on a few established vendors and applications.

The change has been beneficial. "The level of user expertise is starting to merge with the new level of micros available," Banks explained. "We're seeing a new generation of PCs coming out that have the power to become hard-disk file servers in true multiuser applications. Users who have graduated from word processing and spreadsheets can now handle harder decision support applications through these multiuser systems. The learning curve is where we want it."

The industry is also experiencing a push to integrate computing through local-area networks and micro-to-mainframe links. Users with PC experience, for example, are now demanding on-line access to other departmental and corporate data bases. Thriving hardware and software industries are springing up, providing the links to do it. At the higher end, vendors such as DEC, DG and IBM have heeded the call and are making sure their new computer products not only tout

increased millions of instructions per second and better price performance ratios but also the capability to communicate with other systems, most notably those within IBM's SNA architecture. This has put a greater emphasis on centralized coordination that, more often than not, has been placed under the aegis of MIS.

Vendors are now offering such intervendor equipment compatibility as a matter of fact, simply because it carries greater weight in final MIS purchasing decisions than it did even a year ago. As a result, vendors of local-area networks and PC communications links are changing their marketing strategies. These vendors are heading straight for MIS managers instead of users, aware of the increased sway in purchasing power and decision making that MIS has. Vendors know where the purchasing power lies.

"Anything in this company related to computers and that costs more than $250 now has to go through our [MIS-controlled] centralized purchasing center," explained Ted Smith, manager of systems development at Union Carbide Corp. of Danbury, Conn. "That also includes anything to do with networking."

Smith said that although Union Carbide is a successful decentralized computing company, with each division handling its own computer processing and applications, the decision to centralize purchasing stemmed from what he described as a corporate ultimatum to keep DP costs under control. "PC purchases have stabilized for the time being at our company," Smith explained. "We're evaluating what we already have."

Clair Noll, vice-president of procurement and computer services at Pennsylvania Power & Light in Allentown, Pa., explained that all end-user computer purchase requests at the company now go through a Corporate Computer Steering Committee. "We only have about 100 desktop micros right now," Noll said. "Being a company that deals a lot with transaction processing, such as customer credit accounts, we've relied more on terminals than PCs. [The company now has 2,200 terminals connected to IBM mainframes.] We need big data bases. Though top management has decided to control the growth of all keyboards out there, including terminals, we especially keep an eye on micros and how they are tied into these data bases. Centralized purchasing is a good way to maintain control."

In a way, the attempt to increase decentralization under the more centralized guiding light of MIS is leading MIS into a dilemma. Already groaning under the weight of mainframe application backlogs and some budgeting cutbacks, MIS often has neither the time nor the means to bring computing power to users as quickly as corporations want it. Ironically, MIS' strong reaction to indiscriminate micro purchasing might have resulted in the swinging of the pendulum to the other extreme: a slowdown in bringing microcomputing to those users in corporations that are ready for them.

To help open the bottleneck, we found many MIS departments have established entities such as information centers or their equivalents. Information centers can play a vital role in developing low-level user applications as well as training and support programs that many MIS departments simply cannot provide. Though the concept of information centers is not new, the number of info centers has escalated dramatically in the past year or so (with or without MIS blessings) due to the pragmatic realization of their necessity in companies.

> *Groaning under the weight of mainframe application backlogs and budgeting cutbacks, MIS has no time nor means to bring computing power to users.*

"We've had an information center in place for a year," explained Bob Sanders, director of management information systems at Kenner Products Co. in Cincinnati. "It was created because there were problems with data integrity and a lot of reentering of data, which was wasteful. That's been solved."

Software developers have not been slow in realizing the market potential of end-user computing channeled through information centers. A number of software vendors are introducing user-friendly, fourth-generation language development tools with which users can quickly sketch and prototype their own custom applications on micros, usually with the help of junior programmers.

These prototypes are then taken by programmers to be quickly coded (many of these tools enable users to do their own coding) into third-generation languages such as Cobol, allowing them to be uploaded to run on mainframes or departmental minicomputers. The end result has been a servicing of user needs without tying up mainframe power and time. More importantly, this process has taken away few precious man-hours from the DP center.

Such localized fourth-generation application development tools (many employ artificial intelligence techniques) that bypass much of the arcana of traditional DP center programming are the wave of the future. While MIS has resisted introducing fourth-generation languages into the mainframe environment because of their perceived weakness in handling large applications, MIS is realizing its benefits in the user environment.

"We encourage users to develop their own applications through a time-sharing environment or with micros and fourth-generation tools," explained Kavin Moody, corporate director of MIS at Gillette Co., Boston. "Systems development is done in MIS, but users can produce their own decision support programs. If they think they can do it, we'll provide the tools. Above this, we've narrowed the field to a certain number of vendors to provide fourth-generation language data bases for our [DEC] VAX minis."

The current trend toward corporate budget cuts, which also affects MIS, could have some unexpected repercussions beyond the DP center. As more companies promote corporate information officers from the ranks of MIS, the MIS-based mind-set of centralizing corporate computing will no doubt gain more currency, especially in the larger Fortune 500 companies, where this trend is more prevalent. The tendency to reprioritize computer purchases through MIS, under current budget cuts, could place a greater emphasis on larger systems at the expense of smaller, distributed processing systems.

"Several years ago, we were a centralized processing operation," explained a general manager of information systems at a large Eastern manufacturing concern who did not wish to be identified. "We decentralized a few years ago to the departmental level, but now we're consolidating again under MIS. The data processing budget has been flat since late 1985."

The general manager went on to explain that the company's decision to centralize was due in part to what MIS felt was a lack of control over data integration and security at the various operating divisions, but it was also related in large part to the growing influence of MIS "at the higher corporate levels." He added that end-user computing was put on hold to make way for hot computing applications such as computer-integrated manufacturing and computer-aided design and computer-aided manufacturing. "MIS can relate more to the engineering types," he concluded.

At the high end, our survey indicated bigger is no longer thought to be automatically better with many MIS managers. Most surveyed companies were IBM shops that had mixed feelings about the recently introduced top-of-the-line IBM 3090 series of mainframes.

Noll of Pennsylvania Power & Light declared the 3090 "a good technology move for us," fitting in nicely with the company's DP growth curve. Others, such as Smith at Union Carbide, are planning on migrating some of the mainframe applications and development to the more powerful series of mid-range computers now being introduced by DEC, DG and Hewlett-Packard Co. Or at least they plan to hold back on new mainframe purchases, content with the raw processing power they already have and concentrating instead on revitalizing old Cobol programs and new applications.

Though IBM is still considered untouchable at the mainframe level, it seems to be losing ground with MIS managers at the departmental level, its traditional Achilles heel. Companies such as DEC sense the kill and are stepping up their mid-range product introductions, scurrying to solidify their position between the end user and MIS departments before IBM gets its act together. A new breed of SNA gateways helps to knit these systems seamlessly with IBM mainframes and minis. MIS is taking notice.

"Most corporations are more cost-conscious now," Sanders at Kenner Products said. "They're consolidating and looking hard and long at new systems before they purchase. I don't think we're alone in that." ■

Kolodziej is a senior writer at Computerworld Focus.

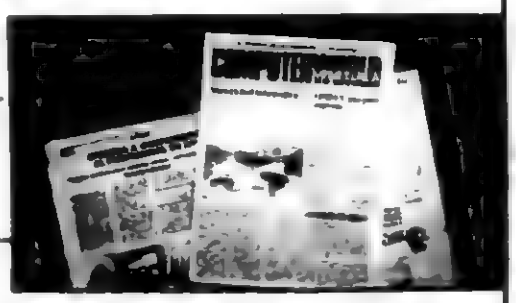
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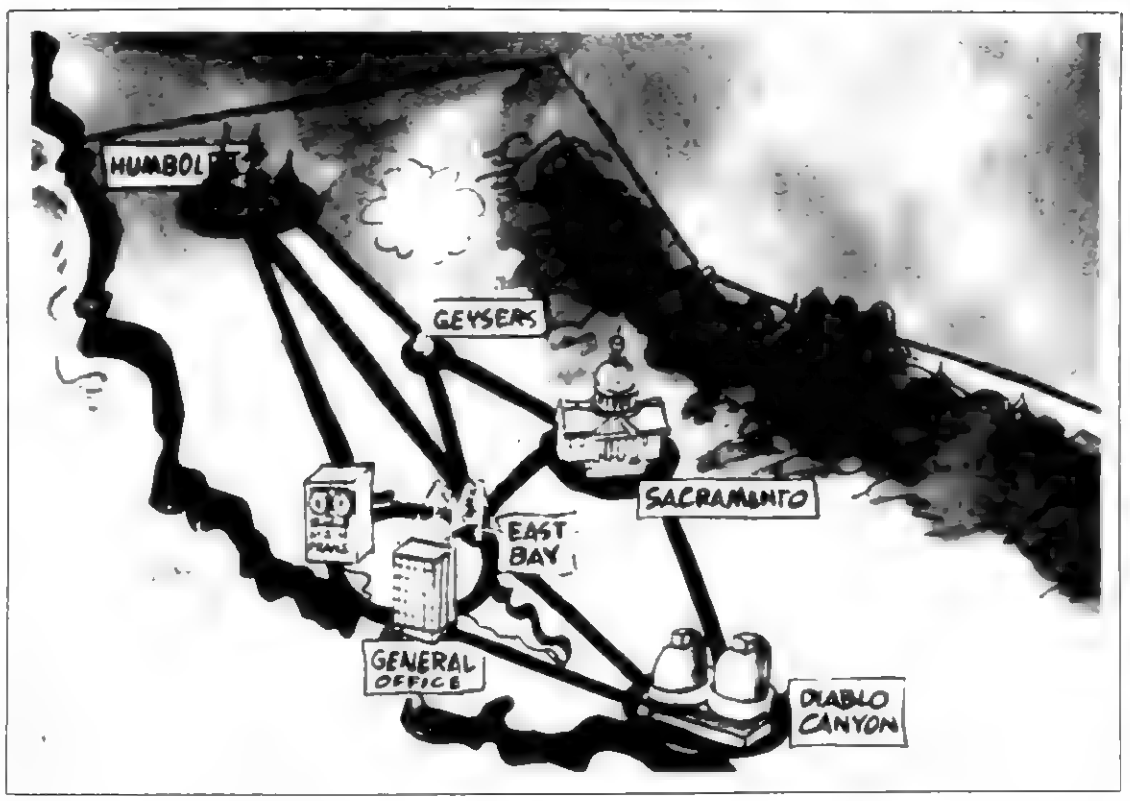
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CORPORATE ACCOMPLISHMENTS

OA Power At PG&E



·BY·LEE·WHITE·

Automating operations to spark productivity is no small feat for any organization. But when you are a major utility company with a widespread user base, it could take a lot of energy.

With 6.8 million customers spread over 94,000 square miles of northern and central California and total assets of more than $19 billion, Pacific Gas and Electric Co. (PG&E) is the nation's largest investor-owned electric and gas utility. Its 30,000 employees operate at company headquarters in downtown San Francisco and out of six outlying regions.

The statistics for PG&E's data processing department, called Computer Systems and Services (CS&S), are equally mind-boggling: CS&S has 814 staff members, nine mainframe computers and 5,000 microcomputers. Management in CS&S estimates there are 15,000 employees, 50% of the total population, who use computers with some degree of frequency.

Office automation at PG&E began in 1979 when President-Elect George A. Maneatis, then vice-president of CS&S, became concerned about the proliferation of memory typewriters. As was the case in most companies, there were many factions that had preferences for one brand over another. "[Maneatis] said, 'Wait a minute. A typewriter is a typewriter. We're going to buy a good memory typewriter, one kind, and we're going to get volume discounts on it, simple as that,' " explained William H. Wallace, vice-president of CS&S, who was Maneatis' assistant in 1979. In this way, Wallace said, Maneatis staked a claim to any typewriter with more than 2K bytes of memory, claiming that any such machine was a computer.

It was not long before dedicated word processors began to appear on the scene, but CS&S took a rather hard line on justifications for such machines, because a fully configured IBM Displaywriter, for instance, cost more than $12,000. Eventually, the company wound up buying "more than 50 and less than 200," Wallace said.

But the real revolution occurred in 1981 with IBM's announcement of its Personal Computer. "We were all sitting here watching [Apple Computer, Inc.], and you'd get out your joystick and play games with Apple computers. Apple was saying, 'We sure would like to get into the business world,' and everybody laughed. Along comes the announcement of the PC and all of a sudden it was just dead obvious to me, the afternoon we heard about it, that personal computers had gone from cutesy things into something called a personal computer. That was a major change in semantics, in whole attitudes," Wallace said.

> *Under the wing of the vice-president of Computer Systems & Services, the manager of the Office Technology Project, with just a few staff members, fostered and nurtured the growth of office automation at PG&E, using the personal computer as a cornerstone.*

Like many other data processing departments, there was a certain amount of disdain on the part of management. But Wallace prevailed, stating that "to sit in the middle of a railroad track with that freight train running straight at you at 80 miles per hour, waving your little red flag to try to slow it down is not going to do any good."

At about this time, Wallace hired Thomas J. Buckholtz to head up the Office Technology Project. Buckholtz, a University of California, Berkeley, Ph.D., had played with computers in high

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school and at the California Institute of Technology in the '60s where he earned an undergraduate degree in physics.

Under Wallace's wing, Buckholtz, with just a few staff members, fostered and nurtured the growth of office automation at PG&E, using the personal computer as a cornerstone. Because management said it believed the microcomputer was going to have phenomenal impact on the way people did their jobs, they made justification easy and the rules simple to follow: The computer had to be IBM or IBM compatible; and the software, most of which was for word processing, was predetermined for two reasons — it had been evaluated and found adequate and PG&E was able to negotiate economically advantageous site licenses.

People who had never used a computer welcomed the micro with open arms. Those who had been using dedicated word processors were at first wary, primarily because the word processing software for the micro was not as good as that for the dedicated machines. However, as time went on, even that changed. "There was so much diskette frisbee going on, and the [dedicated word processor] couldn't play. Soon, [the dedicated word processor users] were turning them in as fast as they could find a place to sell them for junk," Wallace said.

But word processing and simple spreadsheets are just the tip of the iceberg for microcomputer use at PG&E. Users have stretched the envelope and busted it wide open, with the help of Buckholtz's group and other specialized departments created within CS&S.

At the core of microcomputer use is the formalized training procedures that have been in place since the beginning. Once microcomputers became a force at PG&E, management in CS&S realized that training thousands of people scattered over more than half of the most populous state in the country could not be done by trainers based in the department. In addition, one of the principles of the Office Technology Project is user self-sufficiency. As a result, the department offers intensive, four-week, train-the-trainer programs for selected members of the user community. These people are taught how to teach others to use computers, are armed with all the manuals, software and training materials necessary and sent off to spread the microcomputer gospel.



"Along comes the announcement of the [IBM] PC. . . . That was a major change in semantics, in whole attitudes."

— William H. Wallace
Computer Systems and Services

According to Buckholtz, in addition to user self-sufficiency, the Office Technology Project also follows the principles of awareness of common and diverse needs, user-friendliness of hardware and software, ease of integration, flexibility, common placement of information resources at the mainframe and sequencing and timing. Ease of integration and flexibility go hand in hand, Buckholtz explained: By integrating common technologies, practices and procedures, the flexibility to phase out obsolescent hardware and software is relatively painless.

Buckholtz placed particular emphasis on sequencing and timing, explaining that new bells and whistles on the technology scene are of no interest unless the technology is ready for PG&E and PG&E is ready for the technology.

Wayne Hong, senior systems engineer in Management Sciences, found that the supermicrocomputer was a technology for which PG&E was ready. "The applications that we needed involved planning studies, system protection studies, heavy numbers types of applications. Some of these studies took an hour of CPU time on the mainframe. And these kinds of applications constitute 70% of our mainframe activity," Hong explained.

By creating four separate networks of supermicrocomputers, users can act independently of the mainframe and still share data with users on their own and other networks. Another benefit is the speed with which the engineers are able to perform critical computations. The third benefit — and perhaps the most important to the traditional mainframe managers and, as a by-product, other users of the mainframe — is the removal of intensive degradational applications from the mainframe environment.

Hong also pointed out some hard dollars saved with the installation of the

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supermicro networks. "If something happened to a piece of the protection relay equipment, the relay should trip to isolate the fault so the rest of the system would not be affected. We have about 4,000 transmission lines and lots of loops. Every time [the engineers] want to do a study, they have to conceive of all the scenarios and do lots of calculations. A thorough job would probably cost $300,000 a year. With the supermicros, the cost would be about $50,000 a year — the cost of one full-time engineer," Hong explained.

New areas of technology usually do the trick at PG&E, and the firm is for the most part far in advance of the technology.

Take as an example its outlying regions: Two years ago the six regions, with their 15,000 employees, had no microcomputers. Jerry L. Hunter, manager of the Oakland, Calif., region, and others perceived and demonstrated a need for computing power, and the regions were given 20 micros. Today, there are 1,200 microcomputers in the regions, and those computers are being used for applications that must have surprised even the techies back at headquarters in San Francisco.

> "Bell-and-whistle technology is of no interest unless the technology is ready for PG&E and PG&E is ready for it."
> — Thomas J. Buckholtz
> Office Technology Project



Hunter himself was responsible for the formation of a users' council, made up of representatives from all the regions, and he represents the regions at the headquarters-based Microcomputer Review Committee. One of the greatest successes, according to Hunter, is the excitement of the users. "We found so many people with untapped talent. There was some resistance from the old-timers, but the interest was there," Hunter said.

Shirley Fickett, computer systems analyst in the Engineering Computer Sciences Department, is helping people in the various regions maximize their use of computers primarily because the regions have limited access to the mainframes in San Francisco but also to "limit paper passing and increase the turnaround."

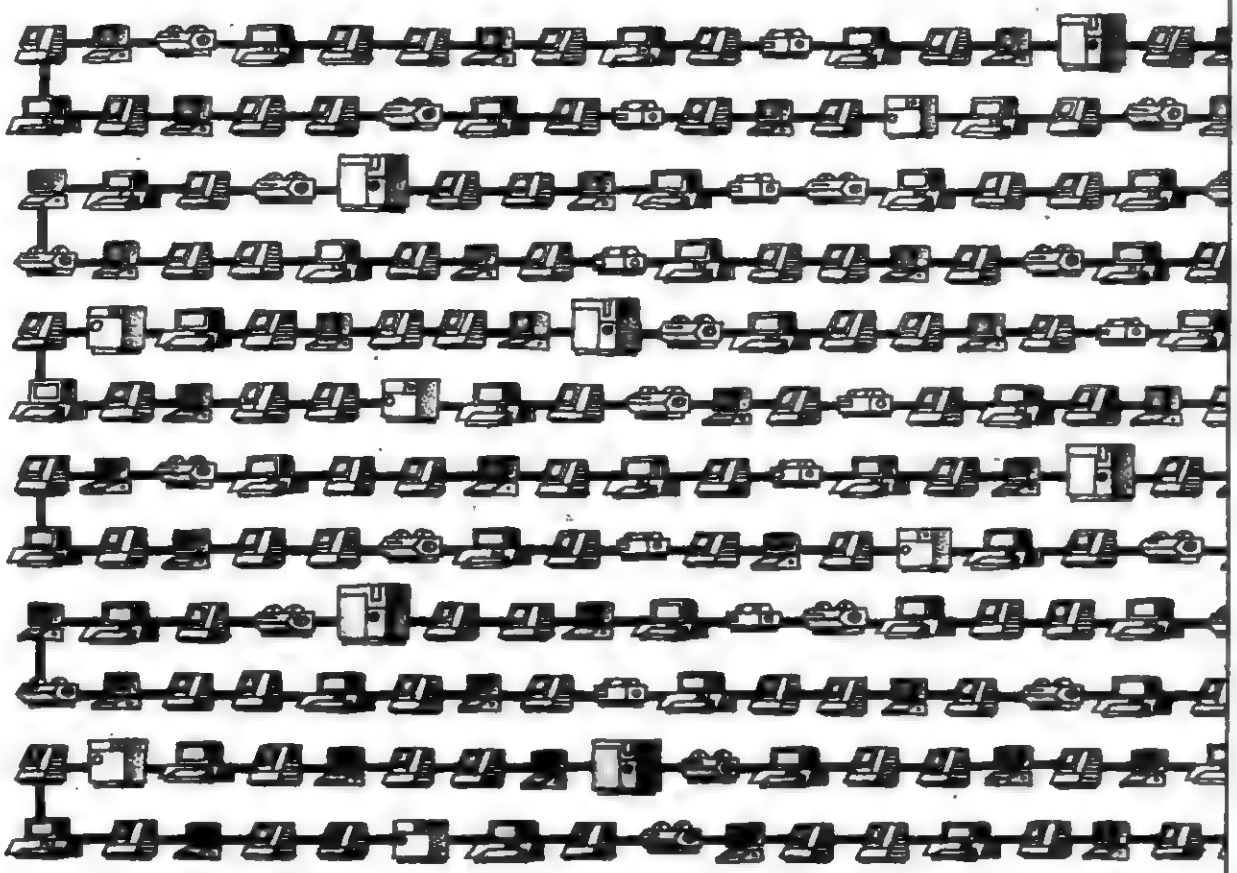
Fickett was called in to solve a particular problem for the estimators and mappers in the Bay Area who were overloaded with new service requests from condominium and mall developers. Once the developers submitted plans to the utility, PG&E mappers and estimators were required to go to the site, determine what new facilities were needed, put up a map, determine what rights-of-way and property lines were necessary, then send the completed map to the PG&E construction crews so that facilities could be constructed.

Because of the construction boom in the Bay Area, mappers and estimators were working more than eight hours a day at least six days a week. Fickett installed personal computers with computer-aided design (CAD) software and, although the project is still technically in the pilot phase because users are still learning the system, they are at a break-even point on the automated vs. manual system. According to Fickett, "Guestimates are a minimum 20% increase in productivity. The estimators and mappers will be ecstatic to go back to regular time."

Another specialist for the regions is Trista Berkovits, who joined PG&E seven years ago as a gas engineer and migrated over to the CS&S department as a senior computer applications engineer in the Engineering Computer Applications Department. Berkovits is heavily involved in a project dealing with moving mainframe data down to desktop computers, partially because mainframe communications access is expensive, but primarily because PG&E is trying to decrease the number of applications running on the mainframe.

Before the programs were rewritten to run on microcomputers, engineers in the field had to rely totally on CS&S staff at headquarters. It often took a couple of weeks by the time people at headquarters processed the engineers' requests and, if the output was inaccurate, the whole process had to be repeated. "One of the things PG&E is trying to do is to put the decision making closest to the user. The people in the regions who are modeling their distribution systems really are the best able to tell what they should model, how they should revise and so forth."

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according to Berkovits.

Rose Bonacum, a computer analyst in the Customer Operations area, provides support to departments at headquarters, including customer services, energy management and residential conservation services, and provides the same to those departments in the regions. She functions as a liaison, meets regularly with the regional computer users' council and sits on the Microcomputer Review Committee. Internally, her area includes about 250 people, and in the regions there are about 1,000 people who depend on her for support.

Because the regions have become so dependent on computers — and with that dependence comes a literacy that may turn to frightening sophistication — a new group was set up just more than a year ago. The group, Computer Client Services, is made up of 13 people with heavy computer science background who actually live in the regions. What this provided to the regions, said Arthur W. Beckman, who started the department, was a computer hack on the premises, "somebody [regional users] could come to with concerns."

> *Perhaps the real success story at PG&E is one that many companies could learn from: 814 staff members in the DP department, nine mainframes, 5,000 microcomputers and a computer literacy rate approaching 50%.*

Beckman, who became involved in the desktop computing movement about four years ago, originally thought that training users in the region could be accomplished by sending trainers out to travel the state. It took little time for Beckman to realize that a couple of trainers traversing the service area of PG&E might get back home sometime in the mid-90s. "So we regrouped and formed this train-the-trainer concept. We have people throughout the state helping us train others. For some it's maybe 10% of their job; for others it is closer to 100%. Seeing how the training was going and seeing the need for more direct support was one of the reasons Computer Client Services came into being," Beckman said.

Brian S. Lunde, who is taking over supervision of Computer Client Services so that Beckman can go back to the big-iron environment of Information Systems at headquarters, said he sees a continued importance placed on the role of the regional computer coordinator. "As part of the region, we can coordinate and establish a common basis of planning," Lunde said. Beckman sees 1986 as a year of continued support and marketing of services with level staffing but predicts 1987 will be the growth year requiring increased staff support for an expected increase in the number of users.

The future certainly looks bright for those involved with computers and office technology at PG&E. Among the evolving technologies, Office Technology Project's Buckholtz noted that desktop publishing, file transfer between mainframe and micros with proprietary software and departmental computing using micros on local-area networks are high-priority items.

Wallace is particularly excited about an electronic postal service, which came out of an idea he had for a shared information system. With the postal service, documents are created on microcomputers and queued out to the micros' hard disks. When traffic on the mainframe is light, out goes the electronic mail carrier, "snatches all the mail and brings it in, sorts it and puts it in various out baskets," Wallace explained. When the traffic is again appropriately light, mail will be delivered to the designated recipients.

At the heart of the electronic postal service is the mainframe working in tandem with the microcomputer, two-thirds of what Wallace calls the three-tier computing philosophy. The missing link at this time is the middle-tier computer. While Wallace is not sure when that computer will be available, he knows its specifications. "We're going to make absolutely certain that the middle-tier computer, the work group computer, is a great communications controller and a great file server and a lousy computer. Otherwise, all we'll do is migrate the mainframe slowly out to the departmental computers," Wallace said.

Perhaps the real success story at PG&E is one that many companies could learn from: 814 staff members in the data processing department, nine mainframes, 5,000 microcomputers and a computer literacy rate approaching 50%. Isn't all this mighty expensive? Hard to justify? Will they ever see a payback? Will they have to pass on the cost of such expensive programs to the consumer?

Judging by recent news about the utility, the answer is no. PG&E recently filed rate requests with California's Public Utilities Commission that include cuts of 5% for residential users, 12% for commercial and agricultural customers and 19% for industrial users.

White is a senior writer at Computerworld Focus.

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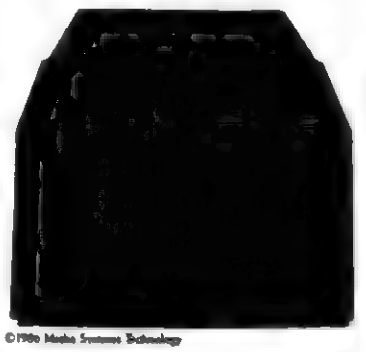
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BOTTOM-LINE PLANNING

Cost Justifying Investments In Office Systems



·BY·JOHN·J.·CONNELL·

What's the bottom line? How many people will it save? What is the rate of return on the investment? The inability to provide senior management with answers to these questions is the primary reason for the slowdown in the introduction of advanced office systems into U.S. industry and the traumas that have befallen the computer industry in the past year and a half.

Organizations went on a buying binge in 1983 and 1984, bringing in personal computers and other devices without justification. Everyone was supposed to become computer literate, the initial cost of individual machines was relatively low and the threat was that those who did not get on the bandwagon would be left behind. Good management sense was thrown to the winds in the rush to put a terminal on everyone's desk.

Beginning in late 1984, senior management became suspicious. What had been touted as a relatively small investment (if you looked only at the purchase price of personal computers) soon became a large investment as the total machine population grew by leaps and bounds. Software became a major additional cost factor, and the price of training and continuing technological support was grossly underestimated.

Management also discovered another disconcerting fact — the machines were being used infrequently or not at all. Because no prior justification for acquisition was required and no system was in place to track the benefits of machine use, users did not feel obligated to maximize the return on machine investment. Furthermore, the much-heralded ease of use of personal computers turned out to be a pipe dream. The single-application syndrome that is found among personal computer users today is a direct result: Having put forth the extraordinary effort required to master one application, users are loath to take on a second.

The size of the investment in these machines and their lack of use caused senior management to ask about the rate of return on PC investments. For most companies, the question could not be answered.

Senior management's response was short and to the point: No more investments in information technology until the return on the investment could be measured in a rational way.

That response, thundering across corporate America, signaled the end of 30% to 40% per year growth rates in equipment sales and raised havoc throughout the vendor community.

There are still those who challenge the need for cost-justification. They reason that personal computers should be as ubiquitous as telephones. There may well be some merit in that view, but the argument falls apart when machines are tied through telecommunications networks in advanced office systems. Such network-based systems represent a major financial commitment and an even heavier operating commitment. They not only cost a lot, but they change the way people do their jobs. Prudent management demands that they be properly justified before installation and that their impact be properly tracked and measured thereafter. The question is how.

In the late 1970s, Booz, Allen & Hamilton, Inc., a management consulting firm, conducted a landmark study under the sponsorship of a number of major vendors to determine how office automation would affect managers and professionals. Special data gathering techniques were used to identify and quantify the various activities carried on by personnel in that category, leading to the detailing of time spent in meetings, on the telephone, handling correspondence and so on. Booz Allen reasoned that if OA tools were applied to those various activities, firms would realize substantial time savings that would translate into hard dollar savings. Statistics published at the time estimated a potential savings of $300 million in U.S. corporations due to office automation.

Many companies used the Booz Allen rationale as the basis for

BOTTOM-LINE PLANNING

investing in advanced office systems. They did their own data gathering and analysis, found that their percentage breakdowns matched Booz Allen's and therefore accepted the balance of the rationale. The problem these firms came across and still deal with is that there is no way of determining whether they have achieved time savings and, more importantly, whether the time saved actually translates into dollar savings.

Many others have pursued variations on the Booz Allen theme in an attempt to categorize and measure office-based work in a way that would permit discrete analysis of the impact of office automation tools. Different data gathering techniques have been employed, new categories of work have been identified and a host of measurement methodologies have emerged.

The Sassone-Schwartz approach — the latest of these methodologies — uses data gathering techniques to identify work categories and identify categories as being of high, low or no value depending on the type of worker and then assigns a dollar value to each category. Thus, a professional who spends 50% of the work year doing professional work, 35% doing clerical work and the balance on unproductive activities would be assigned a total dollar value. Professional work would be credited at the professional's real cost — salaries, benefits and overhead. Clerical work would be credited at the real cost of clericals doing similar work, and unproductive work would be credited at zero. The objective of any investment in OA would be to trigger a shift to the higher value work categories, thereby increasing the total value of the individual employee.

The problem with all of these techniques for justifying investments in advanced office systems is that they use the saving of time, or more effective use of time, as the key objective of the system. Such objectives are valid when dealing with clerical activities involving standardized, repetitive tasks. They are not valid when dealing with managers and professionals whose activities are neither discrete nor standardized nor repetitive. In regard to personnel in these categories, the objective of advanced office systems is to help improve performance. Measurement systems must be structured accordingly.

Paul Strassmann, retired vice-president of Xerox Corp., espouses this philosophy in his book *Information Payoff*. He said he believes that investments in information technology should be evaluated in terms of their impact on managerial productivity — which he defines as the value added by management to an enterprise. In the book, he presents a relatively straightforward formula for calculating managerial productivity, using a typical profit-and-loss statement. The formula involves removing from gross revenue all those expenses over which management does not exert primary control (such as the cost of goods purchased and the cost of capital), treating the contribution of capital as break even and reducing revenue further by the cost of operating labor. The ratio of the remainder, adjusted gross revenue vs. the cost of management labor, is the value added by management, the measure of managerial productivity. According to Strassmann, that ratio tracked over time is the ultimate test of managerial performance. Investments in information technology should be justified based on how much that ratio is improved.

Putting aside some arguments about the methodology, which has been challenged in many quarters, the shortcoming of this approach is that it can only be applied to business units or profit centers, that is, organizations that have an actual profit-and-loss statement. Unfortunately, most corporate organizations are not true profit centers, and for them an entirely different approach must be developed for justifying investments in information technology.

The Office Technology Research Group has been pursuing the question of cost-justifying investments in advanced office systems since its formation in 1977. From these studies, the following four principles have emerged:

- Advanced office systems change the way people do their jobs. Traditional before-and-after analyses of the impact of these systems do not work. The evidence is overwhelming that as people use the machines, they change procedures, processes, communications patterns and operating relationships in ways that cannot be predicted beforehand.
- The impact of a system can only be determined over an extended period of time. When DP systems are installed, their impact can be determined shortly after the cutover date. With advanced office systems, sufficient time must be allowed for the system to be integrated into the work patterns of an organization. Only when systems usage becomes a normal work activity can improvements be identified and measured. Furthermore, in such identification and measurement, special attention must be paid to changes in the internal and external operating environments.
- Machine performance cannot be measured separately from human performance. Here again, the experience with DP systems is entirely different from that with advanced office systems. The former substitute machine labor for human labor, often in a direct trade-off. The latter augment the talents and capabilities of the users. Thus, any measurement system must look at the users and the machine as a combined entity.
- Advanced office systems can only be measured in terms of their impact on organizational performance. The purpose of such systems is to help improve the performance of individuals and, collectively, the performance of the units to which the individuals are organizationally assigned. You may take pleasure in citing examples of individual improvement, but the bottom-line impact of such systems can only be determined through measurement of improvements in unit performance, as attested to by the existing performance measurement system.

> *The purpose of advanced office systems is to help improve the performance of individuals and, collectively, the unit. You may take pleasure in citing examples of individual improvement, but the bottom-line impact of such systems can only be determined through measurement of improvements in unit performance.*

A recent example of these four principles in action involved the Western Division of GTE Corp. The case is a good example of an approach to performance measurement in both line and staff departments and also an illustration of the extent to which machines can change the way people do their jobs.

The Western Division of GTE builds and sells sophisticated telecommunications systems to the military. One department, made up of engineers, administrators and support personnel, is responsible for developing project proposals. To control costs, the firm makes maximum use of support personnel to assemble information and prepare drawings because such personnel cost approximately one-third what engineers cost. The engineer's role is to conceptualize the proposal, monitor its development and track its progress in frequent project meetings.

The department installed a system consisting of 150 terminals with good graphics capabilities tied to a telecommunications network that interconnected many of the terminals to a large mainframe. No attempt was made to change the way proposals were prepared before installing the machines. The system was put in to support the existing process, but after departmental personnel became familiar with the machines, they were allowed to introduce whatever changes they thought would be beneficial. After two years of operation the following occurred:

- The proposal development process has completely changed. Rather than conceptualizers and monitors, the engineers have become direct participants. They use the graphics capabilities of the machines to prepare drawings rather than relying on draftsmen, they enter text themselves rather than through typists, they use the network to track project progress rather than conduct meetings and they draw directly on data stored in the mainframe.
- Although the use of expensive engineers for these various activities would appear not to be cost-effective, the reverse is true. Because of the lessened requirement for support personnel, the reduction in meetings and the virtual elimination of rework, that is, the need to redo unsatisfactory work, the department has estimated it is saving $8.5 million annually on a one-time investment of $10 million.
- The need to attend fewer project meetings has freed up sales personnel so that they can spend 50% more time in customers' offices (perhaps of greatest importance in the long run).
- Demonstrable improvements have been made in proposal quality and timeliness.

How were these benefits measured and, perhaps more fundamentally, why was the system brought in in the first place? More than two years ago, the manager of the Western Division of GTE, concerned about the productivity of his operation and the quality of its output, called upon Jonathon Brown, manager of quality from GTE's corporate headquarters in Connecticut, and David Shay, manager of productivity for Peat, Marwick, Mitchell & Co. in New York, to critique his operation. Shay and Brown conducted a number of interviews of senior and middle management to obtain answers to the following questions:

- What are the objectives of the various components of the department?
- How do you define and measure success?
- What are the critical functions and activities that contribute to success?
- What are the current shortfalls in performance?

From these interviews and subsequent deliberations with technological personnel, a system was configured to provide various operating capabilities and gross estimates were made of the possible benefits of such a system. Concurrently, a methodology was developed by Shay and Brown to track those elements of departmental operations that would have a critical impact on success, as success was defined by division and department management. A proposal describing the system, the potential benefits and the tracking methodology was accepted by senior management and the project moved forward to achieve the results cited.

Lessons to be learned from the GTE case parallel those experienced by many others. Personnel using advanced office systems change the way they carry out their assignments. In so doing, users become inextricably intertwined with machines making it impossible to measure the performance of one separately from the performance of the other. Changes brought on by the use of such systems take place over time and are occurring continuously. Any measurement of the impact of advanced office systems must be in terms of improvement in unit performance, as such improvements are defined by operating management.

For those accustomed to justifying investments in office technology through head count reductions and other hard dollar savings, such measurement approaches may seem imprecise and fuzzy. In fact, they are not. They recognize that advanced office systems are rapidly becoming an integral part of ongoing operations rather than a separate, ad hoc activity.

Advanced office systems are a key element in improving the performance of knowledge workers and the contribution such personnel make to the success of an enterprise. How you measure that contribution is the key determinant in how you measure the impact of advanced office systems.

Connell is executive director of Office Technology Research Group located in Pasadena, Calif. He founded the company in 1977.

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C. **Reason for this inquiry: (check one)**
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- 3 ☐ Information only

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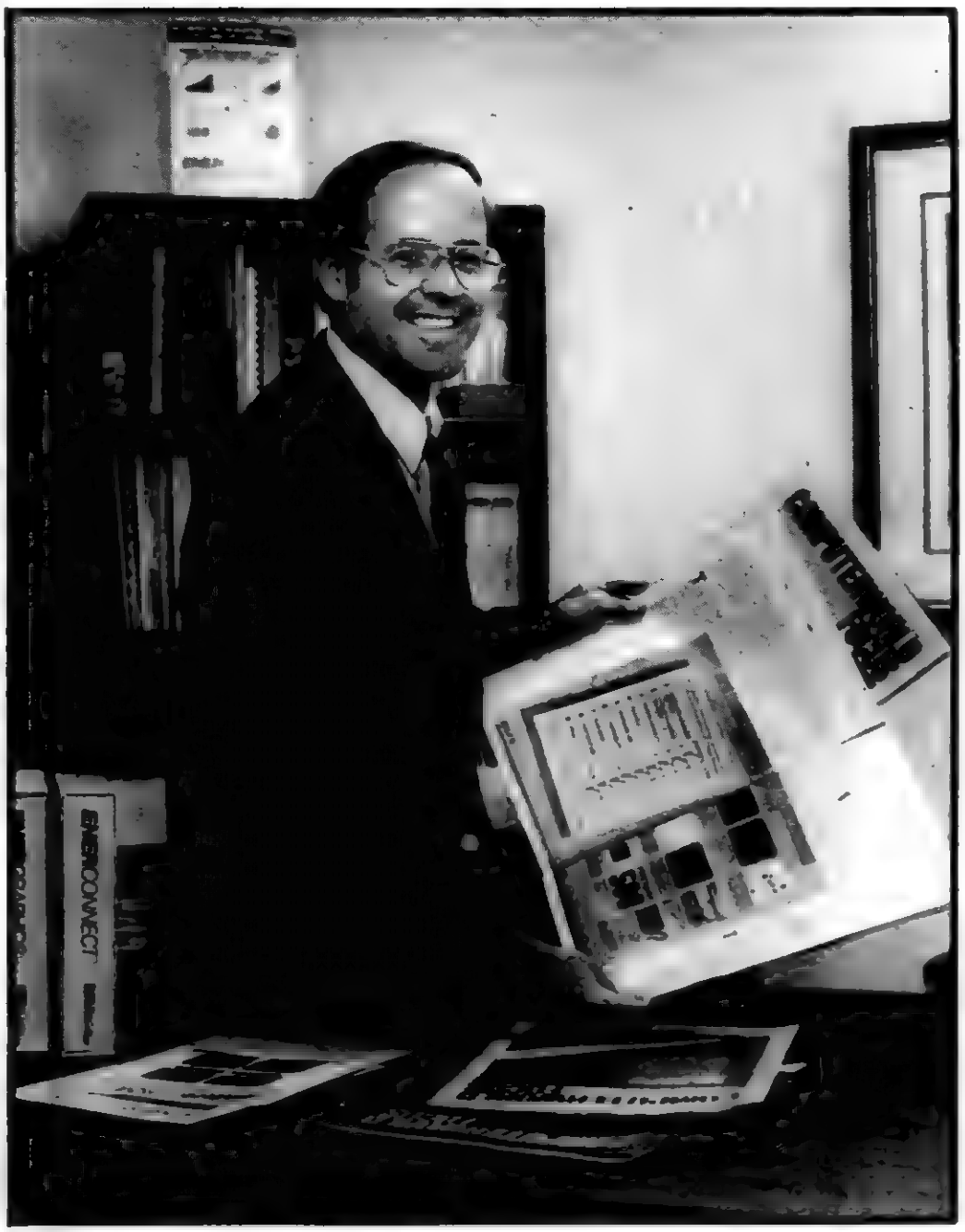
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"Two ads in Computerworld Focus flooded us with inquiries on our new micro product, EnerConnect."



EnerConnect is the second major micro product from Enertronics, developers of the successful EnerGraphics package. As the ad for EnerConnect says, it is "... the first software package that puts mainframe graphics capability into the hands of anyone with an IBM PC ... or 3270 PC."

When it came time to announce EnerConnect, Randy Andes decided to use *Information Week, Business Week,* and *Computerworld Focus.* As Randy puts it, "... we knew *Computerworld* reached the people we need to talk to from past ads for EnerGraphics, and we decided to test *Focus* because, as the name says, each issue focuses on a topic. So, we could select an appropriate editorial environment."

The results? "*Computerworld Focus* has produced the most response of any of the publications used and, by far, the best response. In fact, total response (via the 800 number) has far exceeded expectations. We further intend to continue to tie into *Computerworld's* editorial calendar where appropriate."

The moral? Well focused advertising in a well focused medium will produce the best results every time.

Call your *Computerworld* advertising representative for more details on upcoming issues of *Computerworld Focus.*

Randy T. Andes, Director of Marketing, Enertronics Research, Inc., St. Louis, Missouri.

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PRODUCTS

DEC Expands Network Line With Three New Products

MAYNARD, Mass. — Included in recent announcements made by Digital Equipment Corp. were three products targeting local-area networks.

According to the vendor, Decnet-DOS V1.1 will allow IBM Personal Computers to participate as end nodes in Decnet Phase IV computer networks. Features available with Decnet-DOS include the ability for IBM PCs with currently installed 3Com Corp. or Micom Systems, Inc. Interlan Ethernet boards to communicate and share information with other computers, workstations and terminals in a Decnet network; facilities for sharing files and data across a network; and the ability for users to expand the resources of desktop workstations by giving the Microsoft Corp. MS-DOS system access to the disk storage and high-speed, letter-quality printers on other systems in the network. Decnet-DOS V1.1 will be available in June for $500.

The Decconnect System specifies a method of installing cabling and networking components in a facility. The system uses a radial cabling topology and consists of four parts. The Thinwire Ethernet Multiport Repeater, priced at $2,900, is a radial hub that connects eight thin RG58 coaxial cable segments. The Thinwire Ethernet Station Adapter, with a price tag of $275, is an IEEE 802.3/Ethernet transceiver that allows standard Ethernet products to connect to Thinwire Ethernet cable. The H4005 Ethernet Transceiver ($300) is a non-obtrusive tapping transceiver unit that physically attaches to an Ethernet coaxial cable. The Delua-M Ethernet Controller ($3,275) is used to interface an Ethernet local-area network to most Unibus-based systems. All of the products that make up the Decconnect System will be available in June.

DEC also announced seven Standard Network packages, made up of hardware, software and services, based on the Decconnect System. Two of the packages provide networking capabilities for connecting terminals, personal computers and workstations to Ethernet networks; three packages provide capabilities for networking contiguous work groups on one floor, for connecting floors together and for connecting the traditional computer room to the network; and two packages provide for connecting multiple, geographically dispersed locations and for communicating with an IBM Systems Network Architecture-based environment. The packages range in price from $5,800 to $59,200 and will be available in June.

For more information about any of the products, contact Digital Equipment Corp., Maynard, Mass. 01754.

Circle Reader Service Number 238

Zymacom Office System Out

WESTFORD, Mass. — Zymacom, Inc. has announced an office communications and messaging system that links telephones, personal computers and data processing equipment via existing private branch exchange telephone wiring. According to the vendor, because the Zymacom Information Exchange uses existing PBX telephone wires (two twisted pairs) to link telecommunications and computer equipment and requires no special cabling, the system's components can be moved to new locations.

The major functions of the system are messaging, file display and printing and file transfer among compatible personal computers via a central file server. Features include time and task management tools, electronic calendar and functions such as automatic speed dialing and callback. The system can also convert text messages to synthetized voice to deliver messages to users through their Touch-Tone-type telephones.

The Information Exchange system's major components include a central server with Intel Corp. 80286 processor, 1M-byte to 2M-byte memory, communications interface, 40M-byte expandable disk and 25M-byte cartridge tape backup; application software that runs on the central server for messaging, data sharing and task management; a desktop unit phone with video display and keyboard; speech synthesis unit; message lights; desktop voice/data unit that provides an interface to connect a standard phone and two RS-232 devices to the system network to allow simultaneous voice/data transmission at 9.6K bit/sec. data transfer rate via existing PBX wiring; and a message control console for a receptionist or message center.

Cost for a typical configuration of the Information Exchange system ranges from $40,000 to $70,000 for 40 to 120 users. The system can be configured for as many as 220 users. Leasing arrangements are also available. Contact Zymacom, Inc., 2 Lyberty Way, Westford, Mass. 01886.

Circle Reader Service Number 239

HP Enhanced Laptop Debuts

PALO ALTO, Calif. — Hewlett-Packard Co. has unveiled an enhanced version of its Portable Plus, a 9-lb laptop computer. The enhanced Portable Plus features a new LCD, increased internal memory, new read-only memory (ROM) software applications and additional data communications capabilities.

According to the vendor, the new display has an improved contrast of more than 200% over the LCD of the previous Portable Plus. The computer will also be offered in both 256K-byte and 512K-byte random-access memory (RAM) models, and memory options will allow users to expand to as much as 1.2M bytes in the 512K-byte memory version. Newly available software on plug-in ROM cartridges includes Multimate International Corp.'s word processing software and HP's Executive Card Manager information management package. New data communications products, Reflection 1, Yterm and Sim 3278/PC, improve the ability to exchange information with HP and Digital Equipment Corp. minicomputers and/or with IBM and other mainframe computers, the vendor said.

The enhanced Portable Plus with 256K bytes of RAM is $2,695; the enhanced Portable Plus with 512K bytes of



Hewlett-Packard Co. Portable Plus

RAM is $3,395. In addition, plug-in RAM for either configuration has been reduced in price up to 29% and plug-in ROM application software ranges in price from $195 to $495. The warranty for the Portable Plus has been extended from 90 days to one year. For more information, contact Hewlett-Packard Co., 3000 Hanover St., Palo Alto, Calif. 94304.

Circle Reader Service Number 240

DG Workstations Feature Screen Saver

WESTBORO, Mass. — The Information Systems Division of Data General Corp. unveiled two new workstations. According to the vendor, the new workstations include a screen saver and soft setup menu. Designed to extend the life of the display by preventing image burn-in, the screen saver feature clears the display after a period of inactivity. The soft setup menu simplifies configuration by allowing variables such as terminal transmission speed, parity and mode of operation to be set by keyboard responses to menu prompts rather than DIP switches. The company said Dasher D461 and Dasher 411 are targeted for business automation, WP and interactive data entry applications; Dasher D215 and Dasher D214 for interactive data applications.

Costs are Dasher D461, $1,495; Dasher D411, $1,195; Dasher D215, $895; and Dasher D214, $795. Dasher D400 and D200 series workstations are available 30 days after receipt of order. Contact Data General Corp., Information Systems Division, 4400 Computer Drive, Westboro, Mass. 01581.

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PRODUCTS

IBM Unveils Lap-Size Portable

BOCA RATON, Fla. — IBM recently unveiled its lap-size portable computer, the PC Convertible. Weighing less than 13 lb, the Convertible is battery powered and, depending upon diskette drive and printer use, can be operated six to 10 hours by a typical user without recharging the battery pack, the vendor said. With an optional modem installed, the Convertible can communicate with other computers using existing telephone lines. In addition, the detachable display can be removed and replaced with optional IBM desktop displays.

The PC Convertible has an Intel Corp. 80C88 microprocessor and 256K bytes of user memory expandable to 512K bytes with the addition of 128K-byte memory cards. It features an 80-col. by 25-line LCD, a built-in, inclined 78-key keyboard with full-size typing keys and dual 3½-in. diskette drives. Each diskette drive has a 720K-byte capacity. Also included are a battery pack and an AC adapter that can operate the system while simultaneously recharging the battery pack.

The IBM unit price of the PC Convertible with 256K bytes of memory, dual 3½-in. diskette drives, removable LCD, 78-key keyboard, Application Selector and Systemsapps diskette, AC adapter and battery pack is $1,995. Contact IBM, Entry Systems Division, P.O. Box 1328, Boca Raton, Fla. 33432.

Circle Reader Service Number 242



IBM PC Convertible

Dest Document Reader Gets Models

MILPITAS, Calif. — Dest Corp. announced four models of its Workless Station — a document reader for dedicated word processing and office automation systems. The new models incorporate type-style recognition programs and formatting capabilities previously available as options. According to the vendor, all of the new models can format text consistent with most major WP systems. A stack-feed feature allows 75 sheets of paper to be fed automatically into the systems. Also, the new products can be used for a number of applications including electronic filing, telecommunications and data conversion.

Model 235 can read a page of text in 25 seconds and comes with eight monospaced type-style recognition programs and a format processor board. Model 236 has four additional proportionally spaced type-style programs. Model 245 and Model 246 can read a page of text in 15 seconds. Model 246 also has the additional proportionally spaced type styles. Model 235 is $5,995; Model 236, $6,995; Model 245, $8,995; Model 246, $9,995. Contact Dest Corp., 1201 Cadillac Court, Milpitas, Calif. 95035.

Circle Reader Service Number 244

Seiko's Copiers

MILPITAS, Calif. — The Graphic Devices Systems Division of Seiko Instruments U.S.A., Inc. introduced the CH-5300 series of intelligent color copiers. The copiers produce A- and B-size images with up to 4,912 colors.

The CH-5301 is an A-size device with a print resolution of 152 dot/in. Print time per copy is less than 40 seconds on plain paper or transparency film. The CH-5312 can produce both A- and B-size images. Print time for a B-size image is less than 2 minutes, independent of plot densities. Print resolution is 203 dot/in.

Both units support a full range of video and parallel interfaces; the interfaces support 100 different terminals with no additional software required. Two versions of the video interface are available. CH-110 has 3.75M bits of built-in memory and accepts images with display resolution up to 1,280 by 1,024 pixels. CH-111, with 15M bits of memory, accepts images up to 2,560 by 2,048 pixels. Both video interfaces provide a full-frame buffer that stores the image during printing time, allowing multiple copies to be generated off-line without operator intervention.

According to the vendor, extensive user-selectable features are offered through local intelligence in the copier. Features include background reversal; scaling of images by factors of two, four or eight; programmable aspect ratio correction by factors of 3:4 or 4:3; 90-degree image rotation for creating A-size output on the CH-5312; and monochrome printing capability. Model CH-5301 is priced from $5,995, and CH-5312 begins at $9,995. Copiers can be delivered within 90 days of date of order. Contact Seiko Instruments U.S.A., Inc., 1623 Buckeye Drive, Milpitas, Calif. 95035.

Circle Reader Service Number 243



The market for software is simply going wild. With new applications. New technologies. New ideas. And MIS/DP professionals are the ones who have to deal with it all.

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But hurry, closing is May 30. For more information, contact Ed Mareckl, Vice/President Sales, Computerworld Focus, 375 Cochituate Rd., Framingham, MA 01701-9172, (617) 879-0700. Or call your local Computerworld sales representative.

Issue: July 9 - Closing: May 30

COMPUTERWORLD FOCUS

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CALENDAR

May 14-16, Nashville — **Small Systems Conference.** Contact: Gartner Group, Inc., P.O. Box 10212, Stamford, Conn. 10212.

May 14-16, Chicago — **Network Protocols and Standards.** Also, July 7-9, Washington, D.C. Contact: Systems Technology Forum, Suite 150, 10201 Lee Highway, Fairfax, Va. 22030.

May 28-29, Boston — **Planning the Next Generation of Telecommunications Networks.** Also, Nov. 12-13, Vienna, Va. and Dec. 10-11, San Francisco. Contact: IDC Washington Division, Suite 240, 1500 Planning Research Drive, McLean, Va. 22102.

June 2-3, Toronto — **The IBM System/38: Standards and Practices.** Also, June 9-10, Los Angeles; June 16-17, Chicago; June 23-24, New York City. Contact: DGC, 1450 Preston Forest Sq., Dallas, Texas 75230.

June 2-4, New York — **Data Communications System Components.** Also, July 9-11, Washington, D.C. Contact: Systems Technology Forum, Suite 150, 10201 Lee Highway, Fairfax, Va. 22030.

June 2-5, San Francisco — **Syntopican XIV.** Contact: AISP, 1015 N. York Road, Willow Grove, Pa. 19090.

June 8-10, Stamford, Conn. — **AI in an IBM World.** Contact: New Science Associates, 46 Hunt Terr., Greenwich, Conn. 06831.

June 9-11, San Francisco — **Local-Area Networks.** Also July 23-25, Washington, D.C. Contact: Systems Technology Forum, Suite 150, 10201 Lee Highway, Fairfax, Va. 22030.

June 16-18, New York — **The Business Strategy Conference and Exhibition.** Contact: Online International, Inc., 989 Avenue of the Americas, New York, N.Y. 10018.

June 16-19, Las Vegas — **1986 National Computer Conference.** Contact: NCC '86, AFIPS, 1899 Preston White Drive, Reston, Va. 22091.

June 23-25, Washington, D.C. — **Network Operations and Management.** Contact: Systems Technology Forum, Suite 150, 10201 Lee Highway, Fairfax, Va. 22030.

June 25, New York — **System/38 Data Base Insights.** Contact: DGC, 1450 Preston Forest Square, Dallas, Texas 75230.

July 9-11, New York — **Fourth Annual PC Expo.** Contact: PC Expo, 333 Sylvan Ave., Englewood Cliffs, N.J. 07632.

July 17, Chicago — **Micro-Computer '86.** Contact: German American Chamber of Commerce, 666 Fifth Ave., New York, N.Y. 10103.

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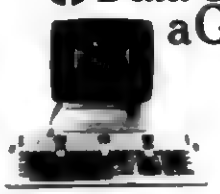
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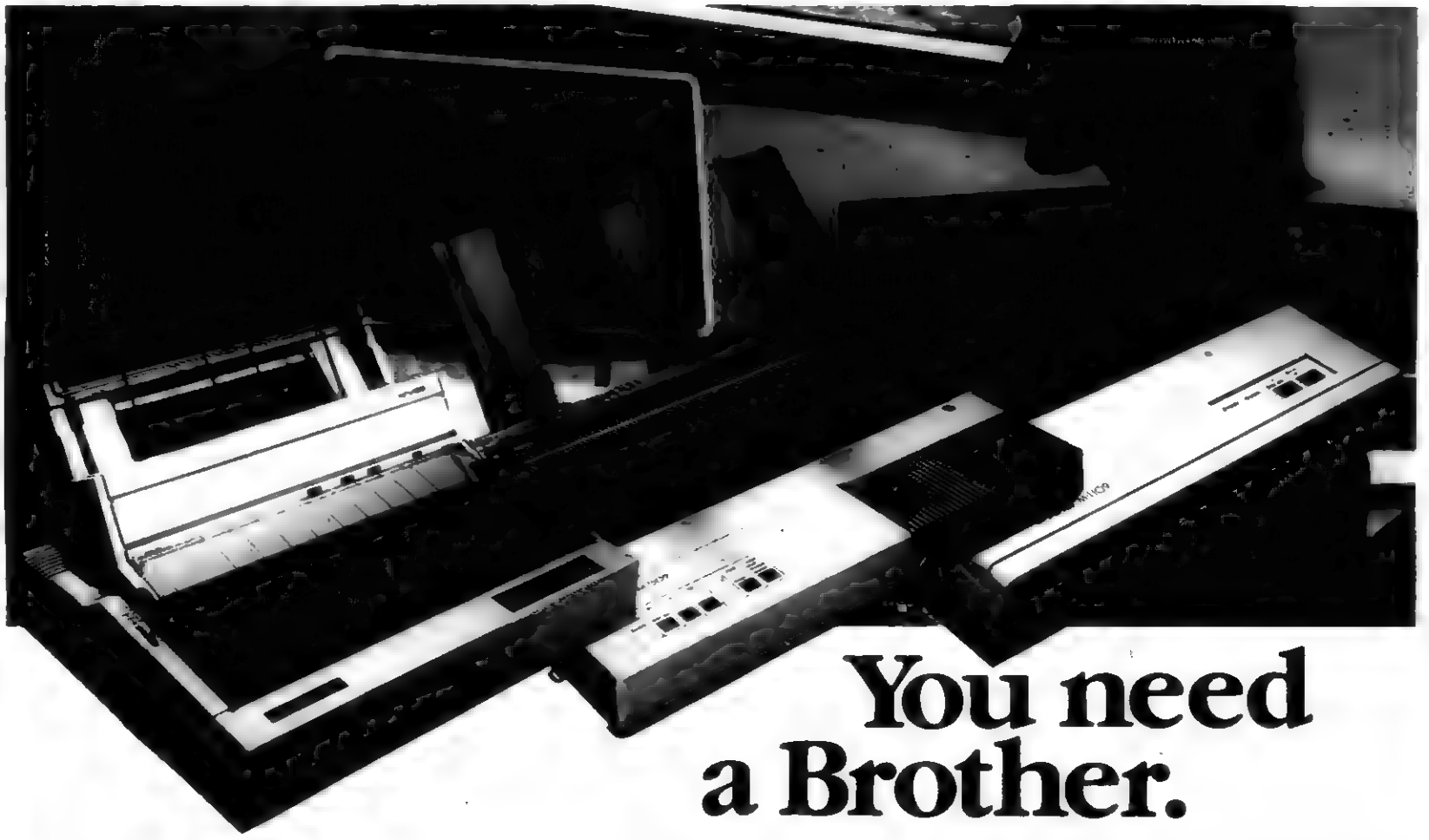
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CIRCLE READER SERVICE NUMBER 172

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The compact Brother M-1509 sizzles with bi-directional printing at a racy 180 cps for drafts...45cps for near letter quality. It credits both serial and parallel interfaces to its features. And, along with most of the 2024L's print functions, it's equipped with a one-inch paper cut function to save paper and a buffer memory to save time.

And if your budget's even less than a shoe-string, the new Brother M-1109 is for you. Its standard features include both a friction-feed platen and a built-in tractor feed. Like the M-1509, it has dual interfaces and a spectrum of print options. All of which adds up to big system advantages at a small system price.

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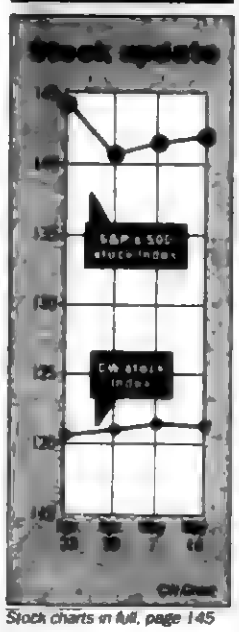
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COMPUTERWORLD

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NEWSPAPER

TOP OF THE NEWS

IBM's 20-year pact with Hogan Systems, Inc. could alter the shape of the banking software market. **Page 146.**

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Micrographics still draws a crowd, despite the increasing presence of optical storage. **Page 2.**

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Canaan Computer Corp. will sell its department systems through IBM's former leading value-added reseller. **Page 6.**

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Software AG of North America rolls out support for IBM's SQL. **Page 10.**

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Novell, Inc.'s direct sales efforts have some of its top customers worried. **Page 45.**

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The vintage-1971 Kenbak-1 is designated the earliest commercial microcomputer. **Page 33.**

■

MIS and vendors of latest generation high-end computers are not speaking the same language. **Page 25.**

■

IBM System/38 users have been expecting a new high-end system for many months, with some observers predicting a third-quarter 1986 introduction. But announcement of what has been known unofficially as the Model 60 may come much sooner — tomorrow, according to some IBM watchers. In addition to the Model 60, IBM is rumored to be introducing enhanced versions of low-end System/38s and a high-density replacement for the 3370 disk drive, which would be welcomed by selected System/38 users who are running disk-intensive operations and have outgrown the 571M-byte 3370.

■

Hewlett-Packard later this month is expected to introduce support for Unix on its Spectrum machines, the HP Series 3000 Models 930 and 950. In June, HP is expected to announce several offerings in its line of computer-aided engineering software.

See **NEWS** page 4

Users await protocol fixes

Evolving MAP/TOP specs confront joint users group

By Elisabeth Horwitt

SEATTLE — Despite reported progress toward usable Manufacturing Automation Protocol and Technical Office Protocol specifications and products, some attendees at the MAP/TOP Users' Group Meeting held last week expressed caution about committing themselves to the still-evolving protocols.

Charles Gardner, chairman of the MAP/TOP Steering Committee, assured an audience of more than 500 attendees that "we're moving from the awareness to the conviction stage." But he admitted that there was still the "difficult issue" of how

See **USERS** page 6

Merger battle may lose buyers

By Alan Alper

NEW YORK — A protracted hostile attempt by Burroughs Corp. to acquire Sperry Corp. could force prospective customers directly into IBM's embrace and could seriously damage both firms' long-term fiscal solvency, industry observers contended last week.

That analysis emerged as Sperry, after nine days of silence, rejected Burroughs' $70-a-share acquisition proposal, claiming the merger was not in its shareholders' or customers' best interests. Sperry made a conditional offer to repurchase the remaining 29.5 million outstanding shares at

See **MERGER** page 4

FCC move eases service restrictions

By Mitch Betts

WASHINGTON, D.C. — The Federal Communications Commission last week dropped regulations that required AT&T and the seven regional holding companies to offer enhanced services through separate subsidiaries.

In its so-called Third Computer Inquiry ruling, the FCC eliminated a 1980 policy requiring separate subsidiaries to market offerings of computerized communications services, such as packet switching and voice mail.

Although the action was seen as a major step toward further telecommunications deregulation, no flood of new services is expected soon as a result of the FCC decision. The regional holding companies still must obtain waivers from U.S. District Court Judge Harold H. Greene, who oversees the AT&T divestiture agreements, in order to offer certain information services, agency officials noted.

Many business communications managers supported the move to kill the separate subsidiary rule, provided that strict accounting rules and other safeguards are established to protect users' interests.

"Structural separation has created disincentives for technological innovation and has denied users a single point of interface for systems solutions," said a spokesman for the Association of Data Communications Users, based in Bloomington, Minn.

"This is one small step in the right direction," said Robert Ellis, president of the Aries Group, Inc., a Rockville, Md.-based consulting firm specializing in voice and data networks. "Anything that gets rid of that artificial separation has to be in the interest of the end user," he said.

Edwin B. Spievack, president of the

See **FCC** page 6

CW EXCLUSIVE

Beyond commodity: IBM's top PC executive talks strategy

By Eric Bender

Standing against the tide of inexpensive clones, IBM will price aggressively against contenders in the low-end personal computer market, Entry Systems Division President William Lowe declared last week.

But Lowe insisted that corporate America's micro buyers should look beyond pricing if they want to take advantage of communications options and advanced technology features now on the horizon.

The attack of the bargain-basement clones is just the latest challenge to IBM's Personal Computer sales, but the Big Blue juggernaut continues to roll. By Dataquest, Inc. estimates, more than 2.3 million standard PCs will ship this year.

In 1980, Lowe, then head of an IBM laboratory in Boca Raton, Fla., gave the late Phillip Estridge the go-ahead to create the PC. During the next few years, as Lowe took a series of high-level executive jobs elsewhere at IBM, the PC group skyrocketed from a handful of people into a major IBM division with 10,000 employees.



Lowe

Lowe, 45, who joined IBM in 1962 as a test engineer, returned to head ESD in March 1985. Interviewed last week at the division's headquarters, he outlined some plans for the Personal Computer's future in large corporations.

CW: You've been saying that PCs are not really a commodity business. Why not?

LOWE: Well, computers are programmable. Technology is really exploding as fast now, and over the next five to 10 years, as it had been in the past.

I see us providing more function and more applications in machines that embody this advanced technology as we go through time.

The PC is a moving machine. It's not a static design point, and I think the new functions and features we'll be providing will be attractive to a lot of people.

See **IBM** page 8

Knowledge workers' changing needs affect MIS, exec says

By Peggy Watt

SAN FRANCISCO — Today's "knowledge workers" represent a new majority of U.S. workers whose changing needs are forcing traditional MIS to loosen its control over corporate information resources, an executive of a leading information services company said last week.

Robert E. Weissman, president and chief operating officer of Dun & Bradstreet Corp., speaking at a conference of the Association for Information and Image Management, said end users are dramatically altering the role of MIS.

"There is an information revolution going on, with end users wresting control from the traditional wielders of power," Weissman said.

Data access on more desktops, since the proliferation of personal computers as well as an information explosion assisted by more accessible mass storage, is spurring the savvy workers, according to Weissman, "bringing forth promises of our new information age."

In the case of Dun & Bradstreet, which has been described as the largest information industry firm in the world, the focus is still on the task, not the tool, Weissman said.

"We don't think of ourselves as being in the information market," he said. "We define a market as having commercial commodities, cost structures and customers. I've never taken a company to lunch." The market is the people whose needs Dun & Bradstreet meets, he said.

That approach and the use of personal computers and, generally, wide data access in meeting those needs has enabled Dun & Bradstreet to double revenue and triple profits in the past five years, Weissman said.

He added in a later interview that MIS managers need to adapt accordingly. "MIS managers are an endangered species if they don't realize the definition of the critical leverage point has changed," Weissman said. "The largest, most expensive, least understood part of the equation [to meet a user's need] is the CPU."

Just as the computer is learning to focus not on data for sale, but on the customer problem to be solved, the MIS department needs to deal with issues before systems, he added.

In fact, Dun & Bradstreet has never had an MIS director, he said. Computers as a means of providing customer and user services "are so ground into the infrastructure of the business that [computer use] grew up spontaneously," he said.

He expects similar philosophies in firms that emphasize problem solving. "The productivity of machines is no longer as important as the productivity of people," he added. "The MIS manager shouldn't allow himself to be measured in computing capacity but on whether the system is responsive to the needs of the users. That's still not believed by some. And their success in that area is restricted to the extent that they resist it."

Microfilm alive, well at show

Lack of standards slows adoption of disk storage

SAN FRANCISCO — Optical disk storage manufacturers were out in force for the annual Association for Information and Image Management show last week, but efficient, fast and relatively cheap micrographics techniques still drew the crowds.

"I've been hearing . . . micrographics or microfilm is dead. It's passe. The technology is old — the wave of the future is optical disk," said Donald N. Frey, Bell & Howell Co. board chairman and chief executive officer, in his opening address. "But what we are now into is the latest of a long list of post-World War II technical hypes."

Despite the rapidly developing new methods of electronic storage, paper still accounted for 95% of document management in 1985, he added. Microfilm handled 5% of the load, and electronic media accounted for 1%.

The show's nearly 10,000 attendees, while jostling for a look at the latest optical disk jukeboxes and aperture card printers, tended to concur that they were not abandoning microfilm or paper just yet.

"I haven't determined whether optical disks are archival enough" and whether they will simply last as long as microfilm is known to endure, said Milton Matzke, a branch manager for state library records in Frankfort, Ky. "I wish they'd come out with some standards."

Campion G. Jaques, a sales representative for Chicago-based Endata, Inc., publisher of parts and equipment catalogs for a variety of fields, said he was eyeing optical disks as another medium on which to present inventory and price listings.

"It's interesting to see how everyone's direction has changed to accept new technology," he said, recalling that early Computer Output Manager recorders were "ostracized" at their first appearance. He already produces catalogs on floppy disks, but the differences between formats only complicate that additional medium, he said.

"But I see optical disks being involved at some time," he added. "I hope it will be compatible, economical, and I'll be able to supply it."

Micrographics' longevity ensures its place in storage technology, said Harry J. Siegel, director of document and publication services for ANR Pipeline Co. in Detroit.

"We have fiche, film and paper," Siegel said. "I think there'll always be a combination. I don't see micrographics going away." But he said he would put optical disks to use for instantaneous retrieval, while keeping the film for archived copies that need to be read less frequently.

— Peggy Watt

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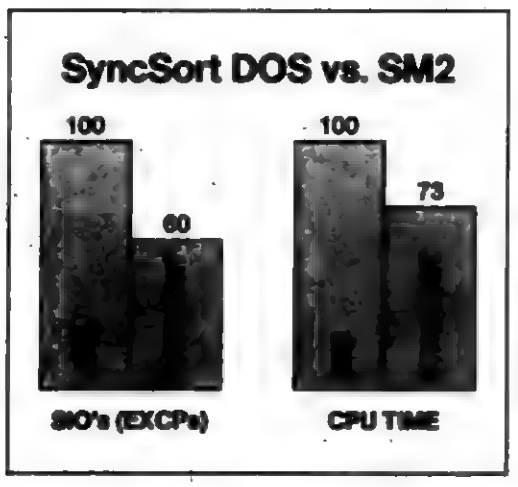
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Merger battle may lose users

From page 1

$80 a share if Burroughs' cash tender offer for 33 million shares is successful [CW, May 12].

Martin Litzky, president of the Sperry users group USE, suggested that a drawn-out hostile takeover attempt by Burroughs of Sperry could hinder both firms' efforts to expand their user bases. The primary concern, Litzky said, is that either Sperry's or Burroughs' mainframe lines would be discontinued if a merger is consummated, despite Burroughs' statements to the contrary.

"On a daily basis, executives are making decisions on the acquisition of computer systems. If they have two or three proposals in hand, one from Sperry, one from Burroughs and one from IBM, they may decide to go with IBM because of concern about the future of the other two firms' product lines," Litzky said.

"I can't imagine a combined company able to maintain two mainframe lines that are not compatible with one another," he added.

Litzky lauded Sperry's rebuff of Burroughs. He said a merger of the two BUNCH companies would not benefit either firm's customers or shareholders. "I don't believe that together they could have an impact on IBM," Litzky said. "They'd be just slightly bigger than DEC."

Meanwhile, the winner of the battle for control of the New York-based Sperry would be saddled with an inordinate amount of debt. Burroughs said it would have to borrow $3 billion to acquire Sperry, and Sperry last week said it would have to borrow $2 billion to finance its stock buy-back proposal.

"The question is, depending on the outcome, 'What impact would such a debt load have on future R&D, manufacturing and marketing expenses at either firm?' " said one analyst who requested anonymity. "The only ones who would benefit from all this are the financial institutions lending the money."

Prepared to negotiate

Late last week, in a letter to Sperry Chairman Gerald G. Probst, Burroughs Chairman W. Michael Blumenthal said the Detroit firm is prepared to "negotiate a meaningful increase" to its $70-a share acquisition offer.

The letter was in response to a Sperry filing with the Securities and Exchange Commission, in which the New York firm said, among other things, it has considered selling itself, divesting of principal assets or forming a joint venture with another concern to defend against Burroughs' hostile takeover initiative.

"Burroughs was not expecting to pay $70 a share; it knew there would be a counteroffer," noted Donald Haback, an analyst with Smith Barney, Harris Upham & Co. "Last time Burroughs offered $65 and wasn't willing to accept $68. This time the question is: How high is Burroughs willing to go?"

With the parameters of the deal now in place, analysts said negotiations between the two firms could begin in the $75-a-share vicinity. At $75 a share, the value of the acquisition increases by $500 million to $4.6 billion.

The $4.6 billion price tag is sure to dissuade all but the most serious of firms to try and out-bid Burroughs, analysts said. Sperry's conditional stock buy-back plan, however, would provide time for any of the potential white knights mentioned, including AT&T, Chrysler Corp., Ford Motor Co., Honeywell, Inc. and NCR Corp. to formulate a bid of their own.

"I can't imagine any of those firms starting cold and coming up with a acqusition plan in a short period of time," noted Harvey Poppel of acquisition and merger specialist Broadview Associates. "Most of them move at the speed of a glacier when it comes to strategic decisions."

The Sperry board recommended that Sperry stockholders not tender their shares until its buy-back plan commences. Sperry said it has $800 million in funds and is negotiating a $2 million credit facility with banks to finance its stock buy-back plan.

Sperry last week filed a complaint in Delaware Chancery Court asking that the Court validate Sperry's tender proposal under Delaware law and enjoin Burroughs from bringing any legal action in any other court attacking its offer.

Martin Marietta announces Ramis II enhancements

Improves multiuser access, adds interface

By Eddy Goldberg

PRINCETON, N.J. — Martin Marietta Data Systems last week announced numerous enhancements, including data maintenance concurrency and a menu-based user interface, to Ramis II, its fourth-generation language and applications development tool.

The Data Maintenance Facility (DMF) Concurrency feature allows multiple users to simultaneously access shared Ramis II files and data bases in both interactive and batch environments, the company said.

Bob Roach, director of Ramis II marketing, said tests of DMF Concurrency showed it performed about 4.5 transactions per second lightly loaded with 19 users.

The user front end, called the Ramis II Menu-Based Architecture (RMBA), allows users to access Ramis II facilities through a series of windows and menus like those in Unison, Martin Marietta's line of personal computer software products.

Ramis II Release 85.3 also supports natural language options as well as interfaces to IBM's DB2 and SQL/DS. Performance improvements to the Systems Building Executive, Formatted Screen Manager, Smartedit, and DMS and DL/1 interfaces are also included.

The Ramis II English Release 2 update adds natural language graphics and automatic processing of time-related expressions for interactive users in the MVS and CMS environments. It costs $13,500 to $27,000.

The DB2 and SQL/DS interfaces allow users to generate Ramis II reports from DB2 and SQL/DS files using standard Ramis II report requests and cost $2,250 to $6,750.

Ramis II Release 85.3 is currently available for the VM/CMS, MVS and DOS/VSE environments for $30,000 to $90,000. It is provided free to current Ramis II users and is upwardly compatible with previous releases.

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TOP OF THE NEWS

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Free maintenance of Sperry equipment for one year was included recently in the company's successful bid for a systems contract for the city of Pueblo, Colo., a move seen as continued aggression against its third-party resellers. The city accepted Sperry's bid for a System 80 Model 8 for $390,000.

■

Availability of AT&T's Unix System V Release 3 is still set for mid-year despite rumors of delays to year's end, according to Bill O'Shea, executive director of AT&T Information Systems' Software Systems Division. A full demonstration of the product is scheduled for the National Computer Conference in Las Vegas in June.

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Main Editorial Office
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Jacore to resell Canaan DCS 5800 systems

Firm hopes to crack Fortune 1,000 through $62 million VAR deal

By James Connolly

TRUMBULL, Conn. — Formerly one of IBM's largest value-added resellers, Jacore Systems Co. of Marietta, Ga., has contracted to distribute departmental systems made by IBM software-compatible manufacturer Canaan Computer Corp. of Trumbull.

According to Canaan officials, the three-year reseller agreement is valued at $62 million.

Jacore will resell Canaan's DCS 5800, which Canaan announced in January as a competitor for the IBM 4361 and System/36 in departmental processing applications.

Jacore reportedly was one of IBM's largest value-added resellers in terms of sales, with $60 million in revenue in 1985, much of it from sales of the System/36.

No longer offers System/36

Jacore no longer offers the System/36, but it does sell AT&T's 3B line of minicomputers. It also sells Microvax II and PDP-11 equipment from Digital Equipment Corp.

"It is one of the largest contracts signed in our company's history. It is significant in that Jacore is one of the largest IBM value-added resellers, with a large distribution network in place," according to Canaan President Ron Ritchie.

Canaan distributes its products through OEMs and value-added resellers. The DCS 5800 was designed to run software compatible with IBM's VM/CMS and to support up to 36 users working with IBM Personal Computers and compatibles or a variety of terminals. The DCS 5800 is priced at $62,000 for a 12-user configuration.

Canaan in Fortune 1,000 mart

Ritchie claimed that the Jacore contract will establish Canaan in the Fortune 1,000 marketplace.

Jacore Chairman Jim Jacobson said of the deal, "We have decided to pursue an agreement with Canaan that exceeds our total annual sales for last year because we believe that Canaan's VM/CMS-compatible system provides a unique solution for departmental computing in Fortune 1,000 companies."

Jacore resells minicomputers and peripherals through an agent and reseller network. The value that Jacore adds will be systems support and applications software, according to Canaan.

Users await protocol fixes

From page 1

to continue increasing the functionality of the specifications without sacrificing their stability.

The two-day conference was the first official meeting of the combined MAP/TOP groups.

The likelihood of MAP and TOP protocols continuing to change over the next year has delayed a number of planned MAP installations, company spokesmen said. According to systems engineer Dan Miklovic, diversified manufacturer Weyerhaeuser Co. opted to wait until some of the confusion surrounding MAP had dissipated before taking the plunge. Weyerhaeuser will be accepting bids from vendors this year and plans to begin implementing a MAP network in 1987.

"We're planning to wait until 1987, when some of the technical issues like interoperability and network management are being resolved," Miklovic said.

Rather than postpone its project until the remaining MAP specifications have been finalized, the Rensselaer Polytechnic Institute decided to proceed at a slow pace. This fall, the School of Engineering will implement a MAP network connecting two IBM 4381s, a Digital Equipment Corp. VAX-11/780, acting as a shop floor controller and a Microvax II. The next phase, scheduled to begin in the spring of 1987, involves connecting other parts of the engineering school on the MAP network.

MAP is a set of factory networking protocols based on the 802.4 token-bus standard. TOP, networking protocols designed for the office, is based on the 802.3 Ethernet standard. Since MAP and TOP use many of the same communications interfaces, users can link their business and factory systems by bridging the two types of networks.

Nobel Mandili, a senior consultant at Northrop Corp., said that higher level MAP protocols are starting to solidify but that "theorizing is not enough; you have to use them."

He said many aerospace manufacturers, including Northrop, are currently testing on their manufacturing facilities the upper layers of MAP, such as the File Transfer Protocol for connecting TOP and MAP networks, and FTAM.

Vic Lukasik of Boeing Computer Services Co. reported that the TOP Technical Working Group Electronic Mail Subcommittee is currently discussing how two emerging document transfer protocols, X.400 and Electronic Document Interchange, may be incorporated into TOP. The TOP group also announced its intention to support 802.3 on broadband coaxial cable.

During the MAP/TOP Implementation Panel, an attendee asked how vendors "could afford to aim at a moving target and keep up with changes in specifications."

> ***'Higher level MAP protocols are starting to solidify, but theorizing is not enough; you have to use them.'***
>
> — Nobel Mandili
> Northrop Corp.

One vendor spokesman responded, "We encourage prudent migration to new specifications" but added that standards organizations should "balance the trade-offs between adding the next bell and whistle and impact on the marketplace."

Network vendors voiced support for the idea of limiting protocol updates to the communications interfaces "so that users can update each layer without having to tear apart their plant systems," as one vendor put it.

At the conference, Retix announced a compiler that makes it easier for users to implement additions and updates to existing MAP protocols such as FTAM, "which is out there, but still not a standard," Retix President Charles Fogg said.

Linking MAP and TOP networks to other communications standards — particularly the IBM Token-Ring — was another major vendor and user concern at the conference.

"I think there is a definite need to bring the office and factory together," said Stephanie Nader, a technical specialist at McDonnell Douglas Corp. The company is interested in implementing MAP and TOP in an information system currently under development, which will link "any computer to any computer," Nader said.

Several developments at the conference promised the eventual integration of MAP- and TOP-based networks with other networks:

- The TOP Technical Working Groups reported that they are discussing how IBM Token-Ring networks can be linked to Ethernet 802.3 networks using TOP. "Initially the idea generated a lot of consternation because people thought IBM was controlling 802.5 too much, especially since they had not released some of their specification," said Lukasik. "Now, they seem as locked into the 802.5 standard as anyone else."
- Touch Communications, Inc. demonstrated a prototype network that connected an IBM Token-Ring and an Ethernet 802.3 system.

The prototype linked IBM Personal Computer ATs on the Token-Ring, and Sun Microsystems, Inc. workstations and PC ATs on an Ethernet, using three vendors' implementations of the MAP protocol FTAM.

Touch Communications plans to release a commercial version of its software product later this year, said Vice-President of R&D Brian McGann. The package will implement Layers 3 through 7 of MAP and TOP specifications for the OSI model on a variety of vendors' systems.

- DEC and Data General Corp. unveiled plans for providing migration paths between their proprietary networks and MAP.

Also at the conference, Concord Data Systems, Inc. announced the Series 4100, a family of bridges that interconnect Concord's 10M bit/sec. broadband and 5M bit/sec. carrierband MAP networks.

And Industrial Networking announced that its MAP/One local-area network had successfully completed testing for MAP 2.1 conformance at private testing company ITI.

Senior writer Rosemary Hamilton contributed to this report.

FCC move eases restrictions

From page 1

North American Telecommunications Association, a trade group for independent telephone distributors, criticized the FCC for eliminating the subsidiary rule and substituting what he called "phantom safeguards" against cross-subsidies.

The agency replaced the structural separation rule with less restrictive accounting and technical safeguards that are intended to accomplish the same goal, which is to prevent the regional holding companies from using their telephone companies to subsidize their new businesses.

AT&T and the regional holding companies argued, and the FCC agreed, that the separate subsidiary rule prevented the companies from offering the kind of enhanced network services that independent vendors can offer. AT&T, for example, said the separate subsidiary rule kept it from offering a voice store-and-forward service.

To prevent discrimination against other enhanced-service providers, the FCC ordered AT&T and the regional holding companies to establish open network architectures by 1988 and to provide enhanced-service competitors with equal access — called comparably efficient interconnection (CEI) — to the basic communications network.

AT&T is pleased with the FCC decision to eliminate structural separation, a spokeswoman said, but is concerned that complex procedures for establishing CEI will create long delays before any new services can be offered. She said the CEI rule was designed to prevent abuses by the local telephone "bottleneck" companies and should not have been applied to AT&T, which no longer has a monopoly.

"The Third Computer Inquiry is just one of the two regulatory doors we need to open," said a spokesman for Southwestern Bell Corp., one of the regional companies. "We'd like to see the second door — the restrictions of the divestiture consent decree — opened, whether it's through congressional or judicial action."

The FCC decided not to tamper with the fundamental regulatory framework established by the Second Computer Inquiry in 1980, under which basic telecommunications services are regulated and enhanced services are not. However, the commission remained undecided on how to classify protocol conversion, and deferred that decision to a later date.

The commissioners said they seek public comments on whether to classify protocol conversion as an unregulated enhanced service, as it is now, or as a regulated basic service or to decide its status on a case-by-case basis.

The FCC's action last week was far less radical than the major regulatory overhaul the agency originally proposed last year [CW, Aug. 5]. The agency had considered scrapping the basic and enhanced service categories, instead regulating only those telecommunications services that are offered by dominant carriers and lack a competitive market. But overwhelming opposition from the industry and users killed that proposal.

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IBM PC exec talks strategy

From page 1

To me, that's different than a television set or a VCR.

That's particularly true if you look at the large-account applications of the products — tying the workstations closer together with intermediate and large processors, sharing data bases, being able to provide applications that span the workstation and the processor in a way that doesn't require the user to get involved in all that complexity.

There are going to be people buying at the low end of the PC business today, taking advantage of the low costs and prices that are available from us and from competitors. My expectation is that, at the low end as well as in large accounts, there's a lot to be done in terms of interfaces, new applications, new I/O devices, connectivity to data bases outside the home. These are going to be available primarily through new design points.

CW: So what is your message to MIS shops now looking for cheap micros?
LOWE: The message is twofold. No. 1, I'm going to be price- and cost-competitive at the low end of my product line. And No. 2, I will maintain compatibility with my product line, with the future devices that I'm going to provide. The wise shopper ought to look at, in addition to price, ongoing maintenance costs and the ongoing application of his machine, and make sure that it is fully compatible to the degree he needs it.

I can match, in manufacturing costs, anyone, either U.S. or abroad. We source the same components. I offset the low labor costs overseas through automation, in investments in my plants here.

The product will become more complex — hopefully not to the end user, but in terms of the function that we're providing. It's pretty tough to provide that level of function without making an investment. And if you make an investment you've got to recover it, whether you're IBM or whether you're a clone.

CW: You've also been stressing reliability.
LOWE: We set out, when we first built the PC, to build a stand-alone machine for personal productivity or for the programming professional to utilize at home. We set a set of objectives, which I now think have to be improved upon when you look at large accounts.

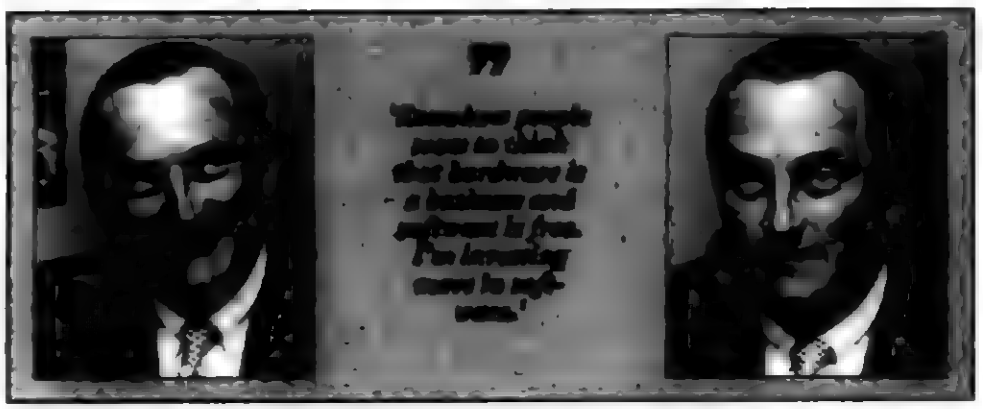
We keep setting very high, tough reliability goals which, frankly, are much more stringent than the ones we set for our product when we first started. We'll be setting objectives for the number of repair actions over a period of time that will be at least 10 times better on products we have under development than products we had under development two or three years ago.

Also, as we're tying the products more tightly into intermediate and large processors in large-account networking situations, we are making sure to support that in software, with error correction routines and network management capabilities.

CW: What are your most common requests from large corporate users?
LOWE: I would say connectivity of the PC, communications, networking and data bases are very high on the demand statement.

The next thing is obviously being able to support more than the 640K bytes on an operating system basis rather than through the techniques that have supported it up to now.

CW: What's the progress on PC-DOS?



LOWE: We're investing in software a great deal. We're focused on it — expanding the addressability, providing a base for enhanced communications capability, with multitasking and eventually multiuser capability.

CW: Where is IBM focusing in work on PC-to-large-system connectivity?
LOWE We've been working on the problems of data support and office systems support across our product line. We've made some good strides forward.

And we've talked about cooperative processing. We're intent on providing a set of open interfaces, which will be on the PC as well as the intermediate and large processors, that will allow sharing of information and the movement of information and the sharing of resources between workstations and the intermediate and large processors.

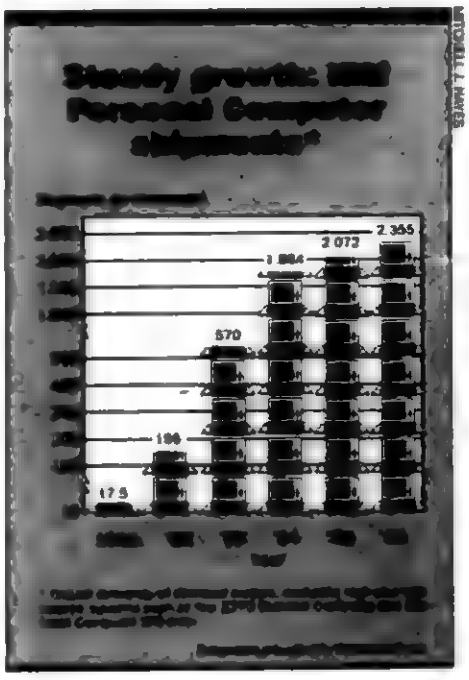
We have described before, and I know I've got a big team in Austin working on, a set of service requesters on our products that will work well with host support, whether that's a 370 or System/36. So that you can utilize the services of an intermediate or large processor — virtual file, virtual print and other resources — as if it were resident on the workstation. Or download from the processor the management of the workstation interface.

It's attempting to provide a shell of software so that the resources between the host and the PC can be utilized by the end user without getting into the complexity of the handoffs between the workstation and the big system.

CW: How's the PC Convertible doing?
LOWE: It's sold much better than we expected. Our expectation now for 1986 is two to three times higher than what it was when we announced the product. As a new class of product — a small-footprint desktop that can also travel — there's probably a lot more potential than the industry realized.

We don't have the Convertible in high-volume retail marketing yet. We have gotten a great deal of demand from large accounts and a very high level of demand from education. The largest volume customers are in the insurance industry. There's also a good deal of interest from management consultants and financial consultants.

CW: What's been the response to the 3½-in. disk drives?



LOWE: I was not concerned with the 3½-in. when we came out, and I'm not concerned with the 3½-in. now. It fits in your shirt pocket, it's convenient, it holds more information than the standard 5¼ and it's a good deal.

It has helped us a great deal with one of the most [important] attributes of the Convertible, and that's the footprint.

For a high percentage of the machines on order, customers have ordered a desktop CRT as well. I think there's a great deal of advantage to having it as a desktop and being able to carry it as well.

CW: How does the 3270 Personal Computer now fit with the rest of the PC line?
LOWE: Consistency with the 3270 family is very important to many of our large customers.

The 3270-PC, when first introduced, unfortunately took the approach of taking the PC base and sort of redesigning it into a product, rather than adding a card or attributes into a PC base. Therefore, when we came out with an XT and came out with an AT, it took us longer to announce the 3270-PC versions.

We're moving in the direction of getting those things together. I would think that eventually we'll build some MFI [mainframe interactive, the 3270 interface] attributes into the base of the PC.

CW: Does the RT Personal Computer's architecture give an indication that future IBM desktop systems are likely to standardize on the PC AT bus?
LOWE: I wouldn't draw any strategic significance beyond the intent to give access to the applications and the attachments available on a PC.

CW: Is IBM planning significant changes in selling and supporting micro software, as are the major independents like Lotus?
LOWE: We get hit with many of those questions ourselves, with the facilities and functions that we own.

I was expecting you to ask about site licensing. I think there's a lot of misunderstanding about site licensing and the business of software. Somehow people seem to think that hardware is a business and software is free.

I'm investing more in software than I am in hardware. I focus on the business equation just as hard on software as I do on hardware. And when we have large customers who want high volumes of software, on a cost-justified basis I provide them a volume discount, just like I do in hardware.

I'm intent on getting a return on my investment in software, just as I am in hardware. In a lot of what I read about site licensing, somehow that factor gets left out.

CW: What options is IBM examining in copy protection?
LOWE: We've got copyright, we've got copy protection, and we work with customers on problems like downloading software, the number of people who use it and the number of licenses. Our corporate customers are very responsible in this regard.

To provide a scheme that is more or less foolproof is a complex question. It's got to be something that doesn't encumber usage, can't cost much and is tamperproof. That's quite a combination of requirements. We're going to work on that, and if we develop something it will be in concert with our application providers.

CW: How will the changes in distribution channels affect IBM?
LOWE: I'm not concerned about the changes that I've seen over the last six to 12 months.

My plan is to use the distribution channels as we go through time with about the same mix of placement that we have now.

We've taken a lot of steps, particularly in the last six months, to strengthen our relationship with our retailers. The decision not to expand the retail chain greatly in numbers, the actions we've taken against gray marketing . . . and the [price protection] package that was announced April 2 provide our dealers with more IBM support.

Dearth of product announcements marks graphics show

But record crowd views many enhancements in 'mature' industry

By Rosemary Hamilton

ANAHEIM, Calif. — Despite a record-breaking crowd of more than 30,000 and a display of more than 1,000 products, the annual National Computer Graphics Conference last week lacked excitement because there were few major new products.

"I've seem some improvements, but nothing much new," said Jules Ficke, a programmer with Synernet Corp., which does contract work for the National Aeronautics and Space Administration's Edwards Air Force Base in Edwards, Calif. "It seems like this year is for refinements."

Rather than breaking new ground in graphics technology, most vendors introduced enhancements to existing products or used the conference, which was sponsored by the National Computer Graphics Association (NCGA), to display products that were introduced earlier this year.

The show seemed to reflect a recent NCGA study that was published in Technical and Business Communications, Inc.'s "The S. Klein Newsletter on Computer Graphics." It concluded that "the industry is at a technologically mature stage, with product development becoming more evolutionary, rather than revolutionary in nature."

Ronald Ball, chairman of this year's conference, acknowledged that it was more subdued than those of other years. NCGA has been sponsoring the conference since 1980. That first show brought in a mere 1,700 people, but each year the show has continued to flourish.

So Ball said he expects it to continue that way, "as long as we're the place they can come to see whatever it is they want to see about graphics."

Lack of debuts not disappointing

A random survey of NCGA attendees indicated that the lack of cutting-edge product debuts did not cause much disappointment. Many attendees said they use the graphics show to keep up with what is currently available on the market, rather than to learn about new frontiers.

"I'm not interested in a new system," said William Black, a senior computer-assisted design and manufacturing engineer at Aerojet Strategic Propulsion Co. in Sacramento, Calif. "I like to come here to get a flavor for where the industry is at."

Black, like other attendees interviewed, was impressed with the strong microcomputer presence in the CAD/CAM displays on the show floor. As a user of McDonnell Douglas Corp. Unigraphics workstations, he said he was on his way to check out the vendor's new micro offering.

PC Productivity Systems, a McDonnell Douglas company, introduced Crossroads, a $2,995 mechanical engineering package that runs on IBM Personal Computers. In addition to PC Productivity, there were dozens of other vendors with micro-based systems. AT&T, for instance, devoted almost its entire exhibit to CAD systems based on its PC 6300 and PC 6300 Plus.

But the workstation vendors were not to be outdone by the micro companies; and some of the major players, including Digital Equipment Corp., Sun Microsystems, Inc. and IBM, which showed its new workstation RT Personal Computer, were drawing large crowds at the show. Notably absent was Apollo Computer, Inc., which did not have its own booth, although its systems were being used in at least three software vendors' exhibits.

In keeping with the evolutionary vs. revolutionary trend cited in the NCGA study, both IBM and Cadam, Inc., a maker of CAD/CAM software, announced they had ported mainframe software packages to lower end systems. IBM was running its CAEDS electrical design software, which has been available on such systems as its 6080 Graphics System, on its RT PC.

Cadam introduced Micro Cadam, a scaled-down version of its mainframe package for IBM PCs. The package will sell for $8,000 and is targeted at first-time users as well as Cadam's installed base, which now has the option of running CAD/CAM software on a desktop.

Among the OEM deals announced at the show was a $30 million agreement between McDonnell Douglas and Tektronix, Inc. McDonnell Douglas said it will incorporate five of the Tektronix graphics terminals into its Unigraphics product line.

Massachusetts Computer Corp. (Masscomp) announced it would incorporate the General Electric Co. Graphicon 700 graphic processor into the high end of its workstation line. GE, which announced the processor last month, said Masscomp is the first company to sign on as an OEM.

Silicon Graphics, Inc., a maker of high-end graphics workstations, announced that it will resell OEM hardware from MIPS Computer Systems, Inc. for its next generation of workstations. Earlier this month, MIPS announced its proprietary reduced instruction set computer hardware.

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Software AG development tool ties SQL applications, Adabas

Also supports programs written in Cobol, PL/I

By Maura McEnaney

SAN DIEGO — Software AG of North America, Inc. last week became the latest systems software vendor to support IBM's SQL, announcing to users the AdaSQL application development tool.

AdaSQL allows IBM users running Software AG's Adabas data base management system to translate an application's SQL commands into commands that can be read by Adabas.

Software AG officials acknowledged that few existing Adabas applications use such commands and that the product is oriented toward the day when SQL is established as a standard and Adabas users want to employ it.

Announced at the 15th Annual Users' Conference, AdaSQL also translates SQL commands embedded in Cobol and PL/I programs into access commands to be used with the Adabas data base management system. Future support for Fortran and the U.S. Department of Defense's Ada language is expected, the company said.

"We expect future adaption to the evolving standand of SQL because currently there is no standard," said Software AG's Executive Vice-President Peter Page.

The AdaSQL product cannot translate all SQL commands to Adabas, according to Bruce Mancinelli, vice-president of development at Software AG.

Although the company has announced no release date, officials said Software AG is committed to interface Adabas to IBM's relational product, DB2, just as it has interfaced Adabas to IBM's VSAM and DL/1 file management systems, Mancinelli said.

Software AG is committed to bring out before the end of the year a new version of Adabas "to selected accounts," but it will primarily be a version with enhanced performance characteristics rather than one that works with DB2 and SQL, Mancinelli said (see story page 19).

Robert J. Becker, data base and data communications administrator for Foremost Insurance Co. in Grand Rapids, Mich., said the new version of Adabas will have improved performance through enhanced I/O efficiency.

"Software AG has gone to the Execute Channel Program level for I/O communications, which has a lot less operating system overhead, instead of continuing to rely on BDAM," he said.

Adamint replacement

Users see AdaSQL as a replacement for what Software AG officials termed an "outdated" earlier product, Adamint, which acted as an interface between Cobol applications and the Adabas DBMS. In addition to its ability to read about two-thirds of all SQL statements, AdaSQL can be integrated with the Predict data dictionary for cross-referencing capabilities.

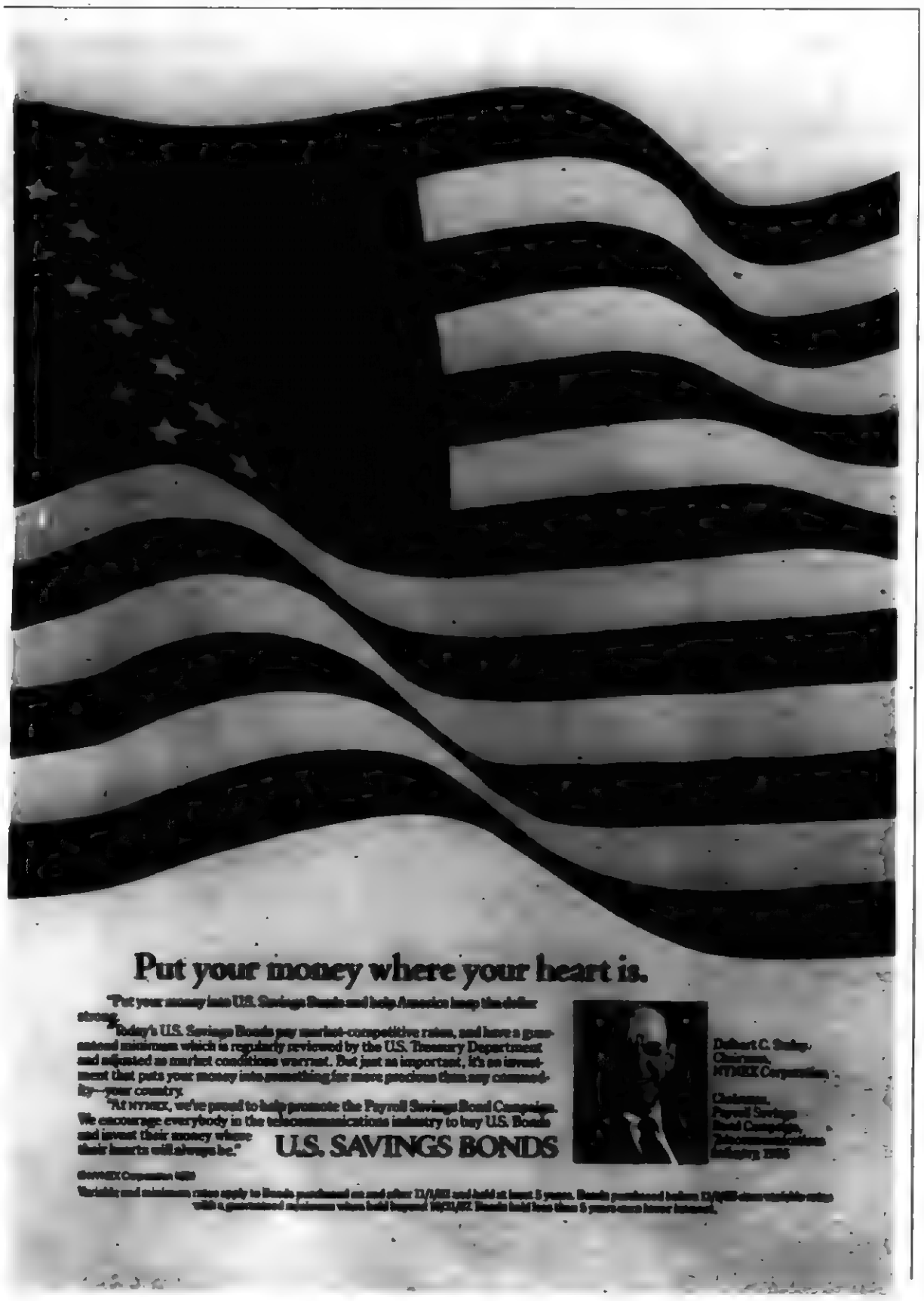
Conference attendee Larry Heard, data base administrator for Hilti, Inc., a construction fastener systems manufacturer in Tulsa, Okla., now heavily uses Adamint to give his Cobol and assembler human resources and order processing applications access to the Adabas DBMS. "AdaSQL will make a Cobol application look more like an Adabas application," he said.

AdaSQL for IBM's OS/MVS and DOS/VSE operating systems will be available in September. A version for Digital Equipment Corp.'s VAX/VMS machine will be available in the first quarter next year, company officials said. Prices range from $10,000 to $15,000.

Other debuts

Also announced by Software AG were the following:

- Com-Pose, an on-line environment manager for IBM MVS and DOS/VSE users running CICS, TSO or CMS. Com-Pose acts as the central communications manager for Software AG's information center, development center office automation and communications system products. Available in July, Com-Pose costs $35,000 for DOS/VSE and $45,000 for MVS.
- Net-Pass, an application session manager that allows users to conduct several logical sessions from an IBM 3270-type terminal. The product works on IBM mainframes running MVS/XA, OS/VS1 and DOS/VSE systems. Scheduled for release in October, Net-Pass is priced from $15,000 to $25,000.
- Adabas/Total Bridge, which allows users of Cincom Systems, Inc.'s, Total DBMS to move file structures to Adabas while running existing applications. Adabas/Total Bridge runs on IBM mainframes running DOS/VSE, MVS and OS/VS1. Available in July, the product ranges in price from $20,000 to $30,000.
- Natural/DL1, a facility that allows users of Software AG's Natural fourth-generation language to develop applications directed at DL/1 file structures. Available in November, the product is priced from $30,000 to $40,000 for DOS/VSE, MVS and VS1 operating systems.



ORACLE RELATIONAL DBMS ROCKETS TO #1 IN THE 1986 SOFTWARE USER SURVEY. WHY?



Source: 1986 Software User Survey published by SOFTWARE NEWS, Copyright ©1986 Sentry Publishing

COMPATIBILITY

The ORACLE® relational database management system is compatible with IBM's SQL/DS and DB2. SQL/DS and DB2 represent IBM's latest generation of database management technology for IBM's largest computers. ORACLE's capabilities and user interface — the SQL language — are identical to those of SQL/DS and DB2. Programs written for SQL/DS and DB2 will run unmodified on ORACLE.

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SQL/DS and DB2 run only on IBM mainframes; ORACLE runs on IBM mainframes, DEC, DG, AT&T, HP, Stratus, Sperry, Prime, Honeywell and several other manufacturers' minicomputers, and on a wide range of microcomputers including the IBM PC/XT and PC/AT. ORACLE runs under vendor-proprietary operating systems or under UNIX.™ All versions of ORACLE are identical and include a complete implementation of SQL— not a subset.

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Having the same software running on your mainframe, minis, and micros greatly simplifies the task of connecting your machines into a network. ORACLE's network software allows microcomputer users to directly access data stored in the shared database on the mainframe or minicomputer, or copy that data into the database on their micros and operate independently.

Today, minicomputer users polled in the *Software User Survey* rank Oracle Corporation as their number one vendor choice for 1986. ORACLE is the number one relational DBMS, with thousands of installations on IBM mainframes, DEC, DG, HP and most other vendors' minis and micros, including the IBM PC. In fact, *INC. MAGAZINE* ranks Oracle as the fastest-growing major software company in the USA.

Surprised? Don't be. Oracle introduced the first relational DBMS and the first implementation of SQL back in 1979.

To attend the next free, half-day seminar in your area or receive additional information, write Oracle Corp., Dept. SWS , 20 Davis Drive, Belmont, CA 94002, or call 1-800-345-DBMS.

ORACLE Seminar Schedule

AK Anchorage ..... Jun 24
AZ Phoenix ..... Jun 5, Aug 5
CA Los Angeles ..... Jun 10
Jul 10, Aug 6
Newport Beach ..... Jul 15
San Diego ..... Jun 17, Aug 7
San Francisco .... Jun 19, Aug 5
Sunnyvale .. Jun 10, Jul 8, Aug 7
CO Denver ..... Jun 17, Jul 17
CT Hartford ..... Jul 16
New Haven ..... Aug 20
FL Jacksonville ..... Aug 5
Tampa ..... Aug 6
GA Atlanta ..... Jul 15
IA Des Moines ..... Jun 25, Aug 27
ID Boise ..... Jul 31
IL Chicago ... Jun 12, Jul 8, Aug 14
IN Indianapolis ..... Jun 17, Aug 19
KY Louisville ..... Aug 7
LA New Orleans ..... Jul 11
MA Boston ..... Jun 19, Jul 16
Burlington ..... Aug 12
MD Bethesda ..... Jun 12
Jul 9, 23, Aug 7
ME Bangor ..... Jul 3
MI Detroit .... Jun 10, Jul 15, Aug 19
Grand Rapids ..... Jun 13
MN Minneapolis ..... Jun 26, Jul 22
MO St.Louis ..... Jun 11, Jul 30
NE Omaha ..... Jul 9
NJ Cvt. Station ..... Jun 5, Aug 7, 28
Iselin ..... Jul 8, 22
NY Albany ..... Jul 23
New York City ..... Jun 12, 25
Jul 24, Aug 12, 26
Rochester . Jun 19, Jul 10, Aug 13
NY Syracuse ..... Aug 19
OH Akron ..... Jul 23
Cincinnati ..... Aug 5
Cleveland ..... Jul 22
Columbus ..... Aug 12
Dayton ..... Jul 8
OK Oklahoma City ..... Jun 24
Tulsa ..... Aug 26
OR Portland ..... Jul 24
PA Harrisburg ..... Jul 8
King of Prussia ..... Jul 24
Philadelphia ..... Jun 18
Pittsburgh ..... Jun 19, Aug 7
Scranton ..... Aug 5
RI Providence ..... Jul 8
TX Austin ..... Jul 10, Aug 19
Dallas ..... Jun 11, Jul 22
Ft.Worth ..... Jul 15
TX Houston ..... Jun 10, Aug 19
San Antonio ... Jul 8, Aug 27
UT Salt Lake City ... Jun 5, Aug 6
VA Norfolk ..... Jun 4
Richmond ..... Jun 19
VT Burlington ..... Aug 6
WA Seattle ..... Jun 12, Jul 15
WI Milwaukee ..... Jul 17

Canadian Seminars

Calgary ..... Jun 3
Halifax ..... Aug 20
Ottawa ... Jun 12, Jul 12, Aug 14
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NEWS

Prime users group wards off vendors to celebrate 10th year

Third-party show steals some users' attention

By Donna Raimondi

RENO, Nev. — Several hundred users of Prime Computer, Inc. equipment gathered last week to swap information at the 10th anniversary of their users group. But many were also eager to view a trade show the National Prime Users Group (NPUG) tried to keep at a distance.

About 900 members of NPUG, sanctioned by Prime in 1984 as the official users group for Prime customers, were treated to a historical exhibit of Prime systems in keeping with the meeting's theme, "Ten Years of Progress." Meanwhile, a group of about 30 Prime-compatible third-party vendors held its own exhibition, Compatibles '86, despite the disdain of NPUG officials.

Many Prime users readily agreed with NPUG's position that users can obtain more valuable information from other users than from vendors. "I'm looking at the direction the Primos operating system is taking and a few other things, but mostly I'm here for educational fill-in and to get a sense of the rest of the Prime community," said attendee Michael Stein, office computer systems manager at the Environmental Protection Agency (EPA) in Washington, D.C.

> ***'We don't mind being separate, but we do want to be in the same building.'***
>
> — Mitch Modeleski
> Mitchell Associates

Often, when new revisions of Primos are installed, "we at least temporarily lose a feature," he said. The users group meeting is generally a good place to find other people who have had the same problems and solved them, he added.

Others, though, were willing to listen to the sales pitches of the third-party vendors. Ann Mihalovic, senior applications analyst and programmer at American Greeting Card Corp., planned to use the resources of both NPUG conference and the Compatibles '86 exposition.

American Greeting Card operates two 9955s and a Prime 850 plus 10 other Prime systems. The company also uses third-party software. "I'm looking for a Fortran 77 compiler at the third-party show, and at NPUG I attended a Primos Rev. 19.4 class for programmers," she explained.

Another user who enjoyed the opportunity to view both the sanctioned Prime exhibits and the wares of the third-party vendors was Bruce Kerns of Alumax, Inc., an aluminum manufacturer in San Mateo, Calif. "I'm here to look at new Prime products here and at compatibles from other vendors downstairs [at Compatibles '86]," Kerns said.

Alumax has switched in the past year from an IBM System/38, several IBM 370s in manufacturing units and some McDonnell Douglas Computer System Co. Microdata systems to Prime machines. He runs the Pick Systems' Pick-based Prime Information system on Prime systems that include the 9955s.

Kerns said Prime Information is not really efficient, but it has an effective end-user interface. "I'm interested in meeting other people with it, and this meeting has been good for that," he said.

Prime Information saw a 25% increase in sales from 1984 to 1985 and a 60% growth rate the previous year. The product is a key in Prime's strategy, according to Lou Volpe, group product and planning manager. "We put together seven sites to measure performance. The results of the study are coming in now and will be turned into revisions for Prime Information and Primos during 1986," Volpe said.

NPUG's insistence on being an educational forum led to a decision to bar any kind of commercial ventures within the conference, said John Steffan, president of John Steffan Associates of Chicago, who served as the group's first president when it was formed a decade ago.

This policy has led to friction between Prime and the third-party vendors. Prime insists that since the policy is to bar marketing and since Prime honors that policy by not selling or hawking at the show, then other vendors should not have that right either, Steffan explained.

"We don't mind being separate, but we do want to be in the same building. We would appreciate it if NPUG would stop active opposition to us," said Mitch Modeleski, president of software developer Mitchell Associates in San Rafael, Calif., and one of organizers of the third-party show. "In the computer industry, the presence of peripheral products indicates a healthy host in a mature marketplace," Modeleski said. "Digital Equipment Corp. and Data General Corp. are Prime's competitors, not us," he added.

"We feel that it is not our problem. We settled it years ago," said NPUG's President-Elect Patricia Craig, customer support manager at the research computing center of the University of New Hampshire. "We are opposed to a trade show environment. Users can get that in a number of places, but what we offer is education and communication."

In a kickoff speech on activity at Prime since the last users group meeting, Mike Harries, Prime director of control systems, said Prime's strategy for the future will be to maximize use of each design effort through enhancements and mid-life kickers to existing products.

The company reaffirmed that it is committed to the Manufacturing Automation Protocol and also announced last week it is developing products to support the Technical Office Protocol specifications.

The only software announcement made was that a revision of the Primix operating system Rev. 2.2, which enhances some utilities, will be available fourth-quarter 1986.

U.S. Commerce official blasts Japanese industrial strategy

By Mitch Betts

WASHINGTON, D.C. — A high-level official of the U.S. Department of Commerce last week blasted Japan's strategy for assisting its computer and electronics industries as a "destructive, zero-sum game" that should be abandoned.

In a speech at a Washington, D.C., symposium, Bruce Merrifield said Japan's government grooms a targeted industry, protects its domestic market and subsidizes exports so that the industry can dominate the U.S. market with products that are priced below cost. He cited Japan's semiconductor industry as one beneficiary of this industrial strategy.

"It's a destructive, zero-sum game. We need to abandon that and instead collaborate together to expand the global economy," Merrifield said.

He warned that Japan may ruin whole industries by flooding markets with below-cost products and may not be able to recoup its massive investment in industrial subsidies.

Merrifield, assistant secretary for productivity, technology and innovation, spoke at a symposium sponsored by the American Federation of Information Processing Societies, Inc. Panelists discussed what role the U.S. government should have in the so-called information revolution of the next 25 years.

The Commerce Department official said the U.S. government should support education, research and the conversion of research into better products by reducing the regulatory and financial barriers to innovative research and development.

Rep. Sherwood L. Boehlert (R-N.Y.), another panelist, said that even in a budget cutting climate, the U.S. government should continue to fund the computer and robotics research programs of the National Science Foundation and the National Bureau of Standards. "We shouldn't eliminate an investment in our future," he said.

Boehlert and Richard P. Case, director of technical personnel development at IBM, also urged government and industry to provide more support for education.

Expert forecasts computers' impact

Warns against becoming 'race of menu pickers'

By David A. Ludlum

NEW ORLEANS — Expert systems and other computer technologies could inhibit initiative and social interaction in the next century, but history suggests such threats will be overcome, a noted forecaster told the annual conference of the Association for Systems Management last week.

The conference opened with an address titled "Future Computers and Their Impact," by Frederic G. Withington, a vice-president of Arthur D. Little, Inc., a Cambridge, Mass.-based consulting firm known for developing systems and forecasting technology.

Withington warned that the increasingly powerful computers of the future could cause people to lose mathematical skills and similar sources of mental discipline as well as self-reliance, social interaction and individuality. Expert systems, in particular, could stifle innovation, and people could become "a race of menu pickers," he said.

But the human race has always "muddled forward" when confronted with such technological backlash, Withington said. "A lot of people were hurt; a lot of blind alleys had to be backed out of," he said of earlier technological upheavals.

> ***Powerful computers of the future could cause people to lose mathematical skills and similar sources of mental discipline.***

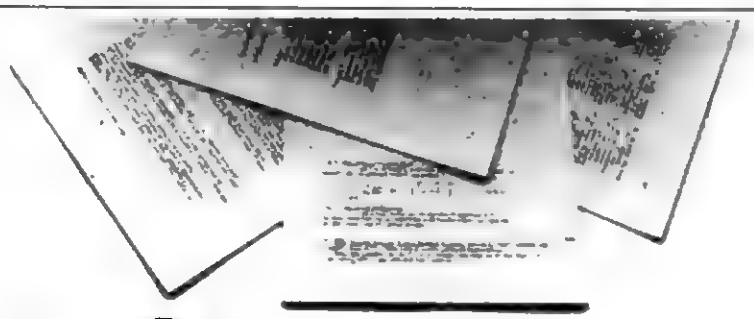
"But I feel sure information systems of the 21st century will be for the good and not oppress anybody for very long."

The consultant forecast evolutionary, rather than revolutionary, developments in hardware and software technology through the early 21st century. He predicted semiconductors will continue to power computers, voice recognition systems will still rely on the ability to match patterns and expert systems will remain limited to "complex but explicit" solutions.

Withington predicted greater changes in some other areas. He foresees flat color displays with photo-quality resolution, printers to match them and "personalized software," such as electronic mail programmed to route publications arriving at a company to individuals according to their interests.

The consultant said he sees major strides in communications through "wiring the planet" for two existing technologies — fiber optics and cellular radio. The chief obstacle to that is the cost, he added.

Among the potential results of such developments might be a pocket-size portable computer that will "communicate, inform, advise and make arrangements," Withington said. Such a "personal servant" might, for example, warn its owner not to drive after drinking, saying to him "I know you just had four drinks because I paid for them, and if you try to drive, I'll call the police."





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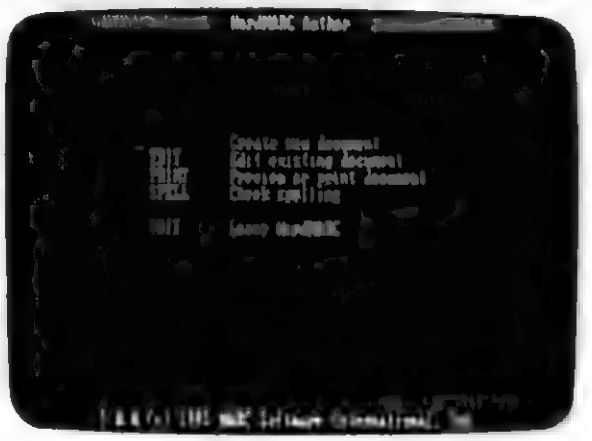
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NEWS

WORLD DIGEST
Computerworld News Service

LONDON — IBM reportedly is trying to persuade UK users not to buy clones of its highly successful Personal Computer. Customers say the giant is hinting at locking them out of future compatibility if they don't buy exclusively from Big Blue.

Some users believe what they are being told by IBM, while others say it's just a scare tactic. Suppliers, however, are already feeling the effect. PCML, a UK firm that sells software and add-on products for the PC, says the feeling in the market has turned away from third parties.

LONDON — The British personal computer users group Compulink recently told the European Economic Commission (ECC) that IBM's clampdown on clone suppliers could result in increased microcomputer prices. In a letter to the EEC detailing its complaint against IBM, Compulink said users were concerned over possible market abuses that may have an impact on the fair competition laws established in the EEC's charter, the Treaty of Rome.

Specifically, the letter complains that IBM's recent moves against UK clone suppliers have sought to prevent those suppliers from doing business by charging IBM PC copyright infringment.

SYDNEY, Australia — The Australian High Court recently ruled that a computer object code was not protected by Australian copyright law prior to Copyright Act amendments that were made June 15, 1984.

On May 6, the High Court delivered its 3-to-2 decision in the case of Computer Edge Pty. Ltd. vs. Apple Computer, Inc.

The Court heard an appeal by Computer Edge against a ruling by the Federal Court that the Wombat computer, which is imported from Taiwan, infringed on the copyright of Apple Computer Australia Pty. Ltd., a dispute that arose in 1983.

TOKYO — Devastated by the increasing value of the Japanese yen against the U.S. dollar, Japan's February communications equipment output almost leveled off at $679 million, up just 0.2% from a year ago, the latest monthly survey by the Communications Industries Association of Japan (CIAJ) said.

Also responsible for the February slump was a heavy drop — by 14.2% — in exports to the U.S. caused by the wake of the bilateral trade discord between the two countries, CIAJ said.

MUNICH, West Germany — Under pressure from member countries now developing their own advanced telecommunications systems, the International Telecommunications Satellite Organization (Intelsat) last week pledged to make "every effort" to keep up with the development of Integrated Services Digital Networks.

Intelsat is a Washington, D.C.-based nonprofit organization composed of 110 member countries. It owns and operates a worldwide satellite telecommunications system also used for domestic communications by 26 member countries.

TOKYO — Fueled by solid sales of high-end, 16-bit machines, Japanese personal computer shipments in 1985

CORRECTIONS

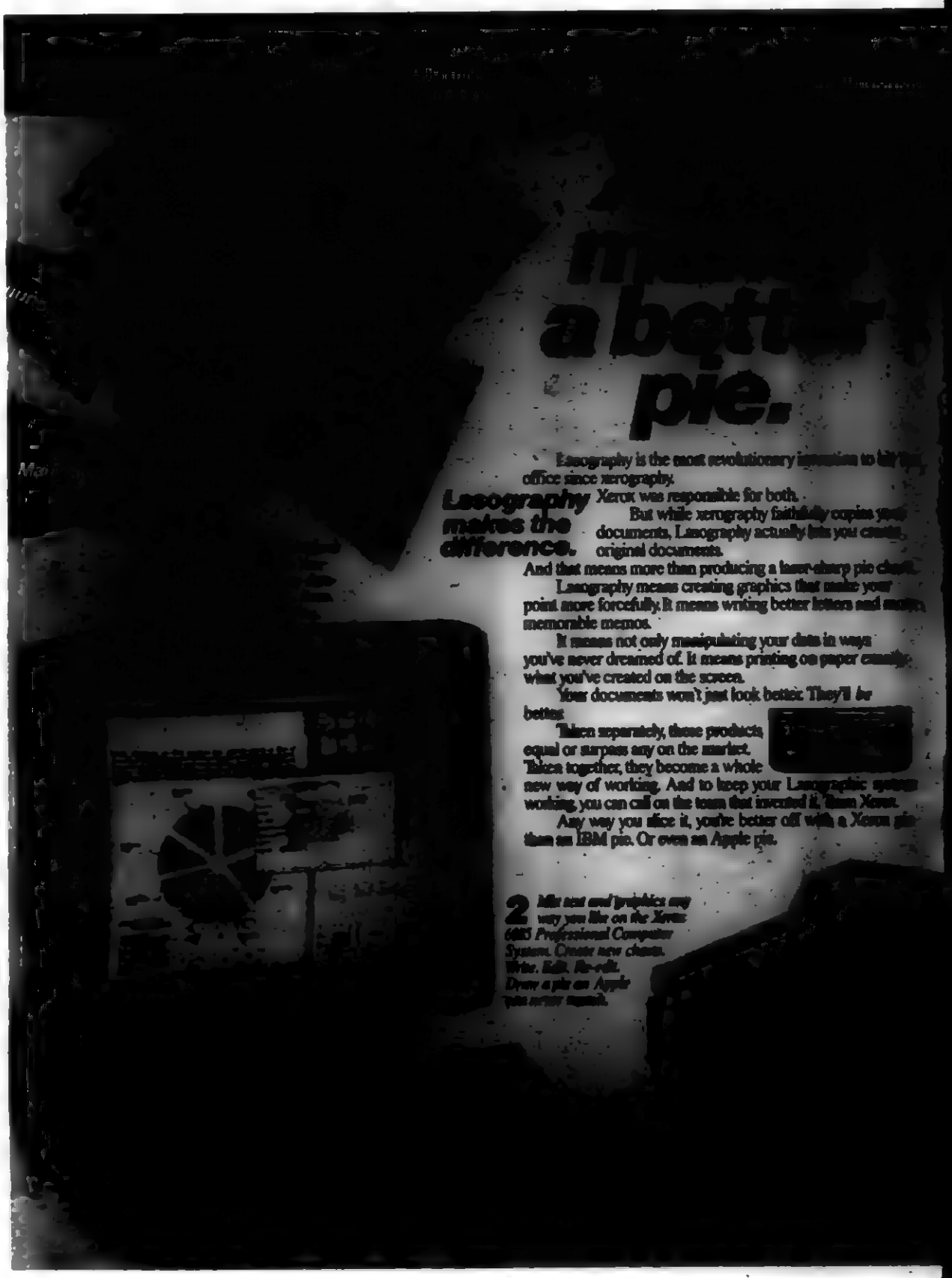
The cost to upgrade 500 copies of Lotus Development Corp.'s 1-2-3 spreadsheet [CW, Dec. 23] is $62,500.

Jack Shevillo is executive vice-president of CMI Corp. [CW, March 24] in Bloomfield Hills, Mich.

Product information about Data General Corp.'s DG 7500 and 7700 workstations is available from DG, 6300 S. Syracuse Way, Englewood, Colo. 80111. The Unix operating system is available for both models [CW, March 10].

Sperry Corp.'s 1100 series mainframes running the SX operating system were omitted from Executive Report chart on Unix implementations [CW, Feb. 3].

The Multsess multiple session manager [CW, Nov. 18] is marketed by Westinghouse Electric Corp., Management Systems Software.



rose 18% from a year ago, to $3.47 billion, according to a recent Japan Electronic Industry Development Association (JEIDA) report. But by units, the shipments grew a sluggish 6% to 1.98 million units.

Broken down by market, domestic deliveries were valued at $2.34 billion, up 10%; by units, domestic shipments totaled 1.19 million. This amount was down 1% from the previous year. Overseas shipments reportedly amounted to $1.13 billion, up 17% from the year before; by units, shipments amounted to 796,000, up 40%, JEIDA said.

TOKYO — Nomura Securities Co. has become the first major Japanese firm to announce plans to use IBM's Token-Ring network. Nomura said it will use the system as part of its $425 million project to upgrade domestic and international brokerage transactions.

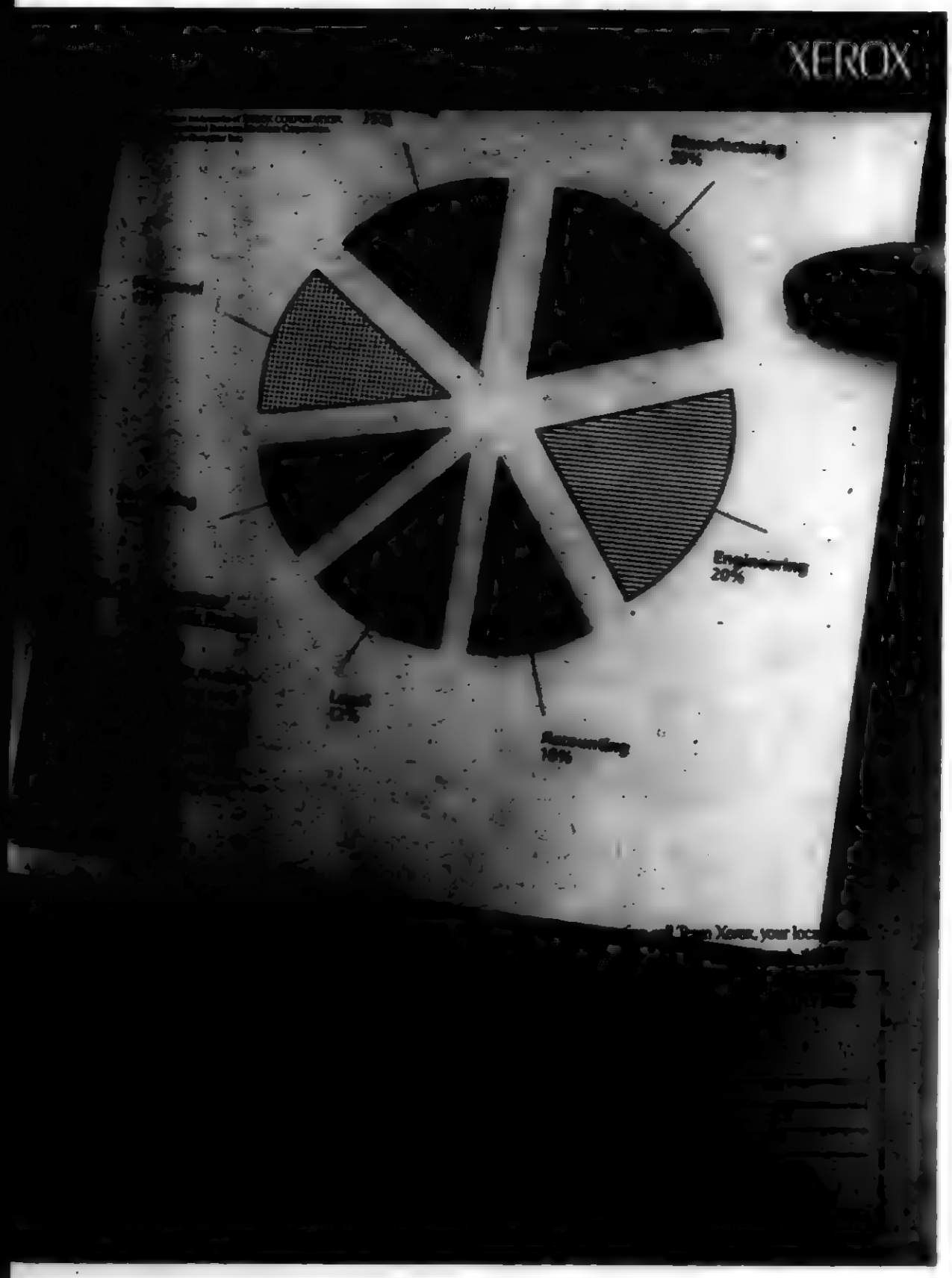
Nomura, Japan's securities leader with 1985 operating revenues of $3.3 billion, plans to install a Hitachi, Ltd.-developed local-area network system in its Tokyo headquarters and in each of its 120 branches.

TOKYO — After a lengthy feasibility study, Nippon Telegraph and Telephone Corp., NEC Corp., Hitachi Ltd. and Fujitsu Ltd. have established their former joint research project as a $25 million service bureau.

The newly formed company, called Internet Co., is also joined by *The Japan Economic Journal*, and will offer general-purpose value-added network services beginning in October, a spokesman said.

VIENNA — Microcomputer maker Epson America, Inc. plans to unveil a new laptop personal computer, according to the company's Austrian distributor. The machine will offer more computing power than the Epson PX-8, popularly known in the U.S. as the Geneva model, the source said.

It is not yet known whether the new laptop will be IBM Personal Computer-compatible. A new inkjet printer will also be released before the end of the summer, which reportedly will be as easy to operate as a matrix printer, the source added.



CTA bribery case snares Pa. officials

By Stanley Gibson

HARRISBURG, Pa. — In a bribery case relating to a contract for computer services, a federal grand jury last week indicted two Pennsylvania political figures. The indictment charges that R. Budd Dwyer, state treasurer, and Robert B. Asher, former Republican committee chairman, agreed to accept a $300,000 bribe from a California computer services company in exchange for a $6 million government contract.

The indictments came as part of an ongoing investigation in what has become known in Pennsylvania as the CTA case, named after Computer Technology Associates, Inc. (CTA), the company that allegedly offered the bribes.

The company's owner, John Torquato, is serving a four-year sentence in California, relating to charges brought previously in the investigation. CTA is no longer in business.

The contract was for services in checking computer records of Social Security overpayments from public school employees. CTA was awarded the job on a no-bid basis. Another firm later submitted a bid for $1.3 million to perform the same work.

The indictment claimed the two men agreed to accept the money as a campaign contribution from CTA.

According to a reporter for the Harrisburg *Patriot*, CTA was headquartered in Torquato's California home.

The reporter said authorities found records of the planned bribe payments on computer disks owned by CTA.

A spokesman for Dwyer said the treasurer firmly maintains that he is innocent and is "looking forward to confronting his accusers in a legal setting."

If convicted, Dwyer and Asher each face up to 60 years in jail and $36,000 in fines.

VIEWPOINT

EDITORIAL

Chernobyl's reminder

Westerners frequently forget the distinction between purely computer technology and information technology, presuming all along that they are one and the same. The Soviet Union's leaders surely know the difference, and we should never forget it. Chernobyl has reminded us of that.

Information processing is but one by-product of computer technology, of course, but it is the focal application in most Western nations. These data-driven societies — especially the U.S., Europe and Japan — have seized on the free flow of information as a tool with which to create new industries, new markets and new wealth.

The Soviet Union is reported to be one of the world's largest consumers of data processing equipment, with the U.S. and Japan. Certainly the success of the Soviet space program is testimony to the USSR's command of computer technology.

But the Soviet Union of today remains as much the antithesis of an information-based society as it was in the darkest days of Josef Stalin. Due to dread and fear born of centuries of invasion and conquest, the Soviet Union is a ruthlessly closed society where to the general public the notion of "information" carries the sinister baggage of spies, informants and purges.

Perhaps the best way to combat the Red menace would be to back up truckloads of microcomputers and modems to the USSR borders and let the information revolution take its natural course. Surely if the Soviet people had an MCI Mail or Compuserve, the nation — and the world — would have known of the Chernobyl disaster in a matter of hours, not days.

The free flow of information between free peoples is a goal worth aspiring to and protecting. It is one of the many things that separates West from East and one of the most vitally important. The U.S. computer community should never cease working to shape and extend the ideal of an information-based society.

Notes & observations

A news story in the May 12 *Computerworld*, notes that Wang Laboratories, Inc. is taking its lumps for presuming to charge for service that its users deem inadequate even when it's free. Meanwhile, the Volvo automobile people have attracted considerable attention with a new policy providing a range of otherwise pricey items associated with on-the-road breakdowns free of charge. When it comes to good customer relations, it's what you do *for* them that counts, not what you do *to* them.

■

According to the most recent U.S. Department of Labor statistics, seven of the nation's 10 fastest growing occupations are in computer-related fields. They are, in descending order of growth projected through 1995, computer programmers, computer systems analysts and data processors, data processing equipment repairers, electrical and electronics engineers, electrical and electronics technicians, computer operators and operators of peripheral electronic data processing equipment. So much for *that* computer slump!



LETTERS TO THE EDITOR

PDN: Taxi convenience, bus capacity

As a provider of X.25 and packet assembler/disassembler software worldwide, I feel compelled to clear up some misinformation in Daniel Minoli's "Packet-switch perspective" [CW, March 31]. He states that packets typically have a minimum length of 128, 256 or 512 bytes and are not efficient because they are like a bus that must wait to be full before it departs. CCITT recommendations and public data network (PDN) implementations have maximum packet sizes but not minimum ones. Packet switching has the convenience of a taxicab with the capacity of a bus. So this problem with the packet switching industry is nonexistent.

Later, Minoli compares the cost of transferring a 300K-byte file across the country on dial-up lines, with a 10K bit/sec. modem, with Tymnet. He does not say that when you pay for packet-switching service, you pay for guaranteed data integrity. What condition will a file be in when it arrives on voice-grade lines at 10K bit/sec.? If the modem is error correcting or if an asynchronous block protocol is used, then all error correction is at the user's expense in hardware, software and connect time. Even with 10K bit/sec. modems, a 10K throughput rate can never be achieved with data integrity because of modems falling back to a lower speed and retransmission. When you add all the costs, packet switching via PDNs is competitive.

Donald Berryman
TITN, Inc.
Edina, Minn.

Understanding data sublanguages

I recently read your interview with Ted Codd on fourth-generation languages, "Codd stresses importance of shared data and sublanguages" [CW, Feb. 24], and was upset with what I read. No wonder there's so much confusion about fourth-generation languages. I'd like to set the record straight.

Codd states, "I don't know of any fourth-generation language that includes a relational data sublanguage . . ." This is not true. Oracle Corp.'s Oracle and Ingres Systems' Ingres, two fourth-generation language products, include the relational data sublanguage, SQL. The next release of Cullinet Software, Inc.'s product, IDMS/R, will contain an embedded SQL capability. Furthermore, many fourth-generation-language vendors feel that their products are more user-friendly and powerful than SQL.

Another inaccuracy in the interview relates to Codd's statements about fourth-generation language requiring record-at-a-time data base access and writing program loops. The first fourth-generation language, Martin Marietta Data Systems' Ramis, was developed so that access to data could be performed at a higher level. Ramis introduced concepts like Sum and Count that automatically access multiple data base records without any navigation or record-level commands like Open, Read and so on.

Finally, my list of benefits provided by fourth-generation languages includes: increased productivity, access to data by non-DP professionals, increased system acceptance through application prototyping approaches and less time to train new personnel.

I share Codd's feeling that screen painters are neat. However, I feel this assessment of fourth-generation languages does not do justice to a category of software tools that have revolutionized the application development process in corporate America.

Jeff Bernknopf
Fourgen Corp.
New York, N.Y.

T1 pricing forces network redesign

I would like to clarify comments you attributed to me in "T1 market opens up" [CW March 31].

Our decision to use Customer Controlled Reconfiguration was made at the time AT&T's Tariffs 260/270 were in effect. By the time we were ready to implement, Tariffs 9, 10, and 11 were filed, and they radically changed the relative pricing of T1s vs. comparable services. This unanticipated 180° turn in relative pricing by AT&T changed many of the assumptions on which we based our design. This has forced us to do a significant design reconfiguration to make the network more cost-effective. It also took a significant amount of time.

Building any T1 network in a period of developing technology and uncertain regulation has its risks. AT&T's erratic pricing complicated our short-term efforts to implement a long-term strategy. The process was expensive, but its part of the cost of technological change.

Robert W.J. Riebenck
Vice-President, Telecommunications
Merrill Lynch, Pierce, Fenner and Smith, Inc.

VIEWPOINT

When 186,000 miles per second just isn't fast enough

Let's talk about speed, you and I. The word has an incredible number of connotations. The speed of sound. Speed demon. The speed of light. Speed freak. Processing speed. Speed limit. Speeding ticket. All of these are fitting terms depending on a given situation.

For instance, I think it only fitting that I got a speeding ticket on the same day that the new Lamborghini Countach was featured in a national car magazine. I wasn't driving a Lamborghini, but I'd probably feel better if I had been.

More fitting is that Beaverton, Ore.-based Floating Point Systems, Inc.'s announcement last month of the world's fastest computer follows hot on the heels of the commemorative anniversary of the world's first computer, the ENIAC.

Limited only by the speed of light

Whereas the speed of the ENIAC relied substantially on human ability to adjust knobs and respond to blinking lights (the kind of stuff still used to represent computers in the movies), the speed of the Floating Point T/40000 is limited to some extent by the speed of light. The company claims that this product has an arithmetic speed of 262G floating-point operations per second (FLOPS).

If this number doesn't mean anything to you, don't feel bad. For those of us who toil in the world of data terminals and personal computers, numbers of this type are still totally alien. Roughly stated, however, 262 GFLOPS tranlates to 262 billion floating-point operations per second. Yes, per second. Floating Point achieves this by integrating parallel processing, multiprocessing, reduced instruction set computing technology and hypercube interconnection — none of which I will discuss here because they each deserve their own individual columns simply to define them.



By HARVEY P. NEWQUIST

The point is that computing speed of incomprehensible magnitude is beginning to make its way to a computer near you. For those who pine away in personal fantasies of an individually assigned Cray, similar performance levels are becoming available in a wider variety of computers.

As prices start getting driven down, limitations to potential users will reside in the slowness of the speed of light. For instance, the Floating Point product has a cable restriction of 40 feet. Why? One of the reasons is that's one hell of a distance for you to ask something moving at the speed of light to travel. Remember, the speed of light is only 186,000 miles per second.

Another example is that the newest supercomputers are continually shrunk in size to improve a processing speed that is slowed by the distance between its connectors. So, why not just eliminate all the connectors by putting most of the processors on a single chip or wafer? Two years ago a very well-funded company known as Trilogy Ltd. tried that using a custom-designed silicon wafer. The heat generated from passing electricity through this environment left Trilogy with the equivalent of a pool of liquid glass and many millions of dollars that disappeared in, well ... no time at all. Again speed becomes relative to the situation.

We are fast approaching a period when there is no such time as real-time. In the cases cited above, real-time is too slow. For most of the world of computing, real-time would be a dream come true after hours, minutes and even seconds of waiting for our machines to grind out their reports and calculations.

Changing the way calculations are done

In regard to calculations, some recent discoveries from the Rochester Institute of Technology even change the way calculations are done in order to save time. Using a non-Euclidean geometry they have developed, a group of RIT researchers solved 99 integer equations that had 132 unknowns and arrived at a binary solution in 12 hours. That sounds fairly unimpressive.

But it has been estimated that simple brute force computer techniques attempting to solve the same equations would take several million centuries. Compare this concept with the idea of billions of floating-point operations per second and see if that doesn't screw up your sense of real-time.

So next time someone tells you to speed it up, or you don't think you have enough processor speed in your system, or perhaps your car is speeding along at a measly 61 miles per hour, remember — it's all very relative.

Newquist writes and consults on artificial intelligence and other advanced high-technology topics from his office in Scottsdale, Ariz.

Building systems projects that will get off the ground

Following college graduation I was hired by a custom programming shop headed by a retired general. After I worked for about two months on a poorly defined and ill-fated programming project, the general called me into his office and told me about a development project he had worked on while a member of the Joint Chiefs of Staff.

Not sure what specifications a new plane should have, the Pentagon commissioned a development team to determine the plane's requirements, design the plane, and arrange to have the plane built.

To determine the Armed Forces' design requirements, the team talked to senior Army, Navy and Air Force officers.

The Army officers insisted the new plane carry at a minimum 500 soldiers, 10 tanks and 25 jeeps. The senior Navy officers felt the new plane should take off and land on the smallest of its aircraft carriers and travel long distances without mid-air refueling. The Air Force officers wanted a plane that would fly at high altitudes at supersonic speeds and be undetectable by radar.

Committee design would not fly

Having defined their requirements, the team began designing the new plane. They did not want to ruffle any of the senior officers' feathers, so they incorporated all of the branches' features and requirements into their design. The resulting design was truly a plane designed by committee and one, the general concluded, that would never take off.

While there are many critical factors in successful systems development, the general's story focuses on two: Clear, reasonable objectives and the right people.

READER'S PLATFORM

By EDWARD BRUCKSTEIN

Successful projects are those whose scope is small, realistic and simple. I have clients who have a "Keep It Simple" logo on the bottom of their memo stationery. Yet, when it comes to systems development, these clients attempt to build huge systems with countless screens, far too many options and supposedly tremendous flexibility, and then they wonder why the systems never get off the ground.

To help prevent these overly complex systems from finding their way into design and development, use a building block approach. Develop small, simple modules that have clearly defined interfaces and that can be easy combined. By developing these discrete modules, project developers can accomplish the following:

- Reduce the risk of something going wrong.
- Produce interim deliverables for users to test-ride.
- Improve system maintainability.
- Provide increased functionality by combining simple features.
- Enhance the system's flexibility and simplicity.
- Ensure the system's successful completion.
- Decrease the system's complexity.

The simplest solution may often also be the most elegant. The best example of this approach is the flood of spreadsheets that has hit the market. Lotus Development Corp.'s 1-2-3 and most other spreadsheet packages use the building block approach in that they provide clear and easy-to-use discrete features that can be combined to provide more complex functionality.

Of course, ideally, every project would be staffed with a small number of highly experienced senior programmers. Realistically, that rarely happens. However, there are ways to make sure the project is staffed properly by providing senior people in these areas:

- Hardware: Having a person who has developed projects on this piece of hardware in the past allows the team to determine, in advance, what functions the machine performs well and what functions should be avoided.
- Application: Having individuals on the project that are familiar with those specific problem areas can eliminate a great deal of aggravation further down the road and help to ensure that the project does indeed fly.
- Business environment: By staffing the project with people who have the industry expertise, management can expect a more solid product when the system is completed.

It is in these last two areas, application and business environment familiarity, that the value of user involvement becomes critical. While the systems development staff may believe they understand the user's environment, the systems they turn out often don't reflect that familiarity. What is needed is full-time user involvement in design sessions, program walk-throughs and even casual discussions with the project team.

Cooperation is the key

The key word, however, is cooperation. All too often, unfortunately, users and the systems development team antagonize one another by not considering the technical and operational feasibility of the things they ask of one another.

Users who are active participants can develop a sense of system ownership and an understanding of the constraints under which MIS must work. Simultaneously, MIS can gain a feel for the problems the users are experiencing.

Finally, as I think back on the time I have spent observing and being involved in various clients' systems development projects, I believe systems under development are best destined to take off when they are simple, clearly defined, closely monitored by users and built in small units.

Building systems that users understand and can work with is what this industry is all about. Make sure your system gets off the ground.

Bruckstein is a senior consultant with Peat, Marwick, Mitchell & Co.'s New York management consulting practice specializing in DP systems planning.

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SOFTWARE & SERVICES

SOFTALK
Edward Warner

4GLs drawing bead on PCs

Fourth-generation languages (4GL) are on the move: Versions for the personal computer are becoming available, and in time, we will see hybrid languages that include the best of a fourth-generation language and Cobol.

The advantage of these languages is well known. They typically allow programmers to use English-style statements to produce in one line the equivalent of four or more lines of a third-generation language.

The advantage of a PC version of the language is also obvious: A mainframe is too expensive to tie down with a coding project. Therefore, it's better to develop software off-line on a microcomputer and upload the finished product to run on the mainframe host.

The early wave of fourth-generation languages for PCs includes PC/Focus from Information Builders, Inc., PC-Info from Henco Software, Inc. and the personal computer version of Applied Data Research, Inc.'s (ADR) Ideal, which is scheduled to be introduced this year. Those are only the early arrivals. According to software industry analyst Damian Rinaldi of International Data Corp., based in Framingham, Mass., "More and more of the traditional 4GL tools are making their way to the PC environment."

While this development surely marks another small victory in the battle of the fourth-generation languages against the third-generation languages they seek to replace, it should not be

See 4GL page 24

Warner is editor of the Computerworld News Service.

Delay of Version 5 release disturbs some Adabas users

By Maura McEnaney

SAN DIEGO — Users group attendees, anticipating a new release of Software AG of North America, Inc.'s Adabas data base management system, instead got a preview of the product and a promise of a July controlled-release date.

While Adabas Version 5 promises I/O performance improvements of up to 42% in some cases over the 4-year-old Version 4, some of the more than 1,500 attendees at the 15th Annual Users Conference here were disappointed that Version 5 was a no-show.

"Last year they said by this time the new release would be out, and we'd all be discussing ways to improve it," said Gary Underhill, data base analyst at Mark Producing in Houston.

"People are pretty hot," said Ira Dobrow, president of Data Ideas, an Austin, Texas, consulting firm. According to Dobrow, discussion over the late release centers on features promised in Adabas Version 4 that are now slated for Version 5. Among those functions is the Read Descending function that would let files be read in inverted order.

Bruce Mancinelli, vice-president for development, said the delay has been caused by a decision to "add capability beyond what we had originally planned" and to ensure the product worked as expected upon release.

"There is nothing specific that has delayed the release; it's just that the development process took longer," said Software AG President and Chief Executive Officer Stuart Miller. "In retrospect, we probably could have been less specific about the release date," he said.

Many users, while anxious for the performance enhancements of the new data

See ADABAS page 24

SOFTWARE NOTES

TI unveils Prolog for AI workstation

Texas Instruments, Inc. of Austin, Texas, introduced **TI Prolog** for use on the TI Explorer artificial intelligence workstation. The TI version of Prolog is a superset of Digital Equipment Corp.'s Decsystem-10 Prolog, a popular implementation of the symbolic processing language. It combines features of Prolog and Lisp.

■

Cray Research, Inc. is making a version of AT&T's Unix System V available to run on its Cray-2, Cray X-MP and Cray-1 supercomputers. Called **Unicos**, it will be a foundation operating system for all Cray hardware products. The

See NOTES page 24.

Software speeds war games task

By Eddy Goldberg

LIVERMORE, Calif. — Developing computerized war games for the U.S. Army is a job that requires sophisticated software engineering tools.

When a team of computer scientists at Lawrence Livermore National Laboratory's Conflict Simulation Center faced the task of developing a multiuser, interactive graphics program for training officers in strategic operations and military tactics, they looked for a tool that would automate systems analysis and design.

Computer scientist Sara M. Hilbert, system designer for the project, said the team wanted a tool that was easy to use and offered consistency checking. Comprehensive data-flow diagram support and strong communications capabilities also ranked

See SOFTWARE page 22

NEW THIS WEEK

- IBM adds applications to its MAPICS II software
- Telesoft ports its Telegen 2 Ada compiler to DEC VAX systems

■ For more on these and other new products, see pp. 83-106.

INSTANT ANALYSIS

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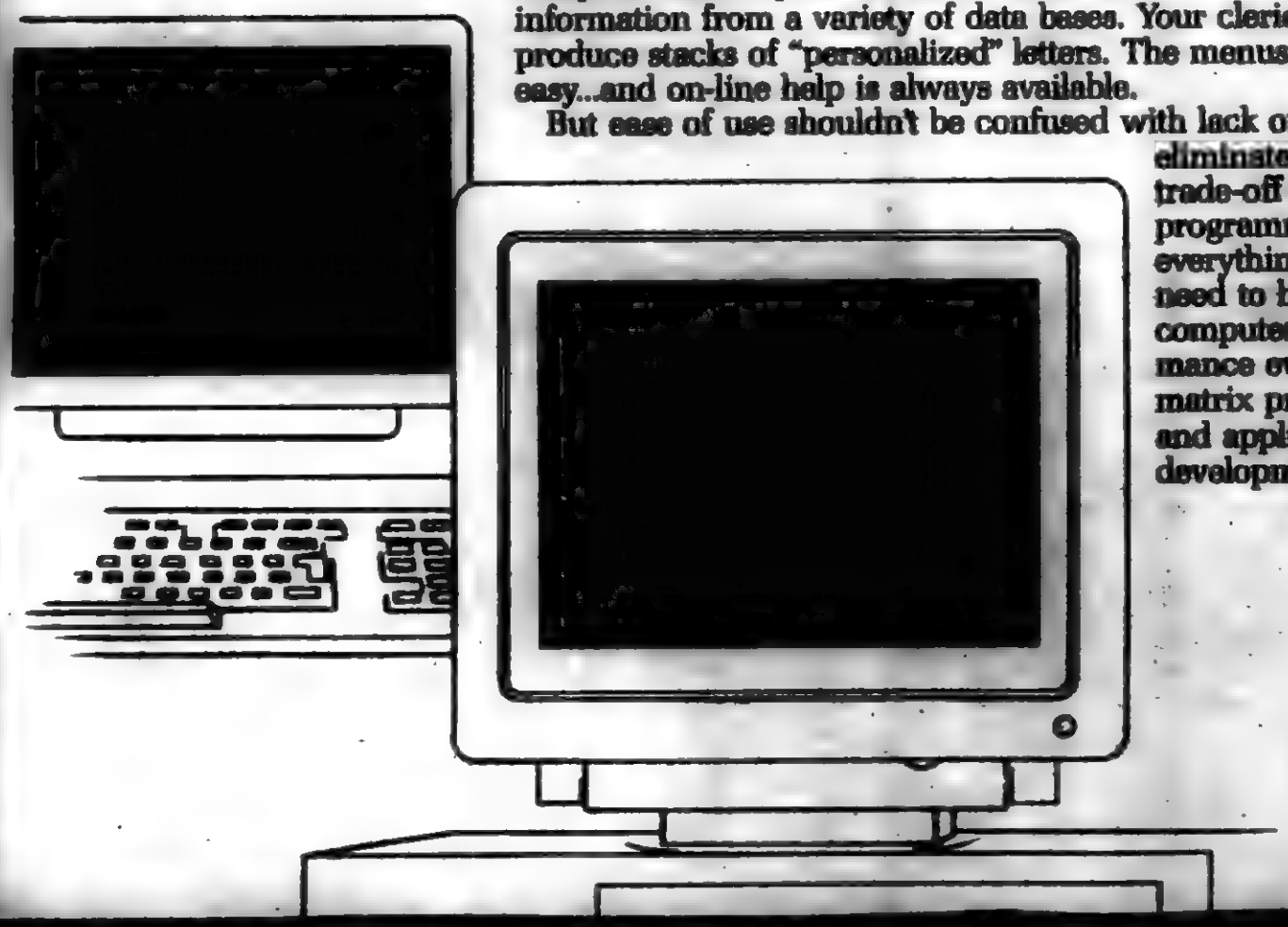
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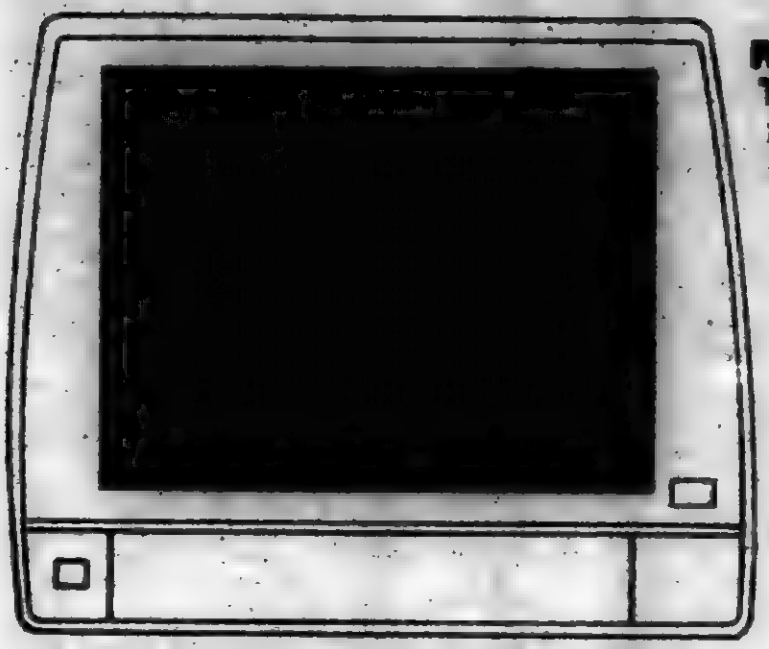


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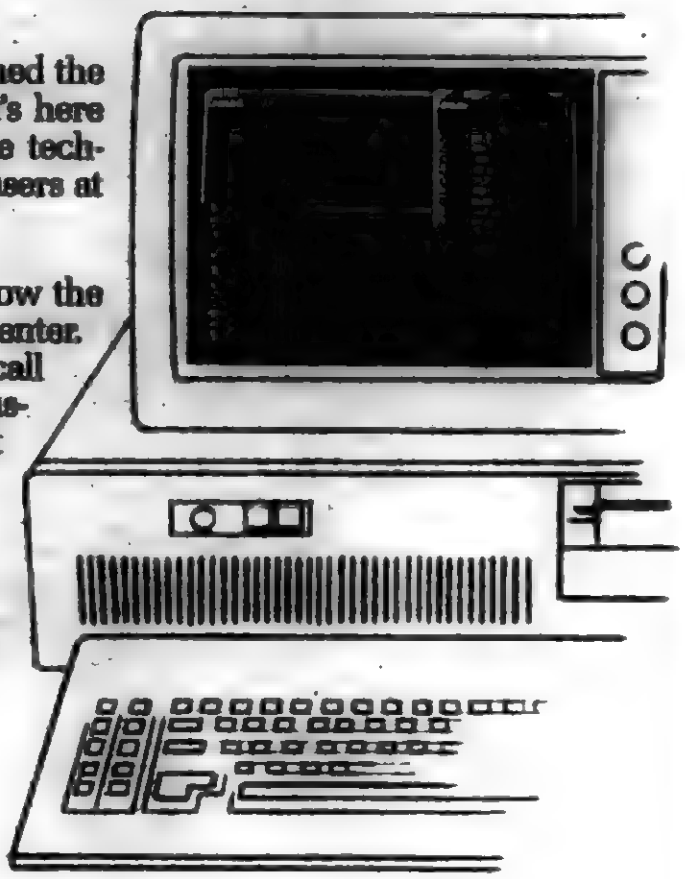


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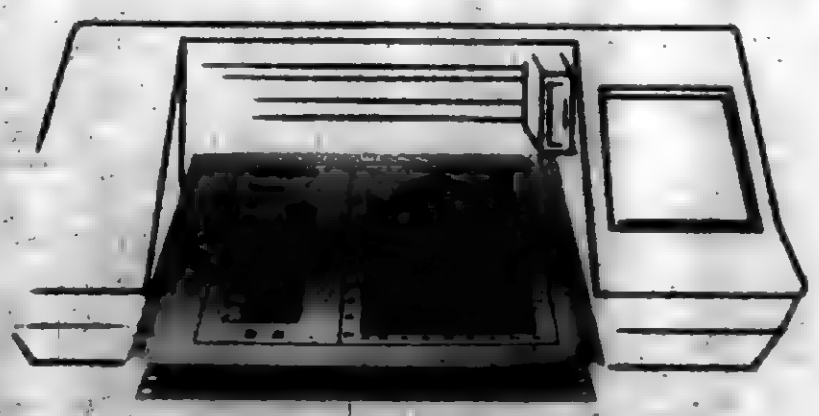
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Software speeds war games task

From page 19

high. After considering various micro- and minicomputer-based solutions, the project team agreed to beta-test Teamwork/SA, a workstation-based environment for systems analysis from Cadre Technologies, Inc. of Providence, R.I.

The software retails for $8,900 per node and was designed to run on Apollo Computer, Inc. workstations.

The three-year project focuses on developing an analysis capability for examining the problems that arise at the corps level, simulating not only the physical events and weapons effects of ground combat with close air support but also including mechanisms to reflect decision and planning considerations. "The program is extremely complex because a lot of functions have to be integrated and coordinated together," Hilbert said.

Simulations involve close combat, aviation, fire support, intelligence, electronic warfare, combat service support, communications and air defense over highly detailed digitized terrain. Trees, rivers and hills are painted on high-resolution screens, and players at terminals can zoom in and out quickly between an entire battlefield and a 10-meter square on that battlefield showing one tank unit.

Distributed VAX

The target hardware to run the combat-simulation software is a Digital Equipment Corp. VAX 8800. Though Hilbert said no decision has been made, the odds are high that the completed war games will run on a distributed VAX architecture.

Since the development team consists of computer scientists, military research associates and management from different backgrounds, clear and concise communication is essential, especially in the specification and design stages. "A lot of what goes into a system during the specification period determines how fruitful it will be," Hilbert said.

A structured analysis tool such as Teamwork/SA is a means for the various parties on the team to document the function of the system according to the way data flows through it, showing how that system will actually perform. The systems analysts can use it to coordinate the many portions of the programs involved in the overall system to ensure it will work as intended when the development is finished.

Hilbert explained that when analysts meet with users to define system requirements, graphical representations can be quickly understood by both sides and instantly changed during the specification process. This helps to clarify the purpose of the program from the start, reducing redesign requirements and speeding the completion of the system.

Data-flow diagrams

One of the most observable benefits of using Teamwork/SA involves the creation of data-flow diagrams. Hilbert said the product automates the generation of data-flow diagrams, freeing the analysts from tedious manual redrawing with pencils and templates. The graphics screen becomes the equivalent of an electronic scratchpad, automatically recording ideas as program developers and systems analysts explore and restructure software. This allows them to focus on the actual system engineering. Programs are retained in a data base and can be used later to modify and maintain code.

Gains are achieved in both productivity and program quality, she said, because work not only goes faster, but changes are more thorough and made at deeper levels. "Integrated access from data-flow diagrams to the data dictionary makes model development, revision and review simpler," Hilbert said. The data dictionary can be accessed at any time from any part of the program.

Hilbert said that syntax and consistency checking are critical to the project, since hundreds of model elements are entered. With automated checking, problems are more quickly located and fixed. She added that even with a time-consuming manual check, the team never could find all the errors the automated checking function can.

Mouse-and-icon approach

The user interface employs a mouse-and-icon approach, eliminating time-consuming keyboard input and allowing a faster, more intuitive approach to development, Hilbert said. Pull-down windows and multiwindowing capabilities afford quick access to several parts of the project model at any time. "The ability to see four or five drawings of parts of a system simultaneously helps in seeing their interrelationships," Hilbert observed.

Hilbert said a standard vocabulary, achieved more easily through icons, makes uniformity of definitions possible, speeds training and reduces misunderstandings between developers. "The graphic orientation clarifies communication by minimizing the use of English," she said.

A common data base allows authorized users multiple, simultaneous access to any part of the program, facilitating team management and speeding program development. Communication problems during a software development project can significantly delay its completion.

Hilbert said the use of structured analysis in the early stages of a project yields downstream savings. "Improved communication, combined with the automation of systems analysis, leads to better overall specifications. Productivity gains are most evident when it comes to debugging and installing the system."

Demand for corporate information services is expected to grow dramatically over the next decade. With many data centers already running 24 hours a day, *managing* this constantly increasing workload may become a bigger problem than doing the work itself.

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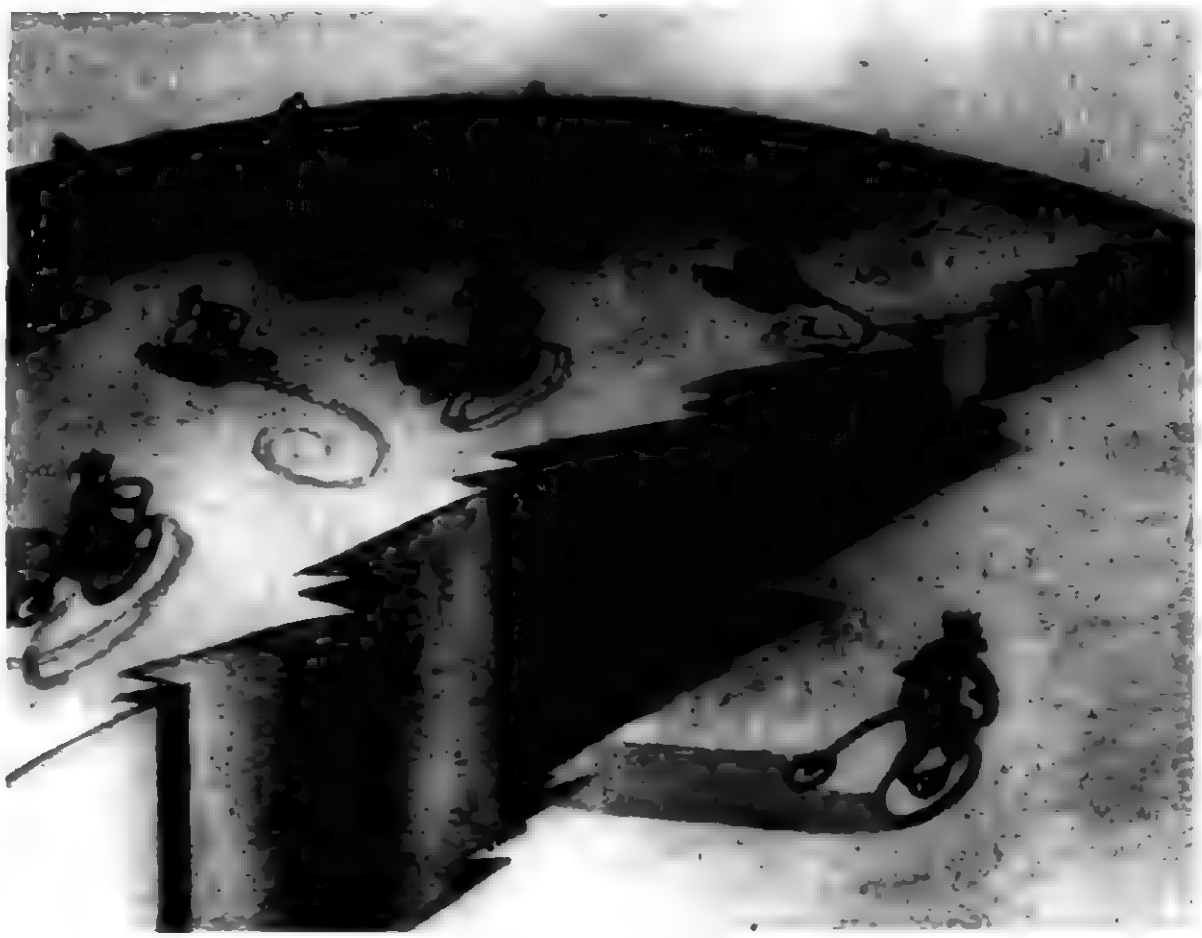
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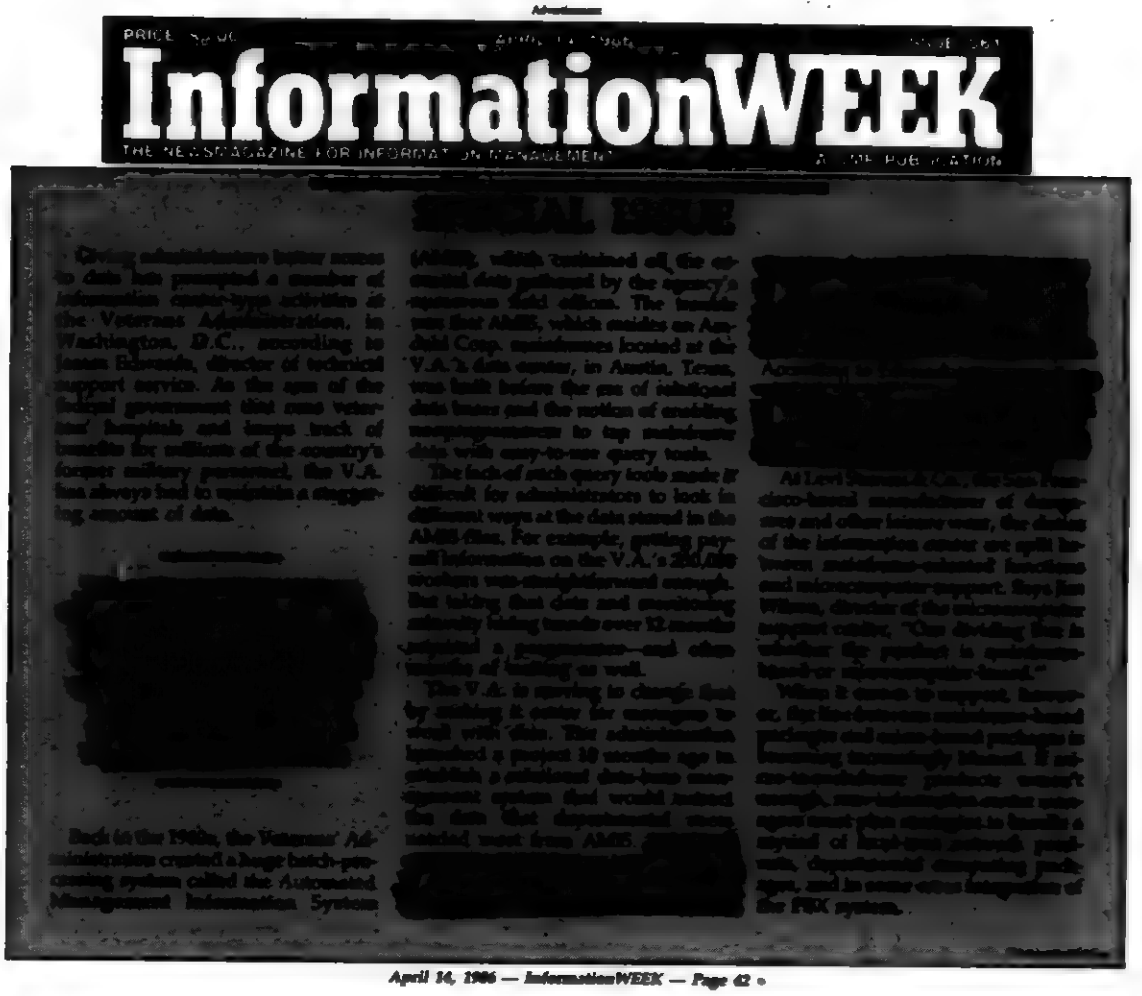
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SPECIAL ISSUE

Giving administrators better access to data has prompted a number of information center-type activities at the Veterans Administration, in Washington, D.C., according to Jason Edwards, director of technical support service. As the arm of the federal government that runs veterans' hospitals and keeps track of benefits for millions of the country's former military personnel, the V.A. has always had to maintain a staggering amount of data.

Back in the 1960s, the Veterans' Administration created a huge batch-processing system called the Automated Management Information System (AMIS), which contained all the essential data gathered by the agency's numerous field offices. The trouble was that AMIS, which resides on Amdahl Corp. mainframes located at the V.A.'s data center, in Austin, Texas, was built before the era of relational data bases and the notion of enabling nonprogrammers to tap mainframe data with easy-to-use query tools.

The lack of such query tools made it difficult for administrators to look in different ways at the data stored in the AMIS files. For example, getting payroll information on the V.A.'s 240,000 workers was straightforward enough, but taking that data and monitoring monthly hiring trends over 12 months required a programmer—and often months of backlog as well.

The V.A. is moving to change that by enabling it easier for managers to work with data. The administration launched a project 10 months ago to establish a relational data-base management system that would extract the data that departmental managers needed most from AMIS.

At Levi Strauss & Co., the San Francisco-based manufacturer of dungarees and other leisure wear, the duties of the information center are split between mainframe-related functions and microcomputer support. Says Jim Wilson, director of the microcomputer support center, "One dividing line is whether the product is mainframe-based or microcomputer-based."

When it comes to support, however, the line between mainframe-based packages and micro-based packages is becoming increasingly blurred. If mainframe-based products weren't enough, many information center managers must also contend with a myriad of local-area network products, departmental computing packages, and in some cases integration of the PBX system.

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The leader in information services and technology

4GLs drawing bead on PCs

From page 19

taken to mean that the fourth-generation languages' war with Cobol is near an end. The arrival of PC-based fourth-generation languages still leaves unanswered the languages' need for portability, greater speed and usefulness outside the world of report generation.

It is in these areas that the next development in fourth-generation languages will take place.

The fourth-generation language is popular for economic reasons. Software development costs, which are labor costs, now often eclipse the expense of a system's hardware. The solution, of course, has been to convert to fourth-generation languages for program development. The language in effect relies on relatively cheap hardware power to overcome the relatively expensive cost of Cobol programmers. With a fourth-generation language, a savvy end user can do mainframe programming.

The programs that result, however, have grave limitations. According to Paul Tinnirello, manager of data services programming at A.M. Best Co. in Oldwick, N.J., fourth-generation languages "lack the speed for use in high-volume" systems.

Fourth-generation languages also lack good debugging tools and portability, Tinnirello said. Perhaps most important, they do not address the fact that the user often already has a fleet of Cobol programs, all of which must be maintained and updated.

Because of these reasons, "people aren't going to flush their Cobol systems down the drain" in deference to fourth-generation languages, Tinnirello observed. At least, not yet.

There is on the horizon a new breed of fourth-generation language that combines the best of Cobol with the best of the language — and with a dose of artificial intelligence added for ease of use. While fourth-generation language users have for some time been adding patches of Cobol to their programs wherever they want speed or greater sophistication, these new languages will not need patching. They will simply be faster products. Such products will be "a likely extension of existing 4GL products," said IDC's Rinaldi.

When those products arrive, users will have the best of both worlds for a change.

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Adabas delay irks some users

From page 19

base management system, admitted they were willing to wait until the product was ready.

"I know that Software AG doesn't move quickly on its releases, but when the product comes out, it's usually very sound," said Howard Robinson, of PVA-EPVA, Inc. in Wilton, N.H.

A fund-raising organization for paralyzed veterans, PVA-EPVA uses an IBM 4381 and a 4341 for producing its mailing lists and donor records. Because the company runs 100,000 transactions a day against several million records, "our biggest problem is performance," he said.

At the Utah Department of Employment Security, employment records are now stored on VSAM files. With the added capabilities and increased performance of Adabas Release 5, Steven Larsen is hoping he will be able to store data about job applicants and unemployment recipients in one place. "I'm looking forward to being able to create data definition models across files," he said.

Sea-Land Corp. of Elizabeth, N.J., currently uses Software AG's Adabas as the DBMS for its human resources and sales and marketing applications. According to Robert Ranalli, the worldwide container company executes more than 10 million commands a day on Adabas running on an IBM 3090, 3081 and 3083.

With the new release's multiple thread or update capabilities, Ranalli said he hopes to remove the processing bottlenecks.

Performance improvements are also important to Sea-Land. "We have some huge files the size of two 3380s. Loading them can take a couple of hours. A 25% to 40% gain in load time means a lot, particularly when it comes to maintenance. It could cut downtime by as much as an hour, and that makes me look good."

Notes: Israeli firm to sell tool in U.S.

From page 19

company will continue to enhance and support its COS operating system, according to John A. Rollwagen, chairman.

■

Another contender for sales of IBM mainframe production control systems is about to offer its product in the U.S. **4D Software, Ltd.** of Tel Aviv, will market its **Control-M** system, which it says dominates the Israeli market. It is in the process of choosing a U.S. base of operations.

■

Maki Soft, Inc. of Basking Ridge, N.J., signed a letter of intent with **Dun & Bradstreet Corp.** to execute agreements on its **Super-Link** product. Company officials claim Super-Link allows micros to process on-line applications synchronously with mainframe hosts, allowing a programmer on a micro to develop screens, field validations and message handling for the application and off-load those tasks from the host.

SYSTEMS & PERIPHERALS



HARD TALK
James Connolly

Translating vendorspeak

Pity the DP manager who has to ask a question of the new breed of computer sales representatives, the marketing type who works for a company that makes supercomputers, minisupercomputers, massively parallel computers and whatever else the so-called next-generation computers may be labeled.

As valuable as those machines may become as they make their way into the commercial DP world and as well as a computer scientist may understand the technology, one strike against these computers is that vendors cannot or will not explain them in terms understandable by the vice-president of MIS who has to budget for the system.

The firms to be wary of are the start-ups and even some established companies exploring new markets. They and their marketing representatives get carried away with the black box concept.

Here are some examples of questions that one might ask of these vendors and their typical responses:

What is the operating system? "There isn't one."

Then how are data, instructions and peripherals managed? "The machine does it."

How? "It's a truly unique approach, but we can't tell you how it works because it's proprietary." (The translation is, "Darned if I know.")

What sort of applications do you expect your customers to run? "They can solve problems they previously thought were unsolvable."

See **TRANSLATING** page 26

Connolly is Computerworld's senior editor, systems & peripherals.

Datapoint expands Starfleet

Diskless PC processor, file server, printer added

By James A. Martin

SAN ANTONIO — Datapoint Corp. recently announced a host of products for its fledgling Starfleet office automation line, including a diskless personal computer applications processor, an IBM Personal Computer AT-compatible file server, a laser printer, a communications server and two high-speed modems.

The products are aimed chiefly at Datapoint's installed base of customers, said Jim Rutledge, senior director of product marketing. In addition, they are designed to enhance further the availability of products operating on the company's Attached Resource Computer (ARC) local-area network and proprietary operating systems, its DOS and the more recent Resource Management System (RMS).

"Our strategy is to provide the installed base with higher performance products at a lower cost and, at the same time, ensure compatibility with existing Datapoint systems," said Edward P. Gistaro, Datapoint president and chief executive officer. "We have to take care of the customers that have hung with us through all this time as well as look to the future," Gistaro told *Computerworld* recently.

Datapoint is positioning the Starfleet as its flagship product line. The first of the series, the 16-bit processor Starship I, was introduced last September, allowing users to run applications under both RMS and DOS. Starship II, due out later this year, will include hardware and software interfaces to Microsoft Corp.'s MS-DOS and Unix [CW, March 31].

The recently announced products, all of which are available now, included the Deskstar, an Intel Corp. 80286-based 16-bit applications processor that provides 2M-bytes of internal memory, expandable to 4M bytes. The Deskstar is essentially a diskless personal computer that acts as a single-user workstation on an ARC network for Datapoint's Pro-Vista line of proprietary office automation software.

See **DATAPOINT** page 30

Less is more: Early user finds DG's smaller mini faster, easier to install

By Donna Raimondi

PEAPACK, N.J. — A company that planned to purchase Data General Corp.'s MV/4000DC minicomputers has discovered that the smaller DG MV/2000DC is faster, more powerful and much cheaper.

The MV/2000DC — DG's answer to Digital Equipment Corp.'s Microvax II supermicro — is out of beta testing and ready to go. The system is simple to install and use, says Luciano Corea, vice-president of office information systems at Beneficial Data Processing Corp in Peapack.

"We have had a beta system for one and a half months or so," Corea says. "About the biggest difference we find is that the 4000 has more ports. But with the same 5M bytes of memory, 120M bytes of disk space and fully laden — the 4000 with 32 ports, the 2000 with 24 ports — there is about a $10,000 difference in price."

Corea's company provides all data processing services to its parent, Beneficial Corp. The DP unit is installing five of the new systems in five locations around the U.S. and in England. This is part of an order for 21 MV/2000DCs that the parent company placed in November when the system was announced.

The staff that is tapping into the 2000DCs are novice computer users, Corea says. They range from a senior vice-president to administrative assistants. "Where it is cost-justified, we will put everyone on CEO," he says. The company has an independent firm conducting a study to determine dollar savings that can be realized be-

See **USER** page 29

INSIDE

Zenith introduces its flat-screen CRT technology/**28**

IBM offers more disk support under VM and Series/1 network control tools/**28**

Southern Systems, Inc. announces a high-speed nonimpact page printer/**30**

NEW THIS WEEK

- Texas Instruments announces a Tempest version of its Explorer LISP-based system
- For more on this and other new products, see pp. 83-106.

INSTANT ANALYSIS

"Unix is Cobol one more time. It isn't as portable as people think."
— **Richard A. Cortese, president of Alpha Microsystems, on why his company favors a proprietary operating system over Unix**

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TOWER SYSTEMS INTERNATIONAL

Zenith displays flat CRT, claims significant advances

By David Bright

SAN DIEGO — A new flat CRT technology from Zenith Electronics Corp. reportedly offers up to 80% more brightness and up to 70% better contrast than conventional CRTs.

At the Society for Information Display's annual symposium, held recently, Zenith scientists demonstrated their patented flat tension mask (FTM) tube and released some details of the technology.

Executive Vice-President Karl Horn claimed that the tube represents "the most significant development in display technology since the color picture tube."

Offered to OEMs

The FTM tube will initially be offered to OEMs in a 14-in. version to be shipped in 1987. According to Horn, the product will be priced competitively.

Both the FTM tube and conventional color CRTs use a thin metal shadow mask with hundreds of thousands of perforations to direct beams from the tube's electron gun to the screen.

In Zenith's FTM tube, the shadow mask is stretched flat and held under tension directly behind the tube's flat glass faceplate. Unlike the shadow mask in conventional CRTs, the new tube's mask does not move under most display conditions, according to Horn.

In addition to increased brightness and contrast when compared with conventional CRTs, the FTM tube is said to provide increased resolution, sharper color fidelity and glare-free viewing.

Kowin system links desktops

Multiuser net offers voice connections for Apple Mac, IBM PC

By Peggy Watt

MONTEBELLO, Calif. — A multiuser desktop computer system with integrated voice connections that can incorporate IBM Personal Computers and compatibles, Apple Computer, Inc. Macintosh computers and other common systems into its network is testing the waters for a summer release.

Kowin Computer Corp.'s Kowin Office features three types of desktop units, varying in sophistication, and can accommodate other vendors' desktops into a turnkey network that includes electronic mail, file sharing, memo pad, calendar and other multiuser utilities. Each workstation includes a standard telephone with a speakerphone and a 300 and 1,200 bit/sec. modem and can be autodialed from the on-line directory.

The software, developed by Kowin and Quadratron Systems, Inc. of Encino, Calif., is based on the Regulus multiuser, multitasking operating system, an AT&T Unix System V-compatible program, and runs compatible application software, according to Kowin representatives.

When microcomputers are attached to the network, they can use the same network utilities but retain stand-alone functions, said Stan Bour, Kowin vice-president of engineering. However, the distinctive Macintosh user interface disappears under the Kowin network, and a microcomputer user loses the autodialing feature.

Kowin is also soliciting value-added retailers and value-added dealers, Bour said. The company said the system will be on the market in July.

Its primary unit is the File Server Graphics Workstation, with three 32-bit Motorola, Inc. 68000 processors running at 10 MHz — one each for the operating system, applications processing and workstation processing; 1M byte of random-access memory (RAM), expandable to 4M bytes; a 20M-byte hard disk drive; and options for as many as three external hard disks and a 20M-byte tape backup. It uses 1M-byte, 3½-in. floppy disk drives.

The operating system processor has 1M byte of main memory and 64K bytes of programmable read-only memory (ROM). The file server has four RS-422 Kowin Network ports, which can connect up to 16 workstations for a maximum configuration of 64 users, though six to eight users per file server is optimum, Bour said.

The other two Kowin desktop systems, the Office Graphics Workstation and Executive Workstation, each contain a 68000 microprocessor, 16K bytes of RAM and 32K bytes of programmable ROM. The graphics workstation features a black-on-white, 12-in. bit-mapped graphics display screen, as used in the Macintosh.

The Executive Workstation is a smaller, transportable one-piece unit with 128K bytes of display memory, a 25-line, 80-character, 9½- by 3½-in. LCD, measuring 640 by 200 pixels.

Both workstations also have two RS-232 serial ports.

Basic retail price for an eight-user configuration of the Kowin Office is $13,955, which includes one File Server Graphics Workstation with a 20M-byte hard disk drive, single 1M-byte floppy disk drive, 1,200 bit/sec. modem and the operating system plus seven monochrome workstations. The company said that the cost to a dealer is $7,820.

Translating vendorspeak

From page 25

Where will they get the software? "We expect a third-party market to develop as people realize how great the machine is, with some of our customers being able to sell their own applications once they write them." (The translation this time is, "Drop back 10 yards and punt.")

It has become obvious that in too many cases the point people for these vendors don't understand the technology themselves. And the researchers are content to design machines for other deep-pocketed research customers who experiment with applications that never go into production. The inventors bring in marketing folks to hit the commercial market with promises of "the fastest computer ever built at a cost of only $XX million."

The problem is that few firms can kiss off that $XX million in the hope that at least one of the dozen "next-generation" vendors are the second coming of Cray Research, Inc. The Cray-1 came out without software, which came later as Cray established its market. If a buyer is to gamble that another start-up can be another Cray, that buyer at least deserves the courtesy of straight answers.

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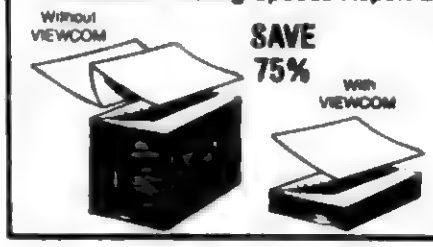
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IBM adds VM drive support, graphics system printer, Series/1 net tools

By James Connolly

WHITE PLAINS, N.Y. — Increased support for its 3380 dual-density disk drives under VM was among a series of product and enhancement announcements made recently by IBM.

In addition to the VM/XA SF Release 1 DASD enhancements, IBM announced its 5087 Screen Printer for the IBM 5080 Graphics System, IBM Series/1 network management tools and limited service support for non-IBM personal computer products.

The DASD enhancements reportedly provide guest virtual machines full-function, shared support of 3380 E model disk drives and guest use of 3880 Model 13 and Model 23 controllers.

IBM said the guest machines are provided with full-pack mini-disk sharing, support for DASD dump and restore, the ability to use extended count key data channel command words and the use of read device characteristics channel command words. The enhancements will be provided on a program update tape in early 1987, according to IBM.

The screen printer is designed for high-resolution, seven-color or monochrome production on A-size or A4-size paper or A-size transparency.

It connects to the video interface of a 5085 Graphics Processor or a 5081 Display. IBM said a single-copy color output takes about 65 seconds to process, and a monochrome copy takes about 30 seconds to process. The printer costs $6,500 and will be available late this year.

The Series/1 announcements included the Series/1 EDX Network Definition Utility Version 1 and the EDX Primary SNA Version 1. The products are corequisite.

The definition utility was designed to provide a user-friendly method of defining the network resource configuration records used to define EDX Primary SNA Networks.

EDX Primary SNA Version 1 is said to support the IBM 3651 and 3684 controllers and the IBM 4680 Store System Controller. It provides physical unit (PU) Type 4 and PU Type 5 images to downline PU Type 2 controllers but is not attachable as a PU 4/5 type to a host. The EDX Network Definition Utility Version 1 costs $1,950, and the EDX Primary SNA Version 1 costs $2,995.

IBM also announced that its National Service Division service representatives will now be able to remove or disconnect from a personal computer a non-IBM machine or feature that has been diagnosed as causing a system or machine failure.

Wang group starts service

DEKALB, Ill. — A 1-year-old Wang Laboratories, Inc. users group has announced an on-line information service to provide subscribers with data bases of software and with capabilities for electronic mail, public forums and opinion polling.

WUSA/On-Line, sponsored by the Wang Users Society of America, will operate as a special interest group on Delphi, a videotex service of General Videotex Corp. of Cambridge, Mass.

Information is available about Wang's Office Information System, VS and Personal Computer systems.

WUSA officials said the service will save users the cost of support by allowing them to get assistance from other users. A Delphi subscription costs $24.95 and includes a Delphi instruction book and three non-prime-time connect hours.

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Announcing TI's Second Satellite Symposium: A To Getting Started.



User says mini offers more

From page 25

cause of Beneficial's 1,200-node, worldwide network running DG's Comprehensive Electronic Office (CEO) integrated office system. The network now includes 12 MV/10000 superminicomputers and one MV/4000 minicomputer.

> *'I suspect this type of system is the machine of the future.'*
>
> — Luciano Corea
> Beneficial Data Processing Corp.

The networked systems are linked via DG's Zodiac communications software by dedicated leased lines to approximately 16 remote locations. Two of the new systems will be configured with 24 ports, the maximum number allowed, and the others will have 12 ports each.

Users are currently being trained in an extensive program of formal hands-on training, Corea says. "If they don't go through the training program, they don't get a user ID," he says.

The only problem Corea had with installation was that it looked too easy. "If you have a technical background, you think it's too simple to be real," he says. "You hook terminals up, start it up and say 'enable,' and then you don't have to tell it anything. A special cable determines intelligently what communications protocol it is hooked up to."

A menu of prompts walks the installer through the process, and if the user cannot make decisions, the system makes a decision for him through a series of defaults.

The system has two batteries that power clock and date time, so if the system is turned off, those two bits of information do not have to be reset. Each time the system is turned on, it runs a total hardware self-check to make sure all is working well.

Part of the reason the system is so simple to install is Corea and his staff asked for a lot of simple user-interface menus when they were the beta test site, he says.

DG wanted a machine users could install and maintain, so Corea's people suggested changes to make that process possible. DG then revised the original AOS operating system to Revision 7.

"I suspect this type of system is the machine of the future," Corea says. "It is small, has 1 million instructions per second of power, and the cost/performance ratio has got to obsolete other larger models. I can't see buying a 4000 anymore."

He points out that the cost per user, although he has not figured it out to the dime, falls somewhere in the $2,500 to $3,000 range. "That is a far cry from even two years ago," he adds.

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Dr. Harry R. Tennant. Senior Member Technical Staff and manager of artificial intelligence research in TI's Computer Science Laboratory. Invented the concept of menu-based natural language understanding. Involved in knowledge representation systems, expert systems, logic programming, information management, and working LISP systems into the PC and other small computers. Author of "Natural Language Processing: An Introduction to an Emerging Technology." Selected as one of America's top scientists under the age of 40 by "Science Digest" magazine.

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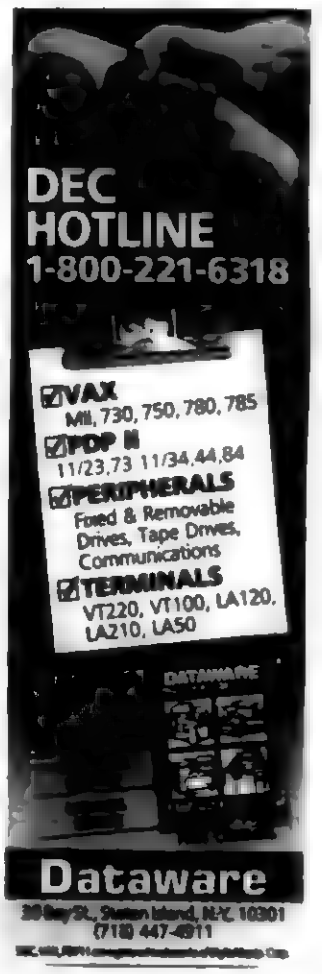
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Southern Systems offers nonimpact printer for minis and mainframes

By David Bright

CLEARWATER, Fla. — Southern Systems, Inc. has introduced a $59,950 nonimpact page printer that prints 80 page/min and is intended as a cost-effective replacement for traditional impact printers.

According to company officials, the IBM plug-compatible Mercurion 1/80 operates at three times the speed of traditional impact printers.

Most nonimpact printers in this speed range come from Xerox Corp. and generally cost about $200,000, noted Jonathan Dower, president of Datek Information Services, Inc., a Waltham, Mass.-based printer market research company. The printer is also said to be compatible with all popular minis and mainframes.

Like Southern Systems' 60 page/min printers, the Mercurion 1/80 is based on a Delphax Systems, Inc. ion-deposition engine.

The Mercurion 1/80 reportedly offers a monthly duty cycle of 500,000 pages at a cost of about one cent per page. It uses 8½ by 11 in. and 8½ by 14 in. cut sheet paper. Features include automatic forms creation with a round-corner capability and all-points-addressable graphics.

Deliveries are scheduled to begin this month.

Datapoint adds to its Starfleet

From page 25

"This allows the user to run more power on the desktop in memory and processing, with prices that are competitive with personal computers," Rutledge said. The Deskstar comes with either the DOS or RMS operating systems. Datapoint's DOSgate software system, released last year, provides an interface between the two.

"With the Deskstar's improved ergonomic design and memory capabilities, we are able to move the 286 processor further into the heart of our product line," Rutledge said. The Deskstar is an enhancement of Datapoint's 8400 processor, released in May 1984, and utilizes the 80286 chip, he added. The Deskstar sells for $3,995.

Datapoint also announced the Stargate communications server, which is a synchronous communications controller designed to link Datapoint systems with IBM's and other vendors' systems through IBM's Systems Network Architecture (SNA), CCITT X.25 and the International Standards Organization Open System Interconnect standard.

The Stargate SNA/Synchronous Data Link Control gateway software enables RMS ARC users to access IBM 3270 and 3770 data communications facilities. The hardware component is a Motorola, Inc. 68000-based microprocessor that attaches directly to an ARC network.

The Stargate server offers 19.2K bit/sec. transmission for medium to large networks and can off-load processor-based communications functions on an ARC network, freeing up previously dedicated workstations, Rutledge added. The gateway system software retails for $2,750, and the server hardware costs $3,500.

The Starserver 10 is an IBM Personal Computer AT-compatible file server running MS-DOS but was designed to work as a file server in small data entry and distributed data processing networks running Datapoint's DOS.

> ***Datapoint Corp. is positioning the Starfleet line as its flagship product.***

Priced at $11,495, the Starserver features an 80286 16-bit CPU, 512K bytes of main memory, 4M bytes of cache memory and 60M bytes of fixed disk storage, expandable with an optional expansion disk unit.

Also included is a monochrome 14-in. monitor displaying 80 char. by 25 lines, MS-DOS and Starport DOS volume server and user diagnostics software. The Starserver system is priced at $11,495.

Datapoint also announced its first desktop laser printer, the Starbeam, priced at $2,400. The printer operates in ARC networks or in standalone environments, supports RMS-based office automation software and is compatible with Datapoint's Starport processor.

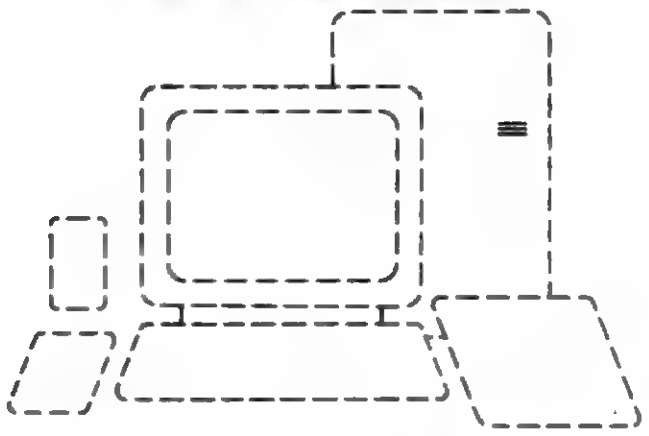
Starbeam prints 8 page/min and features a dry monocomponent electrographic printing method and Courier 10 typeface in normal, bold, italic and footnote fonts. An RS-232C interface allows up to 9.6K bit/sec. transmission rates.

The Race I and II modems, which Datapoint offers under a third-party agreement with Data Race, Inc., reportedly provide error-free transmissions with data rates from 1,200 to 19.2K bit/sec. full duplex.

The Race I features automatic dialing, adaptive line equalization and alternative AT&T 103J mode of operation, and the Race II offers the same features along with the ability to statistically multiplex a second, independent printer channel with the primary terminal channel on the same dial-up line.

The Race I retails for $1,495 and the Race II for $1,695.

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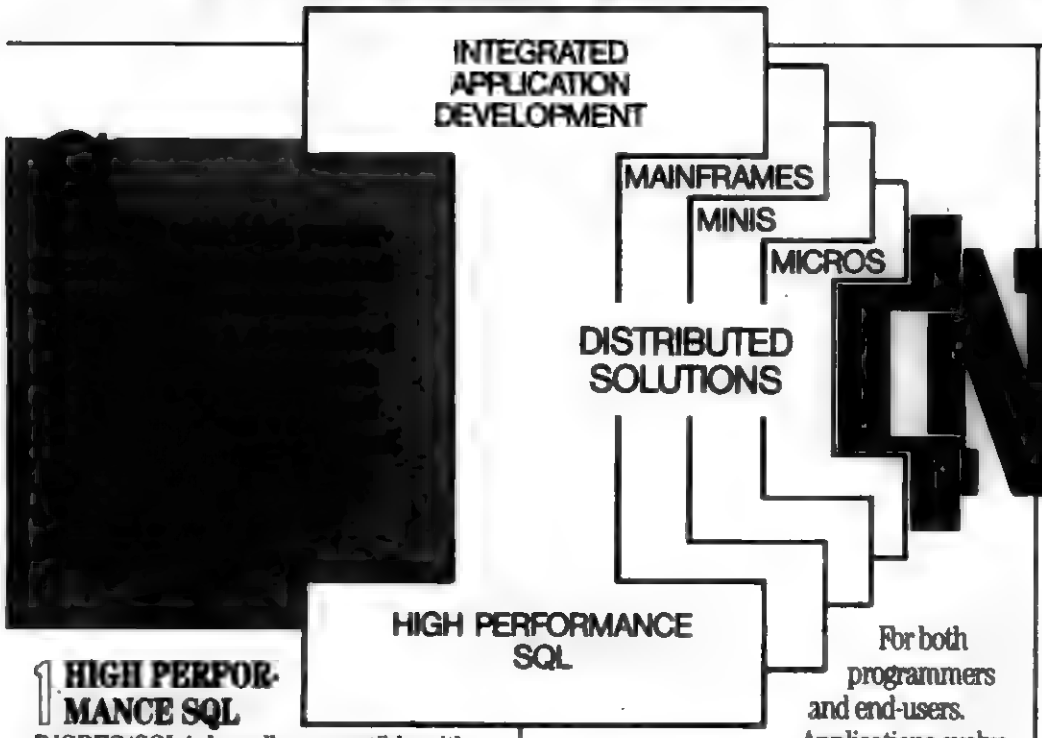
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MICROCOMPUTERS

SMALL TALK
Eric Bender

Resolving the pop-up conflict

Whenever software developers say they're hammering out some guidelines for applications, the rest of the industry looks on with skepticism. Developers are here on this earth to provide diversity rather than standards, and they don't share much beyond a fondness for complicated puzzles.

But earlier this month many faced such a puzzle together, gathering at Colorado Springs, Colo., to work on ground rules for random-access memory (RAM)-resident software. (Originally called "pop-up programs," RAM-resident packages now often travel under the graceless name of "Terminate-Stay Resident" software.)

No one quarrels with the goal of making RAM-resident packages, like Borland International, Inc.'s Sidekick, work more smoothly with other software.

These programs, which hang around in internal memory while a main application is running and supplement it with all sorts of handy little tricks, have skyrocketed in popularity. But they're often unwilling to run with each other or with primary applications — arguing and crashing over memory allocation and keyboard input and anything else they can find to fight about.

Underlying the problem are the usual compatibility culprits — overall weaknesses in the Microsoft Corp. MS-DOS design environment (particularly the lack of multitasking capabilities)

See RESOLVING page 43

Bender is Computerworld's senior editor, microcomputers.

Kenbak-1 enshrined as world's first commercial PC

By David Bright

BOSTON — A vintage-1971 Kenbak-1 personal computer with 256 bytes of memory won the Early Model Personal Computer Contest held last week at The Computer Museum in Boston.

The contest was staged to help the museum trace the history and development of personal computers before some of the machines become extinct.


Steven Wozniak

Apple Computer, Inc. cofounder Steve Wozniak was a judge at the contest, which was sponsored by CW Communications, Inc. and Computerland Corp. After the announcement of the contest winner, Wozniak delivered a talk about his electronics background and the early days at Apple.

Of the more than 320 entries received from 13 countries, 190 finalists were chosen. They will remain on permanent display at the museum. The selection criteria were significance, rarity, date and completeness. "We rejected 138 PCjrs," Wozniak joked.

Built by the Kenbak Corp. with a retail price of $750, the Kenbak-1 used eight data buttons for input and eight lights for output. Intended for the educational, rather than the more popular hobbyist market, only 40 Kenbak-1 machines were sold during their two years on the market. The machine's inventor, John Blankenbaker, later designed Symbolics, Inc.'s first artificial intelligence system.

The following were the four runners-up: the Micral, a commercial model built in France in 1973; the TVT-1 prototype, the first personal computer able to display text on a screen; the VDM-1, a memory-mapped video display generator for S-100-based systems; and an MITS

See FIRST page 42

Pros wary of 'desktop publishing'

Initial acceptance could result in bad graphics flow

By Peggy Watt

ATLANTA — As Apple Computer, Inc. and a growing throng of developers declare that everyone with a microcomputer can be a publisher, the business world should brace for some horrendous graphics from overzealous amateurs, publishing professionals warned late last month at Comdex/Spring '86.

"Remember when the Macintosh first came out and we all got MacMemoed to death?" asked consultant Frank Romano. At that time, delighted users crammed as many different Macintosh fonts as possible onto a page. That scenario will only get worse if IBM Personal Computer users all fancy themselves publishers, he said.

"We're in for a baroque period of graphic design," with graphically poor page layouts, wanton font mixing and design created under unskilled eyes, consultant Jack Powers predicted.

"My guess is people will begin to learn to use the tools, though most people are horrible designers and will never learn," Powers added. He suggested substituting artificial intelligence-aided design programs and emphasizing default choices.

The publishing professionals winced at the term "desktop publishing."

"There's no such thing as desktop publishing. It doesn't mean anything," Roma-

See PUBLISHERS page 43

INSIDE

The industry still debates prospects for 1985's leading micro software start-ups/24

Iomega announces a high-end storage system and cuts prices on disk cartridge subsystems/39

NEW THIS WEEK

- IBM offers its wide-paper Proprinter XL

For more on this and other new products, see pp. 83-106.

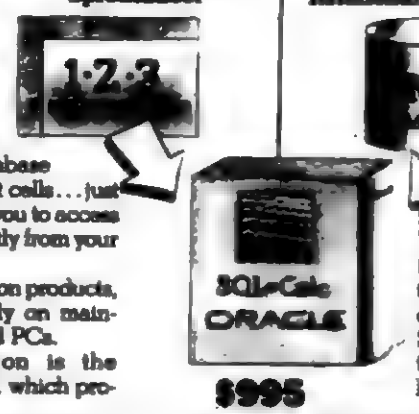
INSTANT ANALYSIS

"When a multitasking system comes in, and there's a need to convert software, what will be the balance of value vs. pain? The demand for these RAM-resident packages indicates that there is a high value for multitasking."

— Robert Frankston, chief scientist, Lotus Development Corp.'s Information Services Division

Oracle's SQL*Calc makes a relational DBMS as easy as 1-2-3.

Oracle Corporation has developed a Lotus 1-2-3 compatible spreadsheet and integrated it with its ORACLE® relational database management system (DBMS). The new product, SQL*Calc,® is the first to combine a mainframe-class relational DBMS with an easy-to-learn and familiar PC spreadsheet user interface.



SQL*Calc is designed for 1-2-3 users who've run out of memory, flexibility and patience. SQL*Calc allows you to put SQL database commands into spreadsheet cells... just like formulas. This permits you to access large amounts of data directly from your spreadsheet.

Like all Oracle Corporation products, SQL*Calc runs identically on mainframes, minicomputers and PCs.

SQL*Calc's foundation is the ORACLE relational DBMS, which provides users with a complete set of SQL commands through which they can create, retrieve, modify and otherwise control their data. SQL is the industry standard database command language for large computers. The SQL commands available in ORACLE are identical to the SQL commands in IBM's premier mainframe relational DBMS products, SQL/DS and DB2.

Built on this powerful DBMS foundation is a Lotus 1-2-3 compatible spreadsheet that allows users to put SQL commands into spreadsheet cells in the same way as they enter formulas. When a SQL command for data retrieval is entered into a spreadsheet cell, information is automatically retrieved from the database and placed into the spreadsheet. SQL*Calc also permits users to modify the database—and even create new database tables—directly from the spreadsheet.

SQL*Calc is easy to learn because its menu and command structure are compatible with those of Lotus 1-2-3. And SQL*Calc's ORACLE DBMS requires no supplement: It is vastly more powerful than the database components of 1-2-3, Symphony, Framework, dBase II, dBase III, or any other PC DBMS.

SQL*Calc is available immediately for IBM PC/XTs and ATs for $995.* SQL*Calc will soon be available on a wide variety of systems, including IBM mainframes, DEC, DG, and other superminis, and most UNIX systems.

For further information, or to order your copy of SQL*Calc, call 1-800-345-DBMS. Or write Oracle Corporation, Dept. CS, 20 Davis Drive, Belmont, CA 94002.

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Gambling on software success: Mixed prospects for start-ups

Success requires enhanced products

By Douglas Barney

Javelin Software Corp., Ansa Software Co. and Symantec Corp. were last year's three most visible microcomputer software start-up firms, breaking into an intensely competitive market. Industry observers still hotly debate these firms' chances for success.

"It is very difficult to break into the market with productivity tools. You need a significant enhancement to a productivity tool to give it an advantage against existing products," Alan Hald, chairman of Microage Computers, Inc., notes.

Some of the start-ups themselves attest to the difficulties. "A lot of people said we would be dead by now," acknowledges Steven Dow, president of Ansa, which continues to brave the critics.

Javelin had a similar experience. "When we started the company, everybody told us it was impossible," says Christopher Herot, vice-president of engineering for Javelin, which began shipping its software last October.

"We were the last three companies to enter the market before the gate shut," Herot remarks. He argues that firms such as Ovation Technology, Inc., which raised millions and failed to deliver a product, scared off many investors. "Four or five years ago all you had to do was photocopy a few pages of a manual and write a schlocky program."

Symantec Executive Vice-President Rod Turner agrees. "I don't think the gate shut, but there aren't going to be too many companies that will join the fray and be successful."

All three firms are currently showing signs of success, with products in the top 10 of the Softsel Computer Products, Inc. Hotlist. In fact, Ansa expects to recoup its total investment this year.

Opportunity for innovation

Softsel co-chairman Bob Leff calls all three products "enormously successful" and disagrees that today's market is highly difficult for new start-ups. "There is still enormous opportunity for innovation." But he adds that "it is not the same as it was three years ago."

Symantec's Turner claims to have sold some 15,000 copies of Q&A, while Ansa and Javelin refused to give sales figures. Ansa is currently selling some 400 to 500 units per month to end users through high-end computer retailers, and Javelin is selling some 200 to 250 units per month, estimates Bob Lefkowits, vice-president of software research for Infocorp.

Nearly all agree that the difficulties start-ups faced last year have multiplied. "The only viable alternative now is to get a Lotus or an Ashton-Tate to distribute the product," Herot says. Javelin recently reached an agreement under which Ashton-Tate will distribute Javelin to international markets, and Herot expects that to account for a significant portion of Javelin's sales.

Some critics believe that Javelin and Ansa, in particular, have priced their products too high. Amy Wohl, in the latest "Wohl Report on End-User Computing," a monthly newsletter, believes that Paradox and Javelin are "snazzy but still overpriced newcomers" that will have to come down in price "before reaching price-performance parity with competitive data base and spreadsheet packages." In fact, Ansa is already offering a $100 rebate on Paradox purchases.

While each firm targeted different markets, they all positioned themselves for head-to-head competition with existing vendors. They are being judged on success relative to the competition, rather than on sales alone.

"All three have very heavy venture capital investment, and as a result it is not enough for them to become modestly successful software companies," says Jeffrey Tarter, publisher of "Softletter," a Cambridge, Mass.-based newsletter. "They were set up by venture capitalists who expect big market shares and big sales volumes."

Javelin introduced a financial analysis package that butted heads with Lotus Development Corp.'s 1-2-3, and while Javelin hasn't displaced Lotus at the top of the best-seller charts, the firm claims demand has grown steadily.

"Everybody has a spreadsheet. We are selling to the people that have run out of gas with their spreadsheet," Herot says.

Symantec launched Q&A, an artificial intelligence-fla-

See GAMBLING page 42

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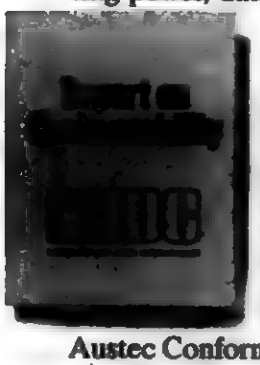
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MICROCOMPUTERS

Iomega uncrates high-end storage system, cuts prices

Targets networking, printer applications

By Peggy Watt

ROY, Utah — Iomega Corp. released the Bernoulli Box Plus, a high-end mass storage system aimed at networking and high-storage applications, and cut pricing up to 26% on all disk cartridge subsystems.

The Bernoulli Box Plus is an 80M-byte external hard disk drive with two removable-cartridge 20M-byte drives. The cartridges support backups and can be read from or written to directly.

Pricing starts at $5,995 for the enhanced hard disk, which comes with Q-DOS, file management software from Gazelle Systems of Provo, Utah; archival backup software; and a host adapter card for use with the IBM Personal Computer AT and compatible systems.

Iomega is aiming the Bernoulli Box Plus at such high-capacity uses as computer-aided design and desktop publishing, according to Tim Orsley, product manager. The storage devices also support major IBM PC-DOS networks, including PC Network and the Token-Ring network, and Novell, Inc.'s Netware systems.

"We consider ourselves competition to tape backup systems, because the removable cartridge drives are a means of additional on-line storage as well as backup," Orsley said.

In addition, the storage system offers the "journaling" feature of storing often-used programs and information on the hard disk and keeping data from separate applications on various cartridges, which may be plugged in as needed, Orsley said.

Its working backup feature reportedly allows immediate random access to backed-up data in the cartridges. The file manager can provide a complete inventory of files as divided into subsections by the user.

Orsley said that the product may compete against the original Bernoulli Box, which received an early boost as an alternative to the initially trouble-ridden hard disk system in the IBM Personal Computer AT. However, between high-storage application areas and network storage, Iomega is "playing with a wide variety of markets," he said.

Announced last week, the price cuts on disk cartridge subsystems were effective immediately. Cost of the 10+10 Bernoulli Box dropped from $3,695 to $2,895.

Board provides EGA overlays

By Douglas Barney

WASHINGTON, D.C. — U.S. Video late last month announced its RM-110 Video Overlay board, which the firm claimed is the first product to provide video overlay for the IBM Enhanced Graphics Adapter (EGA) and compatible boards. The $980 product can support computer training, video data bases and other interactive applications.

"There are several overlay boards or systems on the market today, but U.S Video has the only one available to people who want to use their own software. Our competition requires the user to use their software," said George Wheelock, director of marketing for U.S. Video. "We have made our board as open as possible."

According to the firm, the RM-110 brings EGA graphics and text together with full-color, high-definition video images. These previously incompatible images can be shown at the same time on a single monitor, in either opaque or transparent superimposed mode, or can be keyed to any color provided by red-green-blue monitors.

With color keying, users can create video windows with the help of windowing programs such as IBM's Topview and Quarterdeck Office Systems, Inc.'s Desqview.

Output from a television tuner, laser disk, videocassette recorder, video camera or any other National Television Standard Code (which is the output from most video devices) output device can be displayed on a portion of the screen using popular graphics software packages.

RM-110 includes an on-board laser-disk controller circuit that allows access and control of up to 50G bytes of stored images, or 30 minutes of real-time action video on each side of a 12-in. laser disk. The product also includes support software and monitor cables.

Available now, the RM-110 runs on IBM and compatible personal computers.

Borland's Turbo Prolog hits market

SCOTTS VALLEY, Calif. — Borland International, Inc. last week began shipping Turbo Prolog, its $99.95 entry into the artificial intelligence language market.

Borland founder and President Philippe Kahn said that Turbo Prolog will be implemented on other systems, including mini and mainframe computers, a new approach for Borland.

The firm also announced a price hike for its relational data base, Reflex, The Analyst, to $149.95 effective May 15. It was introduced by Borland at $99.95 after the company acquired the original publisher, Analytica Corp., of Fremont, Calif.

Borland also disclosed the availability of file format specifications for data base files built with Reflex. The company also promised that at least one Reflex add-on product will be announced this summer.

Statistical analysis package debuts

Allows numeric, graphic modeling

By Stanley Gibson

CORVALLIS, Ore. — Called "a word processor for numbers" by its developers, Point Five is a statistical analysis software package for personal computers recently introduced by Pacific Crest Software, Inc.

The $195 program is intended for market researchers, strategic planners, engineers, sociologists, psychologists and others who use quantitative analysis for numerical and graphical modeling.

"Point Five lets users structure a problem one way, take a look at the results and then restructure it quickly for a different type of analysis," President and founder of Pacific Crest, Dan Apple claimed.

Spreadsheets inadequate

Apple also suggested that conventional spreadsheet programs are inadequate for many in-depth analysis tasks. "We created Point Five to overcome users' frustration with the cumbersome mechanics, limited functionality and confining structures of conventional computer programs," he said.

At its simplest level, Point Five operates as a programmable calculator with 150 built-in mathematical, financial, statistical and data manipulation functions, such as standard deviation, return on investment and amortization.

In addition, the built-in functions can be used as a fourth-generation programming language by experienced users, according to Pacific Crest.

Apple, who originally conceived of the program as an aid to cities and towns in planning municipal services, is optimistic that governments and universities will be particularly receptive to Point Five.

'A well thought-out package'

"It's a very well thought-out package," noted Bob Mayhew, senior ADP manager with the University of California at Riverside. Mayhew said that he was impressed by the flexibility and power of the program when he saw the Point Five package demonstrated.

The university will pay Pacific Crest a site license fee of $1,800 and will use the program in statistics classes as well as for its own organizational planning needs.

Another user, John Jackson, an operations analyst with Food Machinery Corp. in San Jose, Calif., said, "Before, I would have picked up a calculator and a scratch pad."

Used for number crunching

Jackson said he has been using Point Five on a steady basis for the past six months, mainly for number crunching. Jackson also claimed he has found the software particularly useful because he can write his own programs with it.

Point Five runs on IBM Personal Computers and compatibles with two disk drives and a minimum of 256K bytes of random-access memory. It runs under Microsoft Corp.'s MS-DOS 2 and above, and works with an IBM or Hercules Computer Technology, Inc.-compatible graphics card. The program can also take advantage of an Intel Corp. 8087 math coprocessor, according to Pacific Crest.

On-line service pools stock info, archival data

By David Bright

WOBURN, Mass. — Hoping to attract corporate and financial decision makers who need both current and past corporate business information, Datext, Inc. and Dow Jones & Co. have announced CD/Newsline. The subscription product merges on-line stock quotes and news stories from Dow Jones News/Retrieval service with seven years worth of business and financial information from Datext's Corporate Database, which resides on compact-disk read-only memory (CD-ROM) optical disks.

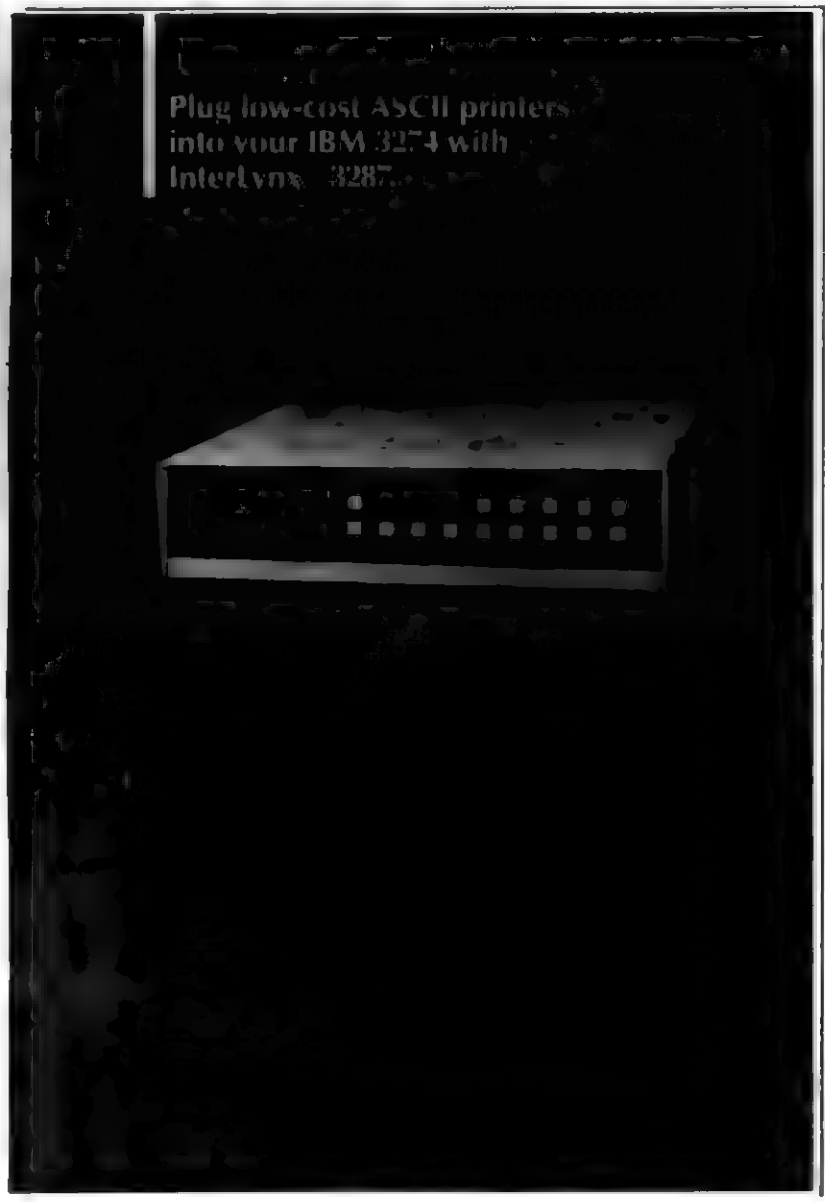
Available in the fourth quarter to existing subscribers of Datext's Corporate Database, CD/Newsline will work with a user-supplied IBM Personal Computer and modem. Annual fixed subscription prices begin at $14,100.

With the service, users can obtain analyses of companies listed on the New York, American, over-the-counter and regional stock exchanges. The service's fixed price gives subscribers the advantage of being able to conduct an unlimited amount of research without being subject to variable on-line charges, according to Datext Marketing Manager Dan Schimmel.

Along with obtaining stock quotes, users can also get a profile on the board members of a particular company, examine current and past news stories concerning the organization and read reports from investment analysts.

Datext's software reportedly guides the user through each step of the analysis, using the same keystrokes to access both the CD-ROM and on-line data bases. The package also includes software for transferring on-line information to standard application programs such as Lotus Development Corp.'s 1-2-3.

The Corporate Database includes up to four CD-ROM disks, each focusing on a consumer, industrial, technological or service sector. Prices range to $24,100 for a four-disk subscription. Volume discounts are available, Schimmel said.



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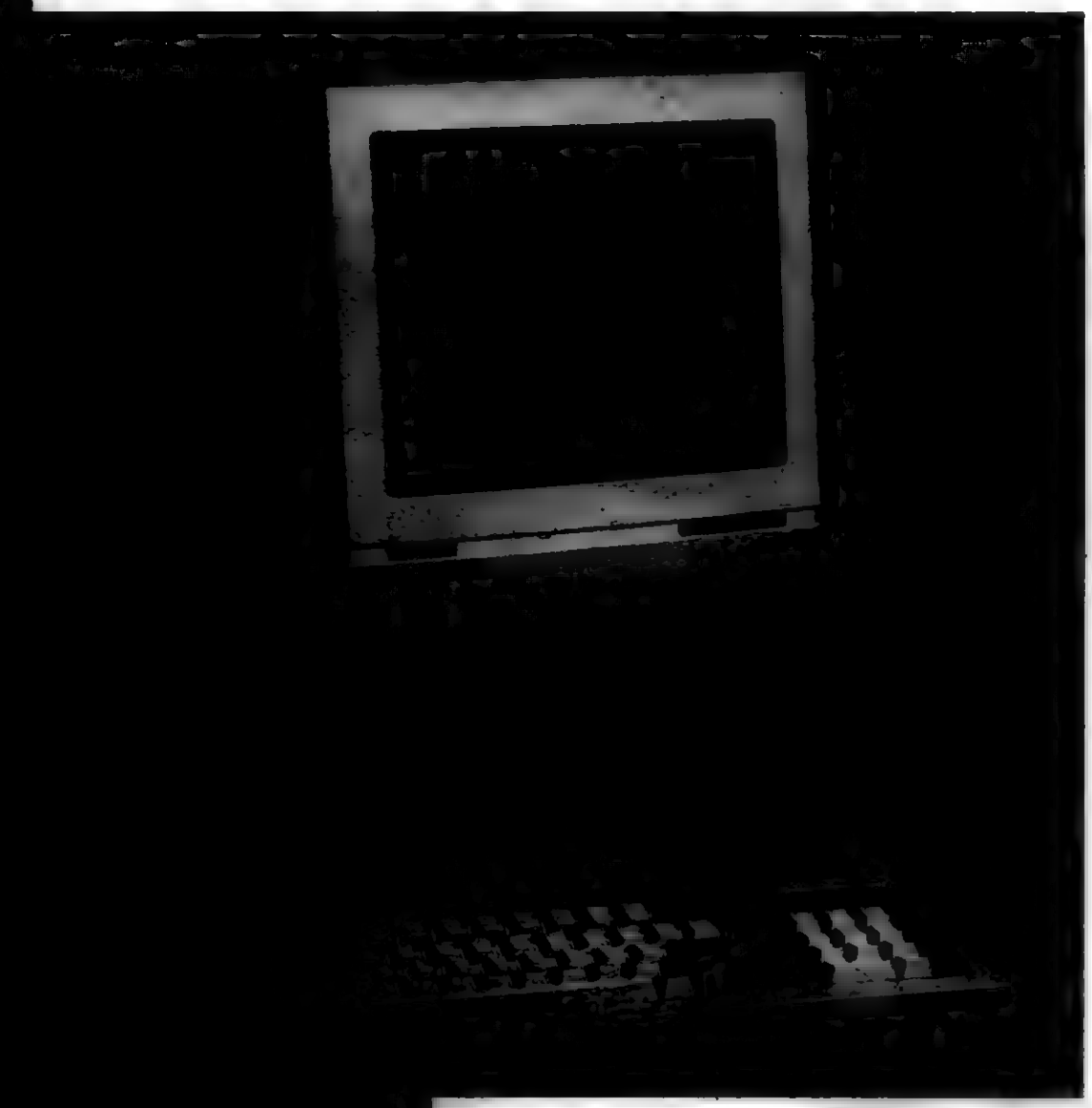
- Database Design
- Application Design
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- SQL
- Application Programming
- QMF
- DXT
- Utilities
- Roles/Responsibilities
- Education

If your company is implementing or planning to implement DB2, the GUIDELINES will provide valuable technical insight to your development and technical support organizations. For further information, please call or write: Mr. Carl J. Lefere, Director—Regional Sales

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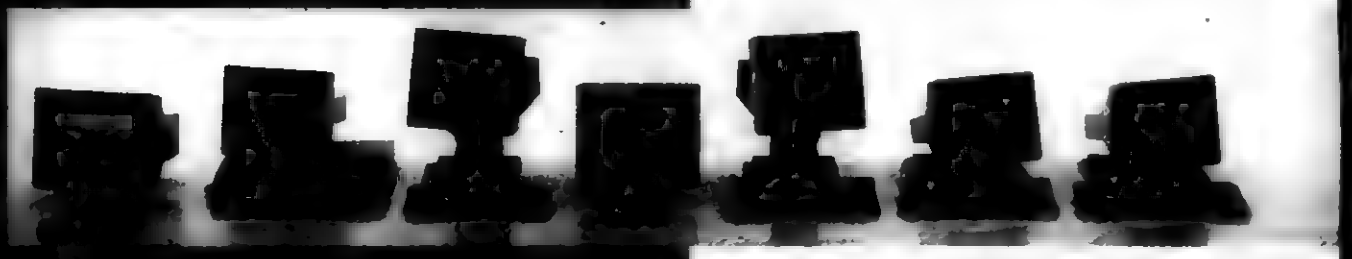
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Gambling on software success

From page 34

vored file manager and word processing package that it positioned against Software Publishing Corp.'s PFS:File product.

"There was a perception that PFS was running out of steam," says Turner. However, Q&A has failed to push PFS:File into obscurity.

With calendar year 1985 sales of $1.4 million, Symantec was the only one of the three firms to make the "1985 Soft-letter 100," a list of the top 100 micro software firms in the U.S., published by "Soft-letter."

Ansa and Javelin were not listed, because they did not begin shipping product until late in the year, Tarter says.

Ansa Software's data base management package, Paradox, faced perhaps the greatest challenge in trying to give Ashton-Tate's Dbase III a run for its money. "Our feeling is that Dbase has been stretched as far as it can be stretched," Dow says. In order to substantially improve Dbase, Ashton-Tate will have to "start from scratch," he maintains.

Earlier this year, however, Dbase III Plus knocked Lotus out of its No. 1 spot on the Softsel Hotlist, and its sales show no signs of abating.

Fortunately, Ansa is selling into a growing market for microcomputer data base software. The U.S. market for such software will increase from $471 million in 1985 to $648 million by 1989. This indicates a higher rate of growth than spreadsheet, word processing or integrated software packages, according to Market Access International, Inc., a San Jose, Calif.-based software research firm that was recently acquired by the Seybold Consulting Group. Market Access, which forecasts to 1989, sees virtually no growth in the spreadsheet market.

> ***'There aren't going to be too many companies that will join the fray and be successful.'***
>
> — Rod Turner
> Symantec Corp.

All three firms claim a steady growth in sales. But to survive they must continue to enhance their mainstream product and introduce applications in other categories to protect against declining demand for the primary product, analysts say.

Javelin soon will announce a new version of its financial analysis package that is faster and offers more features, according to Herot.

Javelin will also make a local-area network version of the product available, but Herot declined to be more specific.

Additionally, Javelin will announce a corporate pricing program and probably provide customers with a choice of copy-protected or non-copy-protected versions.

Ansa also plans to introduce other products. Financial backer Sevin Rosen Management Co. "wouldn't have invested in it if it was to be a one-product company," Dow notes. Ansa has already enhanced its product and removed copy protection.

Symantec will eventually introduce products that are already developed, but are too large for existing personal computers, and will also increase its publishing efforts, Turner says.

The firm currently offers two software add-on products and a memory board.

First commercial PC enshrined

From page 33

Altair 8800, which was included because of its completeness. The Micral arrived after the judging had begun — it reportedly was delayed by customs authorities who couldn't figure out what it was.

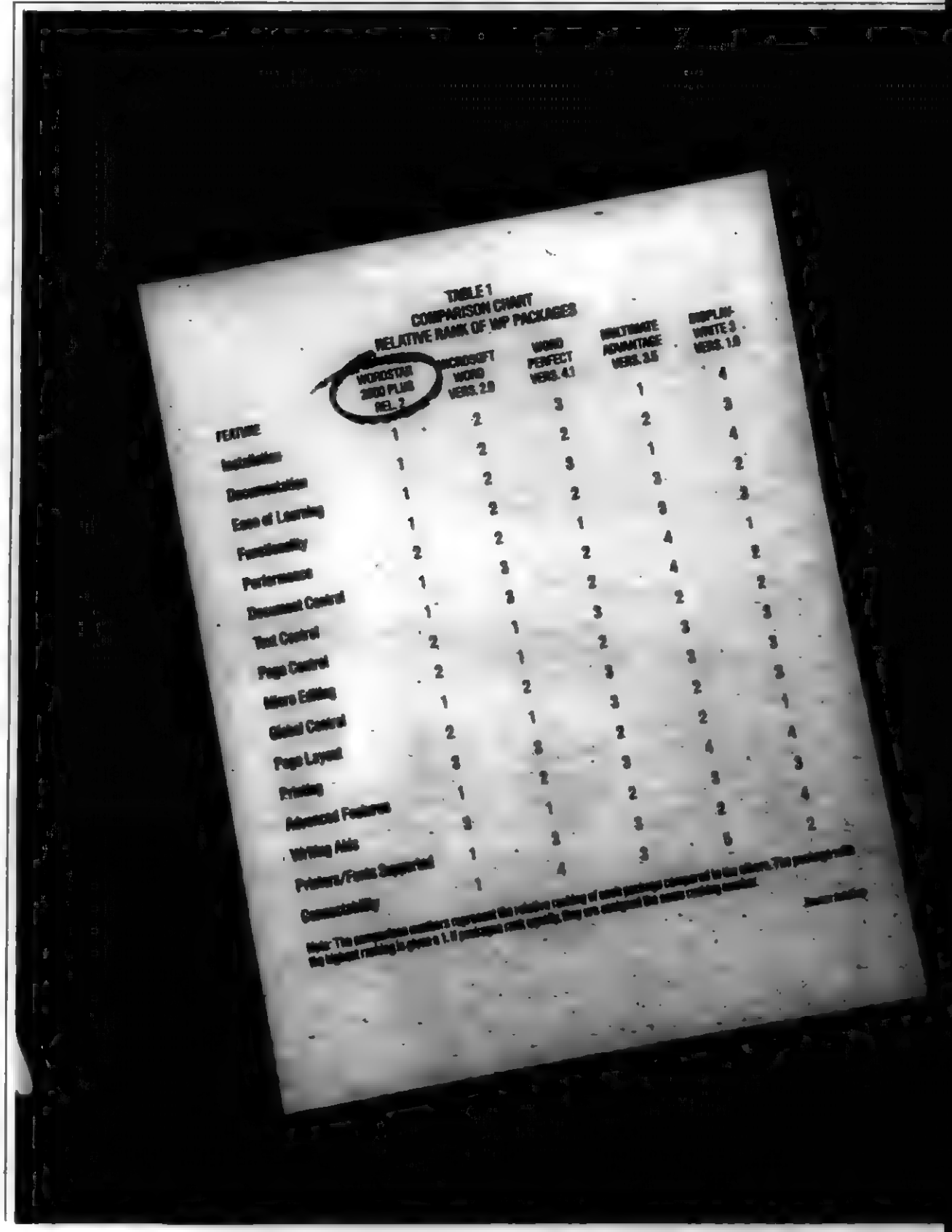
Other noteworthy entries included the Cromemco, Inc. Dazzler, which generated the first color video graphics; the EPA Micro 68, which fit into a briefcase; and a "Blue Box" built by Wozniak and future Apple partner Steve Jobs in the early 1970s for making free long-distance telephone calls.

In his talk, Wozniak focused on that period of his life, rather than the present-day Apple or his new company, CL 9 (for "Cloud Nine"). He said he is intentionally keeping the home entertainment video products company small, so as to have fun and spend time with his family.

Wozniak spoke fondly of the garage-shop days before Apple developed its rigid corporate structure. For example, to finance the production of the Apple I system in late 1975, Wozniak sold his most valuable possession — an HP65 calculator — for $500 and Jobs arranged a 30-day credit plan for the necessary chips. "It's amazing what you can do when you've got one level of management," he said.

Currently, Wozniak works for Apple only as a consultant.

Last weekend, he graduated from the University of California at Berkeley, finally completing the education interrupted by a stint as an engineer at Hewlett-Packard Co. and by Apple's success. Wozniak had originally joined HP to save money for school. Now, after accumulating enough money to finish college and do just about anything he wants, he hopes to become a school teacher.



Publishers wary of desktop units

From page 33

no said. "All we're saying is someone has the capability, on a desk, or in an office, or in the middle of the desert, to produce a page with mixed text and graphics that can be a master for printing."

Publishing professionals were also wary of the overall technical capabilities of low-end electronic publishing and are waiting for camera-ready half-tone photographs and denser dots-per-inch reproduction from laser printers.

However, they did not deny that emerging microcomputer publishing capabilities could prove important to business. For the corporate printshop, it could easily pay for itself simply by producing the business forms that otherwise go to outside presses, Romano said.

But at Comdex/Spring, desktop publishing promoters went much further with promises of extensive capabilities and large markets. Charles Pesko, of the market research firm Pesko Associates of Marshfield, Mass., predicted the current $55 million desktop publishing market will grow to $1 billion by 1990.

John Meyer of Ventura Software, Inc. described a lucrative corporate market with in-house documents being produced on PCs instead of presses and also emphasized uses in professional graphics art houses. Ventura, of Morgan Hill, Calif., recently signed with Xerox Corp. for exclusive distribution of its as-yet unreleased Ventura Publisher for Microsoft Corp. MS-DOS systems.

Hewlett Packard Corp. eyes a strong market for laser-printed publishing "in any knowledge-based business" equipped with PCs, according to Laserjet Marketing Manager Bill McGlynn.

And Ken Skier, president of SkiSoft in Lexington, Mass., a developer of an unreleased page-layout program for IBM-compatible machines, called current applications "primitive compared with what will evolve."

Several of the PC players said they plan systems that are expandable for desktop publishers who want to add specialized features.

Skier said he believes any IBM PC-DOS system will have to incorporate the same "what you see is what you get" principles that the Macintosh has popularized. "Forget the code-heavy font systems typical of professional typesetting," Skier said. "Apple has clearly shown the way."

Apple, which maintains it opened the desktop publishing market, appears undaunted at approaching competition from IBM and compatible suppliers.

John Zeisler, Apple business marketing manager, said, "There's a lot of confusion in the marketplace. With that factor, we have the leadership position."

He said Apple aims at selling a whole system to a new market — and maybe sneaking in the side doors as businesses discover the Macintosh's other attributes. "We're not looking at a desk with a PC on it already," he said. "We're looking at the 40 million without any PC yet."

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Resolving the pop-up conflict

From page 33

and all the other ill-behaved applications out loose in the world.

Since early this year software houses have been kicking around ideas to simplify life. As a starting point, Microsoft put out a proposal for some guidelines.

Philippe Kahn of Borland said the main problem is how to determine when the operating system could be interrupted and asked Microsoft to release some relevant documentation.

At this month's conference, Microsoft did promise to release more information on MS-DOS interfaces. This pleased the assembled developers, who previously had to take "the archeological approach to software engineering," commented Robert Frankston, co-author of Visicalc and chief scientist for Lotus Development Corp.'s Information Services Division.

Borland handed out the experimental package Memory Organization Manager (MOM). This is a RAM-resident program for managing RAM-resident programs that deals with how packages are loaded and unloaded and how hot keys work.

It seems likely, attendees said, that some guidelines will be reached and that these will have some kind of effect. At best, guidelines would minimize the compulsive compatibility testing that has been required until now. At worst, they would offer a handy mechanism for finger-pointing among vendors.

For the moment, there's plenty of blame to share among mainstream application vendors as well. The favorite example of ill-behaved software seemed to be Microsoft Word.

But no one expects a magic solution, as Frankston noted.

"There are a lot of subtle issues here," he said. "As you learn more, it becomes more complex. One of the problems in software engineering is the big gap between getting things to run once and getting things to run consistently."

And Frankston pointed out that these kinds of programs represent "an interim technology," until the arrival of future releases of MS-DOS, offering multitasking and upgraded memory management.

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Vendors fear Novell trend

During Comdex/Spring this April, four network vendor representatives quietly informed Seybold Consulting Group Vice-President Tom White of their fears that "an overburdened Novell" was offering less and less support to the network vendors that sell its Netware software, a trend that could have serious implications for Novell, Inc. customers.

"I heard this uniformly from these companies, who prefer to remain nameless because they still have to deal with Novell," White reports. "They think of Novell's products as a big part of their selling strategy. And they are finding that the company's latest software enhancements, as well as the training they need for their salesmen and marketing people, have been slow in coming. They have trouble getting Novell's attention."

The reason for Novell's lack of response, according to White, is that the company is allocating more and more of its resources to selling complete networks directly to customers, instead of selling networking boards and software to go with other vendors' products.

Two recent Novell moves point in this direction. One is the introduction last fall of Network Servers 286A and 286B, two powerful, IBM Personal Computer AT-compatible file servers with built-in fault tolerance. At the same time, Novell announced the Network Server 68B, a new version of its original Motorola, Inc. 68000-based S-Net file server that supports 24 ports and

See VENDORS page 52

Horwitt is Computerworld's senior editor, communications.

Infotron, Applitek intend to finalize merger by June

By Elisabeth Horwitt

CHERRY HILL, N.J. — A merger currently being contemplated by Infotron Systems Corp. and Applitek Corp. would mesh the two companies' local- and wide-area network offerings into one centrally managed communications system, company executives said recently.

"Merging our companies will provide customers with a one-stop source for communications products and services," Applitek President Ashraf Dahod noted. Merging the two product lines will enable users to talk to any resource on the network without needing to know if it is local or remote, he added.

Infotron and Applitek are both confident that the merger will go through, according to Dahod. Their first joint project will be to develop a gateway between local- and wide-area networks, he said. "We both have X.25 gateways, but the new gateway, which should be out in about a year, will be user-transparent."

The merger's second project, which also should take approximately a year according to Dahod, involves integrating the two companies' network management systems. This will enable customers to collect network statistics, do accounting and isolate problems on a systemwide basis, he noted.

One benefit that Applitek expects from the merger is access to Infotron's far larger sales and service organization and Fortune 1,000 customer base, Dahod said.

Founded in 1968, Infotron is a $72.2 million, publicly held company whose wide-area network offerings include statistical and T1 multiplexers, a T1 networking hub and a network management system. "We provide a data private branch exchange, but users want true, cable-based local-area network capabilities, such as

See MERGER page 49

NSA won't use DES after '88

By Mitch Betts

WASHINGTON, D.C. — The U.S. government is backing away from the Data Encryption Standard (DES), a government-sponsored encryption algorithm that has recently gained acceptance in the banking industry for electronic funds transfers and is used in most commercial encryption products, according to computer security experts.

The National Security Agency (NSA) does not intend to recertify the DES when it comes up for review in 1988 and plans to substitute new algorithms, according to a report by Datapro Research Corp. in Delran, N.J.

The industry is concerned that the NSA's action will lower the standard's credibility in the industry, even though

See NSA page 49

GM, other giants join COS, aim to protect users' rights

By Elisabeth Horwitt

ALEXANDRIA, Va. — Nearly three months after announcing its intention to join the Corporation for Open Systems (COS), General Motors Corp. became a member earlier this month, COS disclosed.

The nonprofit organization revealed at the same time that Citicorp, Dow Chemical Corp. and local-area network vendor Bridge Communications Corp. are also new members.

COS is dedicated to furthering the development and industrywide implementation of networking standards. Consisting entirely of vendor companies until recently, COS has initiated a membership drive to recruit user organizations.

See GM page 52

INSIDE

A local-area network server unveiled by Quadram features an uninterruptible power supply and up to 732M bytes of storage / 48

NEW THIS WEEK

- Ryan-McFarland announces its RM/Infoexpress PC network software

For more on this and other new products, see pp. 83-106.

INSTANT ANALYSIS

"Novell continues to offer more and more hardware; that's like Microsoft starting to sell computers."

— Tom White, vice-president, Seybold Consulting Group

Advertisement

SAS Institute Sets New Standards for Mainframe C Compilers

SAS Institute Inc. announces a mainframe version of the Lattice® C compiler, allowing development of C programs on IBM 370 machines and easy interface with non-C programs and software packages.

"C has emerged as the language of choice for developing applications that are portable across operating environments," says Institute Marketing Vice President Ione Cockrell, who views the compiler as a tool for protecting a company's programming investment.

"Virtually every new computer supports C," she explains, "and portable programs created with the mainframe compiler under OS or CMS run on any other machine with a C compiler."

The compiler uses standard IBM linkage conventions, allowing assembler language programs, MAIN routines in other high-level languages, and packages such as IBM's ISPF and GDDM to be invoked directly from C.

"A C function can be called directly from a high-level language, or a MAIN function in a high-level language can be called directly from C," adds Institute Language Systems Manager Oliver Bradley. "Mainframe programmers can now use C in place of assembler for developing small, fast subroutines called from other languages."

The extensive function library includes nearly all functions from Kernighan and Ritchie, the Lattice C compiler for personal computers, and the draft ANSI C standard. Information is provided on individual function portability.

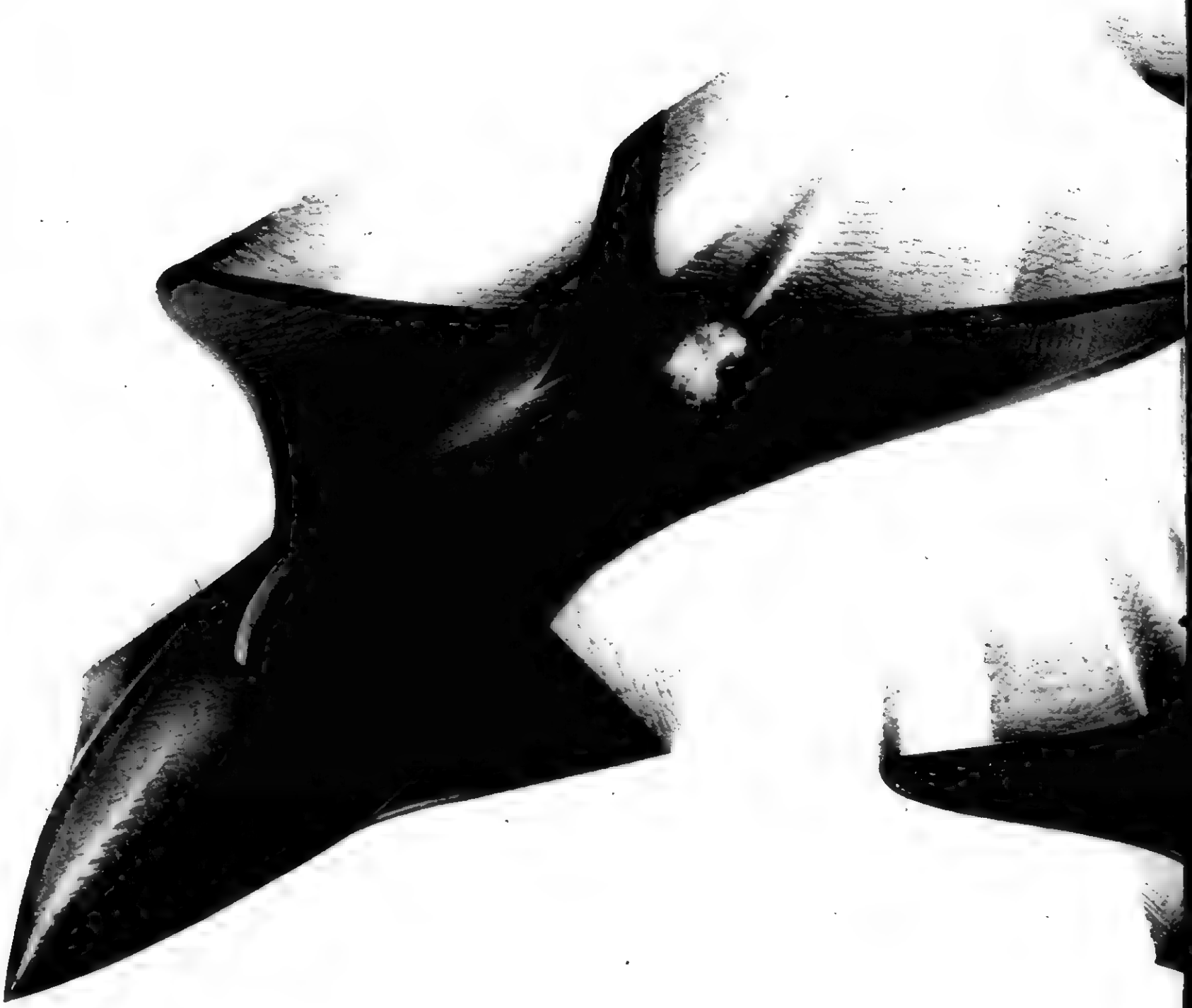
Bradley says the Institute built ease of use into the compiler and library. "We've designed the listing and cross-reference to make a program easy to follow and errors easy to find," he says. "The compiler and runtime library produce explicit numbered error messages, and a traceback of active function calls is displayed when a C program is abnormally terminated by the operating system."

Other mainframe products available from the Institute include a Lattice C cross-compiler, which generates PC object code ready to download to a personal computer; and Phoenix Software Associates' Plink86™ for linking compiled programs and Plib86™ for structuring object file libraries on a mainframe.

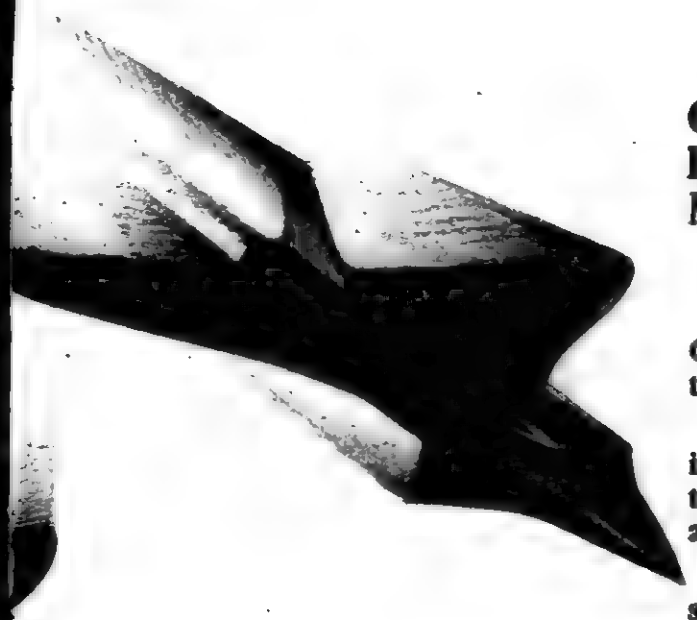
The products are licensed on an annual basis, with technical support and enhancements provided free as part of the license agreement. Additional information is available from the Software Sales Department at SAS Institute Inc., Box 8000, Cary, NC 27511-8000 or by calling (919) 467-8000.

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Quadram division unveils PC AT-compatible network server

Tool offers UPS, 723M-byte disk

By [illegible]

ATLANTA — The Asher-net Server, an IBM Personal Computer AT-compatible local-area network server unveiled by Quadram Corp. at Comdex/Spring '86, features an uninterruptible power supply (UPS) and mass storage of up to 732M bytes on an internal hard disk.

"With this product, we are moving into a higher end system approach," said Randall M. Johnson, marketing manager for Asher Technologies, Inc., a Quadram subsidiary that developed and is marketing the product.

"The reseller base has lately been migrating toward companies that can solve all communications needs, ones that can get PCs to communicate with corporate data bases and distribute the processing and applications. We are working toward that goal."

> ***'As businesses grow increasingly dependent on local-area networks, guarding against potential disasters becomes a serious concern.'***
>
> — William Riner
> Asher Technologies, Inc.

The 800W UPS, which is a standard server feature, enables the system to recover automatically after a surge or flicker of power, according to Asher Technologies Executive Vice-President Bruce Watson.

"The server was designed to protect against occurrences that lead to data loss or operation disturbances plus provide data storage expansion capabilities to meet the most demanding applications," Asher Technologies President William Riner said.

"As businesses grow increasingly dependent on local-area networks, guarding against potential disasters becomes a serious concern," Riner said.

"Everything in the file server is controlled by the UPS, which monitors the current coming into the server," Watson noted. "If the power should drop by as little as 3% to 4%, the UPS automatically kicks in."

The feature enables the file server to store all open files on the Quadram Quadnet internal hard disk and proceed through a system shutdown for up to 20 minutes, powered by two internal batteries. The standard Quadnet server comes with two batteries and space for a third as backup.

Available now, the Asher-net Server includes the Novell, Inc. Netware 2/286 operating system and interface card as standard features.

The server can support up to four different networks that are compatible with the Novell operating system. Among these are the Quadnet VI and IX, 3Com Corp.'s Etherseries and IBM's PC Network.

All configurations feature an internal 360K random-access memory (RAM) floppy disk drive, 2M bytes of RAM, the Novell operating system and network card and the 800W UPS.

The server can accommodate up to four full-height hard disks and/or tape back-up units, allowing up to 732M bytes of mass storage.

Hard disk capacity can be expanded to 2G bytes by adding an expansion cabinet with eight-disk capacity and its own 800W UPS. The cabinet should be available by the third quarter of this year, according to Watson.

A basic configuration, with 109M-byte hard disk, 2M-byte RAM, 800W UPS and the Novell operating system and card, is $15,495; with a 60M-byte tape back-up, it costs $17,495. The same configuration with a 183M-byte hard disk retails for $21,995.



NSA won't use DES

From page 45

experts say DES provides adequate security, according to Fred H. Diamond, editor of Datapro's information security report. The effect will be computer users' confusion, perhaps causing them to refrain from buying DES-based encryption products, he said.

In a letter to Datapro, the NSA explained that because of increasing commercial sector DES use for sensitive applications, it has become an attractive target for codebreakers in other countries.

Joan Reynolds, vice-president for data security at Chemical Bank in New York, maintained that DES is a strong standard for most applications. She expressed concern that the NSA decision will prompt users to delay encryption purchases until the next algorithm appears.

Reynolds and Diamond agreed that the NSA decision comes at a time when reluctant users are beginning to accept the need for encryption to protect sensitive data communications.

Diamond, who asserted that the DES is still very secure, speculated that the NSA is concerned about the security of DES keys used for encryption and decryption because the standard has become so widely and frequently used.

NSA's letter to Datapro confirmed that the DES will not be recertified and said new algorithms will be introduced for NSA's Commercial Communications Security Endorsement Program (CCEP).

Harold Daniels, deputy director of information security for NSA, stated that the use of the DES algorithm "has spread to sensitive applications, which has made it an increasingly attractive target for our adversaries. Therefore, we have determined that it is in the U.S.' interest to introduce new cryptographic algorithms into the CCEP."

Daniels' letter said that the banking industry can continue to use DES for electronic funds transfer applications "where the contents of the message must be validated and the information content is highly volatile and seldom considered sensitive.

"There are no known security problems or risks involved with the continued use of DES equipment, and products endorsed prior to 1988 may be used for the foreseeable future," the letter said. However, it added that the NSA expects most DES equipment to be phased out and replaced by security products employing new NSA-approved algorithms.

Robert P. Campbell, a computer security authority and president of Advanced Information Management, Inc. in Woodbridge, Va., said the NSA decision will disrupt the slowly emerging interest in encryption products and will discredit the banking industry's adoption of DES. He also disagreed with assertions that the DES has been widely adopted.

The DES was adopted by the National Bureau of Standards in 1975 and by the U.S. Department of the Treasury in 1984 for electronic funds transfers.

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Merger set to finalize

From page 45

high-speed file transfer," Infotron Vice-President of Marketing and Development Robert Bower noted. "We like the versatility of Applitek's product line, as well as the fact that it sells network solutions to the high end of the market, as we do," Bower added.

Gateways to mainframe hosts

Applitek's Unilan product line links a broad range of computers and terminals over broadband, base-band and optical fiber-based local-area networks. The company also offers gateways to mainframe hosts and CCITT X.25 networks.

Earlier this month, the two companies signed a nonbinding letter of intent to contemplate an agreement, under which Applitek would become a wholly owned Infotron subsidiary. The two participants hope to finalize the transaction by June.

If the agreement is called off, Infotron will, under certain circumstances, invest up to $6 million in Applitek stock.

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Vendors fear Novell trend

From page 45

2G bytes of disk storage.

Novell has also opened nine Netware direct sales and support centers in the U.S. during the last few months, with three more openings planned for this year. The centers will offer 48-hour turnaround for servicing products, as well as training courses in Novell products.

Novell Vice-President of Marketing Craig Burton denies that the new Netware centers will seriously compete with third-party resellers. "All of our resellers and distributors can use the centers' training and technical facilities," he says. "Besides, they only sell directly to our large corporate customers that buy at least $1 million worth of Novell products."

Burton admits, however, that the new Network Server 286 series will compete with multiuser microcomputer vendors like Molecular Computer, Inc. and OSM Computer Corp., which package Novell's software with their systems.

But other Novell people have admitted the truth of White's accusation. "I asked them, 'Aren't you competing much more directly with your third-party resellers by doing this?,' " White reports. "They said, 'Yeah, you're right; we're not happy about it, but that's the way we're going strategically.' "

Novell's strategy may backfire, considering the firm owes much of its notable success in the volatile, overcrowded, IBM-dominated personal computer networking arena to its third-party vendor strategy.

Novell currently has 30,000 networks running its Netware network operating system installed worldwide, running on the communications boards and computers of more than 30 network and multiuser microcomputer vendors.

And the company keeps adding to the list. Earlier this month, Ungermann-Bass, Inc. announced the availability of Netware on its Net/One Personal Connection. This seems at first glance like plain good news for Net/One users, who now have a choice of three network operating systems: Novell's, IBM's PC Network or Microsoft Corp.'s MS-Net.

The question is whether Novell provides adequate support — not to mention the assurance that succeeding versions of Netware work with all 30-odd product versions — when it has so many other fish to fry.

Of course, not all of Novell's relationships with its OEMs have been all that cordial in the past. Although quite a number of 3Com Corp. network boards get sold with Netware software, the two firms are old rivals whose executives reportedly began taking pot shots at each other not long ago. The feud was recently fueled by 3Com's introduction of the 3+ networking software, which competes with Novell's Netware.

Reseller relationship

According to Proteon, Inc. Chairman Howard Salwen, the new outlets should not greatly change the company's fairly satisfactory reseller relationship with Novell.

"We and Novell are constantly bumping into each other in distribution channels, but we try to stay cordial," he says. "We use the same distributors. Novell carries our hardware; we carry their software. We can't both get the same customers. But we really don't care who sells our boards as long as they are sold."

All very well for the Proteons of the world; but what about the users who are counting on having the latest release of Netware work flawlessly on their Proteon token-ring boards or their 3Com 3Server?

Nathan Roseman, president of network value-added reseller and consultant LAN Services, Inc. of New York, reports that he recently heard Novell President Ray Noorda boast of late that Novell sells some 200 products. "When you consider that their entire company consists of about 400 people, it's no wonder that it takes so long to get anything from them," Roseman said.

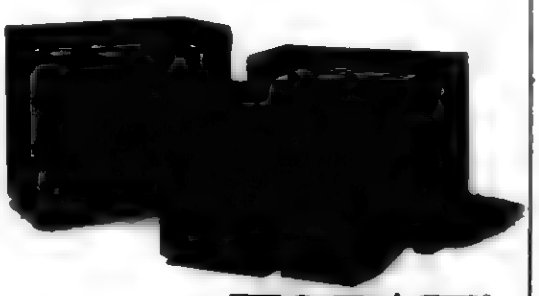
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GM, other giants aim to join COS

From page 45

Lincoln D. Faurer, president and chief executive officer of COS, indicated in a prepared statement that signing up GM was an important step.

"The company has been very active in the standards movement," Faurer noted. GM sponsored the development of the Manufacturing Automation Protocol (MAP) and is currently pushing for industry adoption of MAP as the factory floor networking standard.

"We joined COS to protect users' interests," said Mark Cochroft, GM technical spokesman.

GM already sits on the MAP and the Technical Office Protocol standard steering committee, but the firm wants to participate in "the broader issues being addressed by COS," he added.

'Hope to be elected'

"We hope to be elected to the COS executive committee, but that is not a foregone conclusion," the technical spokesman said.

GM's delay in signing up was bureaucratic in origin, according to Cochcroft.

"Getting approval for the COS membership fee of several thousand dollars involved obtaining a lot of signatures," he noted.

Executive Report

Edited by Glenn Rifkin



CW PHOTO BY O CONNELL/LADOUCEUR

INSIDE

A primer by Walter Ulrich on electronic mail implementation/54

Complement or implement: An interview with Peter Waal of GTE Telenet/59

Will voice mail overshadow electronic mail?/60

Electronic and voice mail

They're no match for each other — yet

By JOHANNA AMBROSIO

Pity the major pharmaceuticals firm that implemented voice mail and fancied itself at the leading edge of technology: Because different systems are installed in different divisions, no one can talk to anyone else.

This situation emphasizes a basic problem in the voice mail industry — the lack of standards. Further, technological and sociological factors, as well as corporate America's organization of the data processing department, have combined to make the implementation of voice mail fraught with frustration.

That's not to imply, however, that voice mail doesn't work. It does, and there are many satisfied users. But voice mail is just beginning the acceptance curve that other technologies — electronic mail, for example — have braved before it. To implement voice mail now is to be a true pioneer. Beware of the arrows.

And because the voice mail side of the equation has yet to be firmly established, few user companies have taken steps to combine voice mail with electronic mail. For now, at least, most users are quite content to keep the two worlds separate until the problems with voice mail are straightened out.

Few doubt that voice and electronic mail will someday marry and that video and other forms of information will join the fray as well. But, in the words of one observer, "We'll all be significantly older by the time that occurs."

"Voice mail technology has not been accepted," says Ed Thomas, marketing manager for software applications in Data General Corp.'s product marketing division. "It's a new technology for users to justify, and they're not really sure of its applications."

Voice mail will take two to three years to catch on with enough users to enact "critical mass," observers agree. In other words, it will take that long for enough people to use voice mail to make the technology worthwhile for everyone else to get into the action.

For its part, electronic mail is not perceived as the cause of the lack of integration. Electronic mail has largely become as well accepted a part of office systems as has word processing.

"Electronic mail is one of the key elements of

Voice mail is beginning the acceptance curve other technologies, such as electronic mail, braved before it. To implement voice mail now is to be a true pioneer. Beware of the arrows.

Ambrosio is a Queens, N.Y.-based free-lance writer specializing in technology and business issues.

Electronic and voice mail — no match yet

Continued from previous page

an integrated office," says John J. Connell, executive director of the Office Technology Research Group in Pasadena, Calif.

"Many companies say it's the single most productive application. Electronic mail is becoming a business tool rather than just a communications tool," he adds.

Connell's latter point is emphasized by the way in which vendors are selling electronic mail. Instead of focusing on the timesaving and productivity bonuses, vendors sell electronic mail as a way to improve customer service and so affect the bottom line.

Users' reluctance to combine electronic mail and voice mail is not necessarily due to a lack of products that meet the need. Data General and Digital Equipment Corp. have voice mail products that are integrated with their office systems software, Comprehensive Electronic Office (CEO) and All-In-1, respectively.

In both systems, voice mail is an option on the office software's main menu. Users are notified on their computer terminals if they have voice or data messages. And users can phone in from remote locations to retrieve their messages.

Besides these systems from established office systems vendors, IBM recently introduced a voice mail option for its Personal Computer. The company also announced the Phonemail/VM link, the integration of its Professional Office System electronic mail system and Rolm Corp.'s voice messaging system [CW, May 5]. A version for the AT&T Unix Personal Computer is slated for a June introduction.

But at best these systems are only the first generation of voice mail systems yet to come. An ideal voice mail system would be fully integrated into the electronic mail system and would complement the written word by allowing voice annotation of documents. In this way, for example, someone could leave a voice message that a document needs approval.

> ❞
>
> ***'Electronic mail is becoming a business tool rather than just a communications tool.'***
>
> — John J. Connell
> Office Technology Research Group

Another useful feature is the ability to access voice messages from the computer terminal or workstation as well as from the phone. Users would have the option of printing out messages or answering them right away in written form if that were more appropriate than a spoken reply.

Further, the voice mail system should be part and parcel of the computer already being used, appearing as an option on the main software menu. And, of course, ease of use is paramount for the many levels of employees that would operate voice mail.

None of today's available voice mail systems meet all those basic requirements. But as more vendors introduce products and as more people begin to use them, capabilities will be refined and added.

"You need to get through to the second or third generation of voice mail before the features are there that will make people want to use it," Connell says.

Connell likens the voice mail situation to the first generation of personal computers. "With PCs, you had the technicians who used the first, awful machines. They complained, vendors listened, and the subsequent generation of software and hardware is finally making things easier to do."

At present, only a handful of users are willing to even experiment with an integrated voice mail

Continued on next page

Expert's Opinion

The key to E-mail success: Complete functional integrati

By [illegible]

Users should be studied and [illegible] any specific problems [illegible] Decision criteria should be [illegible] of the system's users, [illegible] products can be compared and [illegible] to the criteria. Finally, the [illegible] be identified and selected.

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Leading companies in every industry are gaining advantage by mastering electronic mail.

Electronic mail is the nonsimultaneous communication of messages by electronic means. It includes computer-based message systems (CBMS), voice mail, electronic document distribution and facsimile. The focus here is on store-and-forward electronic mail systems like CBMS and voice mail. The message, whether text or voice, is stored in digital format on a computer system for subsequent forwarding to one or more recipients.

The six stages of growth in electronic mail implementation are awareness, pilot testing, single-system usage, multisystem usage, integration and integrated use.

No company has yet achieved true functional integration. Only a few have seriously considered its requirements and its implications. Companies at every stage of implementation should make technology decisions that build toward full integration.

Advances in electronic mail in the last 12 months have been dramatic. Leading companies in every industry are gaining advantage by mastering electronic mail. A study by the U.S. Office of Technology Assessment earlier in the decade projected about 60 billion electronic messages would be originated in the U.S. in the year 2000. That number is achievable.

Articles, case studies and information about electronic mail abound. Studies among end users demonstrate that they are aware of electronic mail and are ready to try it themselves. Companies in this first stage are those that have become aware of electronic mail and want to evaluate how it might help them be more successful.

Two goals must be achieved during the awareness phase:

- Familiarization with electronic mail.
- Understanding user requirements.

Electronic mail and office automation systems must fit the culture and style of an organization. Companies have unique personalities, and technologies that touch people — like electronic mail — must be carefully chosen.

The promise of electronic mail is great, so it is not surprising that people often put the cart before the horse. The tendency is to begin reviewing vendors' products without first understanding what the real needs are. It is not uncommon to find companies relying on a single vendor for information about electronic mail. Requirements should be studied and [illegible] any specific problems [illegible] Decision criteria should be [illegible] of the system's users, [illegible] products can be compared and [illegible] to the criteria. Finally, the [illegible] be identified and selected.

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Pilot tests should be [illegible] other homework has been [illegible] tion of the test user population [illegible] tances. The population must [illegible] the end users as a whole. Yet, the [illegible] must make up a community that [illegible] munication with one another [illegible]

A large enough [illegible] ed to ensure that a sufficient number of messages will be exchanged to make it worthwhile for the users. Good training and support will be essential to get them off to a good start.

After proper selection and testing, electronic mailbox be allowed to the [illegible] Companies should start with communities of interest that experience special information bottlenecks. Users with the lowest urgency should be phased in last when the mail system's reach is the greatest. Training and documentation must keep pace with system proliferation.

Many companies are in this phase of [illegible] system proliferation now. Major companies in the banking and consumer goods industries have populations of 10,000 or more mailbox[illegible]

Satisfaction with one kind of electronic mail — for example, text mail — opens the door for other kinds. Voice mail doesn't compete with text electronic mail, but complements it. People communicate in many forms, and as more and more companies realize that electronic mail should be available in several forms, the demand for the second kind of electronic mail is intensified.

Electronic mail is not destined to exist in a vacuum. It can and should be an integral part of the corporate communications infrastructure. Thorough integration for personal communications is required.

The communications architecture must allow for the seamless merging of message types. When checking the status of electronic messages on a workstation, both text and voice messages should be listed. When dialing in from out of the office, it should be possible to have a text message converted to speech output and read over the phone. Voice messages should be able to be appended transparently to text messages.

Integration means more than this. [illegible] integration with [illegible] as well. A user's workstation should be a window into all forms of communication, including telephone, voice mail and text mail.

Ulrich is president of Walter R. Ulrich Consultants, a Houston-based management and technology consulting firm.

Continued from previous page

and electronic mail system. One of these users is Beneficial Data Processing Corp., a wholly owned subsidiary of Beneficial Finance Co. that provides services solely to the parent company.

Beneficial is pilot-testing DG's voice mail system in the office information systems department, according to Luciano Corea, vice-president of office information systems.

Eight staff members are participating in the pilot, which should be completed at the end of October. "We're going to go slow to make sure we have a problem that needs to be solved with voice mail — that we're not throwing out a solution in search of a problem," Corea says.

The pilot project will analyze user friendliness and the amount of disk storage required, identify applications for the system, weigh cost requirements and see if the need justifies the cost.

Beneficial has also beta-tested DG's integrated voice/data terminal, which also uses the CEO software. Corea says he likes it because it saves desk space, and he found the automatic callback feature especially useful.

Corea says he has about 35 DG Dasher D555 integrated voice/data terminals on order for executives and professionals. Because the terminal has a smaller screen and fewer keys than other terminals, it would not be used by a person with high text-entry requirements.

"I don't see voice being made available to everyone because of the disk space required to store voice messages," Corea says. "It won't replace electronic mail; it will be complementary. I see voice mail's major benefit as sending and receiving messages while traveling."

For all their convenience, however, there is a downside to voice mail and electronic mail. "It requires a bit of cultural change," Corea says. By compressing response times, it "puts additional stress on employees. I know you know I saw your message, and it's incumbent upon me to respond in a more timely way than with past methods. I don't have two or three days."

The sociological factors are considerable indeed, and they are largely responsible for why voice mail has not been better accepted. Says Joseph Ramellini, principal at Integrated Strategies, Inc., a New York consulting firm, "You have to consider the human psychology of the situation. To use voice mail, you have to know how to dictate a letter or a memo. Most people are not comfortable in that situation."

Further, he says, new rules and social mores will arise to help out users in tight spots. "Like with electronic mail, you're never quite sure where the voice message will ultimately wind up. So you have to think of consequences beyond the immediate situation."

People are used to conversations being private, ad hoc communications that are not retained for future reference. With voice mail, new rules will arise as to what messages to keep and for how long.

Society is, however, changing the way it thinks about voice messaging. Answering machines have become commonplace, and some analysts believe the regional holding companies will offer voice messaging services to complement private answering machines. When these holding companies enter the fray, it will help speed acceptance for voice messaging in general.

> ***People are used to conversations being private, ad hoc communications that are not retained for future reference. With voice mail, new rules will arise as to what messages to keep and for how long.***

Ramellini says, "When office automation works well, it doesn't substitute functions but actually changes the way a company operates. That doesn't happen overnight. No matter how wonderful the technology, human beings need time to adjust."

Another problem is the lack of standards in the voice mail industry. "Because voice mail is a nascent technology, there's no real pressure on the vendors," Ramellini says.

"Everyone is still arguing over what voice mail should look like and what it should do," according to Larry Pinocchi, president of Message Processing Systems, Inc. in Charlotte, N.C. "So at this point, integration gives you half-baked voice mail and half-baked electronic mail."

Since voice mail is such a resource hog on the computer one cannot run voice mail and electronic mail — or other PC applications, for that matter — simultaneously. "It's an either/or situation; you can't do both at once," Pinocchi says. "So it wouldn't be right to marry them at the moment." He does agree, however, that they someday will be blended.

Another factor repressing voice mail's growth is corporate structure. Data processing and communications are two separate worlds, although

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Interview

Mail integration must win top-level support

Peter Weal is vice-president for strategic marketing for GTE Telenet Communications Corp., one of the leading public data network providers. Among its many offerings, GTE Telenet provides extensive electronic mail services to its customers and recently added a voice mail option called Telemessager. Computerworld Senior Editor Glenn Rifkin spoke with Weal about the viability of integrating these two diverse functions.

Where is the demand for the integration of voice mail and electronic mail coming from?

The demand is primarily from the early adopters. If you picture the standard distribution curve of a product life cycle, the very early stages of a product will tend to attract all the knob-twiddlers and early adopters. This integration tends to be more of a solution looking for a problem than it is a solution to a stated problem. The whole concept of voice/data integration — whether it be in the voice mail or electronic mail area — or just general real-time voice/data integration is still very much in the cult stage.

What will change that?

One thing that is required is the continued evolution of the technoliteracy of the ruling class. Until recently, there has been a tremendous reluctance on the part of management people to fiddle around with things that have keyboards. About as far as they go is a Touch-Tone telephone or pocket calculator. If they have to sit next to a QWERTY keyboard, it blows their minds. The technology available today for integrating voice and nonvoice environments is still fairly immature.

For example, GTE Telenet has been offering a voice mail service called Telemessager. We've had a number of linkage-type experiments with the Telemessager and Telemail offerings, and we came away with the realization that these are complementary as opposed to integratable products. They are complementary in the sense that there are some applications for which voice mail will suit very well — very brief messages for people hustling between airports — and those which require near ubiquity of terminal access. The cross-pollination of the two produces a whole new set of problems.

Has voice technology come far enough to truly complement electronic mail (E-mail)?

There are technology bases around, such as Digital Equipment Corp.'s Dectalk and Speechpius, Inc.'s Speechplus on the West Coast, which are both very capable products. This is an ASCII stream to a voice synthesis conversion. If you have a bit-encoded message and you want it uttered in the form of synthesized speech through one of these products, the software challenge — the ability to simulate the human larynx — is getting along reasonably well, and technology is going to do that. But the software behind it, which simulates the mental processes that drive the voice — for example, the determination of whether a string of characters is an acronym or a pronounceable word — is a real challenge.

Another problem is the very high propensity for misspelling. Once you overcome the cultural impediment to using electronic mail, you still have the problem of misspelling. Trying to teach a voice synthesizer how to pronounce a misspelled word is really an exciting process.

I emphasize that it is software and software ancillary content rather than the actual electronics where the technology impediment is.

How far off, then, is more widespread use of these technologies?

I think we'll see some integrated voice and electronic messaging services in niche markets in the next year to 18 months — for example, getting snap quotes on commodity prices, oil prices, things like that, where one needs to disseminate information in real-time. This is a poor example, I suspect, but it is one we've had some experience with. When an oil distributor dispenses a petroleum product into a customer's tank at the commercial level, he wants to get the price at the instant he is dispensing it, which could change from the time he picks it up at the terminal in the morning to the time he's delivering it at noon. He's obviously not running around with a computer terminal in his pocket, although there is probably some likelihood that he might at some time. He can call in on a pay phone and get the quote right now, because it has been posted by someone who keeps it up to date.

I emphasize niche because I don't see a broad gauged set of opportunities for integrated voice mail and electronic mail. That is primarily because of the niche nature of jargon and acronyms.

I'm encountering more and more voice messaging systems, but people still feel constrained by them. They might, for example, get a message while they are on the phone, but after they hang up they aren't alerted that a message is there.

That's a common shortcoming of almost any electronic or voice mail system today, primarily because of the inability to force delivery. That doesn't mean it is impossible.

These are challenges that are being grappled with by the electronic mail industry as a whole. Voice mail, to the extent that the delivery process has some analogous properties to those of E-mail, is an area in which you need a mind-reading module in order to figure out that somebody is trying to call you.



GTE Telenet's Weal

I think we'll see some integrated voice and electronic messaging services in niche markets in the next year to 18 months.

If you had to characterize these two technologies, is it accurate to say that electronic mail is a young child and voice mail is an infant?

I'd agree with those characterizations. The gravitational equations come to mind. If you linearly increase the subscriber population of an E-mail system, you in effect square the likelihood of intercommunicability of any two randomly chosen subscribers. That's what caused the success of the telephone. That's where the mass comes from that makes it a commercially viable opportunity.

The characterization of E-mail as a child and voice mail as an infant is an accurate placement of those two on the evolutionary scale of messaging in general.

Are costs a major factor here?

In voice networking, there is still a materially visible cost to moving the kinds of bandwidth that characterize voice messages over long distances. In the data world, that has been mitigated considerably by the technologies like packet switching and other forms of data compression that take the sting of the long-distance dimension out of the cost. So the cost tends to be dominated by network management costs and local-access and terminal-type costs.

So the cost ingredient of an electronic text-based mail system is based on port occupancy of the host computer. That's going to be the dominant cost, and that's true of the voice mail systems as well.

How important are standards to the success of all this?

We believe they are critical. GTE Telenet and 40 other companies have joined the Corporation for Open Systems. The top two items on the agenda for the COS this year are X.400, which will allow the interworking of text-based E-mail systems, and FTAM, the file transfer service. We're very aggressively supporting the X.400 standard on the belief that this is where the growth is going to come from. You can't keep having this Tower of Babel vulcanization of proprietary architectures incapable of interoperating with each other.

The combination of an adopted and implementable standard like X.400, coupled with a directory capability — which is another item on the plate of the COS strategy forum — will make the capabilities within E-mail analogous to those that the telephone network has achieved with its near ubiquity.

Linear subscriber population growth will produce geometric growth, and of course we are looking for the high-volume growth. This will be a major benefit to subscribers as well, because with that growth will come some leveling of what a few people consider the outrageous pricing approaches.

What are the realistic projections for this?

It'll be the end of this decade before we really see any significant benefit materializing out the X.400 deployment. The COS is still in its initial euphoria of the mating dance, and the realities of competition will continue to be there. But I'm very much encouraged by the fact that it is possible to get 40 arch-competitors together in one place at one time and have them talking in civilized tones to each other.

How reasonable is it to expect workers to accept E-mail and voice mail together as a part of the desk?

A business management generation is about five years long. We're seeing the computer literacy and general willingness to use some of the new technology-based tooling percolating up through organizations. It's pretty much in a mode where you see a shedding of the skin at each progressively higher level of management every five years.

By the end of this decade, we'll see enough of key management people who have been through that indoctrination period to have made a significant dent in what up to now has been an ironclad reluctance of senior management to touch anything that looked like a keyboard.

Generally speaking, the distribution of management styles will have been pretty much overtaken by the upwardly mobile, technology-oriented generation by the end of this decade. That will bring these technologies into the important senior management levels. ■

No clear winner in war of mails

By MOLLY UPTON

Will the advent of voice mail supersede the need for electronic mail (E-mail)? No more so than speech supersedes written and graphic communications.

But the question becomes interesting when one considers that several vendors are working to provide the ability to originate and receive both voice and electronic mail capabilities from the same devices. IBM and Rolm Corp., for example, recently announced a link between Rolm's Phonemail and the IBM VM host (CW, May 5). A VM user can now get notification of an existing phone message on an IBM Professional Office System terminal along with regular E-mail. Even then, however, there will be a major difference between the two methods of communications.

E-mail, while used for messaging, is also becoming acknowledged as the primary transmission method for management reports, data and documents and nearly anything else digital that needs to get from one person's workstation to another's.

E-mail clearly has the edge when it comes to preserving the message either electronically or on paper and thus is useful for documentation. Some systems allow documents to be further edited, eliminating rekeying.

Companies are clamoring for the tools to allow managers to cut and paste reports and spreadsheet analysis into E-mail for sending to others internally. Some organizations are writing their own interfaces. Clearly there is opportunity here for some vendors to improve the utility of their E-mail by offering the ability to cut and paste documents and data from other sources into their proprietary E-mail products.

Thus, in addressing the capability to transmit data, documents and graphics as well as the need to document for perpetuity, voice mail is not enough and E-mail has the edge.

For the user considering other applications, the following criteria must be considered when deciding which medium to use:

- Length of message.
- Access to sending or receiving instrument.
- Ease of use of systems used by other enterprises.
- Individual proclivity toward verbal or written communications.

Obviously, voice mail is more appropriate for relatively short messages, while E-mail can handle both short and long messages. Once printed out, E-mail messages can be collected and read later. It is hard to envision the day when employees traipse off to the washroom with a tape of voice mail.

There are telephones at more handy locations than there are terminals, unless one takes one's own portable personal computer. Thus, the text-to-speech synthesis feature (as in Digital Equipment Corp.'s Dectalk) allowing receipt of E-mail messages via telephone should become more commonplace. If message senders would leave an executive summary of their E-mail messages, then when the receiver reached a long message, he could listen to the summary and print it out or listen to the entire message when convenient.

Use could be limited because many systems require Touch-Tone telephones to reach the desired extension's phone mail. The more sophisticated on-site systems will route the caller into the appropriate mailbox without requiring the extension to be entered via a Touch-Tone phone.

Ease of use is and will be a factor. Everyone is capable of using a plain old Touch-Tone, and generally there are voice instructions to assist an incoming user to another system. Thus, for the caller, there is little trauma associated with leaving voice messages.

E-mail also is climbing aboard the easy-to-use bandwagon. Interconnectivity among E-mail systems is becoming a major trend. E-mail services are forming links between themselves, which, it is hoped, will be transparent, enabling a user to learn only one method of access. Vendors such as Soft-Switch, Inc. are providing interfaces between on-site E-mail and services like MCI Communications Corp.'s MCI Mail.

The choice of medium in message handling is generally an individual decision; some people like the keyboard, and some like to talk. There are some people who flock to the use of verbal store-and-forward messages and detest the keyboard — and vice versa.

In environments where E-mail is used heavily, communications seems to evolve. One company noted that executives key their own messages, so the E-mail tends to be succinct and to the point. In at least one site, users observed that sometimes messages were misinterpreted because of the lack of inflection used in verbal communication or the absence of long explanatory preambles. Eventually there evolved a common understanding of E-mail etiquette.

In the current environment of communications, the asynchronous delivery inherent in both voice and E-mail obviates the obstacles imposed by time zones and helps eliminate steps in the tag game. They are both valuable productivity tools. ■

Upton is vice-president, applied technology services, at International Data Corp., Framingham, Mass.



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Continued from page 55

DP and MIS are certainly gaining more control over communications, much as they did over personal computers. But the organizational schism means that no one wants to take on voice mail without a clear reason, or mandate, to do so.

"It doesn't seem as though there are people within corporations out there selling voice mail," Connell says. "Because it doesn't relate to the PC world or to the DP world, it's a stand-alone function. It doesn't lead to anything — and so doesn't have advocates."

Pilot programs for voice mail have run into numerous problems. According to Judy Abreu, director of advanced office systems for CBS in New York, "When we piloted a voice mail system, it didn't work. And we realized the reason was because we were piloting it in our department. Voice mail doesn't work well for people who work together closely; they figure they'll see you later anyway. The people who it works for use voice mail out of necessity."

> ***'When we piloted a voice mail system, it didn't work, because we were piloting it in our department. Voice mail doesn't work well for people who work together closely; they figure they'll see you later anyway. The people who it works for use voice mail out of necessity.'***
>
> — Judy Abreu
> CBS advanced office systems

Given all voice mail's uncertainties, some users opt to lease or rent systems so they can keep up with changing technologies and needs. Other users, such as CBS, use a voice mail service bureau. By the end of the year, CBS will spend about $150,000 on outside voice mail services. Some 1,500 people use the voice mail system.

CBS started using voice mail two years ago in its records division when, in a cost-cutting measure, some field sales offices were closed. "But we still had to keep in touch with the salesmen, so we installed voice mail. It allows us to broadcast one message, or individual ones, to salespeople. And sales managers in the home office could ascertain the status of the accounts," Abreu says.

"We've thought about buying our own equipment, but then you have to consider depreciation, maintenance, one to two staffers to administer it and the floor space, which in New York is expensive," she adds.

In addition, given the requirements of the CBS users, the in-house system would have to be operational round-the-clock. So CBS will delay buying an in-house system for another few years.

A second CBS application is at the broadcast group, where top broadcast executives keep in daily contact. Reports on daily events, daily ratings for the television shows and other information is shared.

"At CBS, a lot of top executives use the system, and they get upset if anything goes wrong," Abreu says.

Despite its reputation, voice mail is not really that expensive when considered on a per-user basis. Assuming there's money in the budget and a reason for implementing it, voice mail is not too difficult to cost-justify. An average system costs about $500 per user to install and maintain. The price includes training and communications costs.

But it can easily save twice that amount. If one considers the reduced number of callbacks, the reduced number of typed memos, night-rate savings, reduced cost of chitchat and the like, the savings for a 25-person

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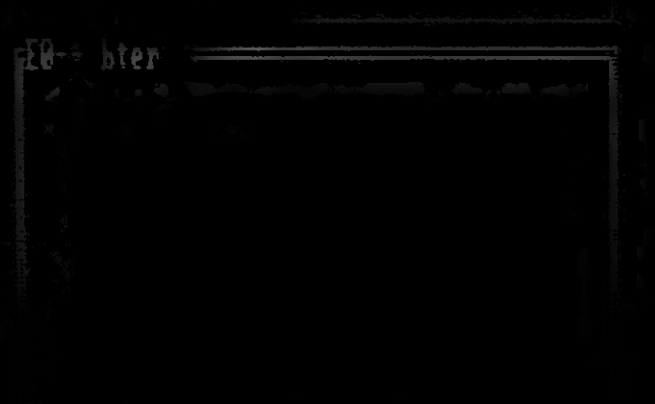
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Continued from page 61

staff can be almost $50,000 per year.

Still, old prejudices die hard, even among technically savvy professionals. According to Fritz Ringling, vice-president of Gartner Group, Inc. and telecommunications analyst, "I was reluctant to use voice messaging at first, because I thought it was impersonal." The Gartner Group has been using a Rolm voice messaging system for more than a year now and Ringling concedes, "I've come to appreciate it as a timesaving tool. I can retrieve or send messages from anywhere, and it's useful for communicating with people in different time zones."

But, he adds, "I still think it's impersonal. And I don't think it cuts down on telephone tag; it's just a different form. A colleague leaves a message on my machine, I leave one on his. The difference is that if he leaves a proper message at least I know what he wants and can call him back prepared." Finally, Ringling says, "There's a stigma associated. If you have a secretary, you're a more important person."

Still, the benefits of voice messaging are legion. And some voice mail users are way ahead of the pack.

Trans World Airlines, for example, has a Voicemail International, Inc. system called Aviar that takes voice messaging a step further. The system takes data from TWA's mainframe and broadcasts it, in natural voice, to callers.

The voice mail system currently provides three applications relating to work scheduling for flight crews, but many more are being considered, according to Al Whitmore. Former TWA staff vice-president of operations control out of Jamaica, N.Y., Whitmore is now a Wilton, Conn.-based consultant in airline operations and computer development.

All three TWA applications are accessible from any tone-generating telephone by a toll-free number. TWA chose the Voicemail International system, Whitmore says, because it is the only one that combines voice messaging functions, data base access and a natural voice.

Natural voice is important, Whitmore says. "A synthesized voice sounds fake; a natural voice is easier to listen to and is just more professional."

> ***Despite its reputation, voice mail is not really that expensive when considered on a per-user basis. It is not too difficult to cost-justify.***

The airline's first voice application, installed in October 1984, informs approximately 8,000 crew members what flights they're scheduled to fly in the coming month.

The schedule of flights is published and distributed to flight attendants and pilots, who then determine which flights they wish to be on. Staff members go through a bidding process for their preferred flights. The flights are actually assigned based on seniority and other factors.

To get the results of their bids, TWA employees phone the voice mail system and enter their identification and security numbers. The system prompts crew members with voice commands as to what to do. The process generally takes 20 to 40 seconds to complete.

The system saves both time and money over the old method, in which the crew members called a central office location and asked an office worker to look up the information. Before the voice mail system, the average phone call ran 1½ to two minutes.

"People don't waste time when they're talking to a machine; they don't ask about your wife and the latest company gossip," Whitmore says. Further, valuable phone time isn't wasted while waiting for someone to pull a file or because phone lines are tied up and the crew member is put on hold, listening to music.

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cutting down on the work load assumed by the office staff.

Because the voice mail system handles the crew members' requests, office workers can concentrate on other tasks.

About six months ago, TWA installed the second voice mail application — the bidding process itself. At present, flight attendants are the only ones using the system for this purpose; pilots will be added shortly.

With this application, flight attendants call into the system to enter their flight preferences. Between 20 and 30 prompts help employees enter the information, and after every three or four prompts, the system reads back their answers to ensure no mistakes have been made.

It is, Whitmore says, a real-time transaction. Data is captured and sent to TWA's host computer. The bidding process takes between three and five minutes; employees are charged $4 each time they call in a bid. This chargeback system helps defray costs, and employees, who require just one call per month to determine their entire work schedule, have embraced the system wholeheartedly.

The third use of the system is for so-called reserve employees to determine their status.

A reservist is someone who has not been assigned a flight but will fill in for sick or vacationing employees. Reservists are contractually bound to call into TWA twice a day to check on their status.

Once the reserve employee has called into the system and has provided the appropriate identification and password numbers, the system queries the host computer and lets the caller know where to report for duty.

TWA probably has another 20 applications for voice mail yet to be implemented, according to John Zigler, the airline's director of flight operations data systems.

The next probable area TWA will target is for the system to call out to tell people something has changed. Currently, users must call in to get information.

"We've got a long way to go. We haven't even come close to exploiting all of voice mail's applications," Zigler says.

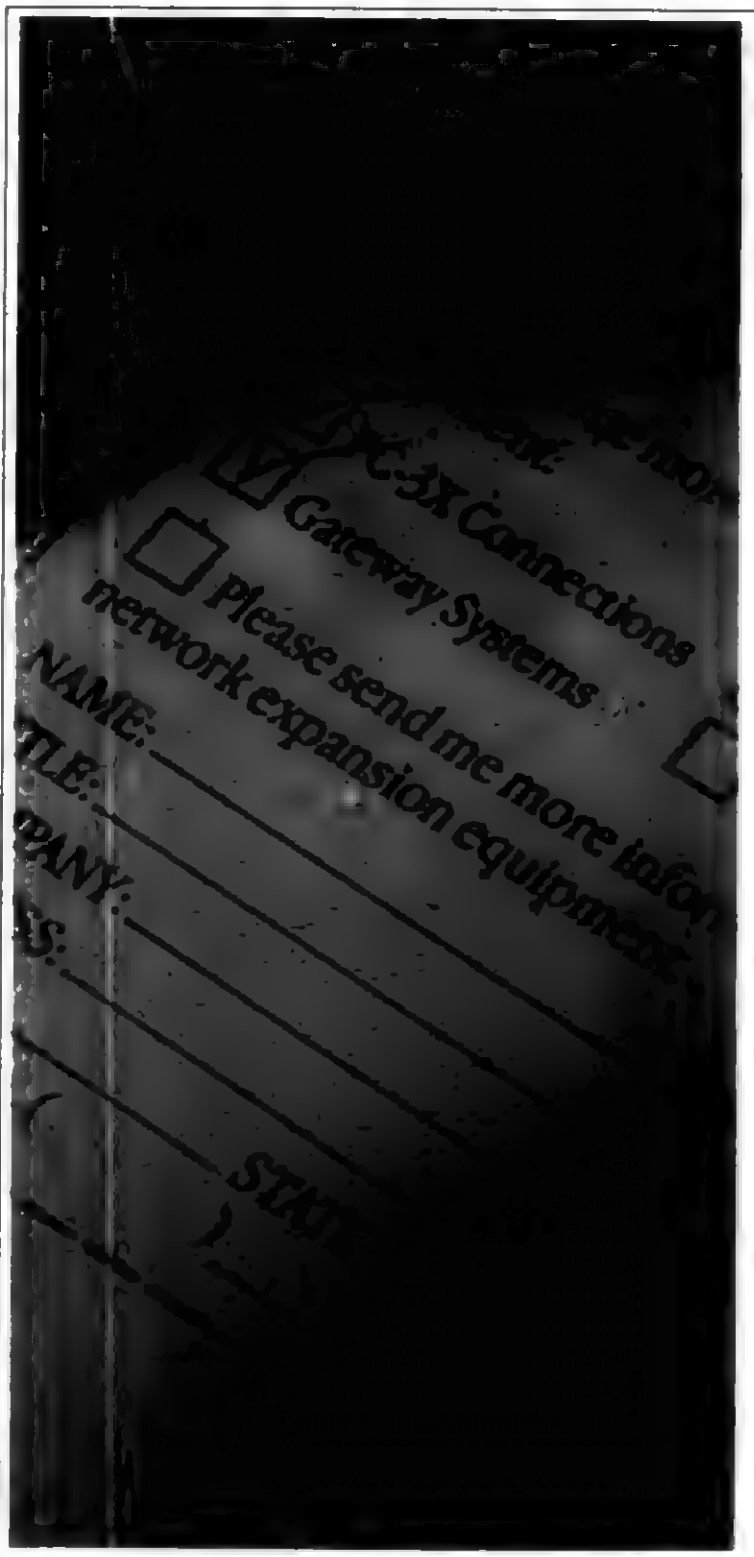
Other carriers have begun implementing voice messaging systems, Whitmore says. Pacific Southwest Airlines, Western Airlines, Continental Airlines and People Express Airlines are using voice mail for applications such as reservations and management communications.

Another possibility in the airline business is to use voice mail to cut down on the number of abandoned calls — when a potential customer hangs up rather than face more of a delay. Often, Whitmore says, these delays are the result of reservation agents giving out information to people calling to ensure that their flights are on time or to find out when the flight of a friend is arriving.

Voice mail could also be used to give the information seekers direct access to an airline's data base, so reservation agents could concentrate on the potential customers who call with rate requests.

Continued on page 66

> ***'People don't waste time when they're talking to a machine; they don't ask about your wife and the latest company gossip.'***
>
> — Al Whitmore
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> ***'I was reluctant to use voice messaging at first, because I thought it was impersonal. But I've come to appreciate it as a timesaving tool.'***
>
> — Fritz Ringling
> Gartner Group, Inc.

Other examples abound. Ramellini tells of a pharmaceuticals firm that put in a voice mail system for its field marketing organization. The marketing representatives were spending the entire week on the road and, much to the consternation of their families, the entire weekend on the phone trying to catch up with the internal corporate people.

"This situation created tension with their families. So voice mail was installed. It cut down on phone time and provided better morale," Ramellini explains.

In addition, he says, it was used as a marketing tool. The marketing director would broadcast a voice memo to all sales reps, asking how the introduction of a new product was going.

Within a few days, after the answers came in, the marketing director was able to ascertain which approaches worked best and, if appropriate, how to reposition the product vis-a-vis the competition.

"It was instant market research," Ramellini says.

Typical of today's users is the CSR-Powertron division of Contraves Goerz Corp. in Pittsburgh. This division, which manufactures controls and motors for machines, uses voice mail — Electronic Voice Exchange from Message Processing Systems, Inc. — as a way for salesmen to communicate with inside staff.

In Contraves' case, the messages can be heavily technical because of the nature of the business, according to Neil Przepasniak, sales manager.

"A lot of salespeople complained they couldn't contact the engineers, which is necessary because we sell highly technical products. A salesman will need to ask an engineer if a modification can be done, and now he can have an answer for the customer in hours and not days," Przepasniak says. About 100 people are using the system.

Another typical user — at least at this stage of the technology — is Joseph T. Ryerson & Son, Inc. Based in Chicago, the steel service center purchases unprocessed steel and performs the first metal fabrication. Ryerson customers buy the steel, now in bars and sheets, and further process it.

Ryerson has installed voice mail in corporate headquarters and in about one-half of its 25 plants nationwide as a way of increasing communications between its inside and outside sales staffs. Voice mail will be installed in the other plants by November, according to Martha Graffy, a Ryerson business systems consultant.

Ryerson first started installing the system last July. The two most important selection criteria were cost and ease of use; the firm chose the Cyndi system from Genesis Electronics Corp. of Folsom, Calif. About 100 calls each month are processed through Cyndi. From 60 to 80 people at each plant use the system. Primarily the users are salesmen and the inside sales staff, but the system is open to all who wish to use it.

Graffy personally goes to each plant to conduct training and limits the classes to between 10 and 12 people. She says the salesmen find the system easy to use, and, she adds, "Everyone likes it."

Indeed, most companies are using voice mail as a productivity and not a bottom-line tool. That may, however, change as voice mail becomes more accepted and more integrated into a corporation's office system.

Finally, there is also some credence to the theory that integration doesn't much matter; users' immediate needs can be fulfilled by choosing one or the other. Some organizations, such as sales staffs, are naturally voice dependent; others, a documentation group, for example, rely more on the written word.

"The value is not in the integration, the value is in the best electronic mail or voice mail system," says Richard A. Loveland, DEC manager of product planning in the office and information systems group.

His advice is to pick a primary system, voice or electronic mail, depending on your application. Then, whenever it is applicable, integrate the other technology.

"Users won't sacrifice their primary application just to be integrated," Loveland says. ■



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FTS 2000

Will GSA's massive procurement sway private telecom strategies?

The U.S. General Services Administration will begin acquisition of a $4 billion telecommunications system in late 1987. The potential effects of this procurement on market and network standards has vendors and business users buzzing.

By EDITH HOLMES

Bernard Bennington is fond of saying that if AT&T had not put an end to Telpak — its bulk private-line tariff — five years ago, the communications industry would have had to invent some comparably catastrophic event.

The demise of Telpak caused the tab for the U.S. General Services Administration's (GSA) common-user Federal Telecommunications System (FTS) alone to rise nearly $100 million a year, notes Bennington, GSA deputy commissioner for telecommunications services. "Suddenly, communications caught management's attention," he says. "Telpak's death has been a great stimulus for change."

GSA now seeks to be the stimulus for change with its plans to replace the aging FTS. The federal government's chief civilian procurement agency has launched the acquisition of a state-of-the-art, long-distance telecommunications network. Dubbed FTS 2000, this procurement of 10 years' worth of voice, data and video services and a service oversight center from a single system manager will be the largest ever.

GSA touts FTS 2000 as the means by which the government can use its considerable buying leverage to hasten the arrival of true, integrated telecommunications services. The agency also suggests that the FTS 2000 acquisition may serve as a prototype for major private users seeking to buy long-distance networks in the postderegulation, postdivestiture world.

"This procurement has terrific potential to push the state of the art, especially in integrated services digital networks [ISDN]," says Robert Bennis, manager of communications systems for Westinghouse Electric Co. in Pittsburgh. Further, he says that "the whole concept of a turnkey system might be very attractive to companies that don't have the resources to create networks like this on their own."

But at the same time, Bennis and other commercial users question whether this purchase of what amounts to the largest private telecommunications system in the world — a network bigger than the 17 largest private networks combined — will ever apply directly to them. And they wonder whether the magnitude of what GSA is trying to accomplish will ever permit this procurement to fly.

The likely vendors for the task worry about the wisdom of proceeding with an integrated network when the standards for the combination of voice, data and video over the same communications links have yet to be set and when the need to replace the current FTS is rapidly approaching the critical stage.

Holmes is a free-lance writer and editor based in Harrisburg, Pa. She specializes in computers and communications.



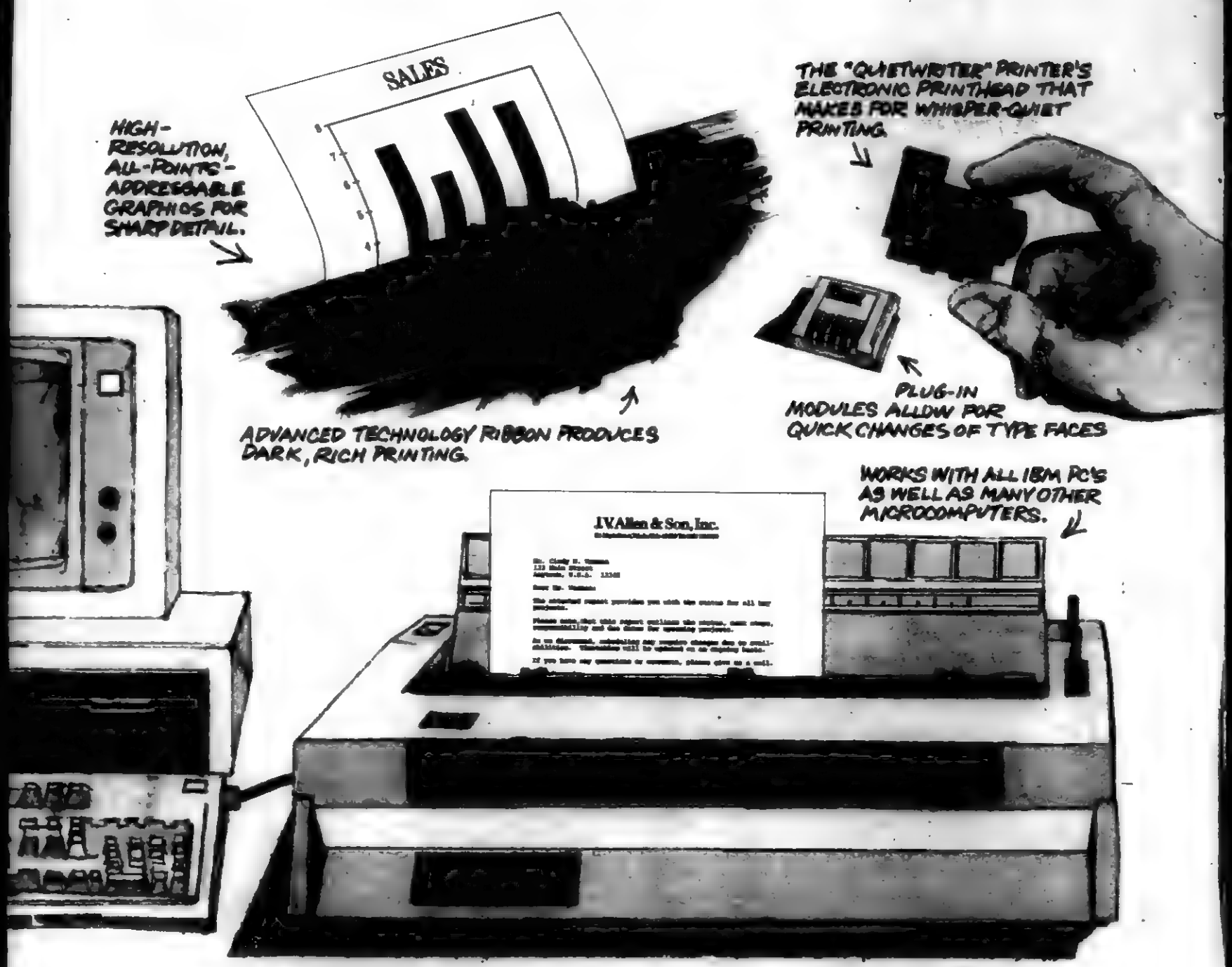
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FTS and FTS 2000

The long-distance network that FTS 2000 will supersede today delivers voice and some data services to 1.3 million civilian and defense agency employees in the 50 states, Puerto Rico and the Virgin Islands. Largely analog, the system carries 1.5 billion minutes of traffic each year, 15% of which is data.

The FTS system has 56 major switches linked by 17,518 private backbone trunks, while another 41,000 access lines serve some 1,655 private branch exchanges (PBX) and Centrex systems, each ranging from 200 to 2,000 lines. GSA manages about 420 of these local switchboards; the rest are overseen by individual agencies.

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'60s, the FTS system was provided entirely by AT&T until the loss of Telpak. It offers such features as a uniform dialing plan, direct station-to-station dialing, on-and-off network calling, automatic alternate routing and national teleconferencing.

For the past five years, GSA has introduced competition into the network by putting blocks of circuits up for bid and awarding them to the carriers offering the lowest prices. As a result of this process, MCI Communications Corp., GTE Sprint Communications Co. — now US Sprint under a GTE-United Telecom, Inc. partnership — and several other carriers entered the federal communications marketplace. Bennington counts six vendors in long-distance service and 27 in local service in the present FTS system.

In all, GSA estimates that FTS saved the government $1.25 billion during the 1970s and even today offers a 12% discount over services available on the public-switched network. The government currently spends more than $420 million annually on the communications system.

GSA says it hopes to hold its costs at this level during the next 10 years, spending more than $4 billion on FTS 2000 between 1987, the year scheduled for contract award, and 1997. Rather than going toward circuits and switches or even a specific network architecture, however, these dollars will be paid to a prime contractor charged with delivering a set of integrated communications services to one million federal end users and a service oversight center to GSA. The contract, an indefinite quantity service agreement, will obligate GSA to purchase a minimum amount of services but will involve no up-front money.

No one company is enough

What the government wants, Bennington explains, is "a one-stop telephone company" from the back of one PBX or Centrex system to the back of another local switchboard. GSA fully expects the prime contractor to turn to several other companies to meet FTS 2000's requirements. No single corporation — be it a communications carrier, a computer company or a systems engineering firm — can handle the task alone.

The chief contractor will be GSA's single point of contact, ultimately responsible for network management, administration and engineering. Because GSA is not buying hardware or architecture, the agency does not plan to be involved in circuit rearrangements, traffic analysis, trouble location and diagnosis, service restoration or billing for the system's usage-priced services.

"We are not engineers; we are not interested in geting into engineering and maintenance," Bennington says. "We have major constraints on personnel and capital, and these constraints have been a driving force for us in the decision to go with a prime contractor."

Indeed, GSA would very much like to return to the roles of contract administrator and services delivery monitor that it played in the 1970s. Bennington anticipates that GSA personnel would run the contractor-provided service oversight center to accomplish these tasks.

Where services are concerned, GSA expects its prime contractor to deliver integrated voice, data and video communications according to minutes of usage and bandwidth and within acceptable levels of bit rates, error rates, blockage factors, trouble rates and trouble response lead times. The agency also anticipates that the successor to FTS will make available such features as broadcasting and mass calling.

Again, "integrated" is the watchword when discussing FTS 2000 services — in no small part because GSA says it believes data will soon dominate federal communications, accounting for 50% or more of FTS traffic between 1990 and 1992.

"The integration of services is the most significant way in which federal telecommunications will change as a result of FTS 2000," Bennington explains. In fact, this change is essential if the total federal work force of approximately 1.9 million — a population that has remained constant for several years despite shifts in administration — is to keep pace with an ever-increasing work load, he adds.

"The keys to continued productivity improvements are data processing and telecommunications," Bennington says. "Our goal is to bring state-of-the-art telecommunications to government by 1990."

To reach this goal and to maintain state-of-the-art communications through the turn of the century, GSA's FTS 2000 procurement requirements call for a continuously upgradable system that assures that new features and quantities will be provided at the lowest cost. Because FTS 2000 represents such a significant single piece of business to the prime contractor, GSA expects preferred-client status. Furthermore, the agency warns potential bidders that, if, down the road, the services provided over the system do not represent the best value available to federal users, GSA itself will encourage other agencies to take their business elsewhere.

[redacted]

While GSA will leave the actual design of FTS 2000 to the prime contractor, what the agency clearly has in mind is a software-controlled, data base-driven ISDN. However, Bennington stresses that — beyond the need to meet certain national security and emergency preparedness requirements — the government has no intention of asking vendors to create facilities and services that the companies are not already planning. Indeed, he maintains, "We have said from the beginning that

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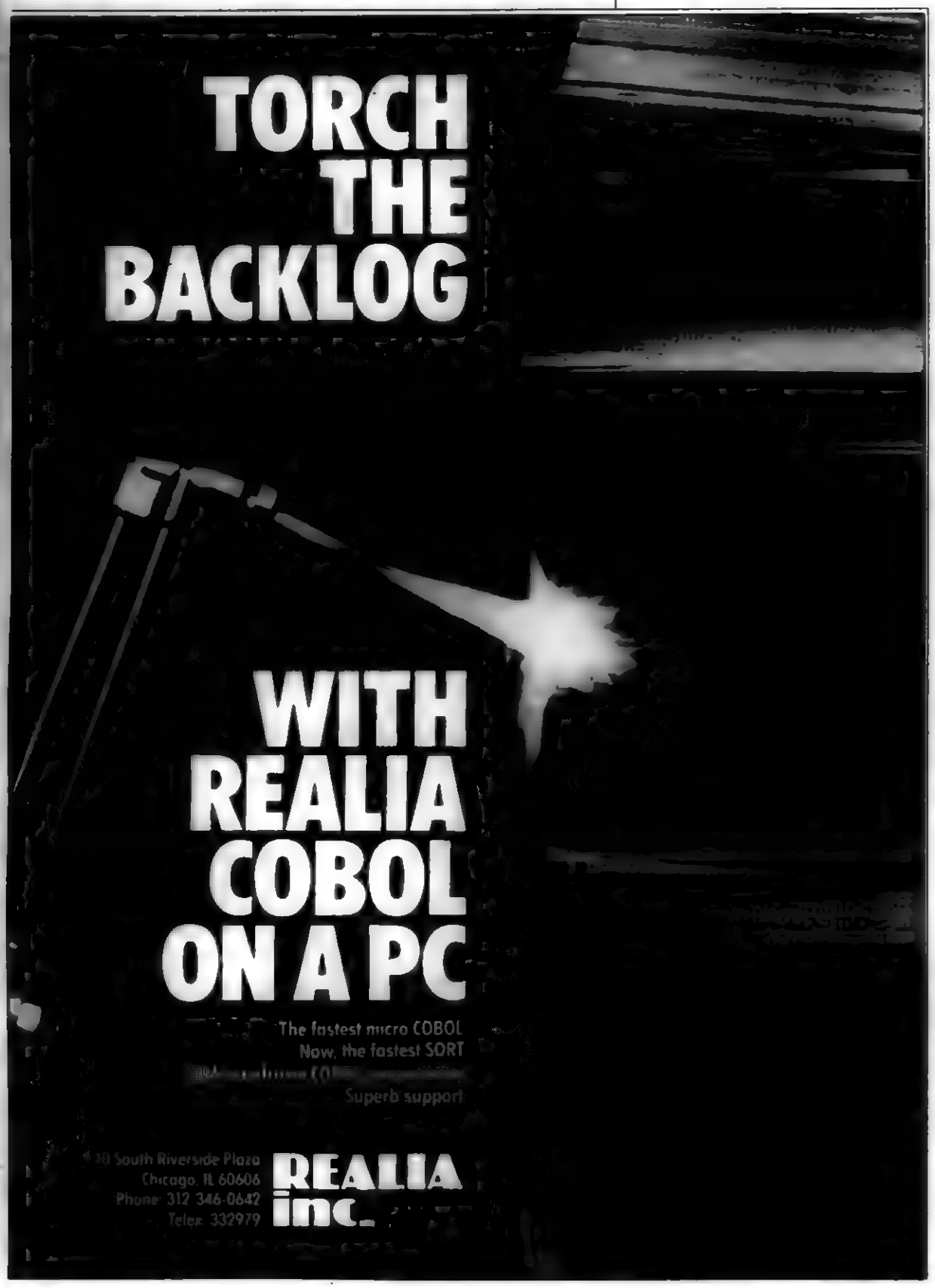
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> ***What the government wants is 'a one-stop telephone company' from the back of one PBX or Centrex system to the back of another local switchboard.***

the successful bidder must piggyback FTS 2000 on an existing network.

"After Telpak," Bennington adds, "we had to wait for a competitive market to form. We expected all along to do what the industry was going to do anyway, and when the industry was ready to move forward, we announced plans for FTS 2000."

Since the procurement was first announced in February 1985, half a dozen contenders for the job of FTS 2000 prime contractor have emerged — among them, the chief incumbent FTS provider, AT&T; MCI and its newly acquired Satellite Business Systems unit; US Sprint; ITT's USTS; and Martin Marietta Corp.

"We have a commitment at the chief executive officer level from most of these firms that each intends to be the successful bidder," Bennington notes. "Our aim now is to get all of them to the table."

That may be easier said than done, judging by the reaction of the industry at large to the draft FTS 2000 request for proposals (RFP) published by GSA last October. According to Bennington, based on written vendor comments to the draft and subsequent meetings between GSA and the companies expressing greatest interest in the procurement, four key issues have been identified:

• **Risk.** The vendors uniformly contend that the initial draft procurement requires them to assume too much of the risk for FTS 2000's success.

Bennington acknowledges the validity of many specific vendor concerns, noting that "the first-draft RFP provided the companies with our initial negotiating position. We expected them to dispute portions of it."

The vendors have already won one key point. They objected to GSA's requirement that the prime contractor adhere to a fixed-ceiling price for the 10-year life of the contract, giving up any ability to account for the return of double-digit inflation or increases in local telephone tariffs.

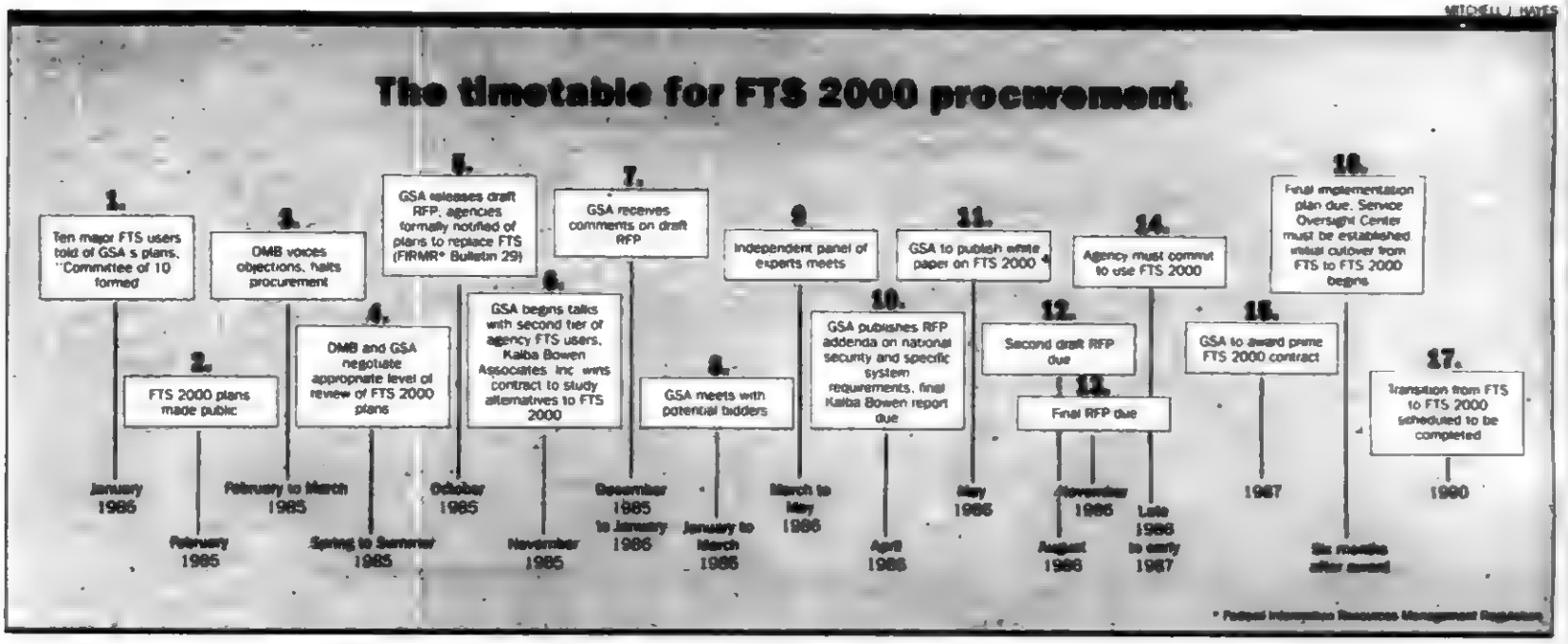
"We listened to the vendors and plan to offer another approach," Bennington says. "Basically, vendors will be asked to bear the risk of costs they can control, and we will probably bear the risk of the costs that no one can control."

• **Guarantees and up-front money.** Potential FTS 2000 suppliers lost out, however, on their request for more guarantees and, specifically, for some initial funding. "We aren't prepared to give on this," Bennington explains. "We will guarantee traffic for the three-year transition period, and that's it." What that guarantee amounts to is the cutover of some one million FTS users to FTS 2000 over the life of the project.

"The way the prime contractor can keep his revenue base is by keeping FTS 2000 users satisfied," Bennington explains. "That's an important element in controlling the contract and its costs."

• **Network intelligence.** Several vendors took issue with GSA's initial allocation of system intelligence, suggesting, in general, that more processing power belongs in the customer premises equipment than in the network itself.

Bennington indicates that GSA is flexible on this issue. He reiterates that "we tried to align what we



asked for with what the major contenders are planning to do. We don't want them to create products and services for the government alone."

He adds that where national security and emergency preparedness are concerned and some tailoring is needed to meet those requirements, "We are prepared to pay for it."

• **FTS-to-FTS 2000 transition.** Many companies expressed concern that, as the incumbent vendor, AT&T has access to more information about FTS than challengers will have. In addition, they are worried about how AT&T is to be managed during the cutover process when the prime contractor takes control of the existing FTS and operates it while creating the new system. Finally, these companies want to be certain that AT&T enjoys no cost advantage that would aid its proposal to build FTS 2000.

Bennington says he believes his agency has come up with solutions to these potential transition problems. These solutions, issues and other matters will be addressed in detail in a white paper that GSA expects to publish in May.

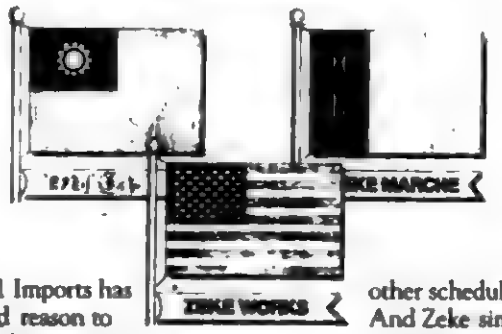
In general, the GSA official explains, "Our chief concern is with the technical management of the system. Continuity of service is really paramount." Continuity of service is the key element GSA will look for in vendor proposals.

In addition to the white paper, GSA will issue a second-draft RFP this August, inviting another round of comments from industry before releasing a final RFP in November. Vendors are relieved to see GSA taking this step.

"The first-draft RFP was not a functional set of specifications," says Jerry Gibson, director of government systems for MCI. In fact, "the first-draft RFP was so flawed that it was an impossible procurement for many reasons. I believe even GSA knew that and was simply putting its finger in the wind to see how things felt."

Potential FTS 2000 contractors anticipate that GSA will take some of their concerns into account in the second-draft RFP but put the odds at 50-50 that the agency will not go far

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enough. "If FTS 2000 ever occurs — and it's not at all certain that it will — it will be substantially different from the original RFP," Gibson says.

In the meantime, several vendors note that the current FTS is in difficult straits and requires a shorter term solution than GSA's "grandiose" network scheme. "The FTS is obsolete and expensive," says one company official, who questions whether FTS 2000 can be completed in time to rescue the existing system. He predicts that federal users will leave the FTS in droves before the procurement — "which will be hotly contested and probably protested no matter who wins" — is in place and any economic benefit can be derived from it.

Many companies are concerned that GSA is conducting its procurement in the middle of the industry's evolution toward software-defined virtual networks and ISDNs.

> ***'Basically, vendors will be asked to bear the risk of costs they can control, and we will probably bear the risk of the costs that no one can control.'***
>
> — Bernard Bennington
> General Services Administration

"These concepts are barely off the ground," MCI's Gibson says. "Who knows what they'll look like in the final analysis?" Standards for ISDNs, in particular, are months away from being set.

Agencies react

GSA officials point with pride to the fact that they involved the 10 largest users of the current FTS system in the acquisition process from the beginning. In January 1985, a month before GSA publicly announced FTS 2000, the agency formed what it calls the Committee of 10, consisting of those users who account for two-thirds of all FTS traffic and expenditures.

"Over 50% of these agencies have signed up for the new system," Bennington says, adding that these commitments, made at the assistant secretary level, are binding agencywide. Among the departments that have agreed to use FTS 2000 during its initial three years are the U.S. Department of Health and Human Services and the Department of Agriculture.

Several of the next 10 FTS users — those agencies that together account for another 15% of FTS traffic and expenditures — have signed up as well, according to Bennington. The 52 agencies whose traffic and expenditures comprise the remaining 19% of FTS usage have not been contacted by GSA.

The Department of Defense, which makes heavier use of the FTS than any civilian agency, has yet to tell GSA that the department's traffic will be put on the new system, and industry sources close to DOD say the department is not likely to take this route. They suggest that the Defense Department will stay with the FTS only if the present system is patched — quickly. The Department of the Treasury, meanwhile, has informed GSA that it plans to implement its own intercity telecommunications network rather than be a part of FTS 2000.

While GSA has asked the Treasury Department "to delay making final plans . . . until a proper evaluation can be made of FTS 2000 services," Bennington says he applauds the department's efforts to examine options other than the GSA-sponsored system.

"We must push our users to consider their alternatives, to constantly evaluate their telecommunications systems to be sure they are getting the best service for the best price," he explains. "Forcing them to do that is the key to controlling the whole FTS 2000 contract. It's the key to keeping federal communications costs down.

"The FTS represents less than 15% of the total cost of government communications, and we expect to maintain this percentage with FTS 2000," Bennington continues. "Our objectives with the FTS and FTS 2000 are to get the best prices we can for a core of civil agencies and to provide support for those agencies that don't have telecommunications staffs of their own."

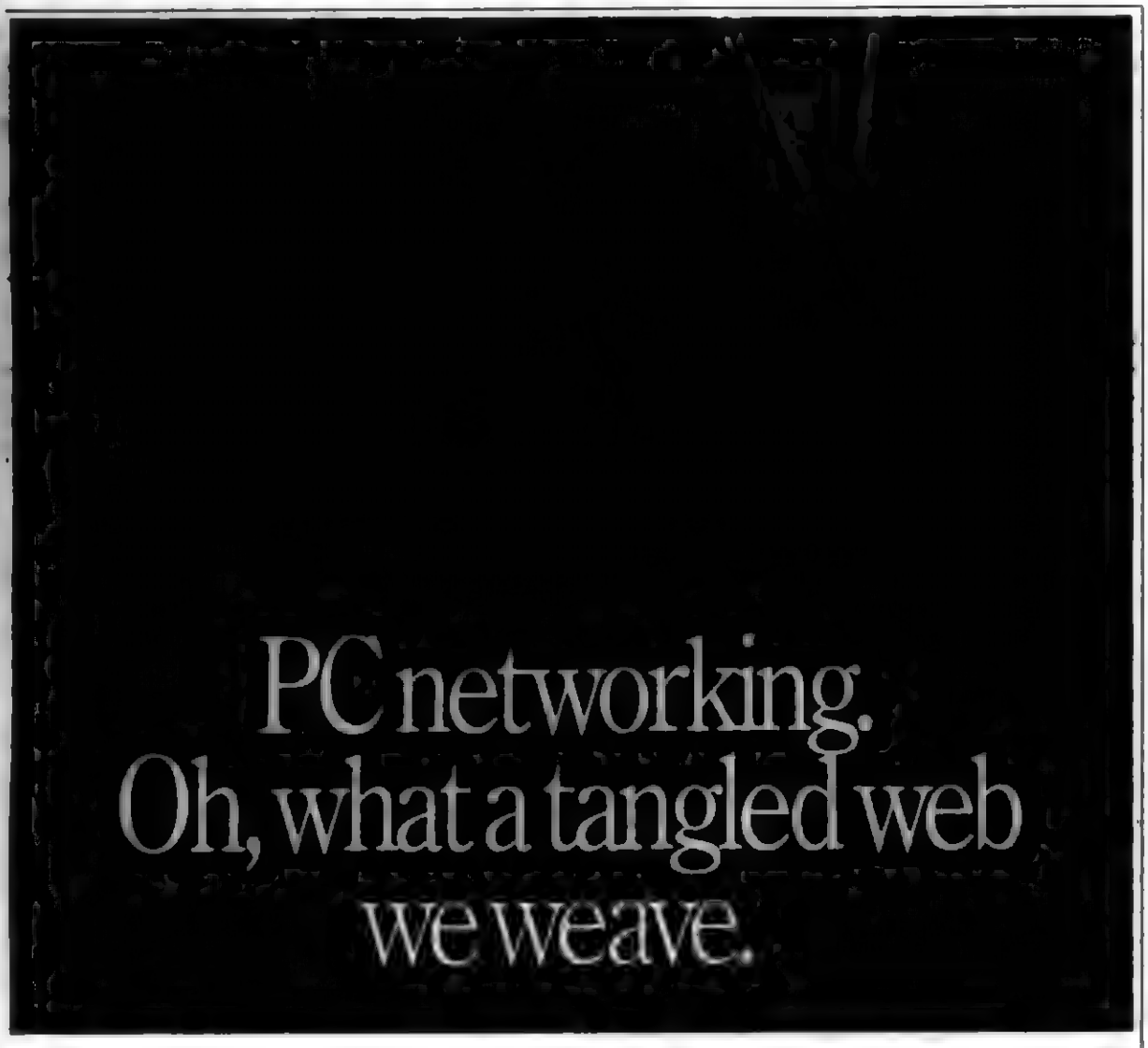
Agencies will be asked to make a final commitment to FTS 2000 between the months that GSA issues its final RFP and makes the award to a prime contractor.

GSA has published a regulation inviting agencies to devise alternatives to the planned system and requiring those that elect to go their separate ways to show that their plans are cost-effective.

Review before commitment

The White House Office of Management and Budget (OMB), meanwhile, has pushed GSA to consider alternatives ever since the agency made its FTS 2000 plans public last year. "OMB's concern is entirely proper," Bennington says. "The White House wanted to be sure that there had been an adequate review of our strategy before we committed to it."

Months of negotiation between OMB and GSA led to the commissioning of Kalba Bowen Associates, Inc. in Cambridge, Mass., to study FTS 2000 alternatives and to the creation of an independent panel of government and industry communications



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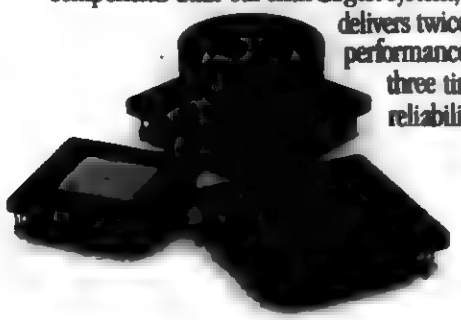
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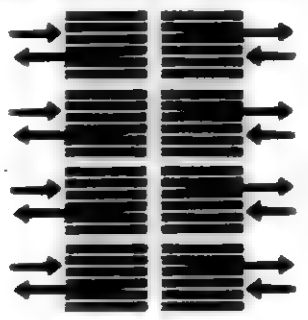
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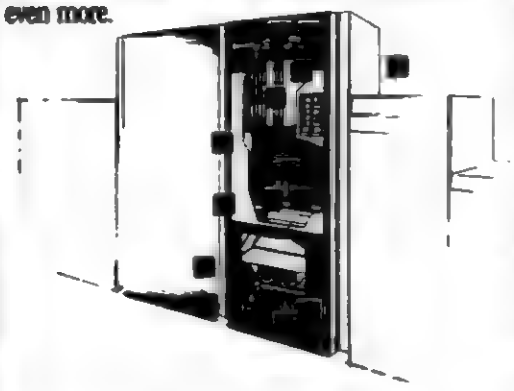


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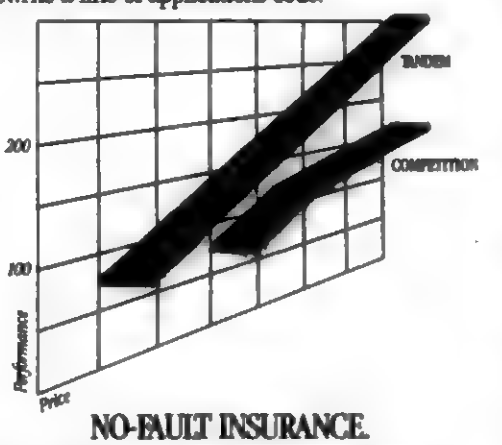


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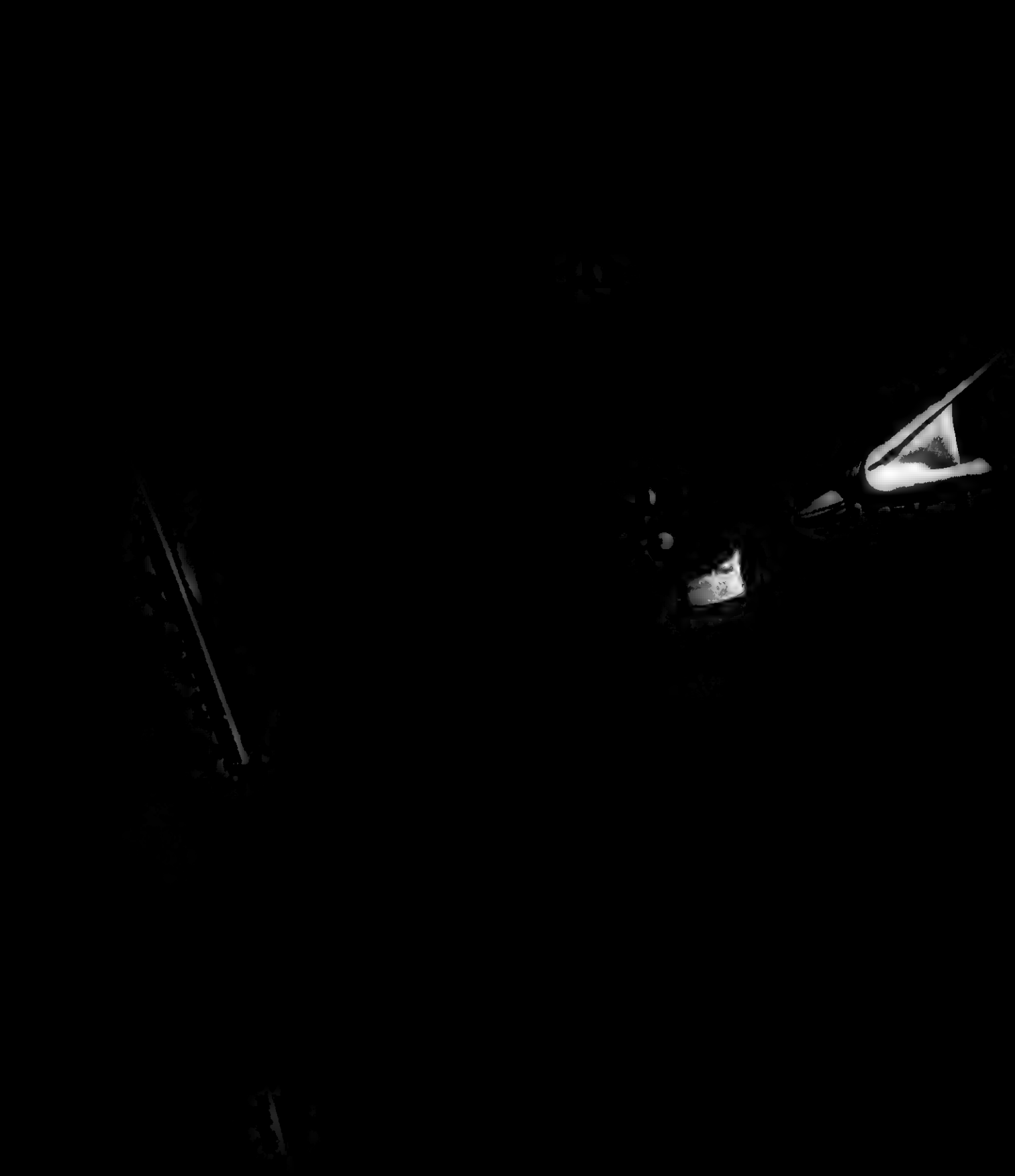
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experts that will review the efforts of both GSA and the outside consulting firm.

A draft of the Kalba Bowen study recently was delivered to GSA, but its contents will not be made public until the agency has completed its review and conferred with the contractor. Meanwhile, the independent panel had met once and was preparing to convene again to hear the consultancy's conclusions.

GSA is convinced that the course it has set is best. "I see no surprises at this point," Bennington says of these two outside examinations of his agency's work.

> ***Rather than applying to the largest commercial users, GSA's turnkey concept might fit the bill for smaller firms that, like the federal government, lack the manpower and the capital to build an extensive network any other way.***

Impact on commercial users

He acknowledges that "size is the key to GSA's strategy. It might not work if an agency — or a company — isn't big enough. We have no evidence to suggest that a department like Health and Human Services or a General Motors Corp. could create and benefit from a procurement like this." GSA has had lots of interest in FTS 2000 from large commercial users. "They want to follow it closely," he says.

Westinghouse's Bennis agrees. "We anticipate some real fringe benefits and spillover effects from this procurement for the Westinghouses of the world."

But at the conclusion of comments like these, GSA's Bennington adds, "What they tell me is, 'When it's successful, we want a copy of the RFP.' "

Skepticism

Even the largest of private telecommunications users remain skeptical about the applicability of this massive public procurement to their future telecommunications needs because of the purchase's sheer size, says Brian Moir, a partner with the Washington, D.C., law firm of Fisher, Wayland, Cooper & Leader.

"Private users are excited about FTS 2000. It's a significant buy, and they will watch carefully to see what vendors offer and how they provide services. But, at a minimum, this network is 10 times bigger than anyone else's," he notes.

Moir, who represents the International Communications Association, an organization of major communications users, suggests that for 500 of the association's 600 members, most of the concept behind the FTS 2000 acquisition will not be transferable at all because of the project's massive size.

"GSA won't create any new technology with this procurement," the lawyer predicts. "All private network users customize technology to suit their needs, and GSA can be expected to do this, too."

Further, while GSA wants the network delivered on a turnkey basis, the agency also requires outside managerial assistance from the prime contractor.

"The trend in industry is just the opposite," Moir points out. "Companies are bringing in telecommunications talent because they can afford to and because the addition of staff saves them money in the long run." GSA, however, is not in a position to offer the salaries to attract the people it needs.

Bennis suggests that rather than applying to the largest commercial users, GSA's turnkey concept might fit the bill for smaller firms that, like the federal government, lack the manpower and the capital to build an extensive network any other way. "Perhaps a consortium of, say, Martin Marietta, GTE Corp. and Rolm Corp. will write the book for doing something similar on a smaller scale," he says.

And what of the GSA network's ability to speed the delivery of integrated services? Bennis says that many ISDN applications, such as full-motion videoconferencing, finally might get off the ground with the advent of the new GSA network.

Moir agrees that "FTS 2000 might bring about integrated services more quickly," but he asks, "Who will benefit?

"I don't see the demand now for these services that the communications systems providers do. Users want services that can be integrated, but they don't necessarily want them delivered in an integrated fashion."

Moir further cautions GSA against a new version of AT&T's old slogan, "The system is the solution." Vendor marketers argue that users want one-stop shopping, he says. "And I agree. But they don't want one-stop shopping, period. They want one-stop shopping as an option."

Despite the concern users and vendors express about the long-term impact — and even the viability of FTS 2000 — GSA's Bennington remains positive.

"Back in the 1960s, the U.S. government was the world leader in telecommunications," he recalls. "Since then, somewhere along the way, we've lost that position. There's no reason why we can't go first-class again." For Bennington and his agency, first-class means FTS 2000. ■

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In Depth

Users tame CICS

'I am often struck by the ingenuity and the extent of changes that CICS users have made to their systems. From the perspective of user stories in the U.S. and abroad, it is not surprising to see a duplication of not only problems but solutions as well.'

By STEVE PIGGOTT

The flexibility of IBM's CICS, which many agree is the transaction processor's major strength, can create headaches for the team or individuals assigned to its installation and maintenance.

It is true that IBM provides the interfaces, user exits and so on by which CICS can be transformed into a more usable product. But coding them is by no means a trivial task, and not all sites possess the necessary skills and knowledge required to accomplish this task to their complete satisfaction.

Many larger IBM MVS shops use teams of six or more systems programmers working full-time on CICS, whereas at the other end of the scale, a small VSE site will probably make only one systems programmer responsible for the upkeep of all systems software.

Piggott is editor of CICS Update, *a technical journal published by Xephon Technology Transfer, Ltd., Berkshire, England. Formerly, he was a systems programmer at a large MVS installation in the UK.*



ILLUSTRATION BY JON MCINTOSH

As the editor of a monthly journal designed to encourage CICS users to exchange views and experiences on a wide range of CICS-related topics, I constantly read articles written by technical support staff from many different countries. I am often struck by the ingenuity and extent of many of the changes they have made to their systems. With such a wide perspective, it is not altogether surprising to see a large duplication not only of problems but also of solutions.

For instance, Rolls-Royce of Canada in Lachine, Que., quite independently opens and closes its on-line DOS DL/I data bases in the same way as Northern Star Insurance Co., Gloucester, England. In addition, an installation in Middlesborough, England, has developed a method of automatically signing off idle terminals in very much the same way as Standadyne, Inc. in Bellwood, Ill., does. Clearly, great minds think alike.

Careful choice, critical judgment

Because CICS users come in all shapes and sizes, IBM has to provide support for many types of terminals, as well as for different programming languages and file and telecommunications access methods. The user must carefully select the relevant options for a number of CICS control programs and tables that form the CICS nucleus.

To avoid ending up with an unnecessarily large and overweight system, good judgment in this matter can prove critical. Generating support for inappropriate functions or blindly accepting IBM defaults can have a far greater effect on performance than the user imagined.

Charles McCrary of Network Computing Corp. in Charlotte, N.C., estimates he was able to reduce his CPU utilization by 2 million instructions per second or the equivalent of an IBM 4381 Model 1. He achieved this remarkable feat by disabling the internal Trace facility in both of his production CICS systems and by restricting the CICS Monitoring Facility to the region for which accounting information was needed for chargeback purposes. This simple and painless solution considerably prolonged the life of the existing hardware at the installation.

IBM does not always have its customers' best interests at heart when it

designs systems software. For example, Melvyn Maltz, a systems programmer in the UK, points out that residency can be forced on some programs in the Processing Program Table (PPT) that have been generated using the group macro, although there is no good design reason for this to happen.

He cites two of the programs that form the CICS Enhanced Master Terminal (CEMT) transaction as a good example. These programs can be made nonresident, with a possible saving of 59K bytes for CICS 1.6 users, by coding the following entries in the PPT in the order they are shown.

```
DFHPPT TYPE=ENTRY,PROGRAM=DFHEMTD,RES=NO
DFHPPT TYPE=ENTRY,PROGRAM=DFHEMTD,RES=NO
DFHPPT TYPE=GROUP, FN=OPERATORS
```

In another instance, closing down CICS is not always the straightforward procedure it should be. End users, oblivious to the finer workings of CICS, might simply turn their screens off when they want to go home. Often they are still signed on; sometimes they are in the middle of a transaction. Some installations, faced with this situation, resort to the rather messy and time-consuming solution of performing an immediate shutdown followed by an emergency restart in order to tidy things up.

David Warner, chief systems programmer at Britvic Ltd. in Chelmsford, England, has developed a transaction to display and alter the status of terminals at his installation. Because of the transaction's greater functionality compared with the CEMT transaction, particularly in the way it handles pseudoconversational tasks, the transaction is used effectively to ensure a smooth and orderly shutdown. An operator can easily tell what end users are still signed on at which terminal and what they are doing prior to terminating CICS.

The Irish Dairy Board in Dublin was faced with similar problems. Its programs are developed using an application generator and, as a result, make use of conversational techniques.

> ***The user must carefully select the relevant options for a number of CICS control programs and tables that form the CICS nucleus. Generating support for inappropriate functions or blindly accepting IBM defaults can have a far greater effect on performance than the user imagined.***

The dairy board has written a program, an entry for which is included in the Program List Table with those programs executed during the first quiescent phase of shutdown. The program determines all outstanding nonsystem tasks and invokes the master terminal Purge function for them. If this fails, the program invokes the more effective but cruder Force Purge function.

Automated operation

At least one UK site has completely automated not only CICS shutdown but also the nightly backups of its on-line files and the subsequent restarting of CICS. This site is able to provide its end users with the CICS availability they require and still perform all the necessary housekeeping without incurring the expense of providing a third operator's shift.

CICS is shut down in a way similar to the methods described above, by the site's own user-written program that is triggered via interval control sometime after midnight. The site, a VSE site, has written another program that releases jobs from the VSE/Power queue via the Ctlspool macro. This program is invoked twice, first at the end of the CICS job stream and then after the backup job stream, when it releases the CICS start-up job.

In addition, the site uses a feature provided by the Macro 4 PLC product Logout, which enables the site to define the automatic replies to some of the console messages it is likely to receive during the processing of the backups or CICS start-up.

CEMT is a powerful transaction and is, quite rightly, restricted in most organizations to only a few qualified personnel, usually technical support or operations staff. Some sites, however, see benefits in extending certain of CEMT's facilities to other staff members. Unfortunately, IBM does not provide a limited-function version of CEMT; users are authorized to use either all or none of its facilities.

Graham Payne, a UK systems programmer, has written a program to allow the applications programmers at this installation to use just the NEWCOPY facility of CEMT, while Robert Arkis, a member of technical support at Butler International, Inc. in Montvale, N.J., allows programmers to use the inquiry functions of CEMT without the ability to change anything. Both of these changes are accomplished by invoking the master terminal program, DFHEMTA, through their own user-written programs.

Transaction dumps

Transaction dumps are normally produced whenever a task abends. These dumps are written to the dump data set until it becomes full. Depending on the release of CICS being used and other options selected, the dump data set either switches to another data set or ceases to be written to.

Notification that an abend has taken place is sent to the end user's screen and to the transient data queue CSMT, which is typically assigned to the system printer and printed when CICS is shut down. This situation is far removed from what most users want and has led many of them to

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> ***Software that interfaces with IBM's VSE/Power queue appears to be very popular. IBM provides all that is necessary to link CICS and VSE/Power. But in the absence of good examples, attempts to implement such an interface can result in a dismal, if not spectacular, failure.***

develop their own refinements in this area.

Several users send a message to the operator's console or some other terminal in the event of a program abend, thus making sure someone apart from the end user is aware that an error situation has occurred. This is most commonly done by replacing the IBM-supplied dummy program error program DFHPEP with user-written code.

DFHPEP gains control after any program abend, and it is a fairly simple job to extract the relevant information concerning the abend and to write it out to the operator's console. Alternatively, there is a global exit supplied that is given control before any transient data request. This can be used to trap messages about to be routed to CSMT and to send all or some of them to the console or any additional or alternative destination.

Not all the transaction dumps will need to be printed, especially in a testing environment. A faulty transaction may abend several times and produce multiple transaction dumps, although only one dump is needed to debug the problem. Jimmy Edgar, technical support manager with American Heritage Life Insurance Co. in Jacksonville, Fla., has written a program that selectively prints dumps from the dump data set. Selection of dumps to be printed can be based on task identifier or abend code as well as date and time criteria.

An alternative solution has been implemented by Terry Callaghan, CICS specialist at Midland Bank PLC in Sheffield, England. Callaghan has developed a program that automatically prints the dump data set immediately after it has been written to. He had made a one-line change to the IBM modules that write the dump data set, DFHDCP and DFHFDP, to start his program via interval control. With SYSOUT defined as held output, full TSO/ISPF Browse facilities can be used to provide a very helpful on-line debugging capability.

The statistics question

A common concern of many CICS users is obtaining CICS statistics in a form they can use easily and efficiently to help them pinpoint both existing and potential problems. As we have already seen, much of the information about CICS statistics is not available until the end of the day.

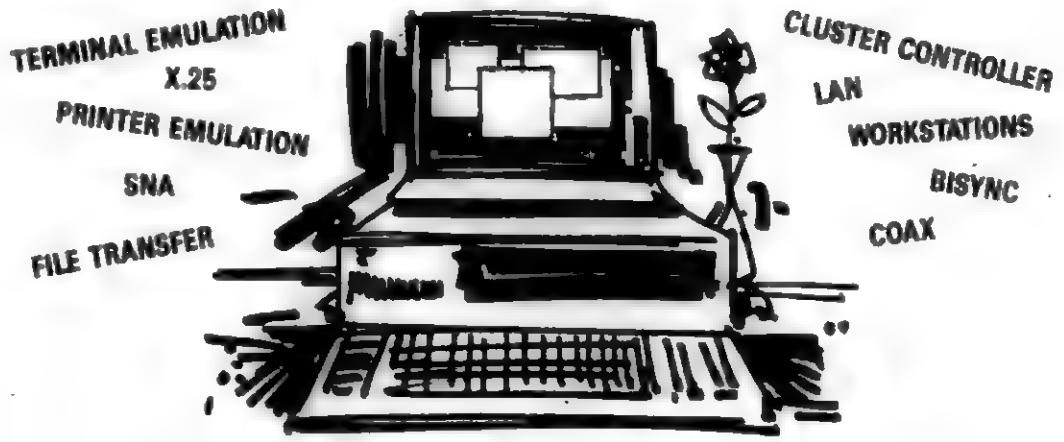
For sites with big DP budgets, the answer is to install one of the many third-party software packages that address this problem. Candle Corp.'s Omegamon/CICS and Landmark Systems' The Monitor appear to be at the top of the range both in terms of performance and price. Nevertheless, several of their competitors represent very good value for the money, particularly those offering job accounting and historical reporting capabilities.

IBM's offering, CICSPARS, has a significant number of users, although their enthusiasm for the product comes across as little more than lukewarm. Support for the unwieldy IBM's PAII has been withdrawn in Release 1.7 of CICS/OS/VS.

Many CICS users have written their own software in order to help them look at CICS statistics on-line. The most frequently used process involves extracting information from one of the various CICS storage areas, formatting the data and then displaying the information on the screen.

The storage areas of most interest are those relating to the principal CICS tables —

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the Program Control Table, the Processing Program Table, the File Control Table and the Terminal Control Table. Each contains useful status information and cumulative statistical data for each of its table entries.

Several users have gone a stage further in extracting statistics from the different DL/1 control blocks and displaying them on a terminal. Some of them have concerned themselves with gathering statistical information on the usage of the DL/1 buffer pools.

Software that interfaces with IBM's VSE/Power queue appears to be very popular. IBM provides all that is necessary to link CICS and VSE/Power. But in the absence of good examples, attempts to implement such an interface can result in a dismal, if not spectacular, failure (as an ex-systems programmer, I can vouch for this from painful experience).

David Green, a senior programmer formerly of Eastern Counties Newspapers in Norwich, England, has written a transaction that writes card image records to temporary storage. These card images are then read by a PL/I program, which in turn links to an assembler routine that writes them to the VSE/Power reader queue using the Putspool macro. Steve Lovett, a systems support manager from Smyrna, Tenn., does a similar thing at his installation. His method makes use of the communications area to pass data from a program that builds the job stream to his routine that puts it to the VSE/Power queue.

Printing from the VSE/Power queue is not so easy because of the higher degree of error recovery needed when dealing with terminal printers. John Ellerslie, a UK systems programmer, has developed his own transaction as an alternative to purchasing a package from a third-party supplier. He does, however, describe his code, which uses the Getspool macro, as "cheap and cheerful."

Global exits

The Global Exit facility, introduced in CICS 1.6, holds many advantages over the previous static user exits. Global exits do not require regenerating CICS control programs to install them or to make amendments. Two or more global exit programs may run at the same exit, or one exit program can run at two or more exits.

John Gaskell, a systems programmer with Hollandsche Verzekering Societeit van 1808 in the Netherlands, uses the terminal control program after-input event exit for two useful purposes. First, he uses the exit to make the program function keys 13 to 24 equivalent to keys 01 to 12. Second, he turns the terminal option for uppercase translation on and off, depending on the transaction identifier being used.

Terminal users switch from traditional applications, which require the uppercase translation option to be on, to text processing applications, where upper- and lowercase data needs to be entered, regardless of at which terminal they are located. Many sites use global exits to compress their data streams.

Search for practical solutions

The articles our journal publishes represent the hard-earned lessons of CICS users throughout the world. Some come from installations far richer in CICS functions than even IBM could imagine. Others originate in sites with limited resources struggling to achieve a degree of user friendliness, security, performance or functionality not provided by the basic system.

I have found that reader interest concentrates mainly on the practical solutions that have been developed by their fellow CICS users. Some sites will come up with good ideas that they are unable to implement because they lack the experience or understanding needed to make them work. Others are unaware of the facilities that are available to help them enhance their CICS systems, or they do not know how to use these facilities properly.

What appears to the experienced CICS specialist to be a trivial change can represent several months' research and effort to the poor soul not so well versed in CICS terminals.

As one U.S. contributor noted, "One man's garbage is another man's treasure" — a sentiment with which many CICS users would wholeheartedly agree. ■



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NEW PRODUCTS

Cambridge add-on gets key features

The Cambridge Software Collaborative of Cambridge, Mass., has added three key features to its Cambridge Spreadsheet Analyst add-on program for Lotus Development Corp.'s 1-2-3 and Symphony packages and dropped the price from $149 to $89.95.

Working with 1-2-3 and Symphony, the Analyst checks spreadsheet models for errors and provides logic analysis and complete documentation. Enhancements in Version 2 of the Analyst include an automatic scan function that checks for more than two dozen types of errors (twice as many as Version 1.2), added report selections and an open-ended design that accepts add-on programs developed by the Cambridge Software Collaborative.

The scan function highlights such errors as unprotected formulas in protected work sheets; formulas with questionable references to labels, numbers, string formulas and blank cells; the absence of references to numeric cells; and unreferenced or overlapping named ranges.

New documentation features a diagnostics report of the scan results, a settings report that delineates the global defaults and settings information for the work sheet under investigation and a report that shows a condensed view of the entire work sheet.

The first add-on program available for the Analyst is the $49.95 Macro Analysis Module, which documents all macro commands in a spreadsheet.

According to the Cambridge Software Collaborative, the menu-driven Analyst operates like an extension to the Lotus spreadsheets, is compatible with 1-2-3 Version 2 and Symphony Version 1.1 and supports the Intel/Lotus/Microsoft Expanded Memory Specification.

Registered owners of Analyst Version 1.2 may upgrade for free and will also receive a free copy of the Macro Analysis Module. Owners of previous versions of the Analyst may upgrade to the new version for $10.

MAPICS II packages bow

Two utilities also to debut at no charge to customers

IBM recently introduced three application packages for its System/38 Manufacturing Accounting and Production Information Control System (MAPICS) II software line.

The vendor also added two features, available next month, to MAPICS II that will be offered to customers at no charge.

The first software package is Master Production Schedule Planning (MPSP), which was designed for planning of production schedules, resources and master scheduling. The software can generate resource profiles to help create and verify the production plans and master schedule. It has a one-time fee of $13,230 or a monthly fee of $660.

With the announcement of this package, IBM said it has modified its MAPICS II Material Requirements Planning package to work in conjunction with MPSP. The modified version will be available prior to the release of MPSP and is required to use MPSP.

The Financial Analysis package is a supplement to the MAPICS II General Ledger, providing more financial reporting and analysis features, such as automatic journal entries and budget preparation. The package sells for $345 per month or can be purchased for a one-time charge of $6,900.

The Forecasting package can generate weekly or monthly forecasts based on historical data. It costs $12,650 on a one-time basis or $630 per month.

The no-cost, added features to MAPICS II include the Multiple Job Queue Support, which allows users to process more than one MAPICS II batch job at a time, and the User Created Menus, which allows users to customize menu screens.

The applications packages will be released in late June, according to IBM. Users must have MAPICS II IMSF and MAPICS II Cross Application Support software to run these packages.

IBM unveils Proprinter XL

IBM has introduced the Proprinter XL, a wide-paper desktop printer for its Personal Computer line that features an operator panel for users to key in print commands instead of programming print mode changes.

The Proprinter XL, which sells for $799, was designed for wide-paper printouts, such as spreadsheets. It accommodates paper up to 16½-in. wide and will print lines up to 13.6-in. long.

The three-button operator panel allows users to key in print commands for print quality as well as character size and quality. A user can press one button to switch from draft-quality to near-letter-quality print or press a combination of keys to switch to boldface type or change the spacing between characters.

The Proprinter XL is available now.

Ryan-McFarland software speeds up multiuser networks

Ryan-McFarland Corp. of Rolling Hills Estates, Calif., has announced RM/Infoexpress for IBM PC Network environments.

RM/Infoexpress is a software add-on to RM/Cobol-8X. According to the vendor, it allows multiuser applications to execute an average of 10 times faster on a network with five users, with no source or object code changes.

RM/Cobol-8X is an ANSI 1974 Cobol compiler with ANSI 1985 Cobol features and IBM VS Cobol extensions. It supports virtually unlimited program size.

Infoexpress, $595, operates with IBM's PC Network, Token-Ring and any network with either PC-DOS or Microsoft Corp. MS-DOS 3.10, the IBM PC Network Program and 100% Netbios compatibility.

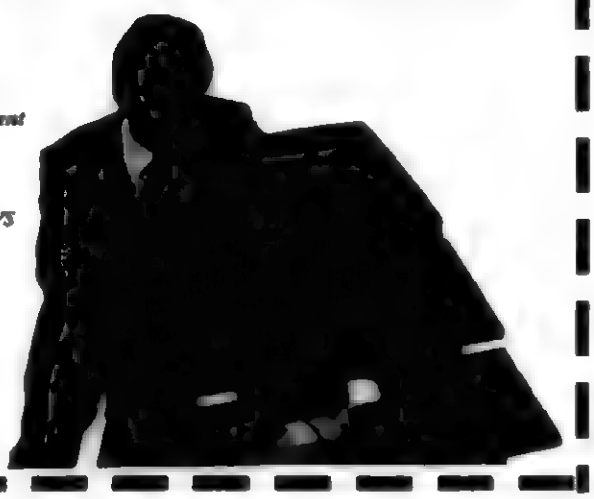
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SOFTWARE & SERVICES

Systems software

McDonnell Douglas Computer Systems Co. has announced the **Reality Integrated Office System**, a software package for its relational data base management system minicomputers.

The package integrates functions such as word processing, spreadsheets and graphics. It also offers electronic mail and the ability for a personal computer running under Microsoft Corp.'s MS-DOS to access the system's data base.

In addition, the package consists of a variety of subsystems, including telephone numbers and addresses, a desk diary, electronic indexing, calculator, teleconferencing, activity management and data base management for personal data bases.

The Reality Integrated Office costs $1,000 to $1,500, depending on the minicomputer system involved.

McDonnell Douglas, 17481 Red Hill Ave., Irvine, Calif. 92714.

■

Software Techniques, Inc. has introduced **Diskit/VMS**, system software for Digital Equipment Corp.'s VAX computers.

Diskit/VMS is said to include utilities designed to help solve performance problems caused by disk fragmentation.

According to the vendor, the software also improves disk access speed by positioning both directories and frequently used files and optimizing file extent sizes.

Other features of Diskit/VMS include a directory management tool and a dynamic process monitor that displays information on files opened by any combination of file characteristics.

Diskit/VMS is priced at $4,500, with additional CPUs costing $3,500.

Software Techniques, 6600 Katella Ave., Cypress, Calif. 90630.

■

Britz Publishing, Inc. has announced **Recon/34/36**, a bank reconciliation system for the IBM System/34 and 36 family of computers.

The program was designed to maintain information about bank checking account activity.

According to the vendor, it can keep an accurate balance for a checking account or keep track of outstanding checks.

Entries are allowed for issued checks, paid checks, voided checks, service charges, debit memos, credit memos and interest earned.

Recon/34/36 can keep track of up to 999 bank accounts for 999 companies.

Recon/34/36 costs $99, including complete RPG source code.

Britz Publishing, 1814 Capital Towers, Jackson, Miss. 39201.

■

Digital Equipment Corp. has announced **VAX Valu Version 2**.

VAX Valu works with DEC's VAX VTX distributed videotex system. It is a line of development tools.

VAX Valu Version 2 is said to simplify the development of distributed videotex applications, provide increased capabilities for multivendor videotex systems and enable applications developers to develop transactional videotex applications.

VAX Valu is priced at $8,160 for the Microvax II, $21,200 for the VAX 8200 and 8300, $27,200 for the VAX 8500 and 8600 and $40,800 for the VAX 8800.

DEC, Maynard, Mass. 01754.

Applications packages

Northeast Data Systems, Inc. has introduced **Intrepid MMS**, a closed-loop Manufacturing Resource Planning II management software package, and **Intrepid DMS**, a distribution management software system.

Intrepid MMS is said to allow users to anticipate material shortages and capacity bottlenecks and to respond to changes in priority. It features an interactive data base that connects all departments. It was designed to run on all systems with Pick Systems' Pick operating system.

Intrepid DMS is said to integrate phases of the distribution process including customer service, order tracking, inventory and price controls. It also features an on-line data base. It was designed to run on all systems with Prime Computer, Inc. Information or Pick operating systems.

Both Intrepid MMS and Intrepid DMS are priced at $3,000 to $15,000 per module.

Northeast Data Systems, 20 A St., Burlington, Mass. 01803.

■

Lawson Associates, Inc. has announced a **Security Module** and an **Employee Expense Module** for IBM 3000 and 4300 mainframe users.

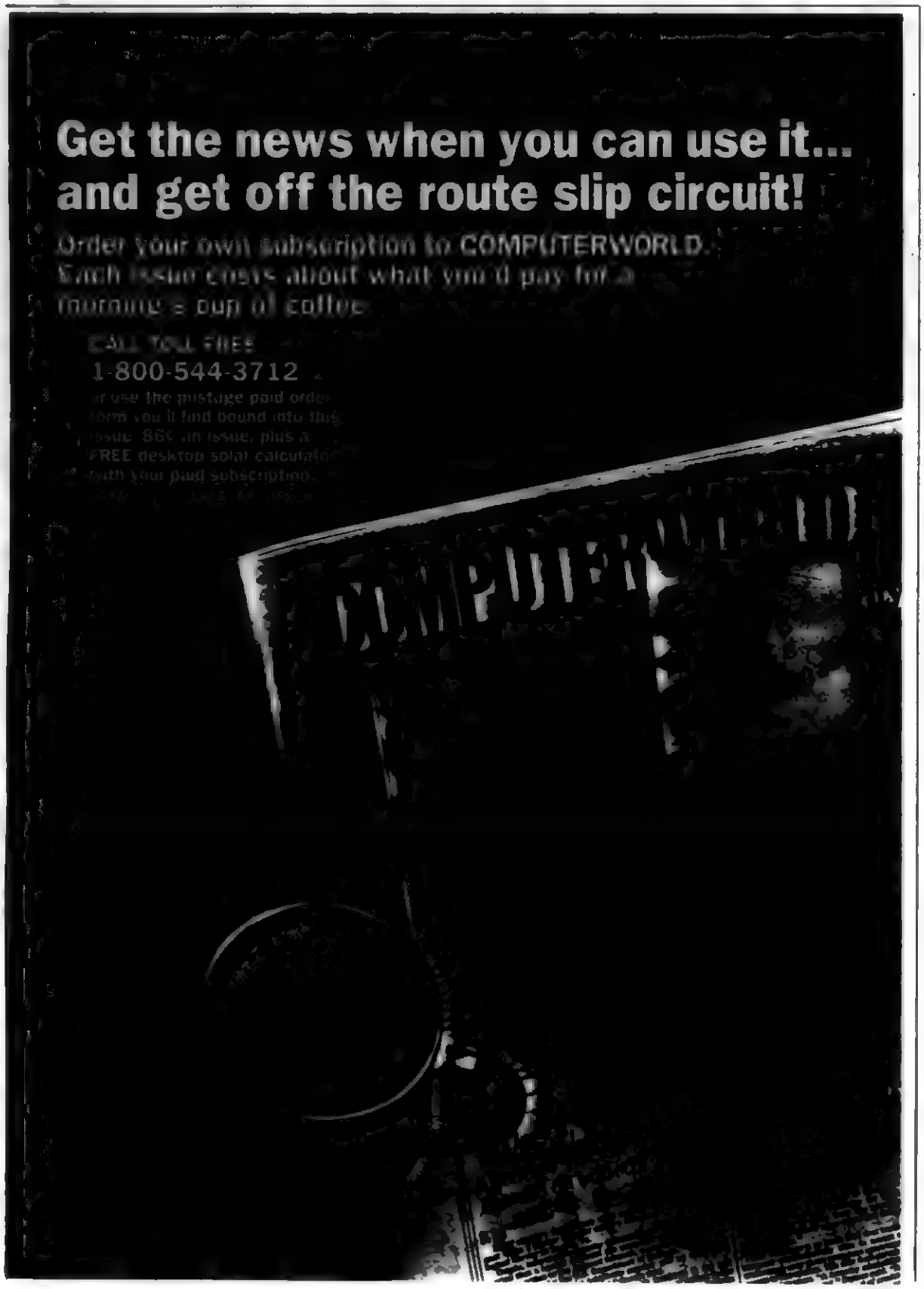
The Security Module is said to secure screens and specific functions within a program. It offers four options: program security, company and process level security, group security and no security. It integrates with all Lawson business management and operational software.

The Employee Expense Module works in conjunction with the vendor's Pinstripe accounts payable package.

It allows users to match employee expenses with advances, track expense reports and advances, create statements for employee records and keep employee expense checks separate from vendor checks.

The modules cost $5,000 each.

Lawson, 2021 E. Hennepin Ave., Minneapolis, Minn. 55413.



NEW PRODUCTS/SOFTWARE & SERVICES

Utilities

IST Sales has introduced **Access+**, an on-line software product for CICS environments.

Access+ is said to allow users to request information from a mainframe computer and receive responses on a CRT screen or in printed reports. Data from one or multiple files can be located and displayed in flexible formats. Arithmetic operations can be performed on the data, which can be presented in detail or in summary.

Access+ operates in both IBM OS and DOS environments and supports any VSAM structure. A DOS site license costs $16,000, and an OS site license costs $24,000.

IST Sales, Suite 240, 2022 Powers Ferry Road, Atlanta, Ga. 30339.

■

Gejac, Inc. has ported **Version 3** of its **SRF Software Performance Monitor** to Digital Equipment Corp.'s PDP-11 computers using the RSX-11M Version 4.2 as well as the RSX-11M+ operating systems.

SRF Version 3 features the video display task, which provides the ability to display real-time bar graphs that show the amount of activity on the computer system at that time, and Secondary Pool Monitoring, which provides RSX-11M+ users the ability to monitor and report on secondary pool-usage statistics in addition to primary ones.

SRF can be licensed for $3,995.

Gejac, P.O. Box 188, Riverdale, Md. 20737.

■

Talaris Systems, Inc. has announced **Version 2** of its **Qdrive** text and graphics integration software package.

New features of Qdrive Version 2 include an all-parameters-displayed menu, an option that permits a user to put more than one page image on one physical page, the ability to scale and center embedded raster graphics and a log file for capturing Qdrive messages.

Qdrive Version 2 for the Digital Equipment Corp. VAX/VMS operating system is priced at $5,900.

Talaris Systems, P.O. Box 26580, 5160 Carroll Canyon Road, San Diego, Calif. 92126.

■

Telesoft has announced **Telegen 2**, a version of its Ada compiler and tools for Digital Equipment Corp. VAX systems.

The package consists of a compiler written in Ada and such components as a library manager, library tool set and an Ada execution environment.

Telegen 2 was designed for the development of Ada applications and can support programs of up to 250,000 lines of code.

New optional tools include a source-level debugger, global optimizer and language productivity tools.

Telegen 2 costs from $18,000 to $35,000 depending on the VAX model.

The optional tools can be purchased separately or packaged as the Host Development System for a cost of $26,000 for the VAX-11/780 and $53,000 for the VAX 8800, according to the vendor.

Telesoft, 10639 Roselle St., San Diego, Calif. 92121.

■

Sterling Software, Dylakor Division has announced **Version 4** of its mainframe auditing utility, **Dyl-Audit CMS**.

The software is said to incorporate the auditing technique known as dollar-unit sampling.

Version 4 also is said to support 12 additional Systems Management Facility, MF1 and Resource Management Facility records for IBM OS users.

Dyl-Audit CMS is priced at $21,800.

The software runs on IBM 370, 3000 series and 4300 series mainframe computers under VM/CMS.

Sterling Software, Dylakor Division, 17418 Chatsworth St., Granada Hills, Calif. 91344.

■

Relational Technology, Inc. has announced **ESQL/Ada**, an Ingres program interface to the Ada language.

ESQL/Ada contains an Ada preprocessor that allows Ada programmers to integrate Ada source code with the SQL data base language and forms control of the company's Ingres relational data base and application development system.

The Ada preprocessor will work with any Ada language compiler implemented for VAX/VMS, Unix or VM/CMS environments. The preprocessor for the VAX/VMS Ada compiler costs $5,000.

Relational Technology, P.O. Box 4006, 1080 Marina Village Pkwy., Alameda, Calif. 94501.

■

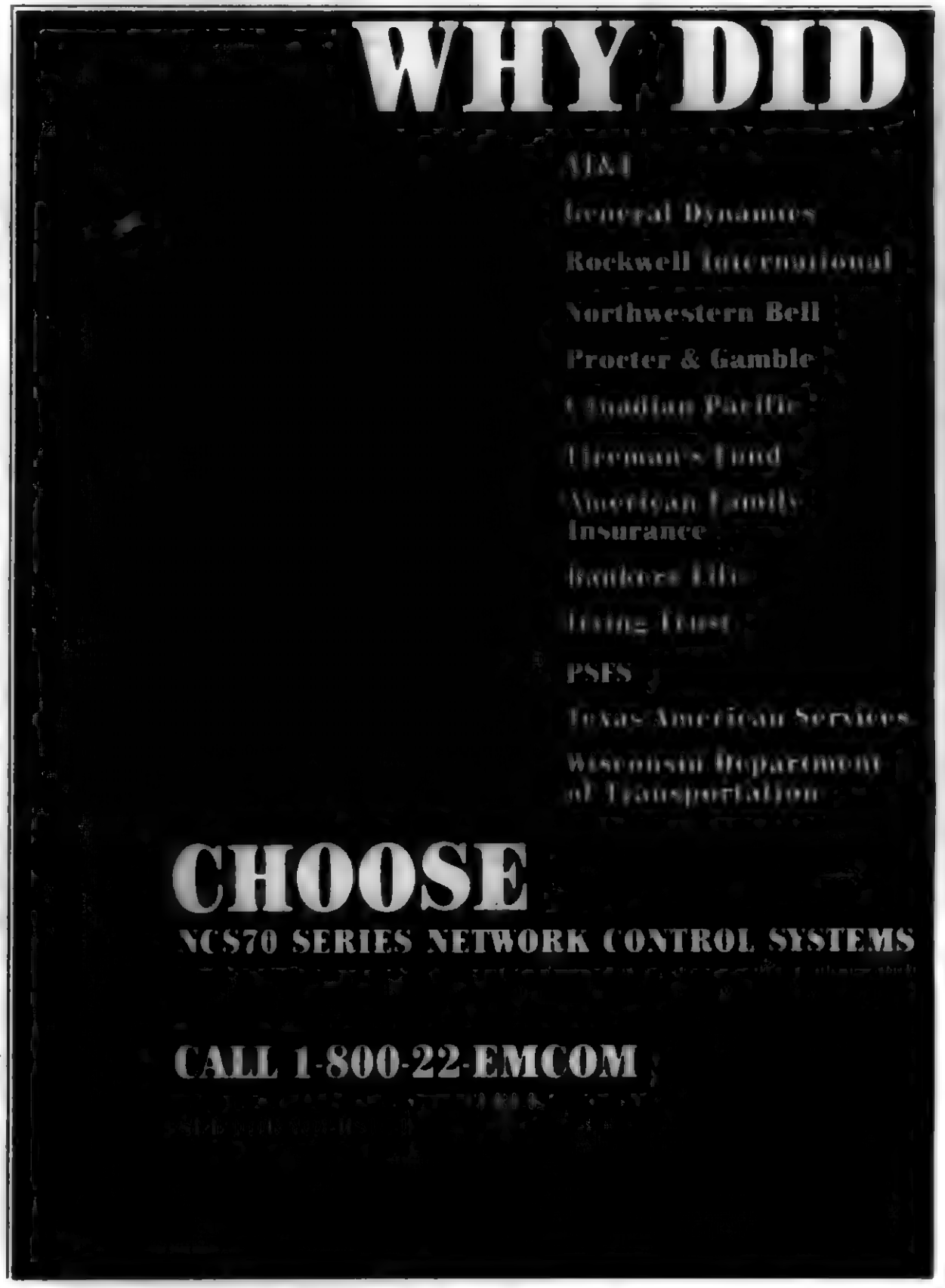
CMA Data A/S has introduced **CMA-Spool**, software said to let remote sites or departmental users control their own IBM 3270 printers.

The software was designed for 3270 VTAM print networks in MVS and MVS/XA installations. It supports TSO, IMS/DC, CICS and Software AG of North America, Inc.'s Complete under one spooling system.

Features include the ability to route spool files to another printer and requeue processed spool files for reprinting.

CMA-Spool costs $11,000.

CMA Data A/S, c/o Symark International, 31600 Rustic Oak Drive, Westlake Village, Calif. 91361.



NEW PRODUCTS/SOFTWARE & SERVICES

Cosmic has announced **Tapecert**, an interactive program for testing the usability of magnetic tapes at different densities.

Tapecert is said to allow the user to select the tape density, the test pattern to use, the number of allowed retries and whether to allow extended interrecord gaps to skip past bad spots on the tape.

The program displays system error messages and record count information, with totals every 1,000 blocks. Command procedures can be set up with defaults for different types of certification runs.

Fortran 77 source code is available for $400.

Cosmic, The University of Georgia, Athens, Ga. 30602.

■

Pelorus Equipment, Inc. has enhanced its **P3423K** diskette subsystem.

The subsystem comes with the vendor's Diskutil software and now provides both read and write capabilities for IBM formatted 8-in. diskettes on any model of the Hewlett-Packard Co. HP 3000 family of computers. The subsystem utilizes two RS-232C ports.

The P3423K diskette subsystem costs $6,000. It can be rented for $600 per month.

Pelorus Equipment, S. Wilson Road, Bedford, Mass. 01730.

■

Triangle Software Co. has announced **Release 5.2** of **JCLcheck** and **Release 4** of the **Prodict** program.

JCLcheck is a utility that is said to detect and diagnose all job control language errors before a program is submitted for test or production runs.

Added features include graphics flowcharts, automatic extraction of procedure library information and Cobol exit enhancements, the vendor said.

Prodict maintains an online dictionary of all production jobs, job networks, data sets, programs and cataloged procedures.

New features of Prodict include easier access to dictionary information for IBM ISPF users.

Both programs run under the OS/VS operating system. JCLcheck also supports VM/CMS and MVS/XA. JCLcheck costs $17,825. Prodict costs $10,250.

Triangle Software, Suite 275, 4340 Stevens Creek Blvd., San Jose, Calif. 95129.

Training software

Intelligenceware, Inc. has announced **Experteach-II**, an expert system product for the IBM Personal Computer.

Experteach-II is a guide to expert system technology consisting of a collection of tutorials, case studies, online and interactive teaching programs, building tools with source code, sample systems and artificial intelligence languages.

Users can build their own expert systems and experiment with a variety of tools and languages, according to the vendor.

Experteach-11 is priced at $475.

Intelligenceware, Suite 730, 9800 S. Sepulveda Blvd., Los Angeles, Calif. 90045.

■

Innovative Software Solutions, Inc. has released **Version A.02.03** of its **Image/3000: Principles and Utilities** module of the Teachme/3000 computer-based training series.

The series runs on Hewlett-Packard Co. HP 3000 computers.

The Image/3000 module has been enhanced to include material on HP's Turboimage data base management system.

The enhanced module will be distributed free to current users of the Teachme/3000 Image module.

The price of the module for new users is $750.

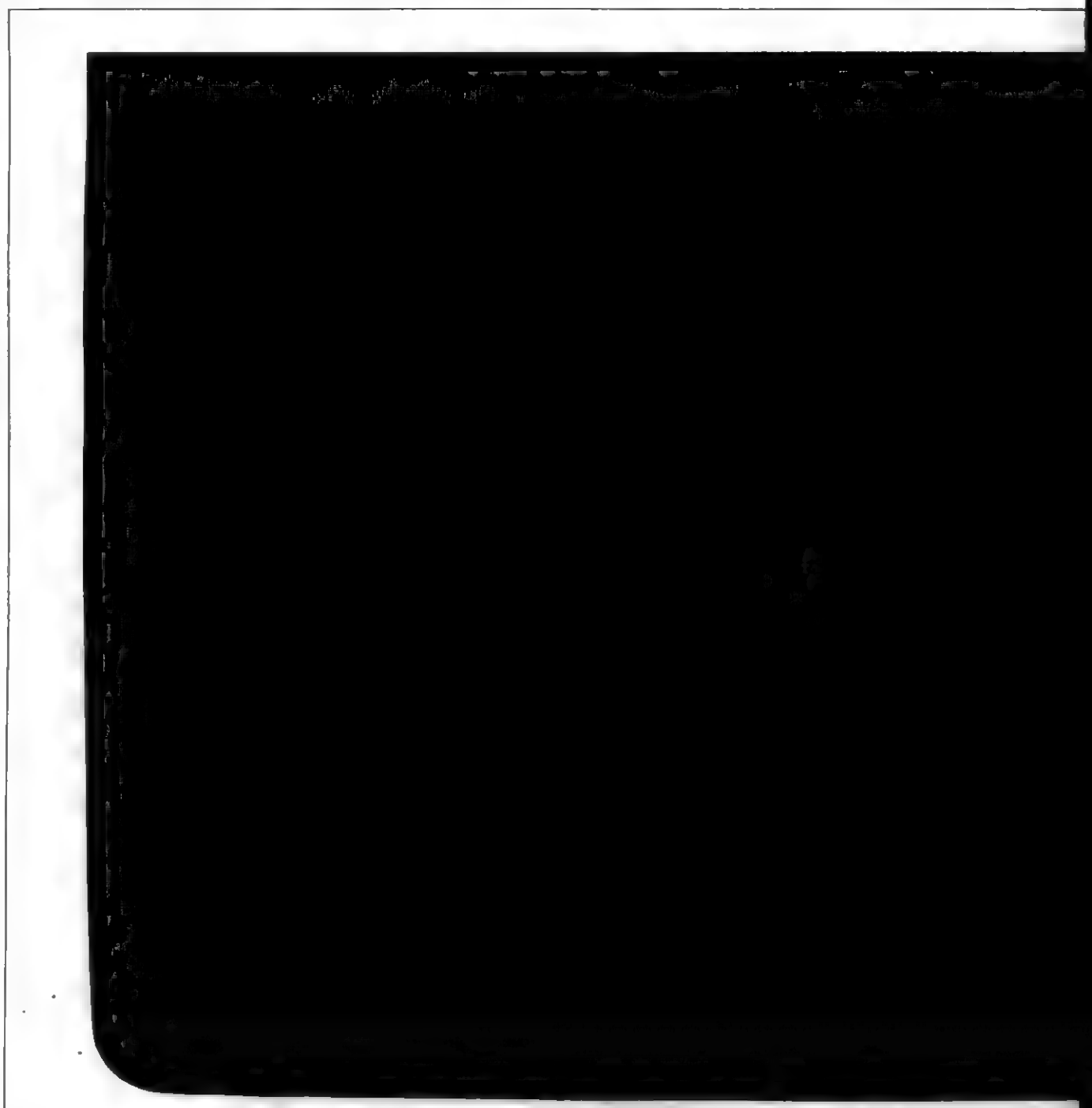
The module and the Teachme driver program combined can be purchased for $1,750.

Innovative Software Solutions, 10705 Colton St., Fairfax, Va. 22032.

Innovative Software Solutions, Inc. has added **Getting Started with Dictionary/3000: Part 2** to its Teachme/3000 series of computer-based training modules for the Hewlett-Packard Co. HP 3000.

The module, intended as a complement to the Getting Started with Dictionary/3000 module, was designed for users with little or no experience with Dictionary/3000.

The module costs $900.



An IBM Color Display.

It can really boost an operator's efficiency. That's what REJIS found out. REJIS is the Regional Justice Information Service in St. Louis.

This information service is a trendsetting, government criminal justice network linking 120 different agencies to a central computer.

REJIS quietly initiated a pilot program using IBM 3179 Color Displays. The units were tested under everyday conditions. Default colors were used, so no software changes had to be made. The quiet test turned into a smashing success.

End users were amazed to see how data popped and how mistakes

NEW PRODUCTS/SOFTWARE & SERVICES

The module and the Teachme driver program combined cost $1,900.

The price of both Dictionary modules combined with the Teachme driver is $2,900.

Innovative Software Solutions, 10705 Colton St., Fairfax, Va. 22032.

Services

Data General Corp. has recently introduced the **Data General On-line Information Service** (OIS).

Operating over the Compuserve, Inc. network, the system is available for all users of Data General computers in the U.S. and Canada and can be dialed 24 hours a day.

Users can gain access to 12 independent hardware and software vendors from whom they can obtain technical information or software patches to overcome known bugs.

They may also submit specific questions about their systems to OIS, which Data General will answer.

Prices range from $40 per hour for general information to $70 per hour for downloading software. There is no charge to sign up for the service or to log on.

Fees are incurred only when a specific service is used, a Data General spokesman said.

Data General, 4400 Computer Drive, Westboro, Mass. 01580.

MICROS

Systems

Bondwell has introduced the **Bondwell 8**, a lap-sized IBM-compatible portable computer.

The Bondwell 8 features 512K bytes of random-access memory, a built-in, 3¼-in., 720K-byte floppy disk drive and 80-col. by 25-line backlit LCD graphics display. It also includes a rechargeable battery, red-green-blue and composite video outputs, RS-232C serial port, Centronics Data Computer Corp. printer port, 300 bit/sec. modem and Microsoft Corp. MS-DOS and GW-Basic software.

The Bondwell 8 reportedly will run IBM-compatible software, including Lotus Development Corp.'s 1-2-3 and Symphony.

The Bondwell 8 costs $1,595.

Bondwell, #10 3300 Seldon Court, Fremont, Calif. 94539.

■

Panasonic Industrial Co. has announced the **Business Partner** IBM Personal Computer-compatible computer and the **Business Partner 286**, an IBM Personal Computer AT compatible.

Business Partner includes six open expansion slots. It offers switch-selectable 4.77- to 7.16-MHz speed and includes 256K bytes of random-access memory (RAM).

Business Partner 286 offers 10 expansion slots, two hard disk drives and two floppy drives. It has 512K bytes of RAM.

Business Partner costs $1,295 with a 5¼-in., 360K-byte floppy disk drive and $1,495 with two disk drives. Business Partner 286 costs $2,795 with a 5¼-in., 1.2M-byte floppy disk drive and $2,995 with two drives.

Panasonic, One Panasonic Way, Secaucus, N.J. 07094.

■

Unbound, Inc. has announced new versions of its **Qube** transportable Digital Equipment Corp. Q-bus-compatible computer.

The Qube family starts with the Q1 Master Module, including four Q-bus quad slots, a 22M- or 44M-byte disk and either a dual RX50 floppy or ¼-in. cartridge tape device. It can be expanded with four additional Q-bus slots and peripheral mounting space for two additional 5¼-in. disk or cartridge tape devices.

Prices range from $6,995 to $19,195.

Unbound, 15239 Springdale St., Huntington Beach, Calif. 92649.

■

Bondwell has upgraded both its **Bondwell 18** transportable computer and its **Bondwell 36** IBM-compatible desktop personal computer.

The new Bondwell 18 features 640K bytes of random-access memory, two 5¼-in. floppy disk drives, built-in 9-in. amber monitor, built-in color graphics, serial and parallel ports, battery-backed real-time clock and Microsoft Corp. MS-DOS and GW-Basic.

The Bondwell 36 now fea-

Continued on page 91

were easier to catch.

Soon, REJIS end users everywhere wanted IBM 3179 Color Displays. The result — IBM color displays are now being placed throughout the REJIS network.

Whether you have a small departmental system or a large computer, there's a range of IBM color displays and color graphic displays that could help enhance your network's efficiency.

For your free demonstration diskette, "Why Color," call 1 800 IBM-2468, Ext. BT/90. Or contact your IBM marketing representative.

Call today.

IBM

AT&T 724 Multiplexer

AT&T DATAPHONE II
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AT&T PC 6300
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AT&T Multifunction Communication System

AT&T 455
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It's a full line of modems, Data Service Units and multiplexers that combine network managing and diagnostic capabilities to deliver maximum uptime from an integrated *system*.

The mainframe connection. When you're in the 3270 environment, the AT&T 6500 Multifunction Communication System makes a lot of sense. Full compatibility, access to multiple synchronous or asynchronous hosts, plus powerful multitasking, put maximum mainframe muscle on the desktop.

AT&T 3B Computers working with our BSC/SNA connectivity software give you departmental processing of mainframe data.

We make the pieces fit. Flexibility and adaptability set AT&T networks apart in both local and departmental use. Systems like the AT&T STARLAN NETWORK and 3B NET give you the network best suited to corporate requirements with no sacrifice in control of your computer resources.

And with our Information Systems Network (ISN), you can even link your current systems and networks to equipment from other manufacturers.

Computers made to communicate. Both the AT&T PC 6300 line and the AT&T **UNIX**™ PC merge computing with communications. Optional or built-in modems and communications management software make simultaneous voice and data exchanges as simple as a few keystrokes.

And thanks to **UNIX** System V, the entire AT&T 3B Computer family offers integrated and flexible communications for departmental computing solutions.

A compatible family. AT&T **UNIX** System V-based computers are compatible within the line. And beyond that, AT&T offers computers, terminals and printers that are operationally compatible with accepted market standards.

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And we've got the Ring to prove it.

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Continued from page 87

tures a 20M-byte hard disk drive instead of the original 10M-byte hard drive.

The Bondwell 18 is priced at $1,295, and the Bondwell 36 costs $1,500.

Bondwell, #10 3300 Seldon Court, Fremont, Calif. 94539.

■

Tandem Computers, Inc. has unveiled the **6AT/20** and the **6AT/40**, two IBM Personal Computer AT-compatible workstations that reportedly can function as stand-alone units or as fully integrated system terminals for Tandem Nonstop systems.

The 6AT/20 has a 20M-byte internal hard disk drive; the 6AT/40 has a 40M-byte internal hard disk drive.

Both are expandable to 80M bytes of disk storage and 11M bytes of random-access memory. They come standard with Microsoft Corp.'s MS-DOS 3.1, eight IBM PC AT-compatible option slots and a detachable keyboard.

The 6AT/20 costs $3,995, and the 6AT/40 costs $4,495.

Tandem Computers, 19333 Vallco Pkwy., Cupertino, Calif. 95014.

■

PC's Limited has introduced the **Executivetwin**, a system said to allow two users of a single IBM Personal Computer to share functions.

Two users can simultaneously share the system's CPU, peripherals and program functions. It features file security through 64 levels of password, file locking and electronic mail.

The system consists of an add-on board, software, cable, monitor and an IBM-compatible keyboard.

Executivetwin costs $495.

PC's Limited, Building 3, 1611 Headway Circle, Austin, Texas 78754.

Software applications packages

Databases Unlimited, Inc. has announced **Cato Version 1.1**, a productivity enhancement software package for the Wang Laboratories, Inc. Professional Computer and Advanced Professional Computer.

Cato is said to offer six functions: calendar/appointment book, notepad, Wang Word Processing emulation, calculator, phone book and clock. The product resides in 60K bytes of memory.

Cato Version 1.10 costs $86.75.

Databases Unlimited, 36 E. 29th St., New York, N.Y. 10016.

■

International Microsystems, Inc. has announced **Labelmaker**, a full-color label-ing system.

According to the vendor, the program will create programmable read-only memory (PROM) and general-purpose labels. Labelmaker allows the user to define label type and size from a stock library.

Labelmaker runs on an IBM Personal Computer or compatible using Microsoft Corp. MS-DOS 2.

Labelmaker costs $1,995, including an eight-color printer and a stock of 10,000 PROM labels.

International Microsystems, 11564 C Ave., Auburn, Calif. 95603.

■

Market Statistics and **Knowledge Access** have announced **Your Marketing Consultant**, a data software package said to offer market data as well as software for manipulating the data.

Your Marketing Consultant allows users to select and rank target markets based on demographic and socioeconomic criteria and select advertising targets and test markets.

The package costs $950.

Market Statistics, 633 Third Ave., New York, N.Y. 10017.

■

Printers Software, Inc. has introduced its **Hourly Rate Budgeting** package for personal computers.

The software was designed to determine the hourly rates that should be charged for cost/work centers. It calculates labor, machine value, rent, heat, insurance, depreciation, light, power, fringe benfits, supervision, taxes, direct supplies, factory overhead, adminstrative and billing expenses and more.

Hourly Rate Budgeting is priced at $995.

Printers Software, 1395 Rt. 23, Butler, N.J. 07405.

SuperProject+

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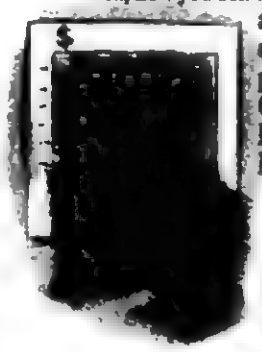


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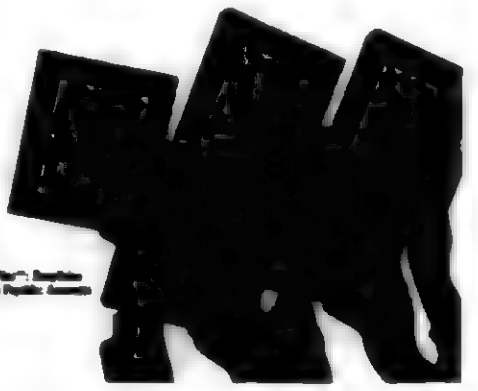
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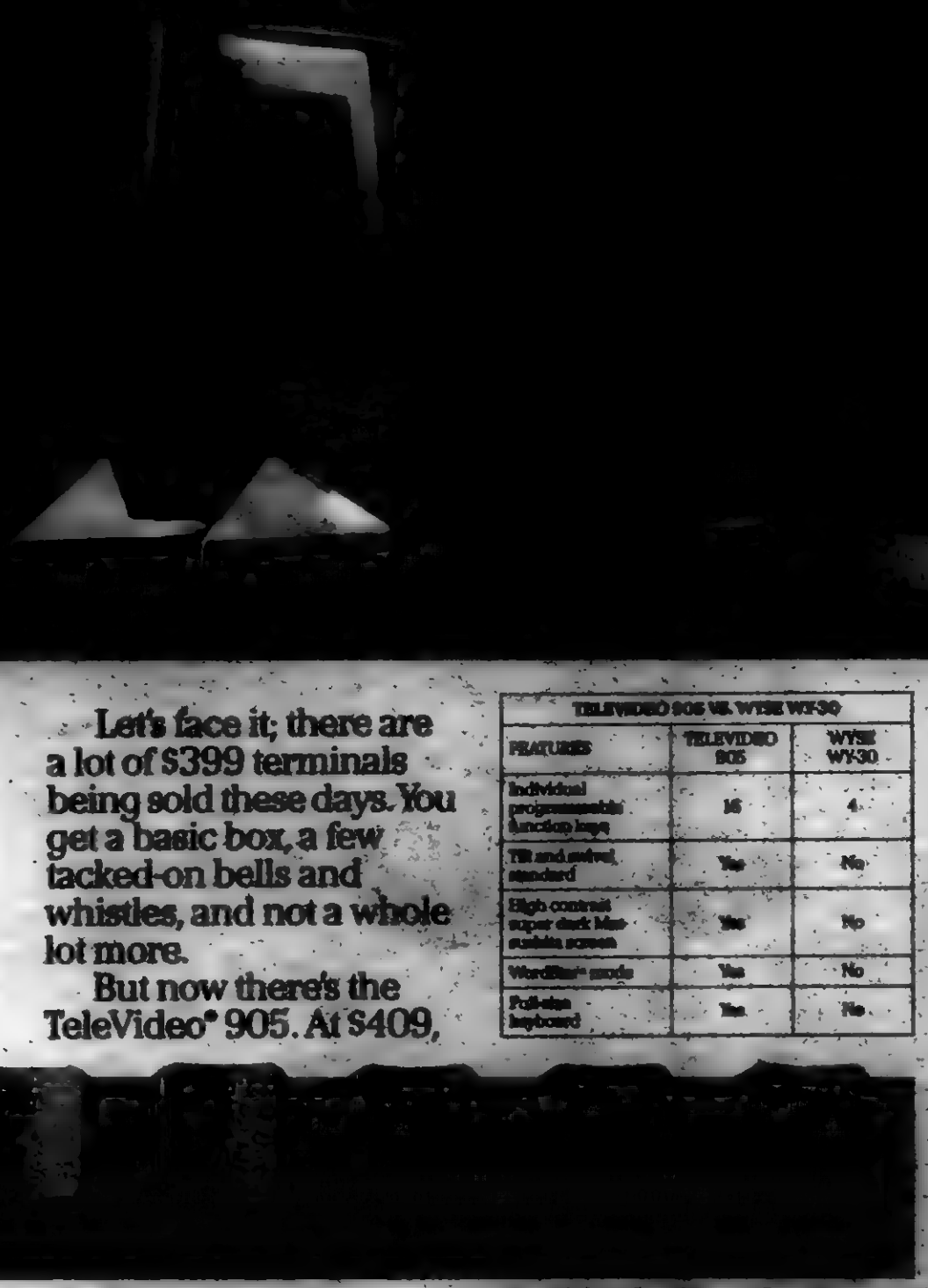
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The TeleVideo 905 terminal. What a difference $10 makes.



Let's face it; there are a lot of $399 terminals being sold these days. You get a basic box, a few tacked-on bells and whistles, and not a whole lot more.

But now there's the TeleVideo® 905. At $409, it has a feature set so powerful, your customers will think they're sitting at an expensive workstation.

For example, there's a sleekly designed monitor case with full tilt and swivel.

A full-size keyboard with sculptured keycaps for smooth, comfortable typing. Sixteen non-volatile, programmable function keys. Key-switches that have been tested to 100,000,000 strokes. Even an enhanced numeric keypad.

There's also a buffered printer port. And, of course, compatibility with the TeleVideo 925 command set, the most popular and widely emulated ASCII command set in the world.

The TeleVideo 905. What a difference $10 makes.

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WordStar® mode	Yes	No
Full-size keyboard	Yes	No

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NEW PRODUCTS/MICROCOMPUTERS

Comshare, Inc. has announced the **Applicant Tracking System** for its Profiles/PC human resources information system for the IBM Personal Computer.

Applicant tracking was designed to help companies fill job positions, respond to job applicants, generate government reports and create customized report formats.

Specific features include skills matching, automatic letter generation and predefined reports.

Applicant Tracking costs $3,200 or $2,100 for companies with Profiles/PC Employees Recordkeeping.

Comshare, P.O. Box 1588, 3001 S. State St., Ann Arbor, Mich. 48106.

■

Polaris Software has announced **Polaris Forms** software for creating custom business forms that supports Hewlett-Packard Co. Laserjet and Laserjet Plus functions.

Polaris Forms is said to allow users to design or update forms with text, graphics and shading positioned within 0.001 in. The program can merge form information from a variety of sources and lets users choose from several different ways to fill out forms.

Other features include automatic time, date and numbering functions.

Polaris Forms runs on the IBM Personal Computer and compatibles. It costs $149.

Polaris, Suite 205, 310 Via Vera Cruz, San Marcos, Calif. 92069.

■

Computer Business Consultants, Inc. has introduced **Little Blue**, a text editor for the IBM Personal Computer, Personal Computer XT, AT and compatibles.

Little Blue offers text formating functions such as margins, tabs, paragraph indenting and right justification; a set feature to block text; file append; a jump command for moving to a section of text; search-and-replace functions; support for subdirectories; and one-step printing.

Little Blue is priced at $49.95.

Computer Business Consultants, Suite 325, 20121 Ventura Blvd., Woodland Hills, Calif. 91364.

■

Handle Technologies, Inc. has ported its Unix-based office automation software, including **Handle Calc** and **Handle Writer/Spell**, to the Santa Cruz Operation, Inc. Xenix V operating system.

Both packages share a common context-sensitive, soft-key-driven interface and document data base.

Prices start at $395 for Handle Writer/Spell and $295 for Handle Calc.

Handle Technologies, Suite 900, 7600 San Felipe, Houston, Texas 77063.

■

The Software Resource Group has added **Outline** to its Brown Bag Software products.

Outline is an outline processor for use with the IBM Personal Computer and compatibles. It is a writing tool that reportedly helps organize and structure data for documents, memos, reports and letters.

It can automatically number, perform macros, transfer between windows and number formats.

Outline costs $89.95.

The Software Resource Group, 2105 S. Bascom, Campbell, Calif. 95008.

■

LBMS, Inc. has announced **Leap**, a software-supported method for strategic information technology and data planning.

Leap is said to use elements of business analysis to produce a plan for phased system development.

Leap is supported by Super-Mate software that includes a knowledge base used to evaluate current system strategies and to recommend future directions for information technology. Super-Mate runs on IBM Personal Computer ATs, XTs and compatibles.

Leap is packaged as method, software, technical training and consulting. A typical package costs $29,000.

LBMS, Suite 800, 2900 North Loop W., Houston, Texas 77092.

■

LBMS, Inc. has introduced **Auto-Mate**, a tool said to supplement and reinforce a foundation of integrated techniques and methods called LSDM, LBMS's Structured Development Method.

Auto-Mate guides users through the development cycle with graphics and documentation support. Mouse-driven graphics support the creation and maintenance of logical data structures, data flow diagrams and entity life histories.

Standard reporting as well as ad hoc reports are available.

Auto-Mate runs on the IBM Personal Computer AT, XT and compatibles. It costs $4,000.

LBMS, Suite 800, 2900 North Loop W., Houston, Texas 77092.

■

DCC Data Service has introduced **On-Line Locator**, a program said to automatically match a company's customer with its closest distribution point.

The program allows network organizations to identify proximity of location. It incorporates a data base of longitude and latitude information. The caller's ZIP code or city and state are used to determine coordinates.

On-Line Locator, for the IBM Personal Computer XT or AT costs $1,495.

DCC Data Service, #610 1990 M St. N.W., Washington, D.C. 20036.

■

Pal Systems has announced **Beagle**, a data analysis system for IBM Personal Computers, Digital Equipment Corp. VAX and Hewlett-Packard Co. HP 3000 systems.

Beagle is said to test hypotheses and propose hypotheses for testing.

Output can be either a set of decision rules for classifying examples in a form that the package can use and that the user can understand or those same rules expressed as programs, currently available in Fortran, Pascal, Basic and C. Reportedly, Beagle rules can be plugged into any software the user writes.

PC-Beagle costs $398. VAX-Beagle costs $1,198.

Pal Systems, 3139 E. Almond Ave., Orange, Calif. 92669.

NEW PRODUCTS/MICROCOMPUTERS

Software languages

Software Merchants Unlimited, Inc. has announced **Systems Implementation by Example (Simple)**, a fourth-generation application development language.

It is said to employ a visual interface that allows users to develop complete business applications without using procedural code.

According to the vendor, Simple can be used in all stages of the system's development life cycle, from systems analysis through design, programming, testing, maintenance and documentation.

Sample runs on an IBM Personal Computer or compatible, according to Software Merchants Unlimited.

It is priced at $995.

Software Merchants, 3767 Overland Ave., Los Angeles, Calif. 90034.

Barrington Systems, Inc. has introduced **Clarion**, a structured programming language designed for commercial applications.

Features include integrated utilities, interactively designed screen and report layouts and data files that permit the use of multiple composite keys.

Clarion also features application programs supporting field-level editing, Help screens, multilevel windows, support for networking, record sharing and record locking as well as a debugger.

The complete Clarion package includes a set of 12 interactive utility programs.

It runs on an IBM Personal Computer or compatible.

Clarion costs $295.

Barrington Systems, 150 E. Sample Road, Pompano Beach, Fla. 33064.

Software utilities

Generic Software, Inc. has introduced **Auto-Convert**, an add-on package for transferring drawing files from Autodesk, Inc.'s Autocad to the vendor's Generic Cadd and vice versa.

According to the vendor, all major drawing components and text can be transferred between the two programs.

Auto-Convert reportedly can also bring three-dimensional drawings from Megacadd's Design Professional software as well as Microcadd's 3-D package to Generic Software's Generic Cadd.

Auto-Convert, one in a series of modular packages, is priced at $24.95.

Generic Software, 8763 148th Ave. N.E., Redmond, Wash. 98052.

Data Management Consultants has introduced **Zview**, a C programmer's screen development tool for the IBM Personal Computer.

Zview offers security checking and Help screen displays at both the screen and field levels.

Other features include the automatic conversion of data types to and from ASCII screen format, a range of optional data field characteristics, a screen painter and windows.

Zview is priced at $245.

Data Management Consultants, #7 5325 S. Valley View Blvd., Las Vegas, Nev. 89118.

■

North America Mica, Inc. has introduced the **Plot-II** plotter package for IBM PC-DOS-, Microsoft Corp. MS-DOS- and Digital Research, Inc. CP/M 86-based microcomputers.

Plot-II is said to generate color keyed and time-scaled project diagrams, bar charts, earned value and costs control histograms or line graphs for projects managed with the vendor's PMS-II critical path software.

Plot-II costs $695.

North America Mica, Suite 110, 5230 Carroll Canyon Road, San Diego, Calif. 92121.

■

The Laser Connection has announced **Softype**, downloadable fonts on floppy disks, and **Popset**, a pop-up utility that lets laser printer users control their printers through the keyboards of personal computers.

Both packages were designed for use with QMS, Inc.'s QMS Kiss, Big Kiss and Smartwriter laser printers.

Popset features commands for margins, font selection, line and character spacing, paper source, common application setups, emulation modes and copy counts. It is random-access memory-resident.

Softype costs $199. Popset costs $59.

The Laser Connection, P.O. Box 850296, Mobile, Ala. 36685.

■

Taylortechnical Corp. has announced **Perform II**, performance measurement software for IBM Personal Computers, XTs and ATs.

Perform II is said to provide the ability to monitor productivity. It compares actual hours with earned hours and calculates percentage of performance.

Data is stored on a daily, weekly, monthly and year-to-date basis.

Perform II is priced at $495. A Perform II Sort Utility is available for $195.

Taylortechnical, P.O. Box 1578, Bloomington, Ind. 47402.

■

Clarity Software Corp. has announced **Cell/Mate**, software said to combine automatically produced English documentation features and error-checking capabilities for Lotus Development Corp. 1-2-3 and Symphony worksheets.

Cell/Mate automatically produces an English description of the contents of a cell, row or column as well as documentation of a formula and all cells used by the formula.

It also produces a list showing

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where a cell is referenced by other formulas.

Potential errors and trouble spots are identified in more than 30 reports.

Cell/Mate is priced at $89.

Clarity Software, Suite 206, 13276 Research Blvd., Austin, Texas 78750.

■

Xerox Corp. has introduced **Scan 'N File** and **Scan 'N File w/ Editor**, software that enables a Xerox Telecopier 295 to scan text and graphics images from paper documents directly to a computer disk.

The software works with Xerox 6060 family personal computers as well as the IBM Personal Computer and compatibles.

Scan 'N File allows the documents to be displayed, edited, printed and stored once on disk. Scan 'N File w/ Editor allows users to cut and paste, type over, draw on or erase all or parts of documents. Files can be merged with documents created by other applications packages.

Scan 'N File costs $595. Scan 'N File w/ Editor costs $995.

Xerox, 800 Long Ridge Road, Stamford, Conn. 06904.

■

Sterling Software, Dylakor Division has announced **Dyl-280 II VMPC/370**, a version of its Dyl-280 II information management utility for the IBM Personal Computer XT/370 and Personal Computer AT/370 computers running IBM's VMPC operating system.

The product allows users to test and develop Dyl-280 II programs at the microcomputer before submitting them to the host for processing.

It also allows users to retrieve and update almost all mainframe data base and file structures including IMS, IDMS, Sequential and ISAM.

Dyl-280 II VMPC/370 is available for a monthly fee of $15 per PC.

Sterling Software, P.O. Box 3030, 17418 Chatsworth St., Granada Hills, Calif. 91344.

■

Attachmate Corp. has announced the **3270 Host Graphics Program**, designed to allow personal computer users to access host-generated color graphics.

The product uses the vendor's IBM- and Digital Communications Associates, Inc. Irma-compatible 3-N-1 Coax Adapter and 3270-PC Emulation Program to manage up to four concurrent host sessions. Full IBM 3270 Personal Computer graphics screens can be displayed.

The product supports both the IBM Color Graphics Adapter and the Enhanced Graphics Adapter.

The Attachmate 3270 Host Graphics Program costs $595. The 3-N-1 Coax Adapter costs $1,195.

Attachmate, 3241 118th S.E., Bellevue, Wash. 88005.

Software data base management systems

CSDC, Inc. has announced **Rolodex with Kardindex**, a data base and record-keeping system for IBM, Texas Instruments, Inc. and other Microsoft Corp. MS-DOS personal computers.

The program features a card indexing system, a label maker, a universal filing system and either an accounts receivable system or inventory control system.

No programming skills are required for operation. A scan feature links entries to a detailed sort key. Up to 750 sort selections and 12 sort arrangements are provided.

Rolindex with Kardindex costs $69.95.

CSDC, 7844 Kendalia, Houston, Texas 77036.

Software enhancements

Forth, Inc. has announced **Polyforth ISD-4**, a version of its Polyforth integrated software development package.

The new version includes a multitasking, multiuser operating system with a complete set of resident tools for interactive software development. It has drivers for serial multiplexers and a programmable read-only memory programmer utility.

Two memory management features have also been added: run-time overlays for IBM Personal Computers and random-access memory disk support for IBM Personal Computers and Motorola, Inc. 68000-based systems.

Polyforth systems cost from $2,450 to $3,875.

Forth, 111 N. Sepulveda Blvd., Manhattan Beach, Calif. 90266.

■

Quadram Corp. has announced enhancements to its **Microfazer II** universal printer buffer.

New features include printer support capabilities. It is now compatible with Hewlett-Packard Co. plotters requiring reverse channel protocol and the Diablo Systems, Inc. 630-type environment requiring End of Transmission/Acknowledgment protocol.

Microfazer II is said to buffer print data without using up any computer memory. It also features front panel switch selectivity and a bypass mode for unbuffered operation with hardware handshaking.

Prices begin at $375.

Quadram, One Meca Way, Norcross, Ga. 30093.

■

Compuvision International has announced **Giraph Business Graphics 6**, a graphics software program for IBM Personal Computers.

Giraph 6 is said to provide multiple choice fill-in-the-forms menus. It

Continued on page 96

How do you answer those tough questions about VAX resource usage? Quantum RS.



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The Logical Choice

NEW PRODUCTS/MICROCOMPUTERS

Continued from page 95

also has improved data entry procedures and graphics features including up to 1,000 data points; optional automatic placement of bar values above or in the bars, and pie values outside or inside the pie slices; and plotter output to any communication or printer port for network compatibility.

Giraph 6 costs $99.

Compuvision International, P.O. Box 1287, Old Chelsea Station, New York, N.Y. 10013.

■

CSDC, Inc. has announced **Version 3.2** of **The Director** hard disk, local-area network management program for Microsoft Corp. MS-DOS personal computers.

The Director is said to provide a menu-driven shell that allows users to call up programs, batch files, local-area network functions and MS-DOS functions with a single keystroke.

The Director also offers password protection and a display sequencer and is said to be fully compatible with networking systems.

The Director is priced at $69.95.

CDSC, 7844 Kendalia, Houston, Texas 77036.

■

Trillian Computer Corp. has added synchronized audio and animation to its **Trillian Demo Generator Concurrent Authoring System.**

The audio and animation synchronization mechanism allows the author to create a demo or tutorial and then add sound. The author can identify frames in the tutorial and write the sound script in blocks corresponding to those frames.

The system costs $6,800. The cassette player, headphones and computer interface cost $197.

Trillian Computer, Suite One, 405 Alberto Way, Los Gatos, Calif. 95030.

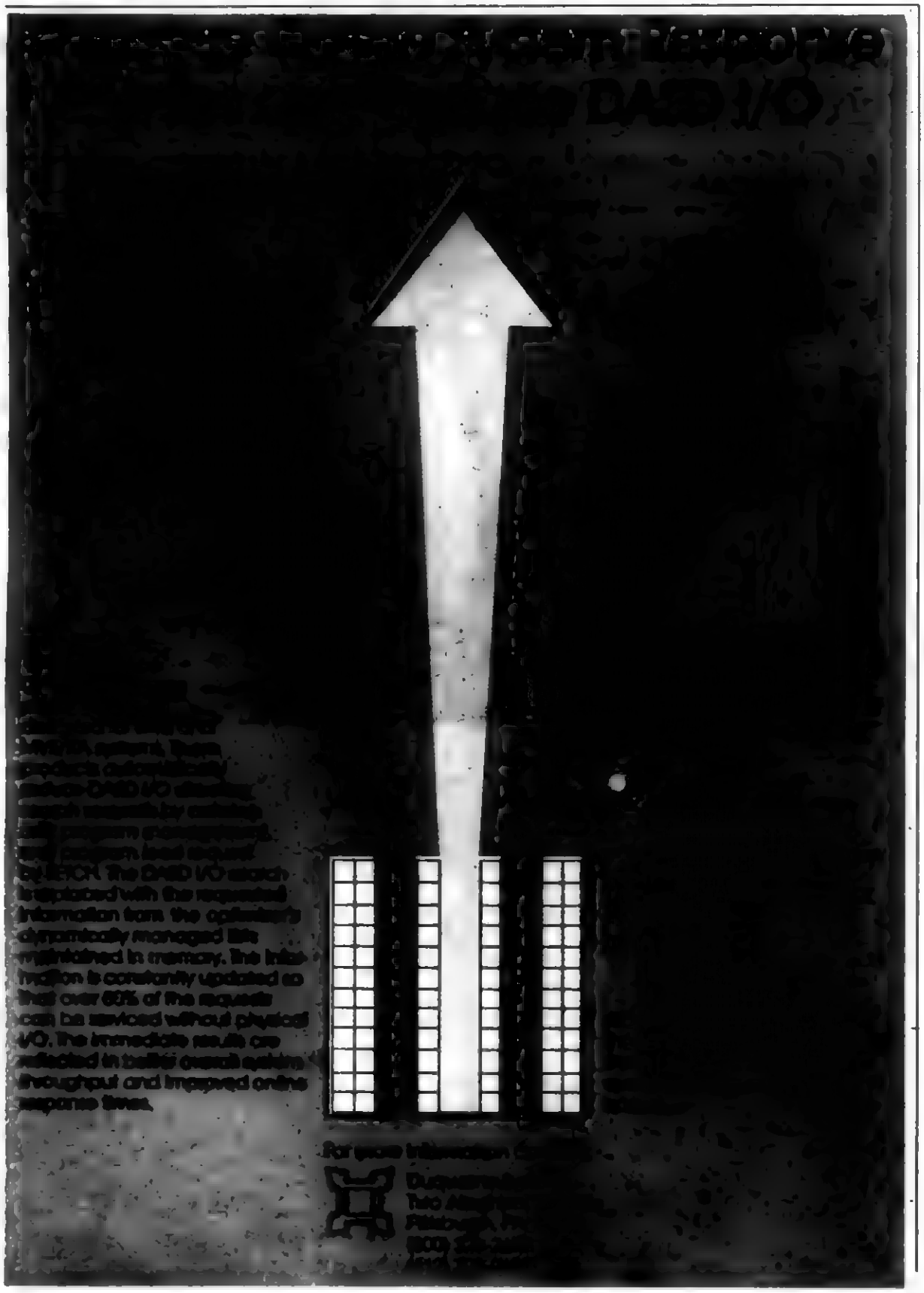
■

Brooks Scientific, Inc. has announced an **equation solver** for use with the vendor's PCTran Plus modular finite element analysis program.

According to the vendor, the solver allows problems of unlimited size to be analyzed. There reportedly is no limit to the number of nodes, elements, constraints and degrees of freedom in a PCTran Plus analysis.

Prices start at $1,295.

Brooks Scientific, 55 Wheeler St., Cambridge, Mass. 02138.



West End Film, Inc. has announced **Version 2** of its **Brushwork** painting package for IBM Personal Computers and compatibles.

New features include unlimited number of brush styles, full color scan-in, full frisket and stencil capabilities, multiple screens and the ability to paint between them, brushes for mixing and smearing images and true-color video capture.

Brushwork is part of the vendor's Artwork Environment. Software costs from $750 to $2,500. A complete system costs $16,500.

West End Film, 1825 Q St. N.W., Washington, D.C. 20009.

■

DBI Software Products has released **Trajectories, Version 5.0.3,** said to produce professional statistical results.

Trajectories offers an interface to mainframe and other software programs. Version 5.0.3 includes expanded statistical functions such as programs for. two-way analysis of variance (Anova) with repeated measures and equal and unequal sample sizes and two-level nested Anova with equal and unequal sample sizes, Neuman-Keuls test and paired T-test.

Trajectories operates on Microsoft Corp. MS-DOS systems as well as Xenix systems. It costs $395.

DBI, Suite 100, 206 W. Michigan, Mt. Pleasant, Mich. 48858.

■

Lifetree Software, Inc. has announced that its **Volkswriter 3** word processor for the IBM Personal Computer is now available on 3½-in. media to run on the IBM PC Convertible and the Data General Corp. Data General/One.

Volkswriter 3 is a full-featured word processing program wih a 170,000 word on-disk spelling checker, automatic multifunction math, customized layouts and text merge.

Volkswriter 3 costs $295. Current owners can upgrade to the 3½-in. format for $50.

Lifetree Software, 411 Pacific St., Monterey, Calif. 93940.

■

Communication Sciences Corp. has released **Version 2** of its **Valet** desktop manager for IBM Personal Computers.

Version 2 includes file management functions such as automatic alphabetical listing of all files and subdirectories; a listing of paths to all subdirectories; the ability to locate a specific file in any subdirectory; and the ability to display the contents of a selected file in ASCII or hexadecimal formats.

It also provides the ability to delete a file in all subdirectories; the ability to move entire subdirectories as well as individual files; and the ability to copy entire subdirectories as well as individual files.

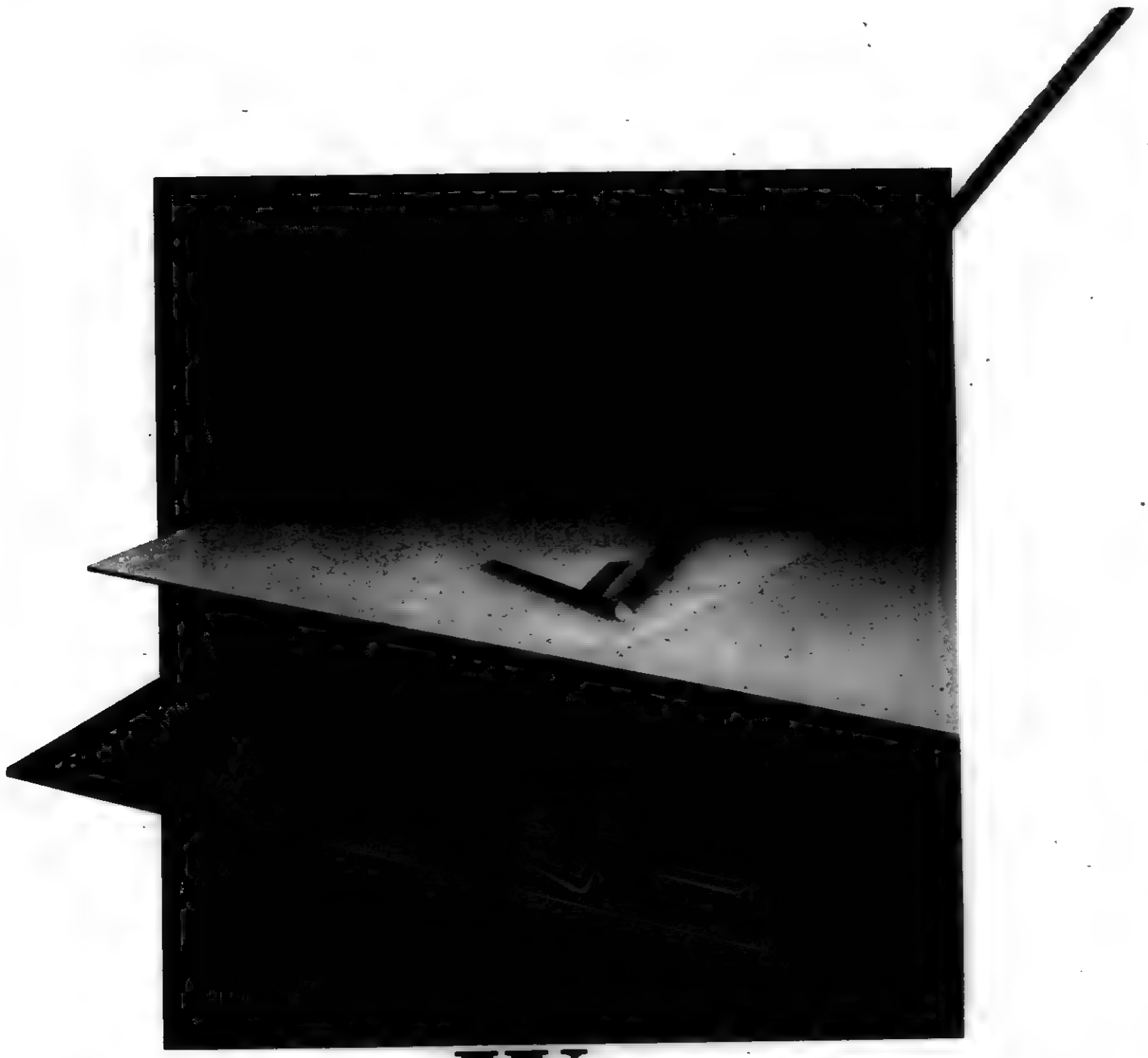
Valet costs $49.95.

Communication Sciences, Box 130, Route 1, Thornburg, Va. 22565.

Communications

Waterloo Microsystems, Inc. has announced the **SNA Irma Server** software product for its Waterloo Port Network Operating System for personal computers.

Continued on page 98



We Have Met The Competition...

NEW PRODUCTS/MICROCOMPUTERS

Continued from page 96

The SNA Irma Server is said to allow a single Digital Communications Associates, Inc. Irma board to be used by any personal computer in the Port network.

A Port network can support multiple SNA Irma Servers. Any PC in the network can emulate an IBM 3278 Model 2 terminal.

Users can perform one or more terminal sessions along with other concurrent activities on their PCs. Also, the SNA Irma Server produces an audit trail of mainframe sessions.

The SNA Irma Server costs $995.

Waterloo Microsystems, 175 Columbia St. W., Waterloo, Ont., Canada, N2L 5Z5.

■

Multi-Tech Systems, Inc. has introduced the **Multimodem 224EC**, a 2,400 bit/sec. internal-card modem said to incorporate the Microcom Networking Protocol (MNP) error correction protocol.

The modem was designed to fit all IBM Personal Computers, Personal Computer XTs, ATs and compatibles. It can operate in asynchronous environments and automatically detect and run with or without the MNP protocol.

Other features include Hayes Microcomputer Products, Inc. AT command set compatibility, autodial and autoanswer and half- or full-duplex operation.

The Multimodem 224EC comes packaged with Multicom PC communications software. The modem costs $699.

Multi-Tech Systems, 82 Second Ave. S.E., New Brighton, Minn. 55122.

■

David Systems, Inc. has introduced the **Integrated Personal Computer Adapter** (IPA), a plug-in board for linking IBM Personal Computers and compatibles to David's Ethernet-compatible local-area network.

The IPA is said to replace the Ethernet transceiver, coaxial cable and 3Com Corp. board. It works over existing telephone wiring. According to the vendor, the IPA and the user's telephone set can share the same wire for concurrent data and voice communications. An analog telephone set adapter using a standard RJ-11 plug is built into each IPA.

The IPA costs $595.

David Systems, 701 E. Evelyn Ave., Sunnyvale, Calif. 94086.

■

PC's Limited has introduced a **half-card modem** said to handle 2,400 bit/sec. transmissions.

The card is compatible with the IBM Personal Computer, Personal Computer XT, AT and compatibles. It features automatic or manual Originate and Answer functions and accommodates transmissions at 300 or 1,200 bit/sec. and in asynchronous mode.

Other features include an integral speaker with software volume control, accessible dip switches for setup, tone or pulse dialing, call progress detection and dual telephone jacks.

The modem costs $295.

PC's Limited, Building Three, 1611 Headway Circle, Austin, Texas 78754.

■

Genoa Systems Corp. has announced **Netsafe**, a local-area network tape server.

Netsafe consists of Genoa's Galaxy external tape backup and restore subsystem. It interfaces with the local-area network at the Netbios operating system level and allows users at any point on the network to program backup automatically. Background processing may proceed while backup and restore is in progress.

A 20M-byte external version of Netsafe costs $1,595, and a 60M-byte external version costs $2,295. Netsafe software is available for $199.

Genoa Systems, 73 E. Trimble Road, San Jose, Calif. 95131.

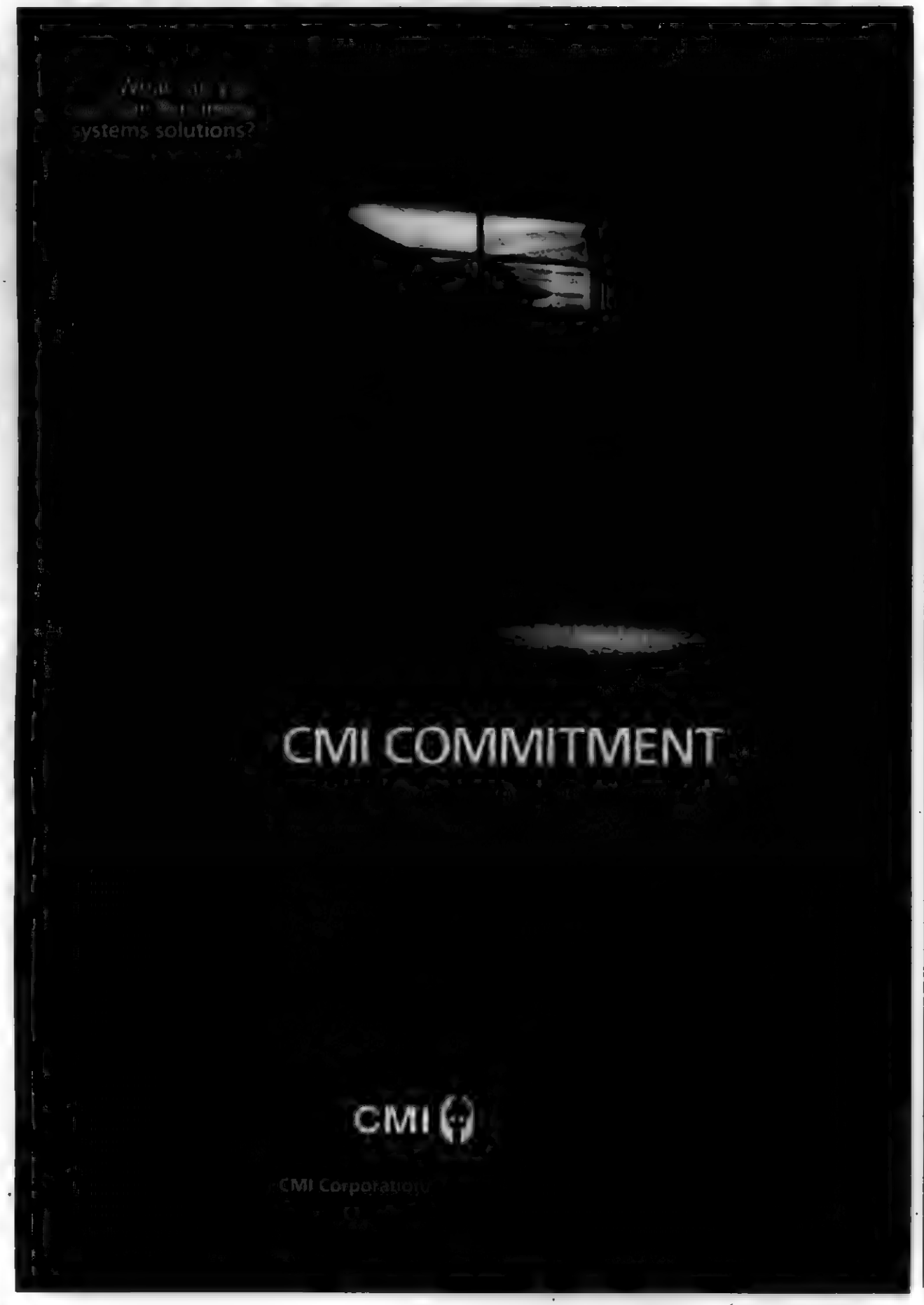
Data storage

Peachtree Technology, Inc. has introduced the **T-33SE**, a 33M-byte tape backup subsystem for the IBM Personal Computer, Personal Computer XT or AT.

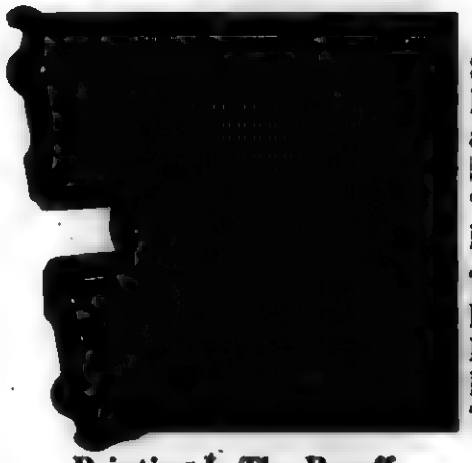
The T-33SE comes with two compact, automatically loading 20M-byte reels and an on-board error detection device.

The T-33SE is priced at $995. It is available in an internal version, the T-33SI, which costs $795.

Continued on page 100



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Storage Technology. It's More Than Our Name...It's Our Commitment.

Storage Technology Corporation Louisville, Colorado 80028-0001 1-800-782-6300.

Continued from page 98

Peachtree Technology, 3120 Crossing Park, Norcross, Ga. 30071.

■

CMS has introduced the **SCSI Power Twin 20:20** 20M-byte combination hard disk and tape backup peripherals in internal and external configurations.

The external configuration includes 20M-byte half-height small computer systems interface (SCSI) disk and tape drives, each of which contains an embedded large systems interface controller. Also included is the half-size CMS Personal Computer Host Adapter card, which allows the personal computer to communicate with the SCSI peripheral bus.

The internal SCSI disk and tape configuration includes a 20M-byte, half-height ¼-in. tape backup unit and CMS' 20M-byte SCSI Drive Plus expansion card drive.

The external unit costs $1,950, and the internal unit costs $1,660.

CMS, 401-B W. Dyer Road, Santa Ana, Calif. 92707.

■

Universal Peripherals International Corp. has announced **Trumpcard**, a 21M-byte Winchester storage subsystem for the IBM Personal Computer, Personal Computer XT and compatibles.

Trumpcard features the ability to support a second Winchester disk drive. The unit's disk-drive component contains two disks and four heads. It offers a transfer rate of 5M bit/sec. and an average access time of 80 msec.

Trumpcard was designed to operate with Micrososft Corp. MS-DOS and IBM PC-DOS 2 or higher.

Trumpcard costs $795.

Universal Peripherals International, Suite 330, Century Centre, 100 Homeland Court, San Jose, Calif. 95112.

■

AST Research, Inc. has introduced the **AST-2000**, a 3½-in. hard disk and tape small computer systems interface (SCSI) subsystem for Apple Computer, Inc. Macintosh Plus and IIe users.

The AST-2000 provides 20M bytes of external hard disk storage along with an integrated 20M-byte tape backup. It features an SCSI port, 3½-in. drive technology and built-in tape backup. The AST-2000 incorporates its own cache memory. It can also be used as a streaming backup device as well as a random-access device.

The AST-2000 is priced at $2,795.

AST Research, 2121 Alton Ave., Irvine, Calif. 92714.

■

N/Hance Systems has introduced the **N/Hance 525**, an optical disk system for users of IBM Personal Computer- or compatible-based computer-aided design or manufacturing systems.

The N/Hance 525 is a write-once, read-many-times system. It provides 230M bytes of formatted storage and includes an optical disk drive, a 5¼-in. disk, an IBM PC short-board controller and device driver software. It has a data transfer rate of 2.5M bit/sec. and can be mounted inside the computer or used externally.

N/Hance 525 costs $3,495. An optional text data base management file system that can index up to one million words costs $1,000.

N/Hance, 908R Providence Highway, Dedham, Mass. 02026.

■

Western Digital Corp.'s Enhanced Peripherals Division has introduced **Filecard20**, a 20M-byte, 3½-in. half-height hard disk drive with hard-disk controller in a slot card design.

Filecard20 was designed for the IBM Personal Computer XT and compatibles. It takes up 1½ slots in the XT. It has a transfer rate of 5M bit/sec. and an average access time of 80 msec. It features a drive with hardened media on two platters with four heads as well as head lock and spindle lock on power down.

The Filecard20 is priced at $895.

Western Digital, 2445 McCabe Way, Irvine, Calif. 92714.

■

Sysgen, Inc. has unveiled the **SC6000 Turbo Controller** for IBM Personal Computer and Personal Computer XT hard disks and the **Matched Pair** Winchester disk drive subsystem.

The controller is said to achieve true one-to-one interleaving by incorporating a full-track buffer and read-ahead BIOS. It can control up to two hard disk drives and can accommodate a Sysgen SC500 tape controller for streaming tape backup.

The Matched Pair incorporates the Turbo Controller. It is available in a full-height, 70M-byte configuration or a half-height, 40M-byte configuration.

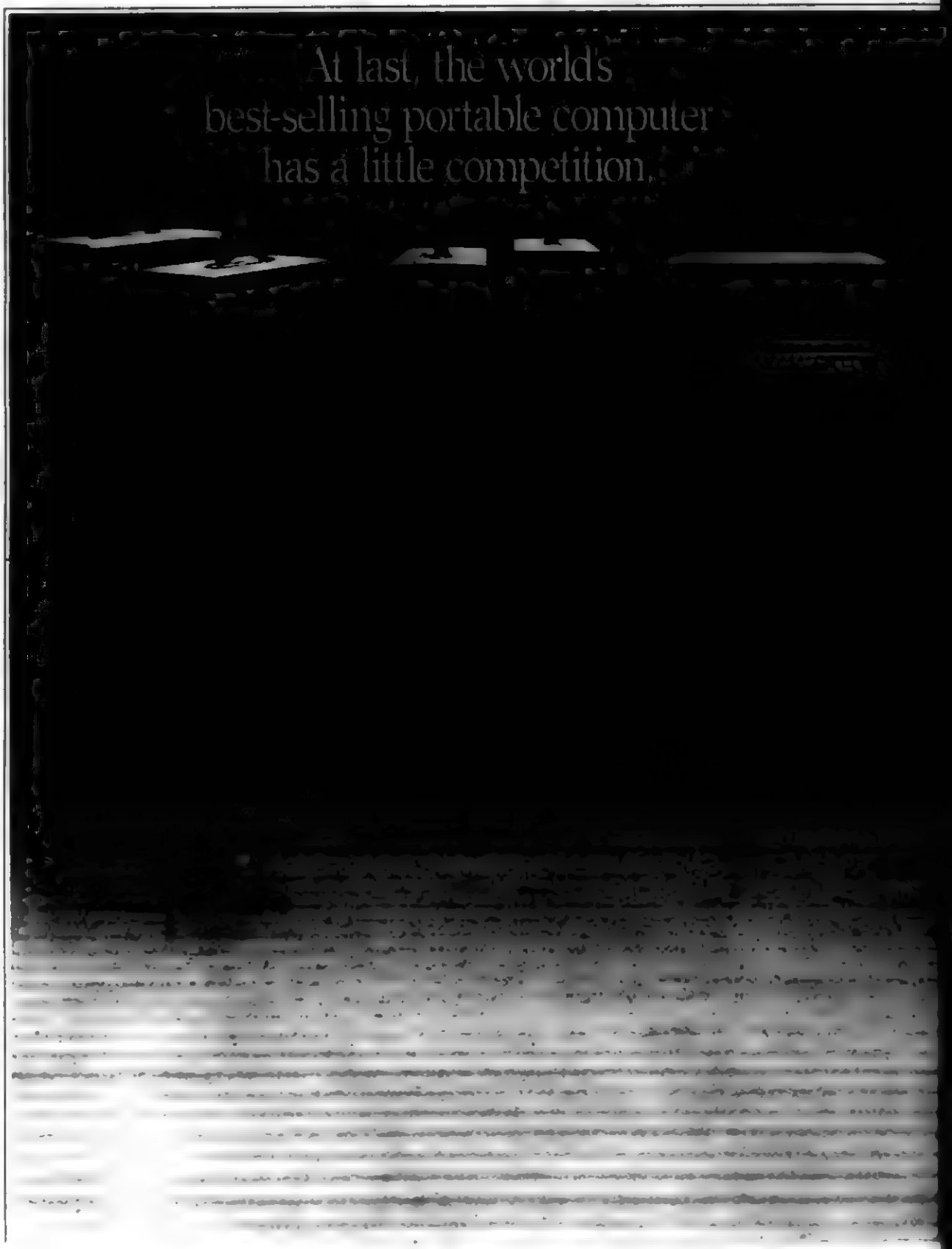
The Turbo Controller costs $250. The 70M-byte Matched Pair costs $2,995, and the 40M-byte version costs $1,795.

Sysgen, 47853 Warm Springs Blvd., Fremont, Calif. 94539.

■

Genoa Systems Corp. has announced **Release 2.2** of the software that supports its **Galaxy** line of half-height 20M- and 60M-byte cartridge or cassette, disk or tape backup systems for IBM Personal Computers and compatibles.

Release 2.2 is said to add full Novell, Inc. Netware compatibility with advanced backup and restore capabilities. It also features whole-disk image backup; non-IBM PC-DOS par-



tition image; the Fixup disk-error utility; enhanced automatic backup; directory sort; multiple tape backup and restore; and full menu revision.

Prices for the Galaxy subsystems range from $1,095 for a 20M-byte internal model to $1,995 for a 60M-byte external model.

Genoa Systems, 73 E. Trimble Road, San Jose, Calif. 95131.

Auxiliary equipment

CPS Electronics, Inc. has introduced the **Electra Guard 20**, a six-outlet surge suppressor strip.

The strip is said to protect microprocessor-based equipment from voltage surges. It offers multistage protection on hot, neutral and ground lines. It is said to meet IEEE specifications, parts A and B, for surge voltage. It features a safety on/off switch and a 6-ft cord.

The Electra Guard 20 costs $99.95.

CPS Electronics, P.O. Box 2460, 4151-112th Terrace N., Pinellas Park, Fla. 34290.

■

Electronic Specialists, Inc. has introduced the **Modem/Power/Static Pac**, said to provide a protection package for the traveling portable computer.

The unit combines broadband AC power filtering, extended-range spike suppression and a static discharge plate.

Power is available from a conventional three-prong outlet and a CEE-22 universal portable computer power connector. Modem connection is through standard modular RJ-11 connectors.

The Modem/Power/Static Pac costs $184.95, including 6-ft power cord.

Electronic Specialists, 171 S. Main St., Natick, Mass. 01760.

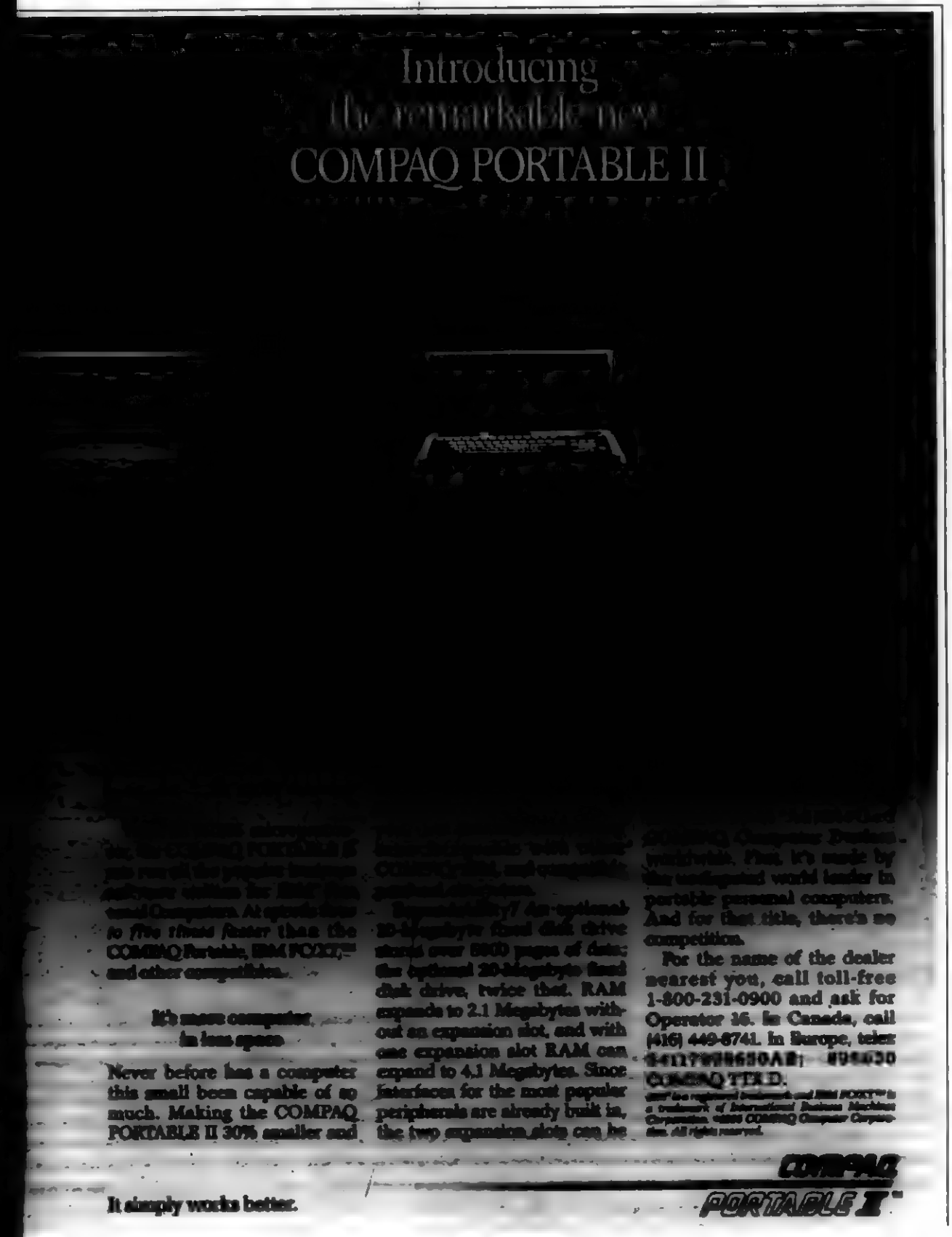
■

Kensington Microware Ltd. has announced the **System Saver Mac** for the Apple Computer, Inc. Macintosh and Macintosh Plus microcomputers.

According to the vendor, the System Saver Mac is said to organize the system's power with two switched outlets for peripherals; protect the system from surges, spikes and noise; and keep the system cool.

System Saver Mac is priced at $90.95.

Kensington Microware, 251 Park Ave. S., New York, N.Y. 10010.



COMMUNICATIONS

Controllers

Hadax Electronics, Inc. has announced an **automatic switching system** designed to provide a means of switching different interfaces between active and fallback positions.

According to the vendor, standard AB switching can be performed either locally through toggle switches on each of the individual channel cards or remotely through a remote-control panel connected to the rack. Gang switching can be performed on each rack in the system locally through the Gang Switch or through the remote control panel.

The standard rack-mount unit accommodates up to 16 channel interface cards. The channel price ranges from $110 to $240.

Hadax Electronics, 44 Sea Cliff Ave., Glen Cove, N.Y. 11542.

Software

Octel Communications Corp. has introduced **Aspennet** networking software, an enhancement to its Aspen and Aspen Branch voice message systems.

According to the vendor, Aspennet allows users to set up large voice networks. The software automatically routes messages between systems over analog phone lines, taking advantage of low-cost routing alternatives.

Each node can have a two-way exchange and the system accommodates up to 500 remote nodes.

Aspennet networking software is priced from $10,000 per node to $2,000 per node, depending on system size.

Octel Communications, 890 Tasman Drive, Milpitas, Calif. 95035.

Multiplexers/Modems

Carterfone Communications Corp. has added the **Adcomm H series** to its Adcomm 96/48 modem and multiplexer family.

The H series features Hayes Microcomputer Products, Inc. compatibility and dynamic bandwidth relocation. It achieves asynchronous throughput speeds of up to 19.2K bit/sec.

Two Adcomm H versions are offered: the -1, priced at $1,695, and the -2, which provides a host-addressable independent statistically multiplexed printer channel, priced at $1,995.

Carterfone Communications, Suite 1100 W., 1341 W. Mockingbird Lane, Dallas, Texas 75247.

Local-area networks

HVE Engineering, Inc. has announced the **Syner-System VME/VME real-time interface**, said to enable VMEbus-based systems to be integrated into one real-time network.

Using two or more HVE Synergist III translators, interconnected by 64-conductor cable, Syner-System interfaces permit unlimited expansion of VMEbus backplanes. This enables multiple VME-based systems to operate independently and in a real-time link.

The system supports 24-bit addressing. A two-node Syner-System VME/VME interface costs $1,495.

HVE Engineering, 1684 Dell Ave., Campbell, Calif. 95008.

Test equipment

Integrated Technology Corp. has introduced the **SC-100 Signal Chaser**, a local-area network signal tracer.

The hand-held device was engineered for coaxial cabling. It may be used on baseband or broadband local-area networks including those by IBM, Wang Laboratories, Inc. and ITT Courier Terminal Systems, Inc. According to the vendor, it has an operating capability to 35 MHz.

SC-100 Signal Chaser costs $75.

Integrated Technology, 1228 N. Stadem Drive, Tempe, Ariz. 85281.

Auxiliary equipment

Leemah Datacom Security Corp. has introduced the **Traqnet 1000 series**, an access control system.

The Traqnet 1016, uses a combination of hardware and software to control access for up to 16 dial-up modems or computer ports. It records every call or call attempt on a single-line audit trail 24 hours a day.

The Traqnet 1016 is priced at $275 per line card. Up to 16 line cards can be installed in the $995 Traqnet 1016 rack mount unit.

Leemah, 3948 Trust Way, Hayward, Calif. 94545.

SYSTEMS & PERIPHERALS

Turnkey systems

Gould, Inc. has introduced the **Gould Remote Sensing System Model 3000** for processing large-scene geographic images.

Available in multiuser configurations, the Model 3000 uses the Gould IP8000 image processor to process Landsat and Spot data used in geophysical exploration and other applications. In addition to the IP8000, the Model 3000 integrates a host computer based on Digital Equipment Corp.'s Microvax II and a remote sensing software package.

Functions include image enhancement, multiple image correlation, image overlay and geometric correction.

The system is priced at $99,185.

Gould, 46360 Fremont Blvd., Fremont, Calif. 94538.

Processors

BICC-Vero Electronics, Inc. has announced a **memory module** for VME-based computer systems.

The module features 2M-byte memory capacity, 8-, 16-, 24- and 32-bit data transfers, 24- and 32-bit addressing with 4G bytes of total address space, unaligned transfers allowing word transfers at odd addresses, byte parity error detection, programmable interrupter, error logging and typical write/read access times of 90 to 240 nsec.

The memory module is priced at $1,623.

BICC-Vero Electronics, 40 Lindeman Drive, Trumbull, Conn. 06611.

■

Texas Instruments, Inc. has announced a version of its **Explorer** LISP-based computer system said to meet the U.S. government's industrial Tempest program.

The Tempest version was designed to reduce security risks by conforming to Tempest standards. This version is fully compatible with TI's commercial Explorer systems.

There are four standard models of the Tempest version of the Explorer. Prices range from $71,900 for a system with 4M bytes of memory, two 140M-byte disk drives and a cartridge tape to $85,400 for a system with 8M bytes of memory, two 140M-byte disk drives and an Ethernet local-area network interface.

TI, P.O. Box 809063, H-856, Dallas, Texas 75380.

■

Texas Instruments, Inc. and **Sky Computers, Inc.** have announced the **Vortex Model 2400** array processor for use with the Nubus architecture in the TI Explorer symbolic processing computer.

The Vortex Model 2400 board will reportedly operate as a memory-mapped, arithmetic coprocessor. It provides capability for matrix algebra, transcendental and trigonometric functions, solutions to differential equations and orthogonal transformations.

The Vortex Model 2400 board, available in the third quarter of this year, is priced at $9,900.

TI, P.O. Box 809063, H-853, Dallas, Texas 75380.

■

Daisy Systems Corp. has introduced **Cellmaster**, an engineering workstation for designing cell-based integrated circuits.

Cellmaster offers automatic placement and routing of free-format layouts, error-free interactive optimization of the chip layout through correct-by-construction editors, and tight coupling with Daisy's electrical and physical design tools. It is also said to permit any number of blocks to be placed anywhere on the chip.

Cellmaster runs on the vendor's Intel Corp. 80286-based Logician workstation with accelerated graphics. It costs $129,000.

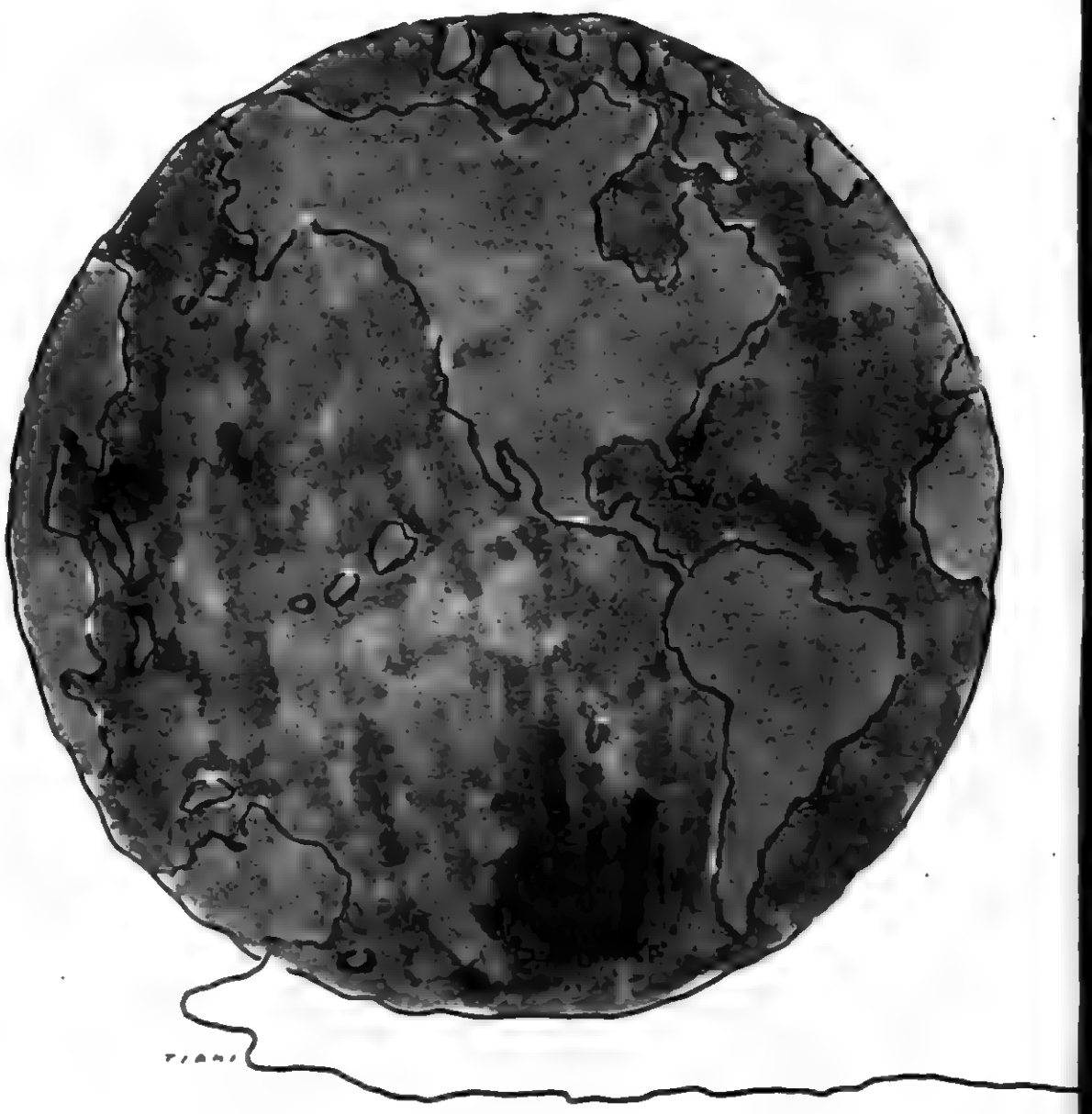
Daisy Systems, 700 E. Middlefield Road, Mountain View, Calif. 94039.

■

Southwest Technical Products Corp. has announced the **S1500** minicomputer designed for small to medium-size businesses.

The S1500 is a 1-MHz Motorola, Inc. 68010 system with a 2M-byte memory. It features a 40M-byte Winchester disk, a 60M-byte streaming tape, eight RS-232 ports and an optional floating-point coprocessor. It

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NEW PRODUCTS/SYSTEMS & PERIPHERALS

runs under the AT&T Unix System V.

According to the vendor the system can accommodate up to eight users.

The S1500 is priced at $9,995.

Southwest Technical Products, 219 W. Rhapsody, San Antonio, Texas 78216.

■

National Instruments has announced a **driver** said to control the GPIB11-V2 interface card in Digital Equipment Corp. Microvax II applications running under the VAX/ELN operating system.

In addition to the general-purpose interface bus (GPIB) device handler, the software consists of a Pascal language interface and an interactive control program. All the software is distributed as source code and is written in VAX/ELN Pascal.

The software is available for $500. The GPIB11-V2 costs $1,495.

National Instruments, 12109 Technology Blvd., Austin, Texas 78727.

■

MDB Systems, Inc. has announced the **MLSI-BA11-2000** and the **MLSI-BA11-3000** rack-mountable chassis.

The MLSI-BA11-2000 can be used as a basic computer chassis for Digital Equipment Corp. Q-bus board-level computer modules. The second chassis is used as an expansion chassis for all DEC Q-bus CPU systems as well as for the Microvax computers.

Each backplane and card guide assembly has 22-bit addressing and can accommodate eight quad-size modules, 16 dual-size modules or any combination.

The MLSI-BA11-2000 costs $1,750. The MLSI-BA11-3000 costs $1,650.

MDB Systems, 1995 N. Batavia St., Orange, Calif. 92665.

Graphics systems

Microfield Graphics, Inc. has announced the **T4 Color Graphics Controller** for use with the IBM RT Personal Computer.

The T4 is a 1,024 by 800 pixel, 4-plane color controller that uses a very large-scale integration-based bit-slice processor. It occupies a single slot on the RT PC's peripheral bus. The T4 is supported by an ANSI color graphics interface.

The T4 is priced at $3,200.

Microfield Graphics, Suite 161, 8285 S.W. Nimbus, Beaverton, Ore. 97005.

Data Translation, Inc. has introduced the **DT2651 High Resolution Frame Grabber**, a single-board image processing product for Digital Equipment Corp.'s Microvax II, Micro/PDP-11 and LSI-11 systems.

The board is said to perform real-time math and logic operations on single or multiple 512- by 512-pixel images with full 256 gray-level accuracy. The Frame Grabber features multiple synchronization I/Os, an on-board 8-bit arithmetic logic unit and two 256K-byte memory buffers.

Also available is the DT2658 Auxiliary Frame Processor, said to speed calculations.

The DT2651 Frame Grabber costs $2,995, and the DT2658 Auxiliary Frame Processor costs $1,595.

Data Translation, 100 Locke Drive, Marlboro, Mass. 01752.

Data storage

Zetaco, Inc. has unveiled the **LRS-10 optical subsystem**, the **MV/4000 and MV/10000 memory expansion** boards, **subsystems**, **DPS-1 dual processor switch** and **STA-1 tape drive interface adapter**, all Data General Corp.-compatible products.

The LRS-10 includes an optical disk, a magnetic disk and Zetaco's controller that emulates DG's Argus. Prices range from $20,000 to $30,000. The expansion boards are available in 2M-, 4M- and 8M-byte capacities and cost from $4,995 to $10,975.

Subsystems are fully integrated magnetic disk and tape subsystems with capacities ranging from 300M to 3G bytes. Prices range from $12,900 to $36,000.

The DPS-1 allows two CPUs to share one tape drive and one line printer. It costs $1,895.

The STA-1 allows connection of an STC-interfaced drive to a Pertec Peripherals Corp.-interfaced tape controller. It costs $1,895.

Zetaco, 6850 Shady Oak Road, Eden Prairie, Minn. 55344.

■

Emulex Corp. has introduced the **EQ3**, a Digital Equipment Corp.-compatible mass-storage packaged subsystem.

The EQ3 is a three 5¼-in. peripheral subsystem enclosure capable of housing either a single disk drive, a disk drive with ¼-in. cartridge tape drive, dual disk drives or dual disk drives and a ¼-in. cartridge tape drive. It is available in both ST506 and enhanced small disk interface disk configurations.

The subsystem provides up to 1.2M bit/sec. transfer rate and up to 638M bytes of storage.

Prices range from $6,050 to $21,000, depending on the configuration.

Emulex, P.O. Box 6725, 3545 Harbor Blvd., Costa Mesa, Calif. 92626.

■

Emulex Corp. has announced nine **Emulex Micro Subsystem** (EMS) **kits** for providing a complete single-disk, dual-disk or tape package for use in Digital Equipment Corp.'s Microvax II BA123 World Box enclosure.

Each EMS kit consists of one or two disk drives with all mounting hardware, a QD01, QD21 or QT12 controller, activity panel, all neces-

Continued on page 104

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NEW PRODUCTS/SYSTEMS & PERIPHERALS

Continued from page 103

sary cables, RX50 or TK50 disk diagnostic and formatter utilities and documentation set. The kits provide up to 1.2M bit/sec. transfer rate and up to 1.276G bytes of mass storage.

Prices for the kits range from $2,570 to $17,996.

Emulex, P.O. Box 6725, 3545 Harbor Blvd., Costa Mesa, Calif. 92626.

■

Emulex Corp. has introduced the **LM04** and the **LM08** memory boards for Digital Equipment Corp.'s Microvax II systems.

The LM04 is a dual-height 4M-byte memory expansion board, and the LM08 is a quad-width 8M-byte board. A maximum of two memory boards can be used to increase the system memory capacity to 9M or 16M bytes.

Both boards feature user-selectable array-disable switching and on-board byte parity generation and verification.

The LM04 costs $1,495, and the LM08 costs $2,995.

Emulex, P.O. Box 6725, 3545 Harbor Blvd., Costa Mesa, Calif. 92626.

■

Emulex Corp. has announced the **SC7003** disk controller for integration of disk drives with a storage module device or extended interface.

The controller emulates Digital Equipment Corp.'s RH750 or 780/785 and 8600/8650 Massbus adapter with an attached RM02/03, RM05 or RM80 disk drive. It has capacities of 80M to 850M bytes and transfer rates from 1.2M to 3M bit/sec.

The SC7003 has up to eight drive ports on the board and features a 28-sector random-access memory buffer.

The SC7003 is priced at $8,950.

Emulex, P.O. Box 6725, 3545 Harbor Blvd., Costa, Mesa, Calif. 92626.

■

Qualogy, Inc. has introduced the **QE-2000** family of enhanced small device interface (ESDI) storage systems for Digital Equipment Corp.'s Microvax and Micro/PDP-11 computers.

The QE-2000 family includes a quad-height controller, the QE2, with a 1M-byte cache memory that will support up to four ESDI drives. The QE2 is configured with 5¼-in. Winchester drives with storage capacities of 140M and 330M bytes.

QE-2000 series products are said to queue up to 32 commands and dynamically compute the best order of execution.

Prices range from $1,770 for the QE2 to $36,000 for a fully configured rack mount system.

Qualogy, 2241 Lundy Ave., San Jose, Calif. 95131.

■

Qualogy, Inc. has introduced the **QS-4000** storage module device (SMD) subsystem for Digital Equipment Corp.'s Microvax and Micro/PDP-11 computers.

The QS-4000 system is said to feature a 1M-byte cache memory and will be offered with the Fujitsu Ltd. Eagle I and Eagle II drives, which can be configured to provide storage capcities up to 1.3G bytes. It can support one or two SMD drives with data transfer rates up to 24M bit/sec.

The QS-4000 products also feature a dual wide Q-bus controller.

The QS-4000 is priced from about $17,000 to $30,000.

Qualogy, 2241 Lundy Ave., San Jose, Calif. 95131.

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*According to manufacturer's suggested retail price as of 3/1/86. Forte will furnish supporting information upon written request.

Terminals

Link Technologies, Inc. has added the **Link 220WP** and the **PCTerm WP** to its alphanumeric terminal line.

The Link 220WP is a version of the Link 220 terminal modified for word processing applications. It includes a keyboard with 41 specially labeled word processing function keys. Functions include a range of file handling, document positioning, text-attribute control and editing commands.

The PCTerm WP is a version of the company's PCTerm modified for word processing applications. It provides an IBM display format and Personal Computer AT-style keyboard.

The Link 220WP costs $649. The Link PCTerm WP costs $699.

Link Technologies, 47339 Warm Springs Blvd., Fremont, Calif. 94539.

■

Human Designed Systems, Inc. has introduced the **HDS2000** series of Digital Equipment Corp.- and Tektronix, Inc.-compatible terminals.

The series is composed of six terminals, featuring 15-in. monitors and a choice of amber, green or page-white phosphor colors.

The HDS2000 series terminals include the HDS2200 VDT; the HDS2200G video graphic terminal; the HDS2200GX high-resolution graphics terminal; and the HDS2210, HDS2210G and HDS2210GX APL display terminals.

The terminals range in price from $795 to $1,895.

Human Designed Systems, 3440 Market St., Philadelphia, Pa. 19104.

Printers/plotters

Digital Equipment Corp. has announced the **LN03 Plus**, a desktop laser graphics printer.

The printer combines electrographic and xerographic technologies with up to 8 page/min. speed and 300 dot/in. resolution, according to the vendor.

In addition, 1M byte of full bit-map memory and Tektronix, Inc. 4010/4014 compatibility are standard.

The LN03 is priced at $4,995. According to the vendor, a field service installable upgrade kit that converts the LN03 Laser Printer to the LN03

NEW PRODUCTS/SYSTEMS & PERIPHERALS

Plus is available for $1,595.

Digital Equipment Corp., Maynard, Mass. 01754.

Power supplies

Kalglo Electronics Co. has added the **Line-Saver Model LS750** to its line of Aegis power conditioning equipment.

The unit utilizes pulse-width modulation to regulate the output voltage. It comes with a 36V sealed rechargeable battery, two Spike-Saver voltage-surge protected and electromagnetic-interference- and radio frequency interference-filtered AC outlets, audible and visual power failure warning system, test mode indicator and switch and replaceable external fuses.

The Model LS750 costs $995.

Kalglo Electronics, 6584 Ruch Road, E. Allen Trnpk., Bethlehem, Pa. 18017.

Components

Virtual Microsystems, Inc. has announced the **AT/Bridge**, designed to provide IBM Personal Computer AT compatibility for Digital Equipment Corp. VAX users.

The AT/Bridge is a board that can be plugged into the bus of the VAX, allowing users to run PC AT application software from their terminals. Its PC AT Bus Interface allows connection to a variety of IBM PC option cards.

It features an 8-MHz Intel Corp. 80286 processor, 1M byte of random-access memory, one IBM-compatible RS-232 port and an IBM PC/AT Bus Interface.

The AT/Bridge currently works with DEC's Unibus running VMS. It costs $7,500.

Virtual Microsystems, Suite 300, 2150 Shattuck Ave., Berkeley, Calif. 94704.

■

AST Research, Inc. has announced its **CM-DHV16** 16-channel, asynchronous, serial interface card.

The card is a quad-size module that replaces Digital Equipment Corp.'s DHV11 asynchronous multiplexer board in DEC Microvax, Microvax II, LSI-11 and Micro/PDP-11 computers. It plugs into any standard DEC Q-bus backplane slot and provides data transfer rates up to 38.4K bit/sec. on all channels simultaneously.

Other features include a serial port for connection to DEC-compatible peripherals.

The CM-DHV16 costs $1,350.

AST Research, 2121 Alton Ave., Irvine, Calif. 92714.

Auxiliary equipment

Falcon Safety Products, Inc. has introduced the **Dust-Off Pro System** for computer maintenance and repair professionals.

Dust-Off is said to improve electronic office machine performance by blasting away dust particles, removing dirt and cleaning hard-to-reach places. It can deliver modulated blasts of triple-filtered, purified air ranging in grade from a burst to a mild puff.

It features a Pro Gun that is attached to an 8-ft extension hose. The hose attaches to a 32-ounce canister of Dust-Off.

Falcon Dust-Off Pro costs $57.50.

Falcon Safety Products, 1065 Bristol Road, Mountainside, N.J. 07092.

■

Falcon Safety Products, Inc. has announced the **Clean Machine Hi-Tech Maintenance Kit**, a collection of its preventive maintenance products for computer and office equipment users.

The kit includes Falcon

Continued on page 108

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TI announces the portable sales tool for General Electric Plastics' field communications.

Instant access with their technical data base and 24-hour communications with headquarters. That's what the SILENT 700™ Model 707 with its easy access module means to GE Company's Plastics Sales Division. Regardless of time zones and sheer distance from the home office, GE Senior Sales Representative Ray Forester can get the latest product data and cost analysis information he needs to prepare for and close a sale. All he needs is his TI 707 portable data terminal and a telephone.

"With the terminal, I can tap into GE Plastics' data base. When ERIS (Engineering Resins Information System) is accessed by my TI 707, I can provide a customer with technical information and product specifications on the spot and leave him with a printout to review.

"The terminal also acts as my message center when I'm in the field. I transfer messages through the GE Crossfile (electronic mail), and the individuals receive them in written format when they pick up their messages. They seem to respond more promptly with accurate, hard copy in front of them. And since I can receive messages anytime, anywhere, the TI 707 all but eliminates 'telephone tag.'"

Ray Forester believes that the TI 707 is ideal for the salesman on the go. It's lightweight and rugged, takes up approximately one half of a briefcase, and is quiet even at peak operation. "It's exactly the productivity tool we needed for our division's field communications," he concluded.

Find out about the Model 707 SILENT 700 Portable Data Terminal from TI and how it can solve your communications problems. Call 1-800-527-3500, ext. 709; in Canada, 416-884-9181. For more information write TI, P.O. Box 809063, Dept. DTB 1930W, Dallas, Texas 75380-9063.

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TEXAS INSTRUMENTS
Creating useful products and services for you.

Continued from page 105

Print Element Cleaner, Platen Conditioner and Cleaner, Anti-Static Spray Cleaner, Screensafe Free Disposable Wipes and a Dust-Off II 4-ounce refill and valve.

The products are contained in a plexiglass kit priced at $39.95.

Falcon Safety Products, 1065 Bristol Road, Mountainside, N.J. 07092.

PRICE REDUCTIONS

AST Research, Inc. has reduced the prices of several **add-in boards** for the IBM Personal Computer family and compatibles.

For the Personal Computer and the Personal Computer XT, the price of AST's 64K-byte Six Pak Plus multifunction board dropped to $249; a 384K-byte configuration is now $395. A 256K-byte Rampage board for bypassing the IBM PC-DOS 640K-byte limitation is now $395. With 2M bytes, the board's retail price is $1,295.

Advantage for the AT sells for $645 with 512K bytes. A 3M-byte version of Advantage costs $1,945. The 3M-byte Ramvantage AT expansion board now costs $1,545.

AST Research, 2121 Alton Ave., Irvine, Calif. 92714.

■

Verticom, Inc. has reduced the price of its **CD-1** and **CD-1A** 13-in., 640- by 480-pixel, red-green-blue monitors.

Both monitors are said to be compatible with the IBM Personal Computer and compatibles.

The reduced price for both monitors is $795.

Verticom, 545 Weddell Drive, Sunnyvale, Calif. 94089.

■

Datacopy Corp. has dropped the price of its **Model 730** and **Model 700** Word Image Processing Systems.

The Model 730 is a flatbed scanner offering either 300 or 200 dot/in. resolution. It comes with cables, Datacopy's Word Image Processing System (WIPS) software and interface board for the IBM Personal Computer XT or AT. It now costs $3,950.

The Model 700 includes the vendor's OCR Plus and WIPS Editor software in addition to the standard WIPS software. It costs $3,950.

Datacopy, 1215 Terra Bella Ave., Mountain View, Calif. 94043.

■

Texas Instruments, Inc. has announced price reductions for its **Explorer** line of symbolic processing workstations.

The lower prices apply to Explorer memory boards based on 256K bytes of dynamic random-access memory chips and to Explorer systems incorporating these memories.

The 8M-byte Explorer memory boards cost $17,500. The 4M-byte boards cost $9,500. An entry-level development system with 2M bytes of memory costs $44,900. Systems with 4M-byte and 8M-byte memories start at $51,900 and $59,900, respectively. All models are said to be expandable to 16M bytes of memory.

Texas Instruments, P.O. Box 809063, H-857, Dallas, Texas 75380.

■

Epson America, Inc. has announced price reductions on hard- disk versions of its **Equity I, II and III** IBM Personal Computer-compatible systems.

The Equity I with 20M-byte internal hard disk now costs $1,895; the Equity II with 20M-byte hard disk now costs $2,495; and the Equity III with 20M-byte hard disk now costs $3,895, according to the vendor.

The hard-disk versions of the Equity I and II feature a 360K-byte, 5¼-in. single floppy disk drive.

The hard-disk Equity III comes with a single half-height 1.2M-byte floppy disk drive.

Epson America, 2780 Lomita Blvd., Torrance, Calif. 90505.

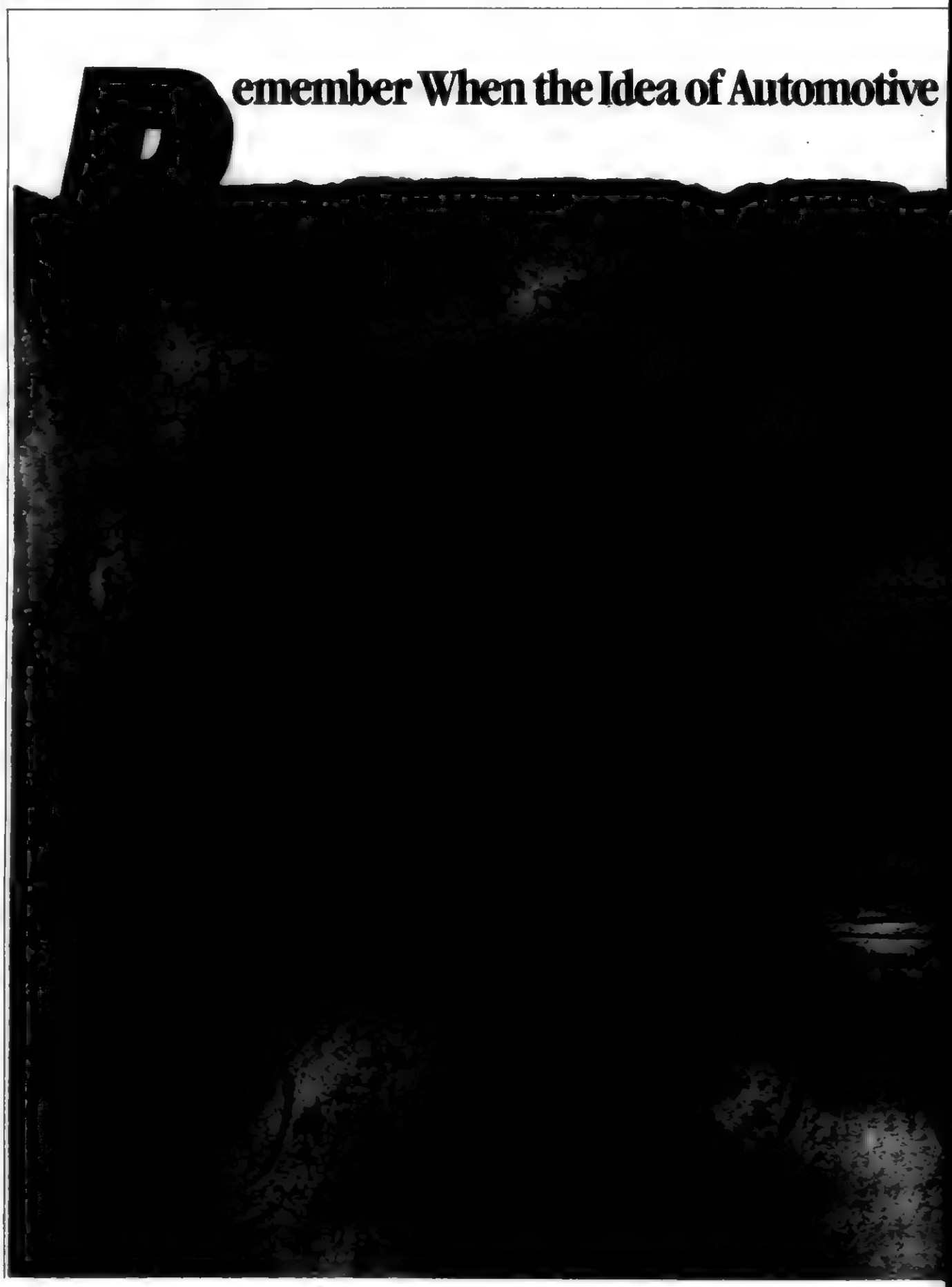
Siecor Corp. has reduced the price of its **Optical Transceiver** fiber-optic Ethernet product.

Siecor's fiber-optic Ethernet products are said to be designed for use in creating fiber-optic backbone local-area networks requiring protection.

Features include collision detection electronics.

The Optical Transceiver costs $699.

Siecor, 489 Siecor Park, Hickory, N.C. 28603.



State employee charged with giving drug dealers DMV data

Ran new-customer checks with system

By Jeffry Beeler

SACRAMENTO, Calif. — An operations specialist in California's Department of Justice faces charges of aiding a cocaine selling ring by leaking restricted information that allowed his accomplices to certify their prospective buyers.

Through his terminal in the Justice Department's Law Enforcement Data Center (LEDC), Gregory Dougherty, age 25, allegedly confirmed the identities of potential drug customers whose names were referred to him by suspected cocaine dealer Bradley Kent, 26.

Before new customers were accepted by the drug dealers, officials charged, Dougherty checked their criminal histories and other background and then relayed his findings to Kent.

The case against Dougherty and Kent is outlined in documents filed last month in Sacramento Municipal Court, where the two are charged with violating the California law forbidding unauthorized disclosure of official criminal histories. Both have pleaded innocent.

Dougherty's alleged illicit use of the LEDC's systems aided the dealers in distinguishing genuine cocaine customers from undercover police, the court papers said.

To spot a possible police trap, the suspects first obtained a customer's name, age and automobile license plate number if they had not dealt with him previously. Then, according to the court records, they directed Dougherty to enter the information at his terminal and ask the state's Department of Motor Vehicles (DMV) system to display the customer's auto registration records.

Access to information about undercover police cars is usually tightly restricted. So if the system replied to an inquiry with a "Record Unavailable" message, the suspects reportedly became wary of their prospect and shunned all future contactwith him.

Transportation Couldn't Get Out of First Gear.



As you can see from the accompanying illustration, the differential transmission wasn't the brainchild of Detroit.

No, it was more like Italy. And the engineer was none other than Leonardo Da Vinci.

Needless to say, talking differential transmissions over a plate of pasta in the 15th century was not altogether fashionable and, naturally enough, was met with some skepticism.

Today, of course, the American love affair with the car is rather evident. We couldn't live without it.

Keeping in mind the automobile as an accepted fact of life, we'd like to introduce you to a service that will become a standard in maintaining complex voice and data communications systems.

Introducing Communications Service Assurance from PacTel Spectrum Services.

A service every MIS director and telecommunications manager wanted but refused to believe in.

"Wish list thinking," they said.

And wish list thinking is what we're offering.

Communications Service Assurance is a new concept, to be certain, and, just like Leonardo's differential transmission, will be met with its share of skepticism. That's OK. We're asking that you keep an open mind.

Communications Service Assurance represents a single source for problem detection, diagnosis and preventive monitoring, as well as expediting restoral of your corporate communications. It helps with expansion and alteration and gives you customized services.

Communications Service Assurance packages the comprehensive solution for improving your system performance. You're able to concentrate on strategic MIS responsibilities instead of playing catch-up and reacting to the hassle, headaches and hang-ups of day-to-day problems plaguing your system.

Communications Service Assurance can be applied to any equipment, any protocols, at any site.

It incorporates diagnostic hardware and software.

It delivers teams of experienced test engineers from diversified backgrounds.

It accesses a unique system inventory data base.

It involves an ongoing industry relations program.

Remember, this is a service. We sell no hardware, lease no lines and repair no equipment.

What we do sell is increased reliability, productivity, bottom line cost-effectiveness and any level of expertise available 24 hours a day (we never close).

We're a wish that's a reality. We're a service that will become as accepted and important as the automobile.

And, yes, we'll keep you rolling in the right direction.

For further information, please call 800-446-4321. Or you can write directly, PacTel Spectrum Services, 100 Pringle Avenue, Suite 750, Walnut Creek, CA 94596, attention N. Floyd, Marketing Director.

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Seattle-area teen hacker sentenced

SEATTLE — An 18-year-old computer trespasser was sentenced in King County Superior Court to two weeks in jail, 200 hours of community service and two years' probation after being found guilty of breaking into the computers of four Seattle-area companies, including software developer Microsoft Corp.

Michael P. Wilkerson of Kirkland, Wash., apologized in court, and his attorney said the young man viewed the break-ins as "an intellectual exercise." He has cooperated with law enforcement by helping train county sheriff's deputies in computer crime and security procedures as well as by assisting authorities investigating a stolen property case in North Dakota.

Wilkerson, who moved to Kirkland from Ventura, Calif., last year, is still a suspect in a credit card fraud investigation by Ventura County police. Several credit card numbers belonging to other people and a computer reported stolen from North Dakota were found and seized during the investigation against Wilkerson last February.

Wilkerson gained varying degrees of access to the firms' computers through access lines. Other victim companies in Washington were Resource Conservation Co., Bellevue; Sunstrand Data Control, Redmond; and Kenworth Truck Co., Kirkland. Microsoft first suspected an electronic break-in and authorized a police telephone tap last fall.

— Peggy Watt



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Ashton-Tate files copyright suit against alleged Dbase pirate

Employee's tip sparked inquiry

By Peggy Watt

BALTIMORE — Software developer Ashton-Tate earlier this month filed a copyright infringement suit in U.S. District Court against Ohis, Inc., a Frederick, Md.-based developer of health and occupational safety data monitoring systems.

Ohis was charged with selling illegal copies of Ashton-Tate products as part of its custom software.

Federal marshals and Ashton-Tate representatives searched the Ohis offices and a company officer's home and seized dozens of copies of Dbase, some of them registered and others apparently illegal, and are reviewing the contents, said Geoffrey Berkin, Ashton-Tate associate counsel.

Berkin said Ashton-Tate began the investigation several months ago after a tip from a former Ohis employee. It culminated with Ashton-Tate's petition to federal court for the search authorization and a restraining order prohibiting Ohis from copying or distributing any Ashton-Tate products, even legitimately, pending court action.

Berkin said Ashton-Tate believes Ohis was including complete copies of Dbase in its $60,000 software systems, designed to track data for occupational health and safety records and which run under the Dbase system.

"We have no reason to believe [Ohis' software] won't work with just runtime copies of Dbase," which are used by most value-added resellers such as Ohis, he said. Runtime copies are licensed by Ashton-Tate for $50.

Ohis' listed telephone was disconnected shortly after the charges were filed, and an attorney for six individuals named in the complaint declined comment.

The Maryland suit is just one of several recent Ashton-Tate efforts to quash piracy in corporations and other commercial use. Last month, the Torrance, Calif., company filed civil charges of copyright and trademark infringement and unfair competition against Volt Data Resources, based in New York, which the software developer claimed was distributing illegal copies of Dbase II and III to employees. The company designs and installs computerized directory assistance equipment, primarily for local telephone companies.

Ashton-Tate also brought copyright infringement charges against Horn Computer International, Inc. of El Monte, Calif., which allegedly distributed illegal copies of Dbase III and Framework on hard disks it sold.

"Piracy is an industry problem, and we expect to continue our efforts against it," said Norman Block, Ashton-Tate vice-president for finance and administration.

Hacker pleads guilty to erasing IRS files

By Mitch Betts

WASHINGTON, D.C. — A 32-year-old Greenbelt, Md., man late last month pleaded guilty to computer fraud, admitting he used his home computer in several late-night raids to destroy administrative files in an Internal Revenue Service minicomputer.

William Vannest pleaded guilty in U.S. District Court to two misdemeanor counts under the 1984 federal statute protecting computers used by the federal government. Upon sentencing, scheduled for June 18, he faces up to one year in prison and a $100,000 fine for each count.

Vannest gained unauthorized access to the Zilog, Inc. minicomputer at the IRS' Consulting Services Branch in Baileys Crossroads, Va., on several occasions in February, March and April 1985, said David F. Geneson, assistant U.S. attorney. The prosecutor said that Vannest "trashed" files used by the IRS branch for testing commercial software products.

Vannest apparently obtained the telephone number for the system and its superuser password — in this case, the word Zeus — when he was writing a contract proposal for a firm trying to sell software to the IRS, Geneson said.

After an IRS systems administrator noticed that files in the Zilog computer had been destroyed, he installed a program to monitor the intrusions and routed the hacker's calls to duplicate files in a Zilog minicomputer at the IRS security office, the prosecutor said. To make certain that the invader knew he was destroying private IRS files, IRS officials added a display screen warning "authorized access only," Geneson said, in order to meet the requirements of the statute.

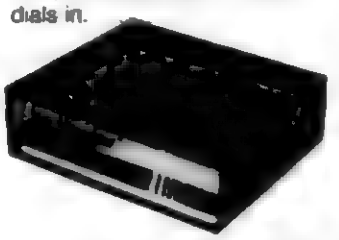
Subsequently, the IRS identified two more raids, one at 2:56 a.m. on April 9, 1985 and another at 3:17 p.m. on April 11, 1985. The telephone calls were traced to Vannest's residence, and he was later arrested, Geneson reported.

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WEEK OF MAY 26

MAY 28-29, WASHINGTON, D.C. — **Systems/34, 36 and 38 Users Show.** Contact: Andrew Wahtera, The Producers, 360 Merrimack St., Lawrence, Mass. 01843.

MAY 28-30, WASHINGTON, D.C. — **Stategic Data Planning and Modeling.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

MAY 29-30, SAN FRANCISCO — **Unix In Focus.** Contact: International Data Corp., Suite 201, 3350 W. Bayshore Road, Palo Alto, Calif. 94303.

MAY 29-31, BLACKSBURG, VA. — **Personal Computer Interfacing for Scientific Instrument Automation.** Contact: Linda Leffel, Virginia Polytechnic Institute and State University, Blacksburg, Va. 24061.

MAY 30-JUNE 2, ATLANTA — **Society of Telecommunications Consultants Spring Conference.** Contact: STC Headquarters, Suite 1410, One Rockefeller Plaza, New York, N.Y. 10020.

WEEK OF JUNE 1

JUNE 2-5, DETROIT — **Vision '86 — Applied Machine Vision Conference and Exposition.** Contact: Vision '86 Public Relations, Machine Vision Association of the Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

JUNE 2-5, NASSAU BAY, TEXAS — **International Symposium on Ada Programming Language Applications for Space Station Development.** Contact: University of Houston — Clear Lake, 2700 Bay Area Blvd., Houston, Texas 77058.

JUNE 2-6, BOSTON — **Harmon Associates Seminars and Workshops.** Contact: Harmon Associates, 151 Collingwood, San Francisco, Calif. 94114.

JUNE 4, SAN FRANCISCO — **How to Build Your High Tech Career Network.** Contact: Association for Women in Computing, Bay Area Chapter, Suite 44, 55 Sutter St., San Francisco, Calif. 94104.

JUNE 4-6, BOSTON — **Engineering Expert Systems.** Contact: Harmon Associates, 151 Collingwood, San Francisco, Calif. 94114.

JUNE 4-6, SAN DIEGO — **1986 National Educational Computing Conference.** Contact: Susan M. Zgliczynski, National Educational Computing Conference 1986, School of Education, University of San Diego, Alcala Park, San Diego, Calif. 92110.

JUNE 5-6, CLEVELAND — **North Central Region Data Processing Trainer's Conference.** Contact: Gary Livingston, Livingston & Associates, P.O. Box 30619, Cleveland, Ohio 44130.

JUNE 7, BEIJING — **China-Didacta '86: The International Trade Fair for Educational Equipment.** Contact: Swiss Industries Fair, Secretariat China Didacta '86, P.O. Box CH-4021, Basel, Switzerland.

WEEK OF JUNE 8

JUNE 8-11, NEW ORLEANS — **Ethernet Decision-Makers Group Exchange Conference.** Contact: EDGE International, Inc., Suite 260, 1539 N. China Lake Blvd., Ridgecrest, Calif. 93555.

JUNE 9-10, TEANECK, N.J. — **Machover on Business Graphics.** Contact: Carol Every, Industry Representative, Frost & Sullivan, Inc., 106 Fulton St., New York, N.Y. 10038.

JUNE 9-11, MYRTLE BEACH, S.C. — **The Association of Small Computer Users in Education 19th Annual Summer Conference.** Contact: Jack Cundiff, Horry-Georgetown Technical College, Conway, S.C. 29526.

JUNE 9-11, NORCROSS, GA. — **Time and Motion Study Fundamentals.** Contact: Institute of Industrial Engineers Registrar, 25 Technology Park/Atlanta, Norcross, Ga. 30092.

JUNE 9-12, BOSTON — **Network Management/Technical Control Conference and Exposition.** Contact: CW/Conference Management Group, 375 Cochituate Road, Framingham, Mass. 01701.

JUNE 9-12, CHICAGO — **Com Lease Spring, The Computer Leasing Conference and Expo.** Contact: Show Management Offices, 3825-I S. George Mason Drive, Falls Church, Va. 22041.

JUNE 9-13, SAN DIEGO — **MUMPS Users' Group 15th Annual Meeting.** Contact: MUMPS Users' Group, Suite 510, 4321 Hartwick Road, College Park, Md. 20740.

JUNE 10-13, ATLANTA — **Summer 1986 Unix Conference and Exhibition.** Contact: The Usenix Association Conference Office, P.O. Box 385, Sunset Beach, Calif. 90742.

JUNE 11, NEW YORK — **The Semiconductor Industry — Its Changing Structure 1986.** Contact: Robert Burton, L. F. Rothschild, Unterberg Towbin, 55 Water St., New York, N.Y. 10041.

JUNE 11-13, MAINZ, WEST GERMANY — **International Tandem Users' Group 1986 Spring Conference.** Contact: ITUG Headquarters, Suite 600, 111 E. Wacker Drive, Chicago, Ill. 60601.

JUNE 11-13, TEANECK, N.J. — **Machover on CAD/CAM.** Contact: Carol Every, Industry Representative, Frost & Sullivan, Inc., 106 Fulton St., New York, N.Y. 10038.

JUNE 13, DETROIT — **James Martin Seminar — The End-User Revolution.** Contact: Thomas J. Bis-

See CALENDAR page 114

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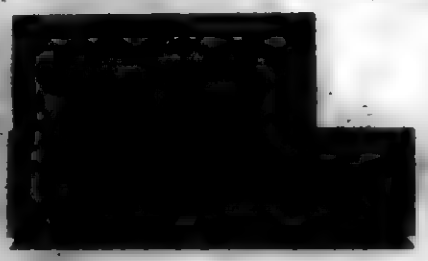
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NEWS

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acquino, Director of Education, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

WEEK OF JUNE 15

JUNE 15-20, LONG BEACH, CALIF. — **1986 Government Management Information Sciences Conference.** Contact: Tom Lang, Assistant Chairman, Data Processing Department, 9150 E. Imperial Highway, Downey, Calif. 90242.

JUNE 16-18, UNIVERSAL CITY, CALIF. — **Synergy '86, Conference on Functional Interfacing for Computer-Integrated Manufacturing.** Contact: Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

JUNE 16-20, CAMBRIDGE, MASS. — **Managing Information Technology: New Responsibilities in a Changing Environment.** Contact: Center for Information Systems Research, Sloan School of Management, MIT, E40-193, 77 Massachusetts Ave., Cambridge, Mass. 02139.

JUNE 17-18, PLYMOUTH, MICH. — **Robotic End Effectors: Design and Applications Seminar.** Contact: Mary Dombrowski, Special Programs Division, Robotics International of the Society of Manufacturing Engineers, One SME Drive, P.O. Box 930, Dearborn, Mich. 48121.

JUNE 17-19, ATLANTIC CITY — **Plas-Tech '86.** Contact: Delia Associates, P.O. Box 338, Delia Marketing Communications Center, Whitehouse, N.J. 08888.

JUNE 18-20, TOKYO — **Marketing Opportunities Seminar.** Contact: Agnes M. Pavel, Program Director, U.S. Telecommunications Suppliers Association, Suite 1618, 333 N. Michigan Ave., Chicago, Ill. 60601.

WEEK OF JUNE 22

JUNE 22-27, PHILADELPHIA — **Management Information Systems for Strategic Advantage.** Contact: Office of Executive Education, 200 Vance Hall, The Wharton School of the University of Pennsylvania, Philadelphia, Pa. 19104.

JUNE 23-25, ALBUQUERQUE, N.M. — **Integrated Fiber-Optic Technology Training.** Contact: Linda Castle, Optoelectronic System Consultants, P.O. Box 35525, Albuquerque, N.M. 87176.

JUNE 23-25, MIAMI — **Electronic Data Processing Auditors Association 14th Annual International Conference.** Contact: EDPAA, P.O. Box 88180, Carol Stream, Ill. 60188.

JUNE 23-26, BOSTON — **ATE East '86.** Contact: Registrar, Morgan-Grampian Expositions Group, 1050 Commonwealth Ave., Boston, Mass. 02215.

JUNE 23-27, AMSTERDAM — **Fourth Annual European Fiber-Optic Communications and Local-Area Networks Exposition.** Contact: Information Gatekeepers, 214 Harvard Ave., Boston, Mass. 02134.

JUNE 23-27, CHICAGO — **A/E/C Systems '86: The Computer and Management Show for the Design and Construction Industry.** Contact: Conference Director, A/E/C Systems '86, P.O. Box 11318, Newington, Conn. 06111.

JUNE 24-26, CHICAGO — **Structured Techniques Association III/ Structured Techniques in the Eighties: Practice and Prospects.** Contact: Mary Anne Gabriel, Heller Financial Corp., 105 W. Adams St., Chicago, Ill. 60603.

JUNE 24-27, CHICAGO — **Autocad Expo '86.** Contact: William Ryan, Autocad Expo '86, Autodesk, Inc., 2320 Marinship Way, Sausalito, Calif. 94965.

JUNE 25-26, COATESVILLE, PA. — **Chester County Expo '86: CAD/CAM Conference from Micro to Mini.** Contact: Lee Smith, Central Chester County Vocational Technical School, 1635 E. Lincoln Highway, Coatesville, Pa. 19320.

WEEK OF JUNE 29

JULY 2-3, LAS VEGAS — **Full Meeting of the Design Automation Standards Subcommittee.** Contact: Ron Waxman, Design Automation Standards Subcommitee Co-Chairman, IBM FSD, 9500 Godwin Drive, Manassas, Va. 22110.

WEEK OF JULY 27

JULY 28-30, RENO, NEV. — **1986 Summer Computer Simulation Conference.** Contact: The Society for Computer Simulation, P.O. Box 17900, San Diego, Calif. 92117.

WEEK OF AUGUST 3

AUGUST 4-8, ANN ARBOR, MICH. — **Contemporary Data Communication Networks: Planning, Management and Computer-Based Design.** Contact: Engineering Summer Conferences, 300 Chrysler Center/N. Campus, Ann Arbor, Mich. 48109.

WEEK OF AUGUST 10

AUGUST 11-14, SNOWMASS, COLO. — **AM/FM International Ninth Annual Conference.** Contact: AM/FM International, Suite 820, 8775 E. Orchard Road, Englewood, Colo. 80111.

WEEK OF AUGUST 17

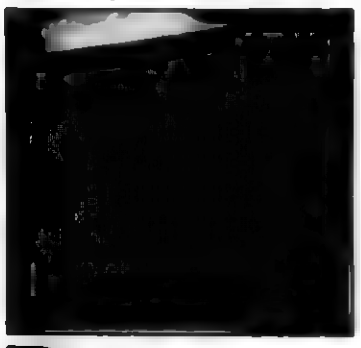
AUGUST 18-22, DALLAS — **Thirteenth Annual Conference on Computer Graphics and Interactive Techniques.** Contact: SIGGRAPH '86, Conference Management, Smith, Bucklin & Associates, Inc., 111 E. Wacker Drive, Chicago, Ill. 60601.

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COMPUTER INDUSTRY

Section begins on page 146

Paradyne anticipates stable year after tumultuous 1985

Hopes to come back from losses, layoffs, key fraud indictments

By James A. Martin

LARGO, Fla. — After a tumultuous year in which five company officers were indicted for fraud, revenues declined, losses were reported, layoffs occurred and takeover rumors buzzed, Paradyne Corp. is predicting a comparatively quiet year for fiscal 1986. But the data communications vendor's troubles are far from over.

There was both good and bad news from Paradyne recently. Net income for the first quarter ended March 31 was modest but rose to $875,000, compared with $151,000 a year earlier. But revenue was $66 million, down slightly from $68 million last year, and the company announced the closing of a manufacturing plant in Puerto Rico. Orders were up 20% over the same period in 1985, but shipments were down 13%.

"Therefore, the company is cautious about the outlook for the remainder of the year," says Robert S. Wiggins, Paradyne's president and chief executive officer, who was interviewed recently in his Largo office. "The softness experienced by the industry in 1985 has not subsided. Management actions taken last year have resulted in lower ongoing expenses, and we will continue to maintain a tight control on spending."

The shutdown of the Puerto Rico operation, which opened in 1979 and employed 165 people, is expected to save the company $1 million this year and $3 million the next. Manufacturing operations are to be consolidated at Paradyne's Largo facilities.

As an additional austerity move, Paradyne will require that all U.S. nonhourly employees take one unpaid furlough day per month for the remainder of the year. Last July, the company laid off 150 of its 3,700 employees and implemented a series of unpaid furlough days.



Paradyne's Wiggins

But aside from its financial doldrums, one of Paradyne's most publicized problems at the moment is the 45-page indictment from a federal grand jury that accused the company, five current and three former officials and a former U.S. Social Security Administration officer of fraud.

The December 1985 indictments alleged that Wiggins and Vice-President George Pressly, among others, attempted to defraud the U.S. government in order to win a $115 million contract. Paradyne was awarded that contract, the largest ever awarded by the Social Security Administration, in 1981.

"The company regards the charges as outrageous and so lacking foundation as to be ludicrous," James Slattery, senior vice-president and general counsel for Paradyne, said at the time of the indictments.

In the meantime, Paradyne has been barred from bidding on any government contracts, and the case is scheduled to come to trial Sept. 8. However, Wiggins says the indictments and the government barring have had little impact on Paradyne.

"Obviously it affects our government activity, but that's never been very high, so it's not a major problem for us," Wiggins says. "Our customers primarily buy from us because we do a good job. A great deal of our business each year comes from our installed base, and I don't believe our ability to do business with our customers has been affected at all."

Irwin Silverberg, a senior partner and analyst with Silberberg, Rosenthal and Co. in New York, agrees. "I don't think their customers believe them to be crooks," he says. "My guess is that their customers think Paradyne is being victimized by the government."

The task of steering Paradyne toward a significant profit, which Wiggins says should happen this year, is a formidable one. Part of that strategy is to reconsider strengths and weaknesses in existing product lines as well as recognize opportunities for new markets, both short and long term.

One area that has come under scrutiny is packet-switching devices. "We have been in that market for two years now, and we haven't seen a great deal of results from that," Wiggins says. "But we are going to continue in that market because we think there is potential for the long haul." Paradyne recently introduced its PDN 5200 family of packet-switching products at the Interface '86 convention in Atlanta.

In the past, packet-switching was "normally associated with expensive networks, and they primarily handled asynchronous devices," Wiggins says.

"Today, the technology allows you to put in a network at a much lower cost with asynchronous and synchronous devices, with some nice attributes of being able to provide redundancy and combining multiple networks into one. So, it has all the advantages you would like in a data communications network, but for some reason the market just hasn't moved," Wiggins adds.

Paradyne also hopes to make a strong move into the T1 network market. The company has a technology and manufacturing license with Spectrum Digital Corp., a Herndon, Va., multiplexer vendor, for a third-generation T1 switching multiplexer line to be introduced later this year.

The emerging Integrated Services Digital Network (ISDN) standard is too premature at this point to become the focus of product development, Wiggins says. "I think a lot needs to be done before anyone totally understands ISDN and what effect it might have on the marketplace," he adds.

Despite the federal indictment, Paradyne's problems have been more "internal than external," according to analyst Silverberg.

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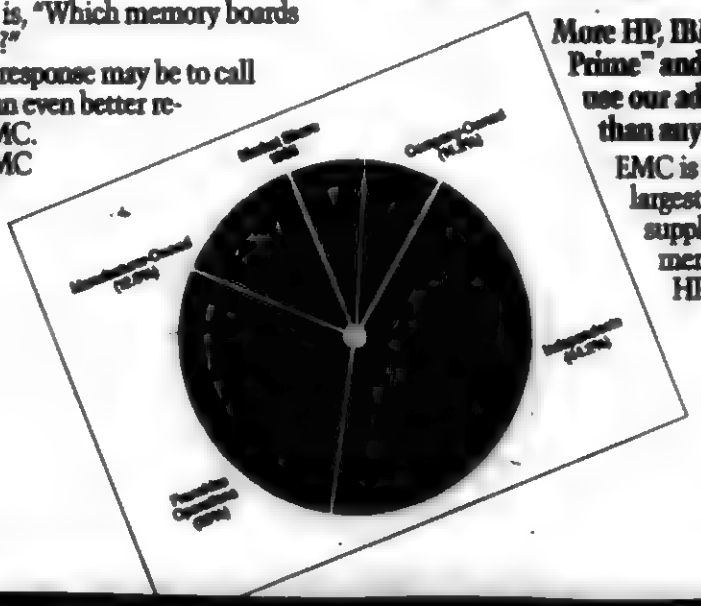
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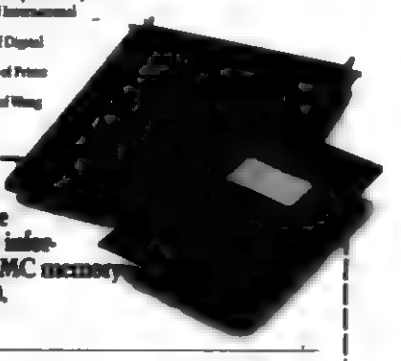
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GTE, Fujitsu plan venture to develop, market PBX tools

Target North American mart

By Alan Alper

STAMFORD, Conn. — GTE Corp., as part of a continuing plan to forge key strategic alliances, recently reached a preliminary agreement to establish a joint venture with Fujitsu Ltd. to develop and market private branch exchanges (PBX) and related communications equipment in North America.

Under terms of a "memoranda of understanding," majority ownership of the company will be held by Fujitsu America, Inc., Fujitsu's North American peripherals and communications subsidiary, a GTE spokesman said.

A definitive agreement, which would specify financial terms and management arrangements, is expected to be worked out by year's end.

The new firm would initially assume manufacturing and marketing of the Omni S1, S2 and S3 PBXs from GTE's Communications Systems' Business Systems division.

It would also develop new PBX products and perhaps market some of Fujitsu's existing communications products.

If formed, the joint venture would enable GTE to share development costs and combine technology with a leading electronics firm at a critical time in the extremely competitive PBX marketplace, the GTE spokesman said.

"It's difficult to keep up today," he said. "The investment required is much greater than in the 1960s or 1970s when the equipment was primarily electromechanical. PBXs are now specialized computers that sit on someone's desk, offering options like conference calling and speed dialing."

Earlier this year, GTE said it was forming two other joint ventures.

It is in the midst of melding its Sprint long-distance telephone service with a similiar offering from United Telecommunications, Inc. and is attempting to combine its central office switch business into a joint venture with Siemens AG (see story below).

Siemens, GTE negotiations at standstill

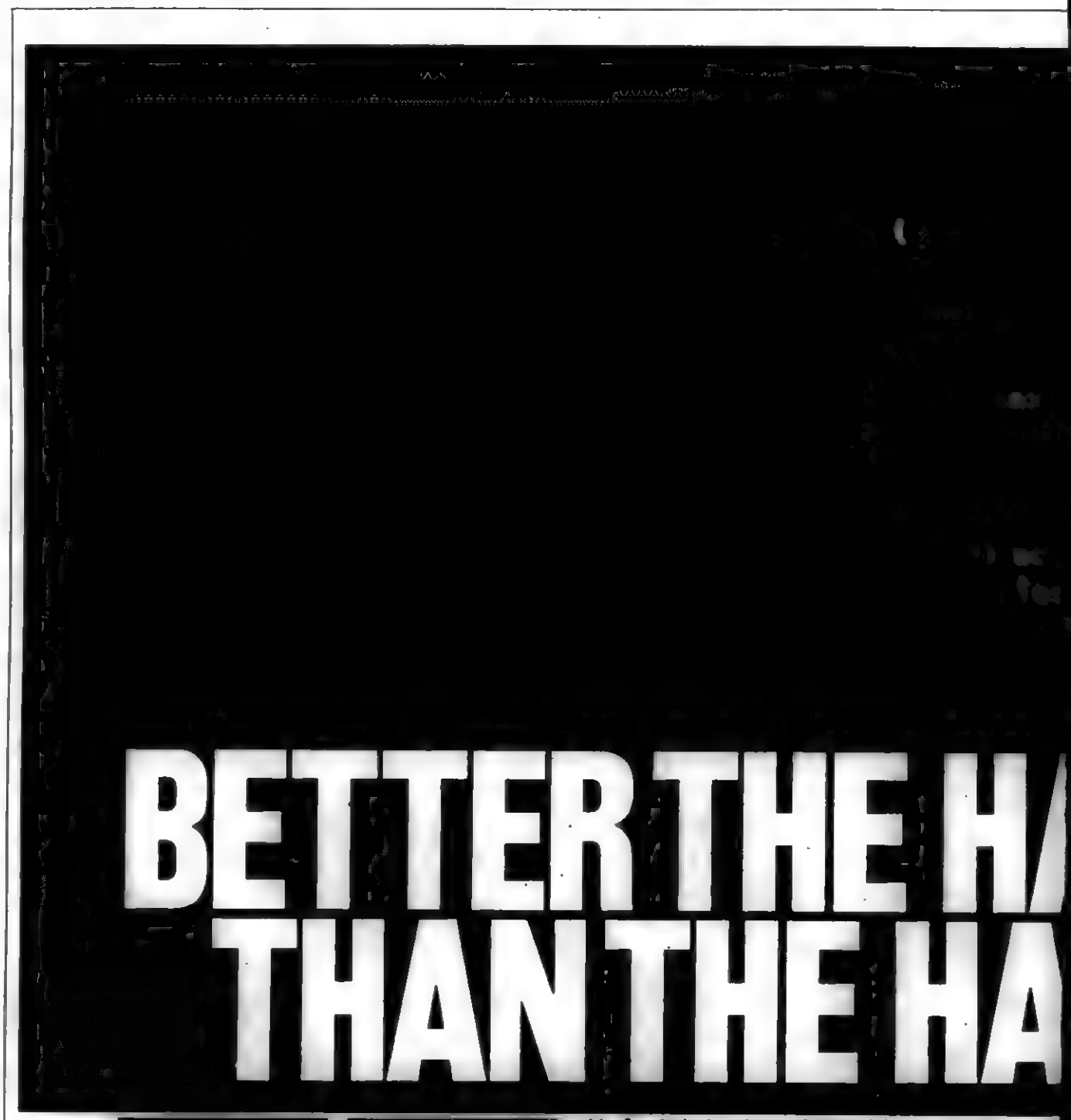
By Beate Knouse
Computerworld News Service

MUNICH — Siemens AG, Germany's leading electronics and telecommunications firm, and GTE Corp., the U.S. telecommunications firm, have not yet succeeded in working out details of their recently announced joint venture. Spokesmen for both firms refused to comment on the stalled negotiations.

> ***"The firms are having trouble agreeing on which telephone switching system to distribute."***

The plan to establish a joint company for the development of communications equipment was announced in mid-January. Siemens hopes to sell its telephone switching systems to 15 GTE offices as part of the deal.

According to Sean White, president of New York-based market research firm Northern Business Information, Inc., the companies are having trouble agreeing on which telephone switching system to distribute through the joint venture. White also speculated that other sources of contention are disagreements over management of the firm and the question of whether to integrate the GTE production plant in Northlake, Ill.; into the new firm.





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Retail dealers turning Blue

From page 146

down on the gray market — those sneaky unauthorized dealers that often steal high-volume corporate sales away from IBM's own direct sales force.

The freeze touched off a wave of consolidation in the retail channel that was already smarting from price competition on all fronts, including IBM direct sales. Authorized stores became hot properties for expansion-minded chains, which bought them as if they were going out of style — which they were.

This has not only given IBM more leverage over its dealers but is also helping to quicken the demise of the independent computer dealers whose business was once based upon personal service and product knowledge. Perhaps manufacturers of blue suits should step up production, since the computer retail channel is quickly beginning to look much like IBM itself.

Tight rein

Ironically, these moves coincide with IBM's departure from direct retailing with the recent sale of all 81 IBM Product Centers to Nynex Corp. IBM obviously feels that the best way it can use its muscle in this channel is by keeping a tight rein on its resellers. But it is uncertain whether IBM can control Nynex, which may have competing interests vis-a-vis AT&T. One thing is certain — IBM authorization for Nynex will be no problem.

For the time being, the winners in the IBM retail game are clearly the major computer retail chains, particularly Businessland, Inc., which has been expanding at a rapid rate and recently purchased two 36-store, company-owned chains within two weeks.

One loser in all this may or may not be Compaq. As IBM increases control over its dealers, it becomes much easier to squeeze the compatibles out of the dealer channel. But based on past performance, few expect Compaq to sit still, and industry sources report that the firm will introduce a sub-$1,000 machine as well as an Intel Corp. 80386-based machine by year's end, both of which are sure to keep it in the running.

Thrust No. 2

Thrust No. 2 in IBM's deepening control over the retail marketplace was made on April 2, with a slew of IBM announcements that may mark the beginning of the end for many add-on board makers.

It now costs a computer dealer the same amount to take a base IBM Personal Computer AT and build it up with hard disks and added memory as it does to buy an enhanced AT from IBM, making one of the dealers' favorite pastimes no longer profitable. In addition, the new IBM Personal Computer XT now comes with 256K bytes on the motherboard, which can be expanded to 640K bytes.

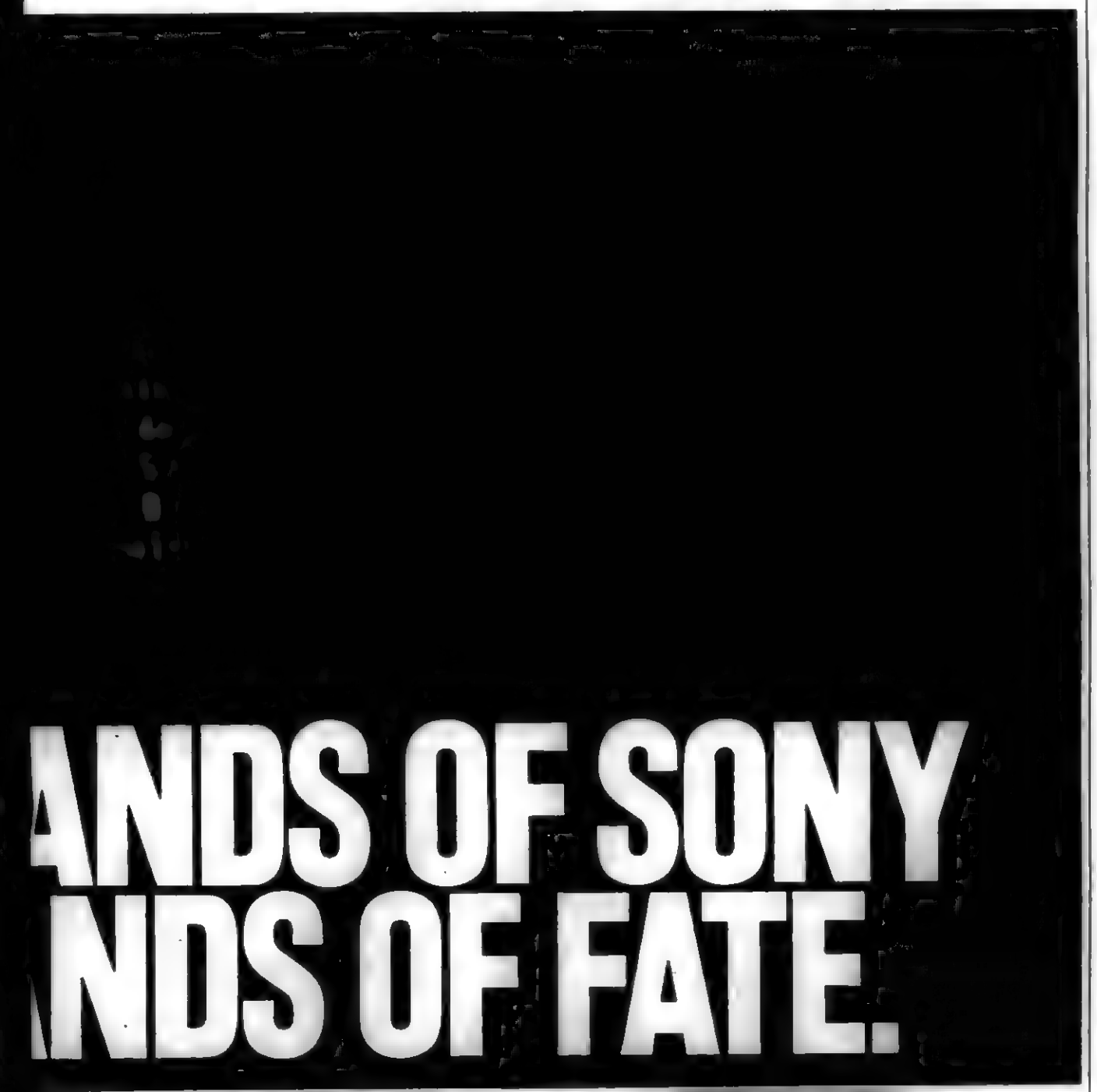
Already, third-party board makers are dramatically cutting prices to make their products attractive to users who haven't yet boosted memory, and some board makers, such as Tecmar, Inc., have begun laying off employees. And the bloodletting among hard disk drive makers may begin any time, if you listen to dealers.

IBM's efforts to control its dealers and squash third-party add-on firms has led to resurgence in speculation about IBM's next move, which could be in the area of microcomputer software.

Remaining compatible

At the April 2 series of announcements, IBM Entry Systems Division chieftain William Lowe warned that firms will have to work increasingly hard to remain compatible — which is just as much a warning to users that they should increasingly buy IBM to remain compatible. When 80386-based machines begin to take over, some analysts expect IBM to introduce several different machines, making compatibility a matter of guesswork.

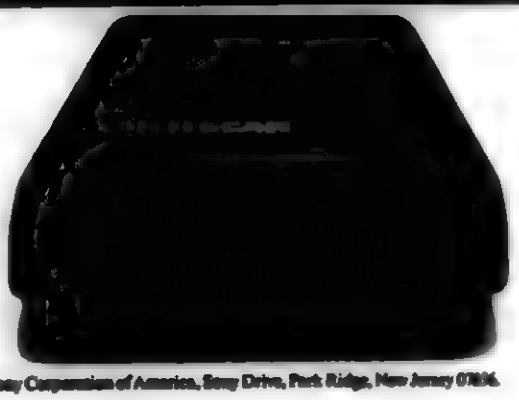
The IBMification of the retail channel might create a significant barrier for those small firms hoping that innovation alone will get them space on retail shelves. With IBM and its handful of retail chains pulling the strings in the retail market place, it may be even more difficult for new or small firms to get heard.



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NSC, Concurrent join forces

To introduce 32-bit supermini by 1989

By Tomohisa Aboshi
Computerworld News Service

TOKYO — In the first move of its kind by a steel maker, Nippon Steel Corp. (NSC) has decided to enter the computer business by establishing a joint venture with Tinton Falls, N.J.-based Concurrent Computer Corp. in Japan this month. Under terms of the preliminary agreement, the firm, Concurrent-Nippon Corp., will introduce a 32-bit superminicomputer in 1988 or 1989.

For the first years, the scope of operations at the firm, which is capitalized at $1.5 million and will be headed by a Concurrent executive to be appointed later, will focus mainly on importing and marketing Concurrent's 32-bit machines for the Japanese market, a spokesman said.

Concurrent will hold an estimated 60%, with NSC holding the remainder. The cooperative company expects $600,000 in sales in its third year of operation.

Japan's Daiwa Securities Co., which coordinated the merger negotiations, said Concurrent's increased interest in the Japanese supermini market meshed well with NSC's hope to diversify its business into electronics.

European group to monitor U.S. investigations into Japanese trade

By Nicky Willmore
Computerworld News Service

LONDON — European chip makers took the first step toward stopping possible Japanese semiconductor dumping by establishing a working group to monitor current U.S. investigations into Japanese trade practices. Dumping duties have already been imposed on some Japanese semiconductor firms by the U.S., and U.S. government and senior trade officials are now holding extensive talks with the Japanese.

European industry officials expressed concern that they do not have a voice in these talks. Europe is also anxious to block reported U.S. proposals to put a floor price on chip sales.

"It would just put more money into the hands of the Japanese and the U.S. companies as well," said the director general of the Electronic Components Industry Federation, a UK trade association. "It isn't satisfactory for the issue to be sorted out bilaterally. It needs to be done on a global basis."

The U.S. antidumping duties do not cover chips manufactured by Japanese firms in third-party countries. Japanese companies are already shifting production volumes to Europe.

NEC Corp. announced plans earlier this month to increase production in the UK, and Toshiba Corp. said it will increase production levels in West Germany by a factor of five. Its stated intention is to increase units produced each month from around 400,000 to about two million by July this year.

Japanese manufacturers already hold about 80% of the world chip market, valued at roughly $1 billion per year.

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Issue: July 9 - Closing: May 30

COMPUTERWORLD FOCUS

Committee bill revives tax credit

From page 146

facturers Association, said the group's members are "glad to see that tax reform is on track." He called the committee bill a "major step toward a brighter future for high technology."

The next steps for the tax reform effort are consideration by the full Senate, where amendments to the Finance Committee's bill are possible, and then an all-important conference between the Senate and the U.S. House of Representatives to negotiate compromises on the differing House and Senate tax packages.

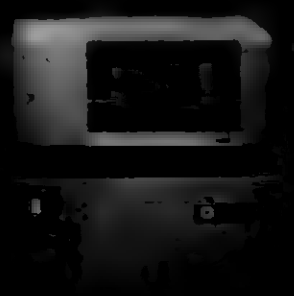
From the industry's point of view, the Senate Finance Committee bill is an improvement over the House-passed bill, although industry lobbyists privately grumbled that they still did not get a permanent extension of the R&D credit.

The House bill would extend the R&D credit for three years at the reduced rate of 20% and cut the top corporate tax rate to 36%. Both the House and Senate committee bills would repeal the 10% investment tax credit, a move that would slightly raise the cost of buying or leasing computers and other equipment.

The Coalition for the Advancement of Industrial Technology, a group of high-tech firms and universities supporting the R&D credit, praised the Senate Finance Committee's bill on grounds that loss of the R&D credit would put U.S. firms at a competitive disadvantage.

"On a day-to-day basis, we must compete against foreign countries that are specifically encouraged by their governments," commented Joseph A. Saloom, chairman of the coalition and an M/A-Com, Inc., executive. "Japan, for example, has had an R&D tax credit since 1966," he said.

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The Departmental Computer Company

Warehouse sale boosts resale mart

By Peggy Watt

SANTA ANA, Calif. — A recent nine-day microcomputer garage sale drew more than 17,000 buyers for excess inventory from 450 Computerland Corp. stores across the country, encouraging aftermarket advocates to herald the place of resale in the computer industry.

Customers who snatched up about $20 million worth of equipment at the Microcomputer Inventory Exchange ranged from corporate computer managers to garage-sale-spirited hobbyists searching for scarce parts to older systems. Prospective customers waited more than two hours to get into the sale, according to Fred Brown, president of Fred Brown Associates in Santa Barbara, Calif., which coordinated the sale.

Brown, publisher of the 2-year-old "Brown Book" guide to used computer prices and a longtime advocate of the resale market, said he thinks the success of the sale underscores the need for a legitimate resale and inventory reduction market for high-tech equipment.

"People are realizing an industry within an industry in the aftermarket," Brown said. "Early buyers need to be able to move up, but they can't abandon their equity." Brown has built a business out of moving excess inventory for computer companies, having cut his teeth on the technique at the now-bankrupt original Osborne Computer Corp.

IBM and Compaq Computer Corp., however, refused to allow even some of their older products in the Computerland warehouse sale. The companies said the co-op sale was contrary to their dealer agreements. Apple Computer, Inc. allowed sale of only its older products that are no longer on the company's price list.

Japanese chip makers to develop SOR equipment

TOKYO — Japan's 13 largest semiconductor suppliers, including NEC Corp., Hitachi Ltd. and Fujitsu Ltd., have agreed to join hands in a $90 million, 10-year government project to develop synchrotron radiation (SOR)-generating equipment, needed to build next-generation semiconductor chips.

As an initial step, a joint R&D firm may be established in June. According to Japan's Ministry of International Trade and Industry (MITI), the ring-shaped SOR generator accelerates electrons and light at the same velocity.

MITI said that full availability of SOR systems will be a shortcut to the manufacturing of 16M-byte dynamic random-access memory chips, the devices 16 times more powerful than 1M-byte memories.

Entrepreneur charged with software piracy

By James A. Martin

TORONTO — In what is said to be one of the first cases of its kind in Canada, a Toronto entrepreneur faces a total of 10 criminal charges for allegedly reproducing and distributing illegal copies of microcomputer software programs.

During a recent hearing, Provincial Court Judge Fred White requested that four counts of theft be added to the list of charges already facing Terence Ram, a Toronto businessman who operated a company called TR Software.

Ram is accused of supplying customers with illegally reproduced software and instruction manuals for such programs as IBM's Displaywrite 2 and Quaid Software Ltd.'s Copyright.

Ram faces 10 charges including fraud, theft and trademark forgery, according to a Toronto attorney, who asked not to be identified. TR Software allegedly sold the unauthorized software programs for as little as $9 and advertised its services regularly in Toronto newspaper classified ads and a catalog.

The charges cover the period of Feb. 11 to Sept. 18, 1985, at which time the Royal Canadian Mounted Police, acting on a tip, seized the property and assets of Ram's company. IBM and Quaid, among other vendors, had received numerous calls for support from unregistered users and relayed their concerns to Canadian authorities, the source said.

Because this case represents a "new type of prosecution," it will be difficult to estimate what penalties the defendant might receive if found guilty, the attorney said. "This is a very new kind of case in Canada, so it is hard to say how a court will consider the penalties."

David B. Sturtevant, senior director of public communications for ADAPSO in Arlington, Va., said it was the first software piracy case in Canada to come to the organization's attention. ADAPSO has been emphasizing stiffer penalties and more federal investigation and involvement in software piracy cases in the U.S.

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Industry experts will instruct full-day courses on network control, IBM/SNA network management systems, strategic planning and network diagnostics.

Monday June 9 1986

9:00 am - 5:00 pm
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T-1 **Fundamentals of Network Control**
Gabriel Kasperek, President, Kascom, Inc.
The basics of network control, including problem diagnosis and repair, maintenance and operational issues.

T-2 **Integrated Voice/Data Corporate Networks**
Roshan Lal Sharma, Sr. Scientist/Consultant, Telecommunications Network Science.
Network topologies and their synthesis, cost-effective network planning, future trends in intelligent networks and their impact on network management and control.

T-3 **Cost Efficient Methods for Implementing New Tariffs**
Cheryl A. Cushing, Manager, Reference Services, Connecticut Telecommunications, Inc.
Post-divestiture tariff rules, including LATAs and POPs with a comparison of major common-carrier tariffs, and evaluation of intra-LATA access alternatives and a review of new regulatory alternatives to traditional network costs.

T-4 **ISDN I**
Samuel Lynch, Senior Consultant, Zatyko Associates.
Definition and concepts, application standards and world-wide status, plus comparison of ISDN against OSI Reference Model as standard.

T-5 **System Network Architecture I**
Thomas Rossi, Senior Consultant, Zatyko Associates.
Current status of IBM's communication architecture, new extensions such as LU 6.2/APPC and NETBIOS and IBM LANs as "defacto" standards.

Ashton-Tate settles NTS suit out of court, pays Safeguard $250,000

By Douglas Barney

TORRANCE, Calif. — In a recent out-of-court settlement, Ashton-Tate paid some $250,000 to Safeguard Business Systems, Inc., owner of National Training Systems, Inc. (NTS), a firm cofounded by Ronald S. Posner, Ashton-Tate's current executive vice-president of sales and international marketing.

NTS was hired by Ashton-Tate to develop training manuals and sales aids for Ashton-Tate's Framework and Dbase software packages. Ashton-Tate refused to pay for the work, claiming it was substandard, prompting NTS to sue for breach of contract.

"I don't think any of it was actually used," said Stanley Witkow, attorney for Ashton-Tate. Safeguard's attorney, Thomas Schneider, was also unsure whether Ashton-Tate used any of NTS' goods or services.

While NTS developed the products, from the fall of 1983 through the summer of 1984, Posner was still with NTS. "At the time the work was being done, he was an employee of NTS, and at the time the suit was being litigated, he was with Ashton-Tate. That sort of put him in an unusual position," Schneider said.

Posner was unavailable for comment.

Zilog to make AT&T chip

Firm picked as alternate vendor of 32-bit chip set

BERKELEY HEIGHTS, N.J. — AT&T last week designated Zilog, Inc. as the first alternate source vendor for its 32-bit Unix chip set, the WE32100.

Zilog, which uses the AT&T chip as the microprocessor in its own 32-bit supermicrocomputer, will manufacture the WE32100 for five years. The Campbell, Calif., semiconductor vendor also has the option to develop and market new products based on AT&T technology and license them to AT&T. The Zilog-made WE32100 chips will carry the Zilog label and will be marketed by Zilog's direct sales force.

John M. Nemecek, AT&T's executive vice-president of components and electrical systems, said the agreement came in response to customer demand. "Our customers told us they wanted the assurance of an alternate source of supply as a demonstration of our commitment to this marketplace," he said.

Zilog, developer of the pioneering 8-bit Z80 microprocessor, is a wholly owned subsidiary of Exxon Corp. Founded in 1975, Zilog was not profitable until 1984 and last year laid off approximately 400 of its 2,100 employees.

Control Your Network

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T-6 Public/Private Data Network I
Daniel Zatyko, President, Zatyko Associates.
Current status of IBM's communication architecture, including applications and standards, and development of X.25 up to 1988 CCITT adoption.

T-7 MAP/TOP Systems Interconnection I
Donald Herring, Vice President, Zatyko Associates.
Status of seven layer OSI Reference Model as framework for future network compatibility, review of major vendor architecture - IBM, DEC, etc. migration to manufacturing automation and office communication protocols.

Tuesday June 10 1986

8:00 am - 5:00 pm
Select One

T-8 Planning the Network Control Center
Gabriel Kasperek, President, Kascom, Inc.
User considerations in the design, equipment selection, software, and instrumentation of a network control center and related vendor issues.

T-9 Problem Resolution and Network Management in SNA Networks
Fred Cook, Senior Consultant Kapersky.
Techniques useful in analyzing problems in SNA networks. Topics include detailed SNA sequences, VTAM trace, NCCF, NPDA, NLDM and a review of critical parameters in NCP System Generation.

T-10 Network Modeling/ Design Workshop
Larry Rhee, Vice President, Connections Telecommunications Inc.
Network design calculations using MIND6 PC-based design software and the complimentary Borland SIDEKICK package. Also included, queuing calculations in simple and complex network models, reflecting SDLC, BSC and X.25 protocols, statistical multiplexers and distributed concentrator networks.

T-11 ISDN II
Samuel Lynch, Senior Consultant, Zatyko Associates.
Technology and system/network/switching of ISDN, and certification and network testing, including 1986/87 field trials/user implementation.

T-12 System Network Architecture II
Thomas Rosett, Senior Consultant, Zatyko Associates.
Technology and systems impact of SNA and relation to open architectures and protocols on networks from DEC and other vendors, and higher layer SNA services - DIA/DCA, PU 2.1, etc.

T-13 Public/Private Data Network II
Daniel Zatyko, President, Zatyko Associates.
Technology and systems impact of long distance, regional and in-house data networks, including message handling systems and office document interchange formats under different operating systems.

T-14 MAP/TOP Systems Interconnection II
Donald Herring, Vice President, Zatyko Associates.
Session will cover MAP/TOP common protocol connectivity, GM and Boeing programs, other vendor demos, user experiences and the implications of Corporation for Open Systems on MAP/TOP, vendor standards and products.

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CW2

Hitachi, Fujitsu profits to decline

By Takehisa Kondoh
Computerworld News Service

TOKYO — Hitachi Ltd. and Fujitsu Ltd. are expected to report sharp declines in profits for the last fiscal year, blaming the semiconductor industry's recession and the Japanese yen's seemingly incessant surge in value against the U.S. dollar.

Like many Japanese companies closing their fiscal years in March, Hitachi and Fujitsu have yet to issue final financial statements for 1985. However, at Fujitsu, profits reportedly may shrink more than 60% from the year before to around $250 million on revenue of $8.9 billion, up about 10% from 1984 levels.

Fujitsu expects to announce that sales of computers reached roughly

Computer Industry section begins on page 146.

$6.26 billion, up 18% from the year before. The company, meanwhile, predicts a 25% growth in sales of communications gear, while the company's memory products line will suffer an estimated 25% drop to sales of $1.2 billion.

Echoing Fujitsu's story, Hitachi cited the erratic fluctuations in yen-dollar exchanges and the semiconductor slump as primary reasons for its gloomy forecast of a 40% profit decline for fiscal 1985.

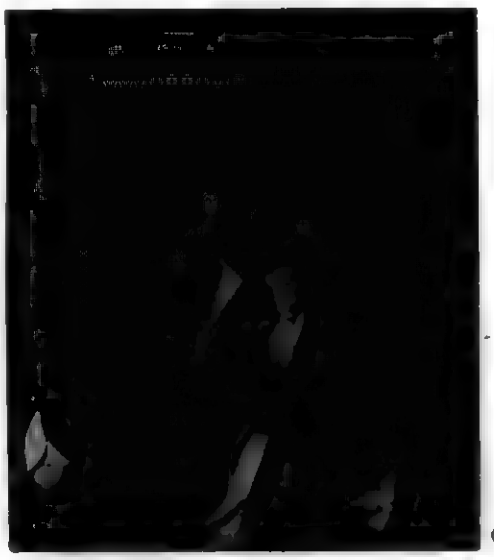
Hitachi forecasts 1985 profits of $1 billion on revenue of $18.7 billion, up just 1% from a year ago. The semiconductor division is expected to earn $2.7 billion, down from 1984's $3.4 billion.

Hitachi said that despite a rapid recovery in chip sales, market prices are far from restored to healthy levels.

According to one company official, a 256K-byte dynamic random-access memory chip now sells for an average price of $2.10 in the U.S. versus the average price of $22 at the end of 1984.

The bullish Japanese currency against the U.S. dollar is also expected to reduce Matsushita Electric Industrial Co.'s profit by some 25% during the current financial term, which ends in November.

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Marc Blessing
Director
CompuSearch
Cleveland, Ohio

A division of Management Recruiters International with 172 offices in the U.S., CompuSearch markets itself as the nation's largest recruitment agency devoted exclusively to MIS/DP placement. But it was not always that way, according to Marc Blessing, Director of CompuSearch.

CompuSearch needed to gain industry awareness. *"Three years ago the general public and most of the DP industry had never heard of CompuSearch. Prospective clients would often say, 'who?' when our account executives would call,"* says Marc. *"We needed national recognition and we needed a publication that would allow us to zero in on our target audience."*

So CompuSearch started advertising in Computerworld. And it worked.

"It worked because of Computerworld's audience," he explains. *"We're getting people with diverse backgrounds — from dedicated professionals with 2-3 years of programming experience to top MIS/DP management."*

"Computerworld's audience delivers the proven professionals that we look for," Marc reports.

"Because of the new contacts that Computerworld produced on both the client and candidate sides, we decided to increase — actually double — our advertising in 1986," he adds. *"We've considered other publications, but we know that our dollars stretch farther with Computerworld. It allows us to hit our target audience,"* concludes Marc.

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MERGERS AND ACQUISITIONS

Data communications vendor **Avatar Technologies, Inc.** of Hopkinton, Mass., recently acquired **Matrix Communications, Inc.** of Marblehead, Mass., for an undisclosed sum. In addition to its protocol converters, micro-to-mainframe links and other communications products, Avatar will now market as the Avatar Alliance Matrix's sole product, the entry-level Alliance local-area network.

Matrix introduced the Alliance last fall and installed the network at some beta-test sites, but needed some financial help to market the product.

■

The Standard Register Co. and **Burroughs Corp.** have entered into an agreement whereby Standard Register will purchase the assets and operations of the U.S. **Business Forms Division** of the **Office and Media Products Group** of Burroughs.

The purchase agreement provides for change of ownership on June 1. The boards of directors of both companies have approved the transaction. The purchase price is in excess of $100 million.

■

National Business Systems, Inc. has reported that **Transact Data Services, Inc.**, an affiliated company, has completed the purchase of all of the outstanding shares of **MSS/DP, Inc.**, a Toronto-based data processing consulting and software development firm. Terms of the purchase agreement were not disclosed.

■

Decision Data Computer Corp. announced the acquisition of **Panatec**, a computer software and operating system developer based in Garden Grove, Calif.

Decision Data purchased Panatec in order to support the company's strategy of developing advanced computer products and vertical market applications software. Panatec is composed of a systems software group, a customer software group and a robotic systems group.

Decision Data also announced the acquisition of the **Beverage Systems Division of Endata, Inc.** of Nashville.

The acquired business will become **Decision Beverage Systems Corp.**, a wholly owned subsidiary of Decision Data to be headquartered in Charlotte, N.C.

Decision Data purchased the operation to expand its position in the IBM System/34, 36 and 38 software market. Endata's Beverage Systems division supplies turnkey systems and software for the U.S. wholesale beverage industry.

■

Softech, Inc. of Waltham, Mass., has acquired **AMG Associates, Inc.** of Arlington, Va., in a stock purchase transaction. AMG Associates is a leading designer of custom software systems and related applications for automatic test equipment, a major component in the production and readiness of government and industrial systems. AMG Associates reported revenue of $3.4 million in calendar year 1985.

■

Isaco announced an agreement in principle to acquire an initial 60% interest, with an option to acquire an additional 31%, in **Mimer Information Systems AB**, a Swedish developer and marketer of integrated relational data base software.

The agreement grants Isaco exclusive rights to market Mimer products in North America, U.S. territories and Pacific Basin countries. Mimer will remain a separate company and continue its software development and European marketing under President Sven G. Johansson, a company founder.

■

Continental Telecom, Inc. (Contel) announced that **American Satellite Co.**, a Contel unit, has signed a definitive agreement to acquire the **Western Union Telegraph Co.'s Government Systems Division.**

The transaction, valued at $155 million, includes certain transmission, maintenance and administrative services to be provided by Western Union to American Satellite following the closing.

■

Nynex Corp. has announced it has acquired **Telco Research Corp.**, which develops and markets integrated software products and services designed for telecommunications and information systems managers to manage their telecommunications resources. Terms of the acquisition were not disclosed.

■

Pactel Communications Cos. reported that two of its subsidiaries, **Pactel Communications Systems** and **Pactel Infosystems**, have been consolidated into one company. The newly integrated company is a subsidiary of **Pacific Telesis Group**, the telecommunications holding company based in San Francisco.

Pactel Communications Systems of Walnut Creek, Calif., sells, installs and services telecommunications and computer hardware products to major companies.

Pactel Infosystems, based in San Leandro, Calif., markets business telephone and microcomputer systems through direct sales, telemarketing and retail centers.

■

Hale Systems, Inc. has completed the previously announced sale of substantially all of the assets of its subsidiary, **Bankline, Inc.** of Phoenix, to **Security Pacific Information Systems, Inc.**, a subsidiary of **Security Pacific Corp.**

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Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities

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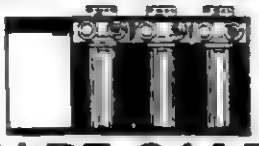
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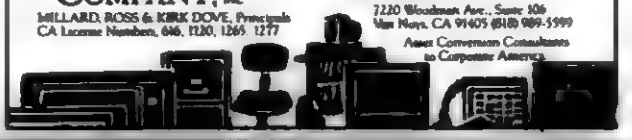
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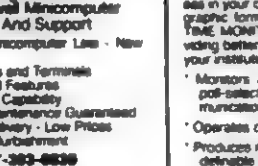
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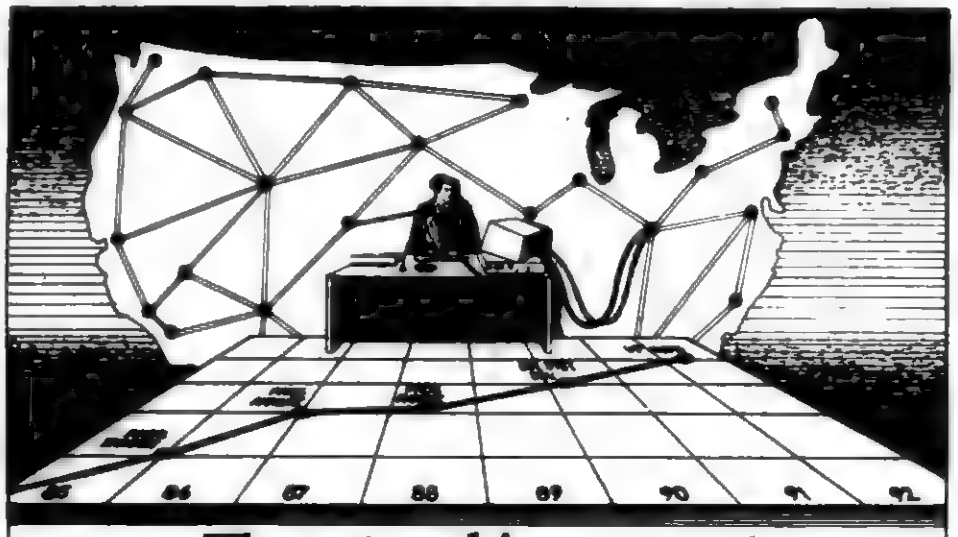
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Qualified candidates should send their resume, in confidence, to: Joe Musumano, Human Resources Manager, Dept. CW 5/19; Cullinet Software, Inc., 400 Blue Hill Drive, Westwood, MA 02090. An equal opportunity employer.

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This position involves the development of expert/knowledge based systems for a variety of applications including process control, robotics, computer/user interfaces, C^3I and demographic data interpretation. MS or PhD desirable

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Experience in planning will be absolutely essential as you analyze banking function & define long range systems architecture to meet business requirements. Working to the highest levels of analysis, your proficiency will ensure the efficient implementation of information systems architecture. The qualified candidate will have 6+ years EDP experience, including extensive involvement with large scale systems and broad banking applications experience.

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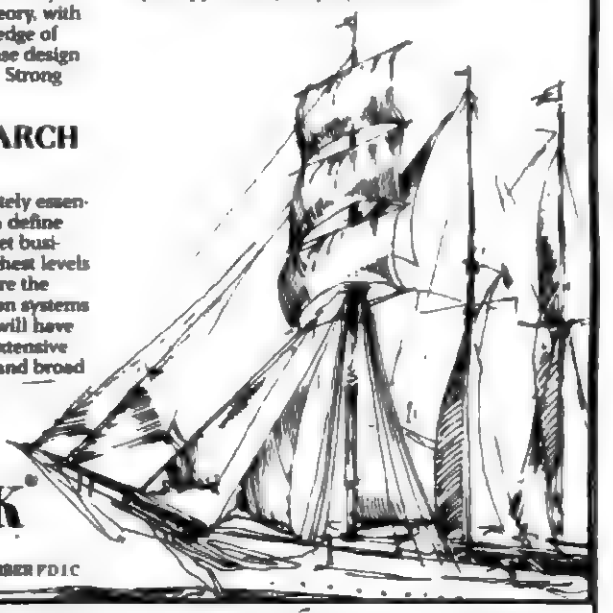
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Sweden: CW Communications AB, Sodra Hamnvagen 22, S-115 41 Stockholm, Sweden. Phone: 46 8 67 91 80. Telex: 14904 9 (NOVACW).

Switzerland: Gebhard Dahlmann, CW Publikationen AG, Witikonerstrasse no. 15, CH - 8032 Zurich, Switzerland. Phone: (01) 55 10 77. Telex: 816710.

Taiwan: Grace Tang, ACE Media Agency Ltd., Room 503, 1, Fu Hsin S. Road, Sec. 1, Taipei, 10587, Taiwan, R.O.C. Phone: 751 3636. Telex: 14142 (ACE GROUP). (Representative for all CWCI publications).

United Kingdom: Martin Durham, CW Communications Ltd., 99 Grays Inn Rd., London, WC1 8UT, United Kingdom. Phone: (01) 831-9252, Telex: 262346.

Euan Rose, Bill Dunlop, Barbara Levy, Christine Taylor, Beere Hobson Assoc., 345 Goswell Rd., Islington, London EC1, United Kingdom. Phone: (01) 278 3415. Telex: 311961. (Representatives for CWCI publications).

Venezuela: Kalman von Vajna Nagy, CW Comunicaciones, C.R.L. Torre Maracaibo, Piso 10, Oficina H, Av. Libertador, Caracas, Venezuela. Phone: 72-76-30.

West Germany: Eckhard Utpadel, CW Publikationens GMBH, Friedrichstrasse 31, 8000 Munchen 40, West Germany. Phone: (089) 38172-0. Telex: 5215350.

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INDUSTRY NOTES

MAI Basic Four files IPO

MAI Basic Four, Inc. announced its initial public offering (IPO) last week of five million shares with a value between $85 million and $100 million. The firm will issue four million shares, and current stockholders will sell an additional million. MAI Basic Four announced earnings of $4.1 million on revenue of $70.8 million for the quarter ended March 31, its fourth consecutive profitable quarter. A year ago, the company lost $1 million on sales of $38.2 million in two months after commencing operations Jan. 29, 1985.

The supermini and supermicro vendor grew out of the former Basic Four Information Systems Division of Management Assistance, Inc. after the latter was split up and sold by arbitrageur Asher B. Edelman.

■

Computer Associates International, Inc. announced a 48% revenue increase and a 42% profit gain for the fiscal year ended March 31. The Garden City, N.Y., software vendor earned $18.5 million, or 83 cents per share, on sales of $191 million. For the fourth quarter, revenue increased 55% from year-earlier levels to $57.6 million, and profits were up 48% to $5.3 million, or 22 cents per share.

■

Two Dallas-based software houses, **Uccel Corp.** and **Sterling Software, Inc.**, reported strong earnings for the quarter ended March 31. On revenue of $37.6 million, Uccel earned $2.6 million, or 16 cents per share, including 3 cents per share from a one-time capitalization of software development expense. A year earlier, Uccel earned $1.5 million from continuing operations on sales of $31.9 million.

Sterling Software earned $1.9 million, or 17 cents per share, on revenue of $58.8 million. In the year-earlier quarter, the firm reported a profit of $629,000, or 13 cents per share, prior to the acquisition of **Informatics General Corp.**

■

Hewlett-Packard Co. has restored full-time, full-pay conditions to most of its employees, but it is implementing a hiring reduction throughout the company. Since two days per month of unpaid vacations and a 10% pay cut were implemented last August, about 40% of the employees have gone back to full pay and full-time work.

Orders at HP remain under pressure, however. "Our order rate, while it isn't all that bad, isn't all that good," a company spokesman said.

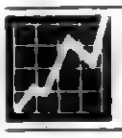
■

Workstation manufacturer **Counterpoint Computers, Inc.** of San Jose, Calif., laid off nine of its 94 employees earlier this month. The start-up company, which attracted national interest after it raised $20 million in venture capital and signed a strategic alliance with **AT&T Information Systems**, plans to take its manufacturing facilities out of house.

■

In an ironic twist of events, New Hampshire attorney Thomas K. Cristo, who gained fame successfully litigating against vendors including **MDS Qantel, Inc.**, last week was named president and chief operating officer of MDS Qantel. Christo was named to the board of directors of the Hayward, Calif., minicomputer vendor last year. MDS Qantel is the only remaining unit of Mohawk Data Sciences Corp. after its recent sale of assets.

New products, confidence, strong quarter boost Tandem



ACTIVE ISSUES
Kathy Porteus

No one can fault the recent stock performance of Tandem Computers, Inc. (TNDM — 31¾). A combination of well-received new products, increased confidence in the company's financial management and surprisingly strong results for the second fiscal quarter ended March 31 have propelled Tandem's stock price up 40% since early April.

Analysts adjusted their earnings estimates after Tandem posted second-quarter earnings of 29 cents a share, when most were expecting per-share earnings of 20 to 22 cents.

Frederic H. Cohen, analyst with L. F. Rothschild, Unterberg Towbin, changed his estimates to $1.35 a share for fiscal 1986 ending Sept. 30 and $1.85 a share for next year. David Wu, analyst with S. G. Warburg, Rowe & Pitman, Akroyd of San Francisco, raised his fiscal 1986 earnings estimate to $1.30 a share and fiscal 1987 estimate to $1.75 a share. Such adjustments reflect "basic improvements in Tandem's management," Wu says.

"There was a time," Cohen says, "when Tandem was not considered serious in terms of product development." But in mid-April, Tandem introduced its high-end system, the Nonstop VLX, which reportedly delivers about twice the performance of the older Nonstop TXP at two-thirds the cost per transaction. Cohen says the "VLX came right on schedule, underscoring management's much-improved controls over product design and production."

Tandem's near-term stock performance will likely be determined by what investors anticipate the company's prospects are for fiscal 1987.

Some analysts say that Tandem's prospects in its next fiscal year are essentially tied to the timing of a turn in the U.S. computer industry. Currently, domestic sales for Tandem, as well as for most other computer companies, remain weak.

"But Tandem's U.S. sales didn't fall off [in the second quarter] as had been expected," Cohen argues, "suggesting strong demand for the company's product line. Like Digital Equipment Corp., Tandem has the momentum of a very powerful product cycle working in its favor."

Donald Haback, vice-president of research at Smith Barney, Harris Upham & Co., says, "Tandem's international business may be able to make up for much of the domestic weakness this year, especially with the currency translation factor." Its foreign operations provided 40% of second-quarter revenue.

According to Warburg's Wu, the company's sales in the UK are especially strong this year because brokerage firms, anticipating deregulation of the London Stock Exchange, are buying more computers. Since such a sales boom may not recur next year, Wu expects Tandem's European sales to contribute less to total revenue in 1987. If next year's domestic sales increase by more than 10%, Wu says, then Tandem's net revenue growth should be about the same as this year's.

Based on this scenario and the likelihood of increased competition, Wu says he does not think there is much of an up side to Tandem's stock price. To be a buyer at these levels, "you have to believe the company can earn $2 a share in 1987," Wu says. Another analyst maintains Tandem is already too expensive.

But Rothschild's Cohen continues recommending Tandem on its potential to reach 50 within the next 12 to 18 months, assuming "the stock market doesn't peter out."

Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

IBM partnership a boon to Hogan

From page 146

Carpenter said.

Pretax losses ran up to $13.8 million in 1985 and $6.9 million in fiscal 1986, which ended March 31. Revenue dropped from a high of $36 million in 1984 to $28.3 million in 1985 and $27 million in 1986.

Carpenter said Hogan has repaired its integrated loan package, which consists of commercial loan, consumer loan and mortgage lending systems. But he said Hogan's credibility problems are "still lingering. That's where the agreement with IBM will help."

One major Hogan competitor, Uccel Corp. of Dallas, does not feel threatened by the pairing of Hogan and IBM. "Over the last four months, we have gone head to head against Hogan four times and sold our products to all four clients," said Donald L. Steele, vice-president and general manager of the Financial Systems Division of Uccel. "We look forward to meeting them in the marketplace."

IBM will have the first right of refusal on future Hogan products, Campbell said, and will provide the front line of support: installation and telephone hot-line service. Hogan will provide the backup diagnostic support and will send a technician to the site when one is needed, he said.

Hogan is noted for selling software to 140 large banks worldwide. It typically boasts that it sells only to institutions with $1 billion or more in assets.

At least one industry follower, however, was puzzled by the match-up. "It is rather curious," said Rick Sherlund of Goldman Sachs & Co. "Marshall & Ilsey Corp. has IMS-based products. Why doesn't IBM sell that product line?" Sherlund said Hogan produces large applications that "are not very considerate of machine cycles, even though they are technically advanced."

The company is known to be working on a product called Financial Information System, which some analysts think Hogan hopes to sell to smaller institutions. But Uccel's Steele says the joint agreement with IBM has added to the complexity of Hogan's situation, with IBM selling packages and Hogan supporting them. "It's not as smooth as one organization doing both," he said.

IBM names distribution president Goldberg to top marketing slot

ARMONK, N.Y. — Victor J. Goldberg, former president of IBM's National Distribution Division, was appointed the top marketing executive of the Information Systems Group in a number of promotions announced last week.

As assistant group executive for marketing, Goldberg will be responsible for the customer sector organization, IBM's direct sales channel in the U.S. He formerly headed the dealer/reseller channel for microcomputers and related products.

Replacing Goldberg as head of the distribution division is Ned C. Lautenbach, former assistant group executive for plans and controls of the Information Systems and Communications Group. Lautenbach is the brother of Communications Products Division President Terry R. Lautenbach.

Additional promotions

IBM also announced the promotion of Vice-President Patrick A. Toole to group executive of the Information Systems Technology Group, replacing the late John E. Bertram, who died last month.

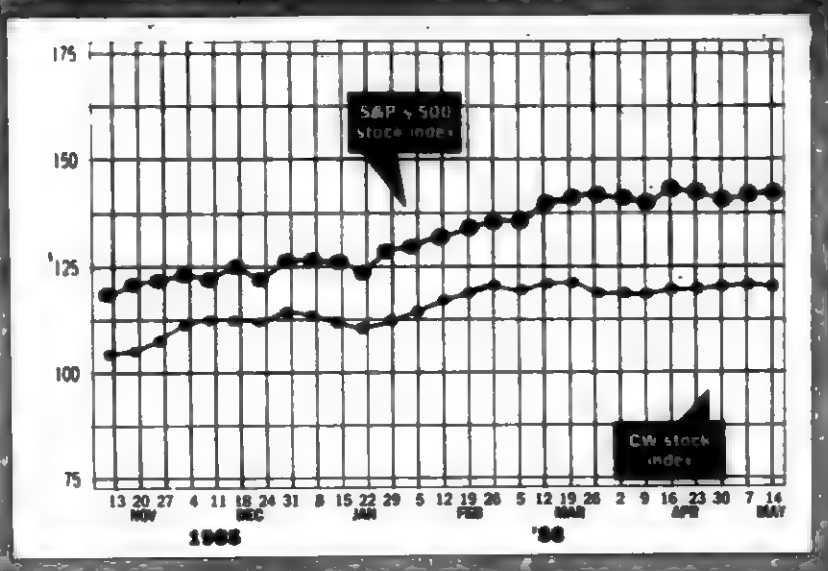
This technology division develops and manufactures IBM's semiconductors, as well as some intermediate processors and printers.

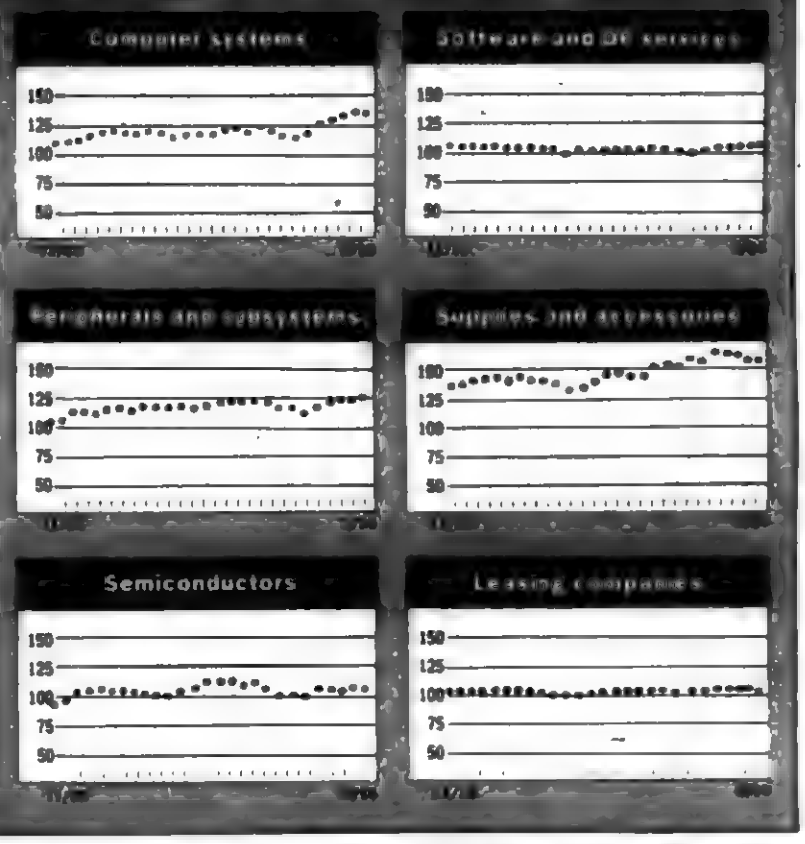
Toole had been the unit's assistant group executive in charge of development and manufacturing.

COMPUTER INDUSTRY

MITCHELL J. HAYES

Computerworld stock trading index





All figures reflect a change per share of 100 or more. $1,000 and base stock market performance in relation to that base. The CW stock index represents the unweighted average performance of 50 companies from all computer industry sectors.

	5/7/86	5/14/86
Computer systems	131.0	128.9
Software and DP services	106.2	106.4
Peripherals and subsystems	123.0	125.0
Supplies and accessories	154.2	154.6
Semiconductors	111.9	110.6
Leasing companies	105.8	104.6
CW stock index	121.9	121.5
Standard and Poor's 500 stock index	141.2	142.0

Computerworld stock trading summary

CLOSING PRICES WEDNESDAY, MAY 14, 1986

EXCH		52-WEEK RANGE (1)		PRICE CLOSE MAY 14 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS					
O	ALPHA MICROSYSTEMS	5-	9	7 1/4	+5/8	+9.4
O	ALTOS COMPUTER SYST	9-	19	18 1/8	+1/4	+1.3
A	AMDAHL CORP	10-	18	15 1/2	1/2	-3.1
O	APOLLO COMPUTER	9-	31	15 1/2	3/4	-4.8
O	APPLE COMPUTER INC	14-	37	36 7/8	+5 3/8	+17.0
N	AT&T	19-	28	24 3/8	-5/8	-2.5
N	BURROUGHS CORP	52-	71	59 7/8	-3	-4.7
O	COMPAQ COMPUTER CP	5-	18	17 7/8	+3/8	+2.1
O	COMPUTER AUTOMATION	1-	9	2 1/4	0	0.0
A	COMPUTER CONSOLES	5-	14	10 1/8	-1	-8.9
N	CONTROL DATA CORP	15-	39	23 1/2	3/8	-1.5
O	CONVERGENT TECHNOL	5-	13	9 1/4	1/4	-2.6
O	CPT CORP	5-	8	4 5/8	+1/8	+2.7
N	CRAY RESEARCH INC	25-	82	81 3/4	-1/4	-0.3
O	DAISY SYSTEMS CORP	11-	38	12 1/2	-1/2	-3.8
N	DATA GENERAL CORP	31-	76	39 3/4	1/4	-0.6
N	DATAPOINT CORP	6-	22	7 1/4	+3/4	+11.5
N	DIGITAL EQUIPMENT	42-	91	88	+1	+1.1
A	EECO INC	13-	17	17	+1 3/4	+11.4
N	ELECTRONIC ASSOC	3-	7	5 7/8	0	0.0
N	FLOATING POINT SYST	18-	42	39 7/8	+1 1/8	+2.9
N	FOXBORO	22-	31	29 1/2	1 1/4	-4.0
N	GOULD INC	20-	38	26 3/4	0	0.0
N	HARRIS CORP	22-	35	32 1/2	0	0.0
N	HEWLETT PACKARD CO	29-	45	44 1/4	-7/8	-1.9
N	HONEYWELL INC	54-	87	76 5/8	1 3/8	-1.7
N	IBM	117	156	148 1/8	-3 1/8	-2.0
O	IPL SYSTEMS INC	1	4	2 3/8	0	0.0
N	ITT CORP	28-	48	46 1/2	-1	-2.1
N	M/A-COM INC	13-	24	16 5/8	+3/8	+2.3
N	MANAGEMENT ASSIST	2	28	2 3/8	0	0.0
N	MATSUSHITA ELEC(ADR)	49-	98	91 1/8	-1 1/4	-1.3
O	MENTOR GRAPHICS	13-	30	17 3/8	-1 3/8	-7.3
N	MODULAR COMPUTER SYS	6-	9	9	+1/8	+1.4
N	MOHAWK DATA SCI	1-	13	3 3/8	0	0.0
N	NBI INC	11-	20	12	-1/4	-2.0
N	NCR	25-	53	52 7/8	+7/8	+1.6
N	PERKIN-ELMER	22-	36	32 3/8	7/8	-2.6
N	PRIME COMPUTER INC	15-	27	21 1/4	0	0.0
N	SPERRY CORP	39-	73	72 7/8	+2 1/2	+3.5
O	STRATUS COMPUTER INC	9-	25	23	+1/4	+1.0
O	TANDEM COMPUTERS INC	13-	32	30 3/4	-1 1/8	-3.5
N	TANDY CORP	24-	44	40 7/8	+1 7/8	+4.8
O	TELEVIDEO SYSTEMS	2-	4	3 1/2	-1/4	-8.6
O	TELXON CORP	6-	21	21 3/4	+1/4	+1.2
N	TEXAS INSTRUMENTS	86-	141	136 1/2	1/4	-0.1
A	ULTIMATE CORP	8-	32	30 1/2	-1/4	-0.8
O	VECTOR GRAPHICS INC	1-	1	1/8	0	0.0
A	WANG LABS "B"	15-	29	17 1/4	3/8	-2.1
A	WANG LABS "C"	15-	29	17 1/8	5/8	-3.5
N	XEROX CORP	37-	72	59 1/4	-3/8	-0.6
	SUPPLIES & ACCESSORIES					
N	AMERICAN BUS PRODS	21-	36	33 1/4	-2	-5.6
N	BARRY WRIGHT	17-	29	23 5/8	+1/8	+0.5
A	DUPLEX PRODUCTS INC	13-	22	22 3/8	+1 1/8	+5.2
N	ENNIS BUS FORMS	14-	26	24 1/8	+7/8	+3.7
N	3M COMPANY	74-	107	102 1/4	+1	+0.9
N	MOORE CORP LTD	15-	27	24 3/4	-3/4	-2.9
O	STANDARD REGISTER	22-	45	41	-1/4	-0.8
N	WALLACE COMP SERVICE	30-	48	47 3/4	+1/8	+0.2

EXCH		52-WEEK RANGE (1)		PRICE CLOSE MAY 14 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & DP SERVICES					
O	ADVANCED COMP TECH	2-	8	5 3/4	+1/4	+4.5
N	ADVANCED SYSTEMS INC	9-	20	17 1/8	-5/8	+3.7
N	AGS COMPUTERS INC	10-	25	21	+1/2	+2.4
O	AMERICAN SOFTWARE	9-	15	11 3/4	-5/8	-5.0
N	ANACOMP INC	2	6	5 1/2	-1/8	-2.2
O	ANALYSTS INTL CORP	5-	11	7 3/4	+1	+14.8
O	ASHTON TATE	6-	30	29 5/8	+1 1/2	+5.3
O	ASK COMPUTER SYSTEMS	7	25	11 1/2	3/4	-6.1
B	ASTRADYNE COMP IND	1-	3	1 3/4	0	0.0
N	AUTOMATIC DATA PROC	35-	71	70 1/4	1/4	-0.3
O	COMPUTER NETWORK	5-	9	8 1/8	+1/8	+1.5
O	COMPUTER ASSOC INT'L	9-	21	21 3/4	+7/8	+1.1
O	COMPUTER HORIZONS	5-	11	13 3/8	0	0.0
N	COMPUTER SCIENCES	13-	36	35 1/8	+7/8	+2.5
O	COMPUTER TASK GROUP	10-	26	26 3/4	+1/4	+0.9
O	COMPUTER USAGE	1-	3	3	+1/4	+9.0
O	COMPUTONE SYSTEMS	3-	11	4 7/8	3/8	7.1
O	COMSERV CORP	1	6	3 1/4	1/4	-7.1
O	COMSHARE	7-	13	12 7/8	+2 1/4	+21.1
N	CULLINET SOFTWARE	12	33	15 1/8	+1	-7.0
O	CYCARE SYSTEMS INC	13-	27	14 1/4	+7/8	+6.5
O	HOGAN SYSTEM INC	4-	12	10 3/4	0	0.0
N	GENERAL ELECTRIC CO	58-	79	77 1/2	+1/4	+0.3
N	GENL MOTORS E (EDS)	20-	49	49 3/8	+1 3/4	+3.6
N	GTE CORP	38-	54	50 1/2	+3/8	+0.7
O	INFORMATION SCIENCE	1-	5	3 1/4	+1/8	+4.0
O	INFOTRON SYSTEMS CP	13-	24	15 3/4	+1/4	+1.6
O	KEANE ASSOCIATES	10-	20	14	1/2	-3.4
N	LOGICON	25-	43	35 1/2	+1/4	+0.7
O	LOTUS DEVELOPMENT CP	15-	37	36 1/2	+1 1/2	+4.2
O	MCI COMMUNICATIONS	7	13	10	1/8	-1.2
O	MNGT SCI AMER INC	7-	16	14	0	0.0
O	MATHEMATICAL APP GRP	1-	8	1/2	1/8	20.0
O	MICOM SYSTEMS INC	12-	35	18	-1/4	-1.5
O	MICROPRO INT'L CP	2-	4	2 1/2	0	0.0
O	NATIONAL DATA CORP	8-	25	24 7/8	+1 1/2	+6.4
O	ON LINE SOFTWARE INT	4-	16	15 1/4	1/2	-3.1
N	PANSOPHIC SYSTEMS	14-	34	34 3/8	+3/8	+1.1
N	PLANNING RESEARCH	11-	23	22 5/8	+3/4	+3.4
O	POLICY MGMT SYSTS CP	16-	35	21 1/2	+3/4	+3.6
O	PROGRAMMING & SYS	4-	10	9 1/4	+1/2	+5.7
O	REYNOLDS & REYNOLD	30-	65	30 3/4	+3/4	+2.5
O	SEI CORP	13-	27	24 1/2	+1	+4.2
O	SHARED MEDICAL SYST	26-	38	36 3/8	-3/4	-2.0
O	SCIENTIFIC COMPUTERS	4-	8	4 5/8	0	0.0
O	SOFTWARE AG	12	22	21 3/8	+3 3/8	+18.7
N	URS CORP	10-	18	15 1/4	7/8	-5.4
N	UCCEL	11	21	21 1/4	+1 3/8	+6.9
O	VM SOFTWARE	17	29	28 3/4	+3 1/4	+12.7
	SEMICONDUCTORS					
N	ADVANCED MICRO DEV	22	38	26 1/4	1 3/4	-6.2
O	ADV D SEMICONDUCTOR	7	23	12 1/4	1/2	-3.9
N	ANALOG DEVICES INC	14-	24	23 3/4	1/4	1.0
O	ANALOGIC CORP	11-	16	13 7/8	3/8	-2.6
N	APPLIED MAGNETICS CP	9-	19	19 1/4	+1/4	+1.3
O	AVANTEK	18-	26	18 7/8	1 3/8	-6.7
O	HADCO CORP	3-	7	5 7/8	+5/8	+11.9
O	INTEL CORP	21	33	28 1/8	3/8	1.3
O	MICRO MASK INC	5-	12	5 7/8	0	0.0
N	MOTOROLA INC	29-	48	46 3/4	+1 5/8	+3.6
N	NAT L SEMICONDUCTOR	10-	15	13 7/8	1/4	1.7
N	TERADYNE	17	33	26 1/2	2	7.0

EXCH		52 WEEK RANGE (1)		PRICE CLOSE MAY 14 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	PERIPHERALS & SUBSYSTEMS					
P	AM INTERNATIONAL	3-	8	8 1/4	-3/8	-4.7
A	ANDERSON JACOBSON	2	5	2 1/8	1/8	5.5
O	AST RESEARCH INC	7	33	19 3/8	1 1/8	5.4
O	AUTO TROL TECHNOLOGY	3	13	5	1/2	9.0
O	AVANT GARDE COMPUTNG	3	21	4 1/2	+1/8	+2.8
O	BANCTEC INC	6	12	11 1/4	5/8	5.2
O	BEEHIVE INT'L	1	2	1/8	0	0.0
N	BOLT BERANEK & NEW	20-	43	43 1/4	+3/8	+0.8
O	CAMBEX CORP	1	3	1 1/2	0	0.0
N	CENTRONICS DATA COMP	3	11	6 1/4	+3/4	+13.6
A	CETEC CORP	6-	9	7 7/8	0	0.0
A	COGNITRONICS	4	7	4 1/8	7/8	17.5
N	COMPUGRAPHIC CORP	23-	36	23 5/8	+1/8	+0.5
O	COMPUTER TRANSCEIVER	0-	1	7/8	0	0.0
N	COMPUTERVISION CORP	9	44	17 1/8	3/4	-4.1
N	CONRAC CORP	12	18	17	+1/8	+0.7
A	DATAPRODUCTS CORP	11	20	16 3/8	+3/8	+2.3
A	DATARAM CORP	4	17	16 3/4	+5/8	+3.8
O	DATA SWITCH CORP	4	9	8 1/4	-1	-11.7
O	DATUM INC	5	9	6 3/4	3/8	5.2
O	DECISION DATA COMPUT	10-	20	12	+1/8	+1.0
O	ENDATA INC	2	8	6 1/8	3/8	5.7
O	EVANS & SUTHERLAND	12	27	27	-5/8	+2.3
O	GANDALF TECHNOLOGIES	5	13	6 1/2	-1/4	+4.0
N	GEN'L DATA COMM IND	8-	21	13	0	0.0
N	HAZELTINE CORP	17-	30	17	1	5.5
O	ICOT CORP	3	12	11 7/8	1/2	4.0
O	INFORMATION INTL INC	10	17	15 3/4	+3/4	+5.0
O	INTECOM INC	3	11	4 1/2	+5/8	-16.1
O	MEGADATA CORP	3	8	3 1/8	+1/8	+6.3
A	MSI DATA CORP	7	14	14	+1 1/4	+9.8
N	NASHUA CORP	24-	52	46 3/4	3 7/8	7.6
O	NETWORK SYSTEMS CORP	11	27	14 1/2	1/8	0.8
N	NO AMERICAN PHILIPS	32	47	45 3/4	-1 3/4	-3.9
N	NORTHERN TELECOM LTD	26-	41	30	1/4	-0.8
O	OMEX	1	3	1/4	0	0.0
N	PARADYNE CORP	6-	18	10	+3/4	+8.1
A	PENRIL CORP	7	14	7 3/8	+1/8	+1.7
N	PLESSEY CO (ADR)	19-	38	34 1/2	+1/2	+1.4
O	PRINTRONIX INC	9	18	13 3/8	+1/4	+1.9
O	QMS INC	6	16	13 1/2	-1 1/8	-9.0
O	RAMTEK CORP	2	7	5 7/8	+1 1/4	+27.0
N	RECOGNITION EQUIP	9	17	14 1/8	+1/8	+0.8
N	SANDERS ASSOCIATES	30	44	30 3/8	1 5/8	5.0
O	SCAN TRON CORP	9	22	18 1/2	+1/4	+1.3
N	SCIENTIFIC ATLANTA	10-	15	11	3/8	-3.2
O	SEAGATE TECHNOLOGY	5	13	13 1/4	+1/2	+3.9
N	STORAGE TECHNOLOGY	1	5	4 1/4	+1/4	+6.2
O	SYKES DATATRONICS	0	2	3/8	0	0.0
A	T BAR INC	5	9	8	1/8	2.0
A-	TAB PRODUCTS CO	14-	23	20 3/4	3/8	1.7
O	TANDON CORP	3	9	7 3/8	-3/4	-11.3
A	TEC INC	6	13	5 1/2	1/8	2.2
N	TEKTRONIX INC	47	68	60 1/2	-3/4	+1.2
N	TELEX	34-	68	63 3/4	-3/4	-1.1
O	TESDATA SYSTEMS CP	0	3	5/8		-10.0
N	TIMEPLEX INC	15-	23	17 7/8	-3/4	-4.3
N	TITAN CORP	4	11	9 7/8	1/4	2.4
O	VISUAL TECHNOLOGY	1	3	5/8	0	0.0
	LEASING COMPANIES					
N	COMDISCO INC	7	24	21 1/2	1 7/8	8.0
N	CONTINENTAL INFO SYS	5	21	19 3/8	1 5/8	7.7
O	FINALCO GROUP INC	4	5	4	0	0.0
O	PHOENIX AMERICAN INC	2	6	4 3/8	1/4	5.4
O	SELECTERM INC	6	12	7	4	36.3
N	U S LEASING	32	46	40 3/4	1	2.3

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INSTANT ANALYSIS

"Our industry's place in the Information Age is like the auto industry in the 1920s, when people drove fine cars over decent roads until they came to the edge of town and the roads turned to dirt."

— Robert E. Allen, chairman and chief executive officer, AT&T Information Systems

IBM partnership a boon to trouble-plagued Hogan

'Ironclad' agreement may alter banking software mart

By Charles Babcock

DALLAS — IBM's landmark OEM agreement to market Hogan Systems, Inc.'s financial applications (CW, May 12) not only delivers a much-needed boost to problem-plagued Hogan but could significantly alter the shape of the banking software market.

Industry analysts called the 20-year pact "the most ironclad" agreement IBM has entered into for a product line from a major vendor of vertical market applications. Observers said the combination of the IBM name and sales force could be enough to put Hogan's competitors under severe pressure.

In addition to increased sales, Hogan can look forward to an increasing stream of maintenance revenues. Hogan can cut advertising costs and continue development efforts, while a larger sales volume might prompt IBM to cut prices. "We were looking for ways to dramatically increase sales to produce additional revenues and provide financial stability," said Donald Campbell, Hogan's vice-president for marketing.

Under the agreement, Hogan will phase out its 14-member direct sales force as IBM assumes exclusive rights to market Hogan products under the IBM label in the U.S. and Canada. IBM is expected to mount a direct sales force at least three times larger than Hogan's, which will give Hogan software access to banking markets nationwide.

"You could argue that the Hogan sales force wasn't large enough to cover all the markets in the country," said Cato D. Carpenter, software analyst with Alex Brown & Sons.

Although additional competition is expected to emerge when Cullinet Software, Inc. brings out its anticipated financial applications, Carpenter thinks Hogan may repair its tarnished reputation and stay a step ahead of the competition.

The agreement comes as a boon to Hogan at a time when it is still reporting quarterly losses as a result of its disastrous installation of a malfunctioning loan application package in 1985. Sales plummeted, Hogan's Chief Executive Officer Richard Streller resigned, and 40 major financial institutions had to do without an integrated loan package they had been counting on as Hogan regrouped.

"In effect, Hogan recalled the product,"

See IBM page 144

Senate committee-approved bill would revive 25% R&D tax credit

By Mitch Betts

WASHINGTON, D.C. — The computer industry is counting itself as one of the winners in the continuing tax reform struggle in the U.S. Congress. The Senate Finance Committee recently approved a bill that sharply cuts the top corporate tax rate and revives the 25% tax credit for research and development, two features that the industry has strongly supported.

However, small high-technology firms that depend on venture capital were considered losers. Assuming it passes the full Congress, the committee's bill would raise the capital gains tax rate to 27% from the current 20%, a far cry from the rate reduction sought by the American Electronics Association and others representing small firms.

Just when it appeared that tax reform was dying, the Senate committee emerged with a bill that cuts corporate tax rates in return for killing many tax credits and deductions. In this climate, the industry won approval for a four-year extension of the 25% R&D credit, which expired at the end of 1985.

Industry lobbying groups praised the committee's decision to retain the R&D credit and to slash the top corporate tax rate to 33% from the current 46%.

Ted A. Heydinger, vice-president of the Computer and Business Equipment Manu-

See COMMITTEE page 122

INDUSTRY INSIGHT
Douglas Barney

Retail dealers getting a case of the Blues

For years, IBM barely tolerated fun-loving microcomputer dealers that ran small shops catering mainly to hackers, and many of these dealers looked upon major corporations as abhorrent symbols of American capitalism. But as these dealers learned to love corporations (or at least their deep pockets), IBM turned its seductive and adoring eyes toward them and began authorizing every Tom, Dick and Harry's Computer Store, Inc. to sell the IBM Personal Computer.

Yes, for a time IBM was easy. But the gift of IBM authorization wasn't enough to ensure the total fidelity of many dealers, which just as lovingly pushed other products, giving birth to (gasp!) competition for IBM.

The fabulous success of consummate compatible maker Compaq Computer Corp., the burgeoning micro sales of an "upstart" called AT&T and the emergence of a whole host of super-low-priced Asian clones all began chipping away at IBM's hopes for complete control over the computer retail marketplace.

Sensing vulnerability, IBM has recently thrust its talons deeper into the flesh of computer dealers in an attempt to rescue its declining market share. And things will never be the same for the fast-declining dealers.

Thrust No. 1 was IBM's announcement last November that it was freezing its dealer authorizations at some 2,500 and was also cracking

See RETAIL page 121

Barney is a Computerworld *senior writer covering the computer industry.*

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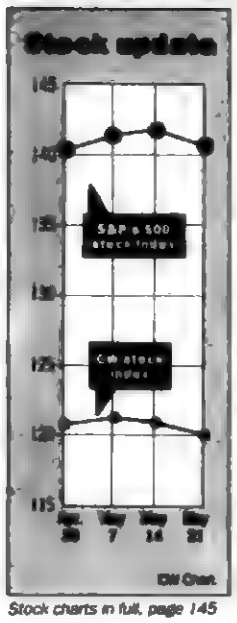
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COMPUTERWORLD

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Sperry customers may be placing purchase orders on hold in light of the continuing merger stalemate with Burroughs. **Page 2.**

■

IBM's RT PC has yet to find its way into corporate use, but software developers believe it may become a mainstream product. **Page 6.**

■

Hardware vendors release software standards for implementations of the Pick operating system. **Page 15.**

■

NCR Comten unveils a communications processor with three times the processing power of IBM's 3725. **Page 37.**

■

Javelin Software is the latest vendor to offer a corporate licensing program. **Page 27.**

■

Rear Adm. Grace Hopper, co-developer of Cobol and the woman responsible for standardizing computer languages and procedures throughout the U.S. military, is being forcibly retired by the Navy at the end of August. Hopper, 79, one of the computer world's most valuable players since before World War II, officially retired from the Navy Reserve in 1967. However, by Act of Congress, she has been recalled to active duty on a year-to-year basis ever since. Now, says Hopper's aide Lt. Brenda Sullivan, "The recall is not being renewed. The retirement was not by [Hopper's] choice." Hopper indicates that she already has lined up an unspecified postretirement job.

■

Citicorp officially tenders its expected $675 million offer for Quotron Systems, Inc., the Los Angeles-based provider of on-line stock quote information. It was unclear at press time on Friday whether Quotron officers would continue to oppose the bid. Citicorp is offering $19

See **NEWS** page 6

DEC E-mail an OSI first

Implements X.400 model for networking products

By Elizabeth Horwitt

LITTLETON, Mass. — Digital Equipment Corp. last week became the first computer company to offer users a complete set of commercial networking products conforming to all seven layers of the Open Systems Interconnect standard.

The breakthrough came with DEC's announcement of an electronic mail package that enables users to generate messages on a DEC proprietary editing or E-mail system and then transmit the message to a remote VAX or Microvax system.

The DEC package, called the Message Router X.400 Gateway Version 1.0, is the

See **DEC** page 6

User apathy faces Unix V.3

By Eddy Goldberg

Two weeks before AT&T is to unveil its long-awaited Unix System V update, evidence indicates that corporate computer managers see no compelling reason to switch to Unix.

The new Unix version, called Release 3, is due from AT&T Information Systems early next month, company sources say. It is intended to address businesses' growing need to share files transparently across a multivendor network through AT&T's addition of the Streams networking and Remote File Sharing features.

"We want to provide a network-based

See **USER** page 7

IBM unveils low-end SNA connectivity

By Elizabeth Horwitt

RYE BROOK, N.Y. — IBM last week greatly extended connectivity within its product line by introducing a low-end communications processor and a centralized network management system that oversees a broad range of IBM networking devices.

The developments will provide cost-effective implementation of Systems Network Architecture functionality at small remote sites and on IBM's Token-Ring network.

According to a principal developer of the products, last week's announcement reinforces IBM's commitment to become a complete communications supplier. With the new products, said Chris Harlaut of

See **SNA** page 8

■

VM networks get MVS communications features

By Charles Babcock

Advanced networking and addressing features of IBM's Systems Network Architecture were made available under the VM operating system last week. The features, which allow users of VM to create larger networks, were previously available only with IBM's transaction-oriented MVS operating system.

"IBM has finally gotten VM up to snuff with other communications products," said one DP executive who had begun to reach the former network address limits of VM.

Specifically, last week's releases affect use of extended network addressing and SNA Network Interchange on SNA net-

See **VM** page 4

CW EXCLUSIVE

Shape up: Industrial designers have profound MIS impact

By Clinton Wilder

They talk about behavioral sciences, urethane foam models and "the postmodern aesthetic genre." They never make sales visits or service calls, yet they are intimately associated with the daily lives of every computer user.

They are industrial designers, members of a computer industry subculture that determines product details from the lettering of error messages to the shapes of circuit boards.

Industrial designers' impact goes far beyond pure aesthetics. Design subtleties such as keyboard shape and monitor mobility can affect a very critical part of every information systems manager's professional life: worker productivity.

"Product design is not an ephemeral thing. It determines how users do their work," says Paul Benigni, manager of Digital Equipment Corp.'s design group, which includes industrial design, graphic design and human factors engineering.



DEC's Benigni

Benigni is one of the more innovative pioneers in the field, having started at DEC 10 years ago when, he says, "computers were nothing but big boxes with very few people using them. Now it's not good enough to put in a shiny metal box and have people be in awe of it. Physically, we began to soften the forms."

Approaches to product design vary widely across the industry, and many vendors contract with independent design firms or consultants to handle the job. But companies with in-house design teams say they firmly believe that interaction during product planning among designers, electrical and mechanical engineers and marketing representatives is critical to a product's success in the marketplace.

"Determining the right design may be qualitative, but it's not something that can be judged by just one

See **COMPUTER** page 14

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NEWSPAPER

Sperry rejects Burroughs bid; takeover attempt turns hostile

Group of Sperry users plea for consideration

By Alan Alpar

NEW YORK — Burroughs Corp., spurned in its sweetened $75-a-share proposal to acquire Sperry Corp., last week reverted to a hostile $70-a-share tender offer to take over its mainframe rival.

The events last week may lead to a protracted struggle for control of the company. The dispute is already causing Sperry customers to postpone orders, according to observers.

Meanwhile, a group of 17 Sperry users in the New England area last week sent a letter to Burroughs Chairman W. Michael Blumenthal and Sperry Chairman Gerald G. Probst requesting that the value of their investment in Sperry equipment be protected during the merger discussions.

May hurt both firms

"We think the merger is going to hurt both companies," noted group chair Elaine Massa, manager of technical services at Connecticut Natural Gas. "We think it's done a lot of damage already."

Of the 40 people in attendance at the group's meeting last week, none felt the merger would benefit Sperry users, Massa said. "We hope Sperry can get out of this," she said. "The firm has so much going for it right now."

By not responding to Burroughs' $75-a-share offer by 5 p.m. last Wednesday, Sperry set into motion a series of events that would enable Sperry shareholders to sell their shares to the Detroit company at $70 a share or wait until Sperry's conditional self-tender offer kicks in at $80 a share.

Sperry's self-tender, however, becomes effective only if Burroughs is successful in purchasing 33 million of Sperry's shares, a move that would give it a 51% stake in the company. Burroughs would then seek to acquire the remaining outstanding Sperry shares by exchanging them for preferred stock and debt securities valued at $70 a share.

Burroughs' offer expires on June 5 but can be withdrawn at any time until this Thursday.

"Sperry is trying to utilize every mechanism to avert making the deal, consistent with the board of directors' concern to maximize shareholder value," noted Michael Geran of E. F. Hutton & Co. "They're still working through the options available to remain independent."

The drawn-out takeover fight — while benefiting Sperry shareholders — the majority of whom are institutional investors and arbitrageurs — is causing Sperry customers to postpone orders, Geran said. "If you're an 1100/90 user, would you want to give Sperry $5 million for another system right now?" he asked. "The only ones having fun are the arbitrageurs."

Massa agreed that the merger discussions have caused some Sperry customers to postpone orders. "We have an 1100/90 on order. There is some question whether it would be a smart move, given what's going on, to go ahead with it," she said.

The group, which according to Massa recently petitioned the Sperry users group USE to be recognized as the New England Chapter, requested the following if a Burroughs-Sperry merger becomes a reality:

- Continuation of the research and development effort in conjunction with Sperry's product line.
- Continuation of current levels of system and software support.
- Continued assurance of upward compatibility of users' hardware.
- Assurance that major applications software systems and facilities such as Mapper and Unis are maintained.
- Assurance that responsible, high-quality full engineering support in the Sperry and former Univac tradition is continued.

> ***'We think the merger is going to hurt both companies. We think it's done a lot of damage already. . . . We hope Sperry can get out of this.'***
>
> — Elaine Massa
> Connecticut Natural Gas

In a prepared statement, Sperry said it terminated negotiations with Burroughs because agreement could not be reached on a transaction of $80 a share. According to Sperry, it entered into negotiations on the understanding the Detroit firm was willing to negotiate a price "north of $75" a share.

Evidence of bad faith

"Sperry believes Burroughs' new proposal of $75 for the cash portion and securities of uncertain value for the second step violates the explicit understanding upon which Sperry commenced negotiations and is evidence of bad faith," Sperry said. "Sperry remains committed to pursuing appropriate options to enhance shareholder value," the company said in a statement.

Burroughs responded by saying it was "mystified" by Sperry's rejection of its $75-a-share offer since that "is higher than the value the Sperry board placed on Sperry" in its self-tender offer for $29.5 million shares. Burroughs declined further comment.

Meanwhile, a shareholder filed suit against Sperry in Delaware Chancery Court, charging that the firm's directors have breached their fiduciary duties and obstructed merger talks with Burroughs. The suit seeks to be recognized as a class action.

CORRECTIONS

The photographs accompanying the question-and-answer story with IBM's William Lowe [CW, May 19] were taken by Maxine Usdan.

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AT&T cuts rates an additional $450 million

Slash comes on heels of $1.5 billion reduction

By Rosemary Hamilton

WASHINGTON, D.C. — So as not to exceed the allowable rate of return dictated by the Federal Communications Commission, AT&T proposed $450 million in price cuts last week in addition to the $1.5 billion in reductions it announced late last month.

The price cuts AT&T proposed April 24 were to reflect the lower costs it would incur from the proposed rate reductions in local access charges that go into effect June 1. However, on May 14, the National Exchange Carrier Association (NECA) proposed an even lower access charge. Based on that revision, AT&T would have been earning more than the allowable rate of 12.75%, even with the $1.5 billion in reductions it proposed, according to an AT&T spokesman.

Upon receiving the revised proposal from NECA, the FCC requested that AT&T revise its rate reductions to reflect that change or provide justification for not doing so. At press time, the FCC had not yet reviewed last week's proposal from AT&T and therefore could not comment, a spokeswoman said. The price reductions are scheduled to go into effect June 1.

"This is going to put the squeeze on other long-distance vendors," said Michael Killen, president of Strategic, Inc., a market research firm in Santa Clara, Calif. "MCI has already announced it will cut its rates. It's great for businesses and consumers. An average of 10% is a lot of money."

As of last week's proposal, the rate reductions are as follows: AT&T Long Distance Service is decreased by 13.8% for day and evening hours and 5% for late night and weekend hours. AT&T WATS service will cost 15.2% less. AT&T 800 service will be cut by 12.2%. Its Megacom service rates are lowered by an average of 15.1%. On average, the price cuts are 2.5% greater than the April 24 reductions.

Rates for the AT&T Software Defined Network service were also reduced. Earlier, the vendor said the service would be cut by 10%. According to James Brynes, an AT&T spokesman, the April 24 reduction was actually 6.6% and had been revised to 6.8%.

Brynes also claimed it would not be worth exceeding the allowable rate of return because "it would mean administrative turmoil and costs because we'd have to give rebates to our customers."

VM nets get MVS features

From page 1

works running under VM. Extended network addressing expands the number of logical units that can be included on an SNA network from 64,000 to more than eight million. SNI allows multiple SNA networks to be linked together, according to IBM spokesmen.

The new VM networking capabilities are the result of Advanced Communications Function for VTAM (ACF/VTAM) Version 3 Release 1.1, announced last Tuesday. Prior to Release 1.1, MVS had to be installed as a guest under VM in order for users to take advantage of the MVS networking features.

Sign of commitment to VM

Some large VM users said they liked the new VTAM capability, while others said they will continue to use MVS as their network operating system, running VM as a separate system alongside it. VM traditionally has been used more for program development than for transaction-oriented networks. All agreed, however, that making ACF/VTAM Release 1.1 available was a sign of IBM's commitment to VM.

"There is a relatively small number of installations with problems solved by ACF/VTAM Release 1.1," said W. Romney White, president of VM/CMS Unlimited, a consulting firm in Dorchester, Mass. But the announcement of the new release is a hopeful sign "that VM appears to be a full partner with MVS," he added.

"It's pretty important to us, because it allows us to grow our network any way we want to," according to a corporate DP manager who requested anonymity. His company was running up against the VM network address limit of 4,000 terminals per domain. "We were going to have to do something by the beginning of next year," he said.

'Treat VM as a major product'

The new release is less useful to a corporate client such as J. C. Penney Co. of New York, which operates a nationwide retailing network, because it already uses extended addressing and SNI under MVS. But William D. Friel, vice-president and director of systems and data processing, said IBM had "no choice but to treat VM as a major product. There is a strong customer base for it."

In addition to extended addressing and SNI, IBM included a number of enhancements for systems operators.

By using a new Display command, an operator can view the specifications with which a device was added to the network when he is having problems with that device. Previously, he was compelled to go to the Network Control Program generation statement and find the logical unit name, line speed and other characteristics or read through a VTAM dump, according to William E. Warner, IBM's manager of network management products at the Communication Products Division in Raleigh, N.C.

Through a new Force command, an operator can force the shutdown of a device on the network then restart, rather than have a terminal sit locked up while operators search for the problem, Warner said.

IBM also announced Attachment 370+, which permits communications and device support between a host and an IBM Personal Computer AT, 3270 Personal Computer and 3270-PC AT. The program provides access to the information, functions and facilities of the host, including file transfer, execution of host procedures and virtual disk.

Attachment 370+ comes with two interfaces — the Personal Decision Series interface and the Extend/370 interface for experienced users.

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Software lag holds up RT PC use

Developers see broader market, dramatic boosts

By Douglas Barney

The IBM RT Personal Computer, a technical workstation announced in January, so far has few users, due to the current dearth of software and a slow rate of shipment from IBM, users and analysts say.

Developers, however, expect dramatic RT PC performance boosts and an increasing acceptance of the RT for multiuser office applications to spur sales.

Computer dealers report that initial orders have come largely from developers interested in porting or writing software for the RT and from hardware and peripherals manufacturers. Volume shipments to dealers have only recently begun, and many dealers have still not received shipments.

Although software and the RT itself are said to be on the way, with most software packages set to ship this summer, corporations are reluctant to buy.

"We have not even thought about it because of the lack of software and not wanting to be on the leading, or bleeding, edge of technology," says Gregory Enders, information center specialist, Williams International Corp. of Walled Lake, Mich.

Williams' engineering staff of approximately 150 people currently uses Computervision Corp.'s CPG 200X for computer-aided design and manufacturing (CAD/CAM) and a couple of Harris Corp. minicomputers. "Our engineers are just now thinking about PCs, but I haven't heard one pop up and say 'RT PC' to me yet," Enders says.

Despite the machine's slow start, and what developers refer to as minor performance problems, the RT may prove to be a highly popular product. IBM says the market for the eight-user RT is more than three million technical professionals in the U.S., and many software developers concur. The market, however, could go beyond technical professionals, and the machine may well become entrenched in the mainstream business market.

For example, at the time of the RT's introduction, three office packages were announced — Solomon III accounting software from TLB, Inc.; office automation software from Applix, Inc.; and Samna+, an integrated word processing and spreadsheet package from Samna Corp. that is one of the few already shipping, according to Samna President Said Mohammadioun. In addition, a decision support package from Comshare, Inc. targets both technical and business professionals. Many of these packages will be marketed by IBM.

Developers believe the RT will become a mainstream product. "I think the RT could be quite a fast office machine, although it is not positioned that way by IBM," according to Michael Laing, general manager of the Americas division of Moldflow Pty. Ltd., a supplier of computer-aided engineering software and services for plastics and metal components. He said the machine can do double duty by performing office functions and engineering or design functions simultaneously.

"The fact that it runs Unix, has the IBM label on it and can run DOS if you want it to makes it a very attractive package," says Anthony M. Goschalk, director of marketing for Applix. "There is clearly some attempt from some part of the IBM organization that says there is more potential for this machine than just an engineering workstation."

> ***'We are pretty well convinced that we are just at the beginning with the RT.'***
>
> — Michael Laing, Moldflow Pty. Ltd.

Some users are holding off, due to questions about the RT's performance advantages. "They must improve performance and cost performance, as well as provide the ability to do the functions that we are doing today, before we will be interested," says a manager of engineers for a Fortune 100 manufacturing corporation who asked not to be named.

But developers believe that increased performance is already on the way. "We are pretty well convinced that we are just at the beginning with the RT. There are a number of enhancements which will be useful to us coming down the pike," says Moldflow's Laing.

Another shortcoming is the limitation of the machine's multiuser capability. Although IBM bills the RT as an eight-user system, most developers recommend putting fewer users on the machine. "From our perspective, the biggest constraint on the RT running eight users is the fact that there are only 4M bytes of real memory, and on any virtual memory machine, the more real memory you have, the better it goes," Applix's Goschalk says.

Part of users' reluctance may be due to IBM's marketing. "I think it could be marketed a lot more aggressively," Samna's Mohammadioun says.

According to an IBM spokesperson, 12 third-party developers have completed packages, another 16 are close to completion, and 10 to 15 other vendors have begun work on packages. Another 7 packages are co-labeled and marketed by IBM under its vendor logo program, and three packages are privately labeled by IBM.

CAD/CAM tools unavailable

The major holdup has been in CAD/CAM software, the machine's hottest application. "None of the CAD/CAM software is available until September, so a lot of people haven't purchased the RT yet," says Vicki J. Brown, a senior research analyst in the computer-integrated manufacturing service for International Data Corp. Noting that IBM is only just beginning to ship in production volumes, Brown believes that "1986 may not be a good year for the RT, but certainly in 1987 you will start to see it take off.

"I am projecting that over 1986, 10,000 of these boxes will be shipped, but under the current circumstances that might be an optimistic prediction. About 60% will go to the CAD/CAM segment," Brown adds. The Yankee Group estimates that 18,000 RTs will ship this year.

Some developers are committed to the RT because they believe that IBM will continually enhance the product and thus expand its market. "I think we have bought in to the beginning of a family that is going to have a relatively long life. As our software develops and becomes more compute intensive, I think we can count on the RT staying ahead of our desire to consume CPU cycles," Laing says. Frank King, IBM's group director for advanced engineering system development, stated last February that the RT's performance would be doubled roughly every year.

There is another, perhaps even more compelling reason to port software to the RT. "If you are in the workstation marketplace and IBM is doing a workstation, you don't ignore it," Goschalk says.

Yankee Group's Charles Roussell agrees. "They are in it because IBM is in it. It wouldn't matter if IBM sent out a pair of roller skates with IBM on it, they would write something for it."

TOP OF THE NEWS

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per share, the same price Quotron rejected last month as inadequate, but Quotron has been unable to find another corporate suitor since then.

■

At a London conference on graphics software systems earlier this month, Microsoft Chairman Bill Gates hedged his previous statement that a version of MS-DOS that breaks the 640K-byte random-access memory barrier would be ready by the end of 1987. "I have said that, but I'm on shaky ground," Gates said.

■

The computer-industry trade-show glut claimed another victim last week as the Interface Group cashiered its sparsely attended Comdex/Winter exposition. The 3-year-old show, held in March in Los Angeles, had disappointed show sponsors with poor turnout of attendees and exhibitors.

■

An alternative to the IBM System/36 is reportedly due this week from Decision Data Computer Corp., a supplier of peripherals and software. The company claims the Decision36 will be targeted at small and mid-size businesses.

■

Northern Telecom will announce today major upgrades to its newest line of Meridian PBXs. The new options are said to quadruple the speed of the PBX systems, while doubling their main memory capacity.

■

Reliable sources say that both Rolm Corp. and AT&T will stage the long-awaited announcements of their low-end digital PBX systems at next week's International Communications Association conference in Atlanta.

DEC E-mail an OSI first

From page 1

first commercial software product to implement the X.400 message-handling protocol, one implementation of the seventh layer of the OSI networking model proposed by the International Standards Organization.

As DEC now becomes the only vendor offering an X.400 product, only Microvax and VAX users may use the Message Router. However, according to DEC spokesman David Korf, the new product will allow users to communicate with future X.400-compatible products from other vendors.

"Other companies already are demonstrating prototypes for X.400 software, especially in Europe," Korf said. He added that companies working on the X.12 file formatting standard have expressed support for X.400 as a document transfer and routing standard. At the recent MAP/TOP Users' Group Meeting, members of the Technical Office Protocol subcommittee reported that they were discussing X.400 implementation in TOP.

"All of the major computer vendors will have X.400 products within the next three to six months," said David Terrie, president of Boston-based Newport Consulting. Terrie gave DEC "technical straight As" for being first with an X.400 product. "It's a good strategic move. DEC can be an effective catalyst for industry adoption of the OSI model, providing a backbone that anyone supporting OSI can talk to."

Terrie called OSI "DEC's weapon against IBM. Everyone is building gateways to SNA," he noted. The emergence of real OSI products will "shift the industry's center of gravity" by allowing multivendor systems to communicate with one another without having to go to IBM's Systems Network Architecture (SNA), he added.

'Rich functionality'

He pointed out, however, that it will be several years before OSI protocols will have the "rich functionality of DEC or IBM's proprietary networking protocols. For example, DEC's directory management is far more advanced." Right now, OSI does provide "basic messaging connectivity," Terrie said.

DEC's announcement is significant because the new X.400 will "play with all the other DEC OSI layers," including the recently announced VAX OSI Transport Service (VOTS) and VAX Packetnet System Interface, according to company spokesman Korf.

VOTS is DEC's implementation of the OSI Transport layer. Packetnet implements the most recent CCITT specifications for X.25 packet-switched networking. Another OSI portion out from DEC last week is VAX OSI Applications Kernel Software Version 1.0, which conforms to the OSI session layer.

Message Router X.400 will be available in quantity in July. Prices start at $6,240 for the VAX, with the VAX 8800 version costing $8,000. The Microvax version costs $2,400.

User apathy faces Unix V.3

From page 1

solution to communications-oriented problems, where the end user and application programmer are freed from worrying about whose network underlies the business solution they're dealing with," says Bill O'Shea, executive director of the Software Systems Division of AT&T Information Systems.

Nevertheless, the communications giant still must win over the hearts and minds of corporate users. "I'm still skeptical," says Bob Fredriksen, manager of planning and administration at GATX Corp., a diversified transportation and financial services company based in Chicago. "There's really not much there for us that we're not getting from our PCs," he says.

A recent survey of more than 250 Fortune 1,000 companies, conducted by Forrester Research, Inc. of Cambridge, Mass., showed fewer than one

> ***As DOS pushes up against its memory limitations, the networking and file-sharing capabilities of Unix V.3 may be another reason for people to consider Unix as a solution.***

in four of the sites surveyed will implement Unix by the end of 1987. Of those sites using Unix today, "Most of the Unix implementations are pilot or are very limited," says Forrester President George F. Colony.

Further, nearly half the sites with Unix currently installed said they have it because "it came with the hardware."

"You'll see it more in manufacturing than in financial applications," says Lydia Borgatta, who heads up advanced workstation development at Bankers Trust Co. in New York. This trend was spotlighted in February when General Motors Corp. called for its suppliers to adopt AT&T's Unix System V or a certified equivalent as the standard operating environment for manufacturing systems (CW, April 28).

"We needed a standard operating system for transportability of application software," says John Williams, senior manufacturing project engineer and chairman of GM's Unix System Implementation Task Force. "We do not want to be tied to a single-vendor solution for hardware or software," he adds.

Williams presents an alternative to the perception that Unix is still best used in laboratories and universities. "We surveyed what was out there, and Unix seemed to have a ground swell," he says, citing its popularity in trade journals, its growth in application software and the IEEE moving toward a standard for Unix (IEEE Trial Use Standard 1003.1 was approved in March). He says he foresees increasing Unix use in office automation and on engineering workstations and adds that its transportability will appeal to anyone interested in marketing applications.

Dave Moschella, an analyst at International Data Corp. in Framingham, Mass., says that although Unix has done well on mid-range systems and engineering workstations, it has made little progress at the mainframe or personal computer level. He expects this situtation to continue into 1987.

"In commercial environments, Unix has trouble handling large data bases," Moschella says.

'Challenge of the late 1980s'

The Forrester report singled out the integration of personal computers as the "major information processing challenge of the late 1980s." As DOS pushes up against its memory limitations, and as multiuser computing and shared information processing continue to grow, the networking and file-sharing capabilities of Unix V.3 may be another reason for people to consider Unix as a solution.

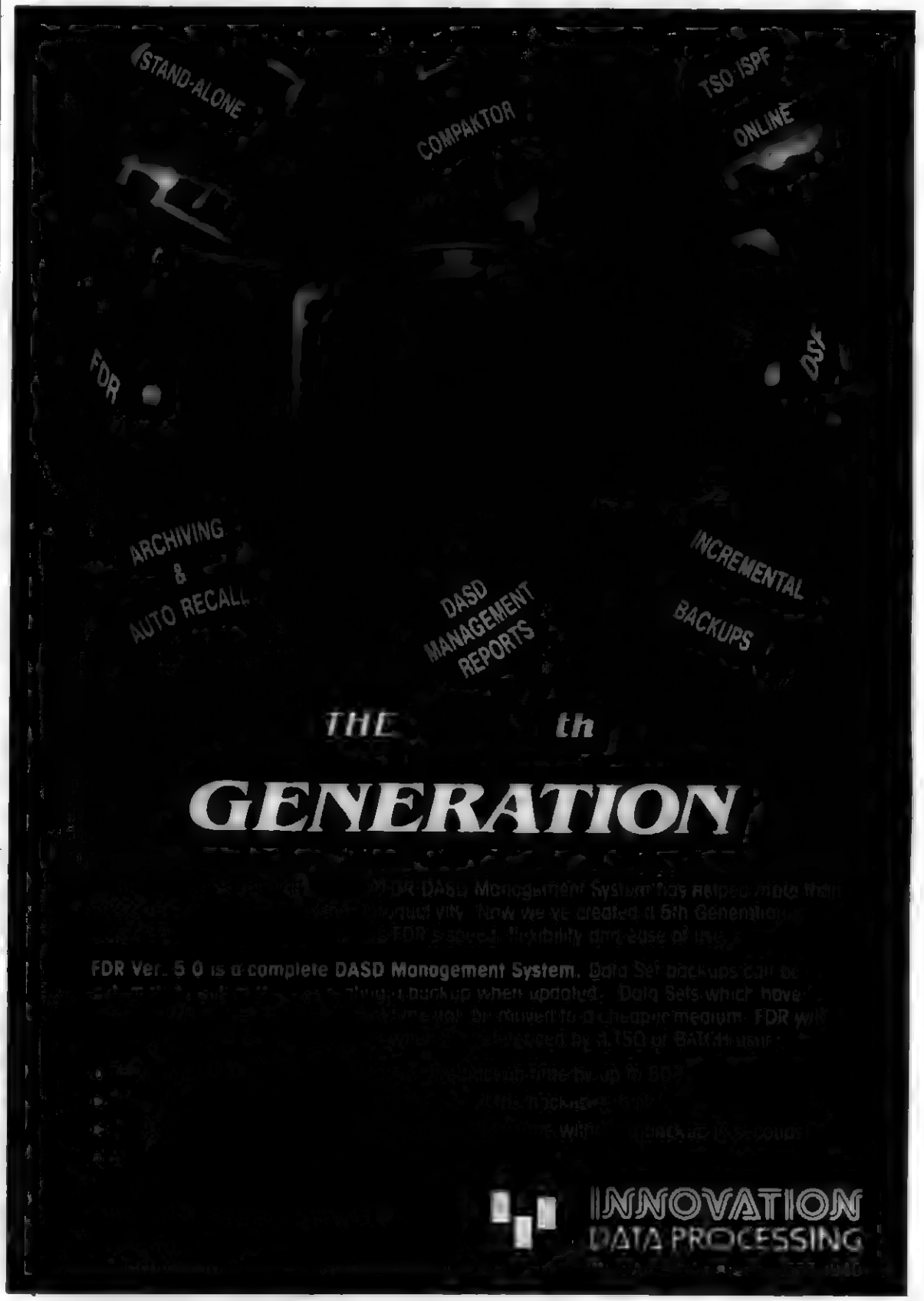
"Unix V.3 is going to represent the best way of integrating personal computers," contends Gig Graham, executive vice-president of marketing and sales at Venturcom, Inc. of Cambridge, Mass. Venturcom developed and markets Venix, a System V derivative for processors from Intel Corp. and DEC.

"MS-DOS will always be on PCs, but PCs are getting bigger and faster. MS-DOS 5.0 will probably look more like Unix," Borgatta says.

Another problem area is security. "You don't want the systems programmer for the check processing program to have the same kind of access as the person who wrote the program," Borgatta says. The Unix operating system is structured to be entirely accessible to the programmer. Operating systems such as IBM's MVS or DEC's VMS are partitioned to prevent this.

The federal government and AT&T's use of Unix as their operating system for commercial-type applications shows it is possible to add the necessary security to Unix. But this function is not yet well documented nor is it readily available from AT&T.

Unix is still young in terms of the commercial environment, she observes, and though she says she thinks the learning curve will flatten out in a few years, Unix will never replace MVS but will more likely be used for business on coming generations of personal computers and minicomputers.



SNA gets connectivity

From page 1

IBM's LaGaude Laboratories in France. IBM is both extending its current communications product line and enhancing the connectivity of existing offerings "so our customers can install bigger networks more efficiently and cost effectively."

Users also saw the developments as having important implications for IBM's communications strategy. IBM's introduction of the 3720, a low-end member of the 3725 family of communications processors, was "the part of the announcement that I concentrated on," said Trav Waltrip, vice-president of data processing at Travelers Insurance Co., based in Hartford, Conn. "It represents IBM's statement of direction toward less expensive network gateways."

Along with 3270 Models 1, 2, 11 and 12, IBM announced several other communications products, including the following:

- Netview network management package. See related story this page.
- Full-function Systems Network Architecture capabilities for its VM operating systems. See story page one.
- X.25 SNA Interconnection, a software package that allows terminals using SNA to communicate over an X.25 packet-switched network without going through a host.
- IBM 5821 Digital Service Unit/Channel Service Unit Model 10, an interface between IBM systems and AT&T's Digital Data Service lines.

The 3720 benefits IBM customers by "distributing SNA functionality into the ranks of smaller offices," said Paul Kirvan, a principal of Turnersville, N.J., consulting company Paul F. Kirvan & Associates. The 3720 would replace cluster controllers at remote sites, he added, noting, "You can't implement sophisticated SNA network management features on a cluster controller."

"Introducing a low-cost communications controller helps shore up IBM's weak mid-range system line, which Wang Laboratories, Inc., Digital Equipment Corp. and Data General Corp. are competing against, by putting their own mid-range systems in between IBM PCs and mainframes," commented Marty Gruhn, a vice-president at Tempe, Ariz., consulting company Sierra Group.

"I think shrinking the size of the 3720 and having it support the Token-Ring will be very useful to us," Waltrip said. Travelers has 19 IBM 3081 hosts and has already installed more than two million feet of IBM Cabling System wiring for a series of Token-Ring networks that will eventually support some 9,800 terminals, he added. The 3720 will provide a gateway from Token-Rings at remote sites back to hosts at Travelers' headquarters, Waltrip said. "It could have been done with 3725s, but they clearly are expensive boxes that can't be installed at all our remote sites."

> ***'I think shrinking the size of the 3720 and having it support the Token-Ring will be very useful to us.'***
>
> — Trav Waltrip, Travelers Insurance Co.

The 3720 supports up to four mainframe hosts and is said to offer approximately one-third the throughput performance of a 3275. The 3720 Models 2 and 12 were designed to operate in a remote environment and can be controlled from a central site via a remote console interface. The 3720 Models 1 and 2, which support up to 28 lines, are scheduled to be available by October this year. The 3720 Models 11 and 12, which support two Token-Rings and up to 16 lines, are scheduled to be available by July 1987. The 3720 series prices start at $26,000. The new IBM 3721 Expansion Unit, which enables a 3720 to support an additional 32 lines, is priced at $16,000 with one scanner and is scheduled to ship in October.

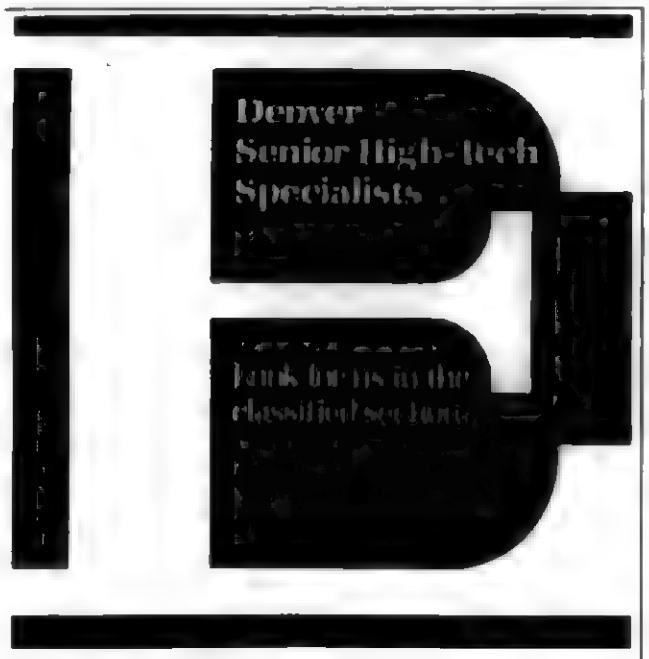
Waltrip also expressed interest in the newly announced 3725 Communication Controller Enhancements, which expand the controller's main memory from 2M to 3M bytes and increase the number of 56K or 64K bit/sec. lines per scanner from two to four. "They will allow us to put more telecommunications lines on a 3725, which will help me reduce the total number of 3725s I have," he explained. The 3M-byte storage capability is priced at $2,700, with availability scheduled for October of this year.

IBM expanded its X.25 support with two software products, X.25 SNA Interconnection (XI) PRPQ 7L1000 and X.25 SNA Network Supervisory Function PRPQ 7L1001 (NSF). The two offerings can either be installed on their own or complement Network Control Program Packet Switching Interface, IBM's current X.25 network offerings, Harlaut said. Available first-quarter 1987, XI enables both SNA and non-SNA terminals to communicate over an X.25 network through a communications controller rather than through a mainframe host. NSF, installed in the controller that handles SNA-to-X.25 networking, collects and records accounting data for traffic handled by XI.

The IBM 5821 Data Service Unit/Channel Service Unit Model 10, also announced last week, transmits at up to 56K bit/sec. over Digital Data Service lines. It also can be used over private, twisted-pair, four-wire networks. Scheduled to ship in July, the 5821 is priced at $850.

The Data Service Unit and enhanced X.25 support reflect IBM's acknowledgment that "the real world is not all blue" and a determination to sell users total networking solutions, including connections to non-IBM systems, Kirvan said.

Gruhn added: "Our overall sense is that IBM is really reacting to DEC's increasing dominance in the networking arena. To put it bluntly, DEC is breathing down IBM's neck."



IBM's Netview links five network packages

Global manager handles SNA nets

IBM last week packaged and enhanced five network management offerings into one global management system. Netview, IBM's new network management product for Systems Network Architecture (SNA) networks, offers in one integrated package the functions of several existing IBM network management offerings:

- Network Communications Control Facility.
- Network Logical Data Manager.
- Network Problem Determination Application.
- VTAM Node Control Application.
- Network Management Productivity Facility.

Netview "allows our customers to buy one network management product instead of five, and we've also added enhancements to improve the network operator's productivity, thus reducing the cost of his job," said William Warner, IBM manager of network management products.

Through the Netview Status Monitor, the operator can access data on different segments of the network or obtain an overview of all network resources at once.

'Good news'

"IBM's packaging individual network management pieces into a global network manager within VTAM is good news for us," commented Trav Waltrip, vice-president of data processing at Travelers Insurance Co. in Hartford, Conn. "Previously, we had to build an application to link those pieces together to give us overall network management. IBM is saying, 'We have an overall management strategy for both local- and wide-area networking.' "

Paul Kirvan, principal of Turnersville, N.J., consulting company Paul F. Kirvan & Associates, called Netview "the most significant of IBM's new products. In the past IBM has not been renowned for network management," he added. "This seems like a major step in developing a product that manages all the major areas of networking.

"Netview's support of the Token-Ring is especially important," Kirvan explained, "indicating that IBM is bringing all of its major communications products into the system."

He predicted a future IBM announcement of Netview support for System/36 and 38, "because they are key elements of the IBM network picture."

Netview interfaces

IBM is making documentation on Netview architecture available to third-party vendors so that they can write interfaces to the system, Warner said. "We recognize that customers have a lot of network equipment that is not IBM's." Netview's architecture also allows for network diagnostic information to be sent to other network management systems, Warner added. "But IBM wants to provide end-to-end telecommunications network management."

"I suspect that Codex, Infotron, General Datacomm and the other network equipment vendors will soon be announcing compatibility with Netview," Kirvan said.

Netview enhancements include more than 1,500 Help panels and tutorials, a Help desk facility, a status monitor facility, the consistent use of color and function keys in the user interface and a mechanism to enable the operator to move easily from one network management function to another, Warner said.

Netview links

IBM also announced links between Netview and several of its currently available communications devices. Diagnostic and monitoring data collected by the Token-Ring Network Manager, a set of network diagnostic tools announced by IBM last month (CW, April 21), can be sent to Netview for further analysis.

The 3728 Matrix Switch Host Facility, which IBM also announced last week, allows a centralized network management program to configure and monitor functions performed by the 3728 Matrix Switch. The facility will ship in November.

Netview also can access enhanced functions provided on the new IBM 5865, 5866, 5868 modem series, enabling it to retrieve and update remote modem configuration data, trigger through a modem a remote function and gather line analysis and transmit and receive test results from modems.

Netview operates in SNA Advanced Communications Function for VTAM network environments. Monthly licenses are priced at $1,255 for the MVS/XA version, $1,060 for MVS/370 and $940 for VM. MVS versions of Netview are scheduled to be available in fourth-quarter 1986, and VM versions should be available in first-quarter 1987.

— Elizabeth Horwitt

6 REASONS WHY

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SOFTWARE ENGINEERING OF AMERICA SEA

Southern Bell signs up first ISDN customers

Plans to provide transition service until 1988 rollout

By James A. Martin

ATLANTA — Southern Bell Telephone and Telegraph Co. announced last week that Trust Company Bank of Georgia and Prime Computer, Inc. have signed up to be the first customers of the utility's Integated Services Digital Network (ISDN), scheduled to be introduced in early 1988.

In the interim, the company said it will begin offering in early 1987 "transitional ISDN access technology," a digital network service that provides dedicated voice and data communications simultaneously over a single telephone line. ISDN will use virtual digital lines, a more cost-effective alternative whereby different customers share lines.

Because of the increased competition resulting from interstate banking, Trust Co. decided "if we were going to stay on top, we needed to be provide better services," said Tommy Vaughn, vice-president and communications manager of Suntrust Services, a subsidiary formed by the recent merger between Trust Company and Sun Banks of Florida, Inc., in Orlando, Fla.

"Bankers ought not to have to deal with modems when they ought to be making loans," Vaughn said, pointing out that using digital services would not require modems. "ISDN will provide the flexibility we need. With all the networking we do across the spectrum of vendors, ISDN can let us go in and plug in and not have to make a lot of software changes."

Initial costs high

Although initial implementation costs are expected to be high, Vaughn said ISDN will allow the bank to take advantage of such services as video conferencing, which is now too costly.

Trust Company will use 50 basic ISDN lines in branch offices now under construction in suburban Atlanta. Trust Company presently operates five separate networks, including those with specific applications for automatic teller machines and the bond department, and expects ISDN will replace portions of those networks and interface with the remainder.

Prime Computer will be equipped with 25 basic ISDN lines and one primary line in its existing branch office in suburban Sandy Springs, Ga. The basic lines provide two B channels, which carry digital voice or data transmissions at 64K bit/sec., and one D channel, which carries signaling. The primary line will provide 23 B channels and one D channel.

Tying worldwide operations

Prime's Atlanta sales and service office "relies heavily on data communications to enhance our system offerings," said Jim FitzGerald, product manager of ISDN Development for Prime. "Our customers are spread all over the globe, and there is concern and a great need to tie together the worldwide operations with a single topology. ISDN appears to be that topology."

Many of Prime's customers are interested in ISDN technology as well, FitzGerald added. "Banking, brokerage and manufacturing firms will be using ISDN for transaction processing and data base retrievals. Our scientific and engineering customers also want ISDN because it affords high terminal connectivity, security features and high data rates."

Atlanta will be Prime's first venture into ISDN implementation and will provide both local- and wide-area network access to users in the office, according to FitzGerald.

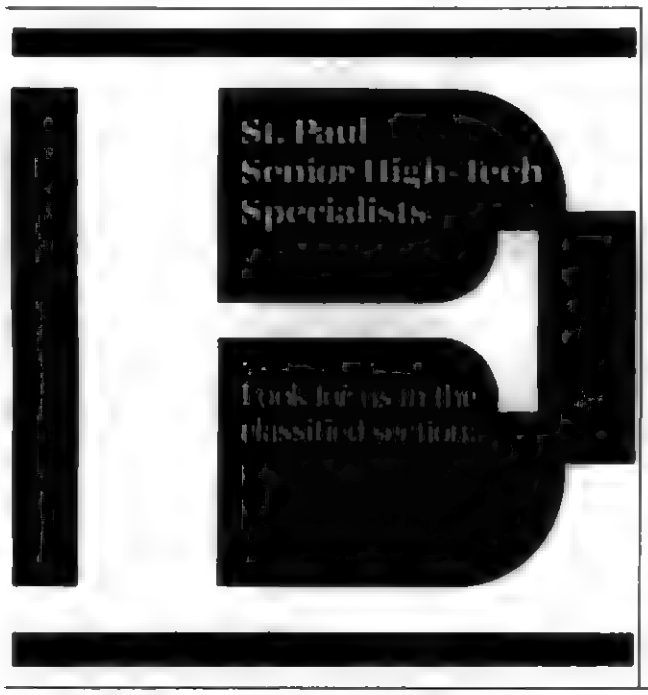
At present, Prime's Atlanta office operates on three Prime superminicomputers tied into the corporate network via Telenet X.25 packet-switching connections.

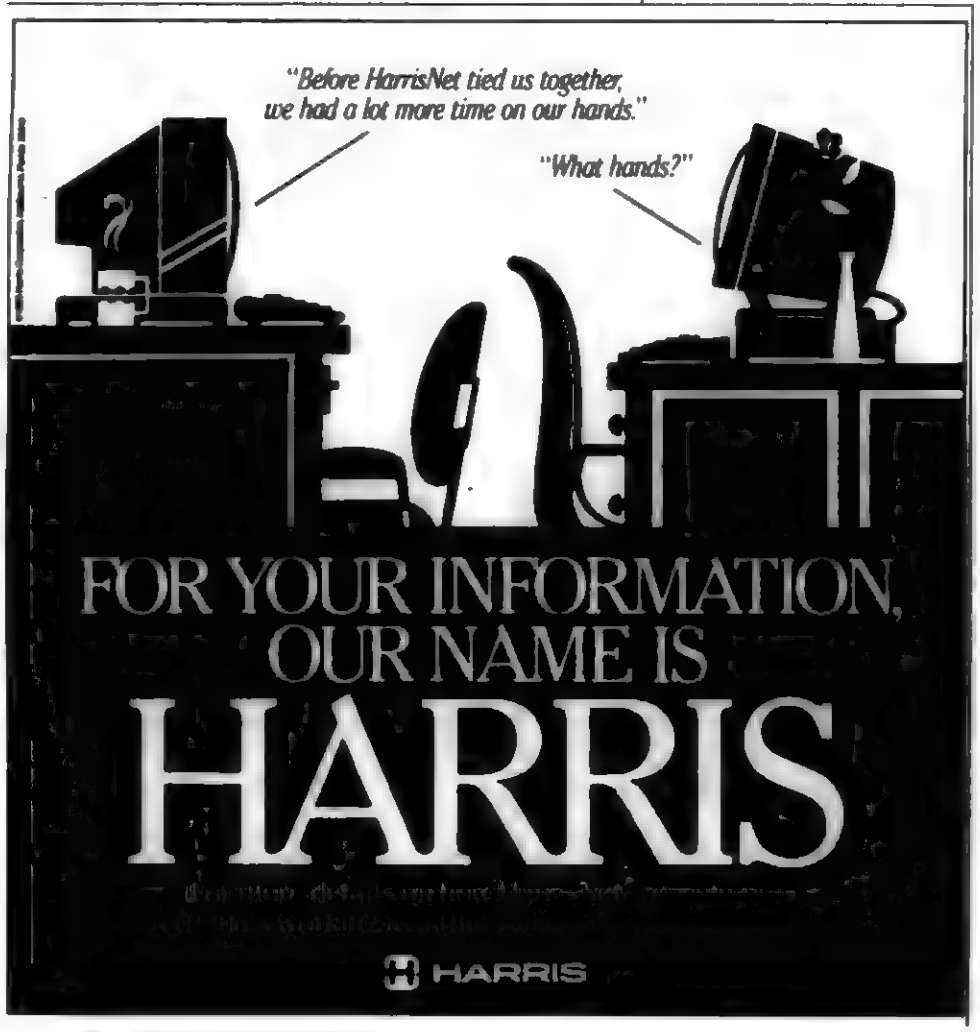
ISDN will provide the means by which users in the Atlanta office can directly dial up corporate mainframes in Prime's Natick, Mass., office, allowing for more efficient and flexible connections, FitzGerald said.

Tariffs for ISDN services have not been determined, according to Southern Bell officials.

Also last week, Bell South Corp., the holding company for Southern Bell, said it has developed a "dedicated transitional digital facility to ISDN," described as a "three-channel digital multiplexer for a simultaneous digital voice and data communication system."

The system will provide a voice channel for analog telephone and/or analog data services, a medium data channel for any standard 300 to 19,200 bit/sec. asynchronous or synchronous AT&T Digital Data Service and a low-speed data channel for any standard 300, 600 or 1,200 bit/sec. asynchronous data.





Datamedia to announce supermicros

By James Connolly

NASHUA, N.H. — Incorporating the Motorola, Inc. 68020 as a microprocessor, Datamedia Corp. is scheduled to introduce three additions to its DMC/932 family of 32-bit supermicrocomputers today .

The systems, supporting up to 32 users, were designed for use as distributed processors and departmental processors in medium-size or large organizations and as central processors in small companies.

While earlier models in the DMC/932 line used Motorola 68010 chips, the new models are based on a 16.7-MHz 68020 and an optional Motorola 68881 floating-point coprocessor. In addition, the mid-range DMC/932 Model 2620 and high-end DMC/932 Model 2640 include a 16K-byte dual set cache.

According to Datamedia, the Model 2620 running the U.S. Steel Corp. Cobol benchmark provides more than twice the power of the Digital Equipment Corp. Microvax II or the IBM 4341 Model 1 for $22,500. The entry-level system, the DMC/932 Model 2610, costs $18,500 and the Model 2640 costs $28,500.

Datamedia is targeting the systems at IBM host DP environments with IBM Systems Network Architecture Synchronous Data Link Control, 2780/3780 and Bisynchronous 3270 emulation capabilities that reportedly allow remote connection to up to four hosts at speeds of up to 56K bit/sec. The systems allow Ethernet connections, multiuser windows and menus.

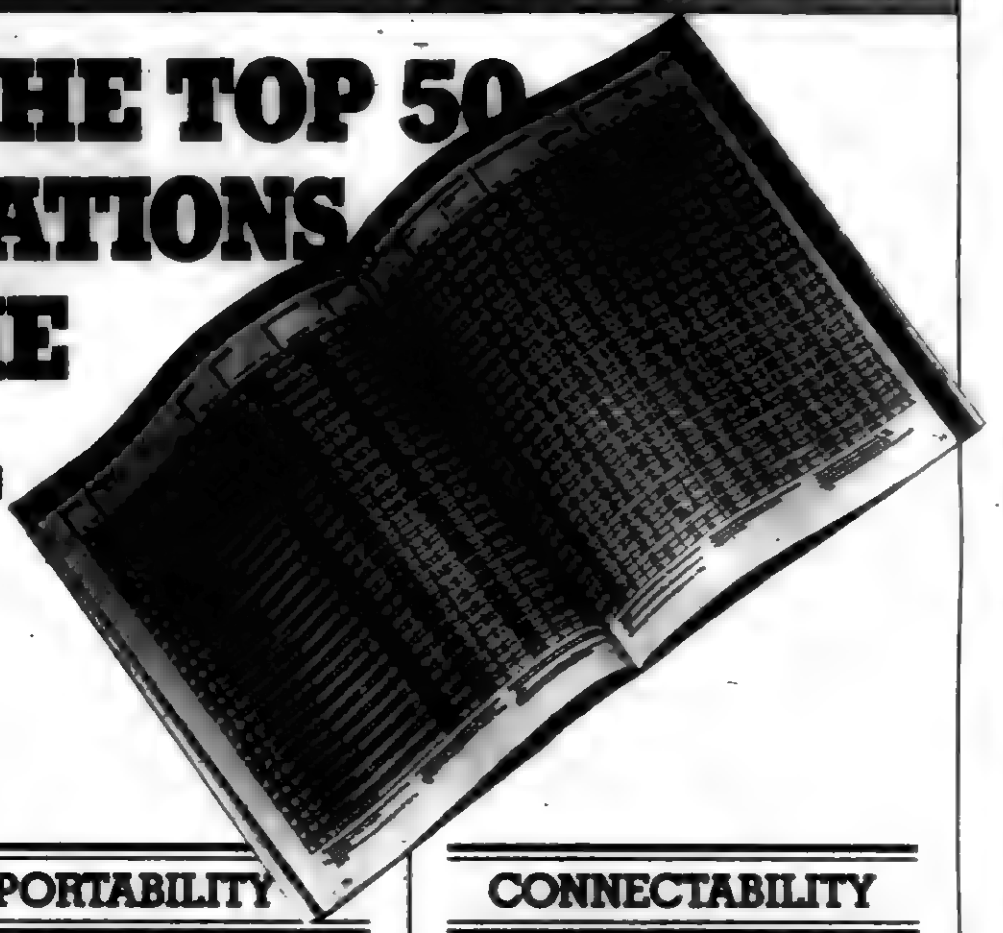
"We believe this application of industry standards, advanced microprocessor technology and networking capability will enable MIS/DP departments to take advantage of the cost-effectiveness of the latest technology while protecting their current investments in data processing and communications equipment," said Datamedia President Guy A. Daniello.

The systems, which run AT&T Unix System V Version 2, reportedly are upgradable from the Model 2610 through the Model 2640.

The base configurations include 2M bytes of memory, which can be expanded to 16M bytes. The systems also can be expanded to support 500M bytes of disk storage.

Based in Nashua, Datamedia is a private company that claimed sales of $26 million in 1985. Their supermicros are distributed through a direct sales force, OEMs and systems houses.

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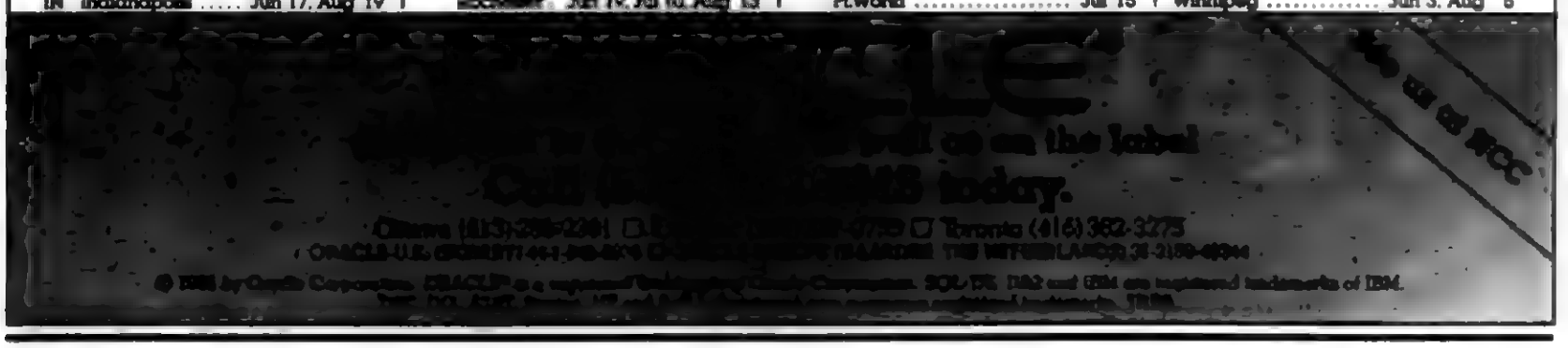
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ORACLE Seminar Schedule

AK	Anchorage	Jun 24
AZ	Phoenix	Jun 5, Aug 6
CA	Los Angeles	Jun 10, Jul 10, Aug 6
	Newport Beach	Jul 15
	San Diego	Jun 17, Aug 7
	San Francisco	Jun 19, Aug 5
	Sunnyvale	Jun 10, Jul 8, Aug 7
CO	Denver	Jun 17, Jul 17
CT	Hartford	Jul 16
	New Haven	Aug 20
FL	Jacksonville	Aug 5
	Tampa	Aug 6
GA	Atlanta	Jul 15
IA	Des Moines	Jun 25, Aug 27
ID	Boise	Jul 31
IL	Chicago	Jun 12, Jul 8, Aug 14
IN	Indianapolis	Jun 17, Aug 19
KY	Louisville	Aug 7
LA	New Orleans	Jul 11
MA	Boston	Jun 19, Jul 16
	Burlington	Aug 12
MD	Bethesda	Jun 12, Jul 9, 23, Aug 7
ME	Bangor	Jul 3
MI	Detroit	Jun 10, Jul 15, Aug 19
	Grand Rapids	Jun 13
MN	Minneapolis	Jun 26, Jul 22
MO	St.Louis	Jun 11, Jul 30
NE	Omaha	Jul 9
NJ	Cvt. Station	Jun 5, Aug 7, 28
	Iselin	Jul 8, 22
NY	Albany	Jul 23
	New York City	Jun 12, 26, Jul 24, Aug 12, 26
	Rochester	Jun 19, Jul 10, Aug 13
NY	Syracuse	Aug 19
OH	Akron	Jul 23
	Cincinnati	Aug 5
	Cleveland	Jul 22
	Columbus	Aug 12
	Dayton	Jul 8
OK	Oklahoma City	Jun 24
	Tulsa	Aug 26
OR	Portland	Jul 24
PA	Harrisburg	Jul 8
	King of Prussia	Jul 24
	Philadelphia	Jun 18
	Pittsburgh	Jun 19, Aug 7
	Scranton	Aug 5
RI	Providence	Jul 8
TX	Austin	Jul 10, Aug 19
	Dallas	Jun 11, Jul 22
	Ft.Worth	Jul 15
TX	Houston	Jun 10, Aug 19
	San Antonio	Jul 8, Aug 27
UT	Salt Lake City	Jun 5, Aug 6
VA	Norfolk	Jun 4
	Richmond	Jun 19
VT	Burlington	Aug 6
WA	Seattle	Jun 12, Jul 15
WI	Milwaukee	Jul 17

Canadian Seminars

Calgary	Jun 3
Halifax	Aug 20
Ottawa	Jun 12, Jul 12, Aug 14
Chicoutimi	Jun 18
Toronto	Jun 3, Jul 8, Aug 5
Vancouver	Jul 10
Winnipeg	Jun 3, Aug 5



Business economists foresee more 1986 corporate spending

Rise in computer sales concurrent

By Mitch Betts

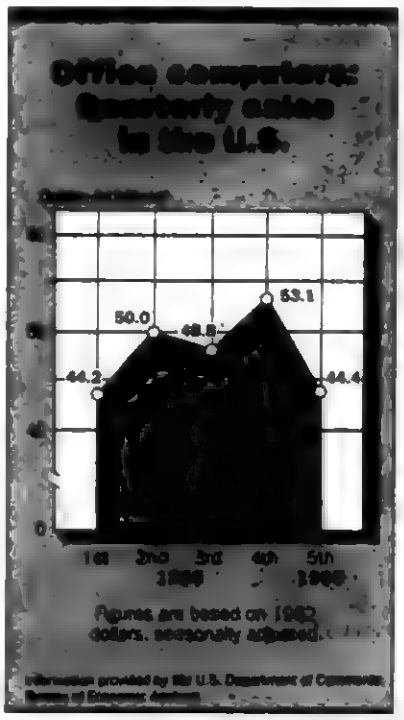
WASHINGTON, D.C. — Many U.S. business economists are becoming optimistic that corporate profits and investments will increase later this year and in 1987, a broad trend that might translate into more corporate spending for computer systems and a modest recovery for the computer industry.

The bullish economic assessment came from a survey of 330 members of the Cleveland-based National Association of Business Economists (NABE). The quarterly survey, released last week, predicted 5.5% growth in business investment, equipment and building this year and 5% growth in 1987.

The association's optimism for 1986 is not universally shared. McGraw-Hill, Inc.'s spring survey of capital spending plans indicated that spending by nonpetroleum industries will increase only 1.2% this year.

The first quarter of 1986 was clearly a bad one for computer sales in the U.S. Seasonally adjusted figures released last week by the U.S. Department of Commerce showed that domestic sales of office computing equipment dropped by $8.7 billion (in constant 1982 dollars), or more than 16%, from the fourth quarter of 1985 to the first quarter of 1986.

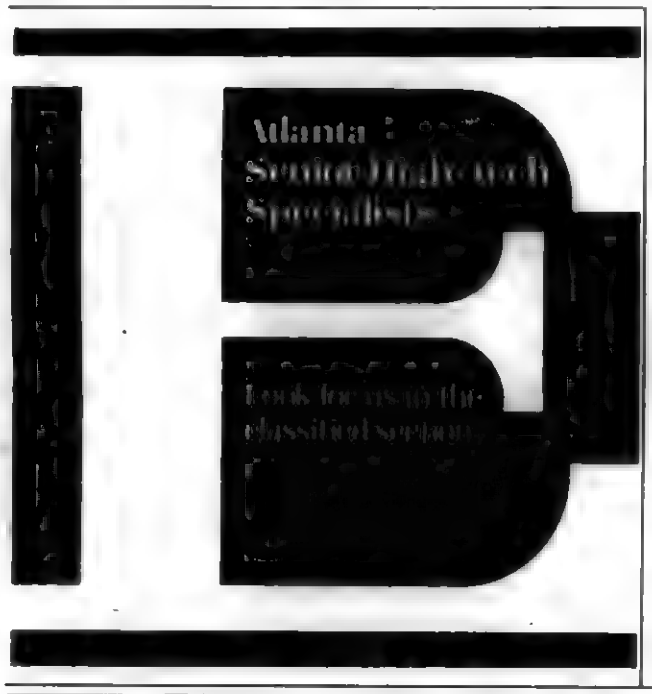
However, several important economic indicators are suggesting a stronger economy in the second half of this year, according to a report by industry analysts at Alex Brown & Sons, based in Baltimore. "We believe an improved economic climate is critical to stronger order rates" for information systems, the analysts reported.

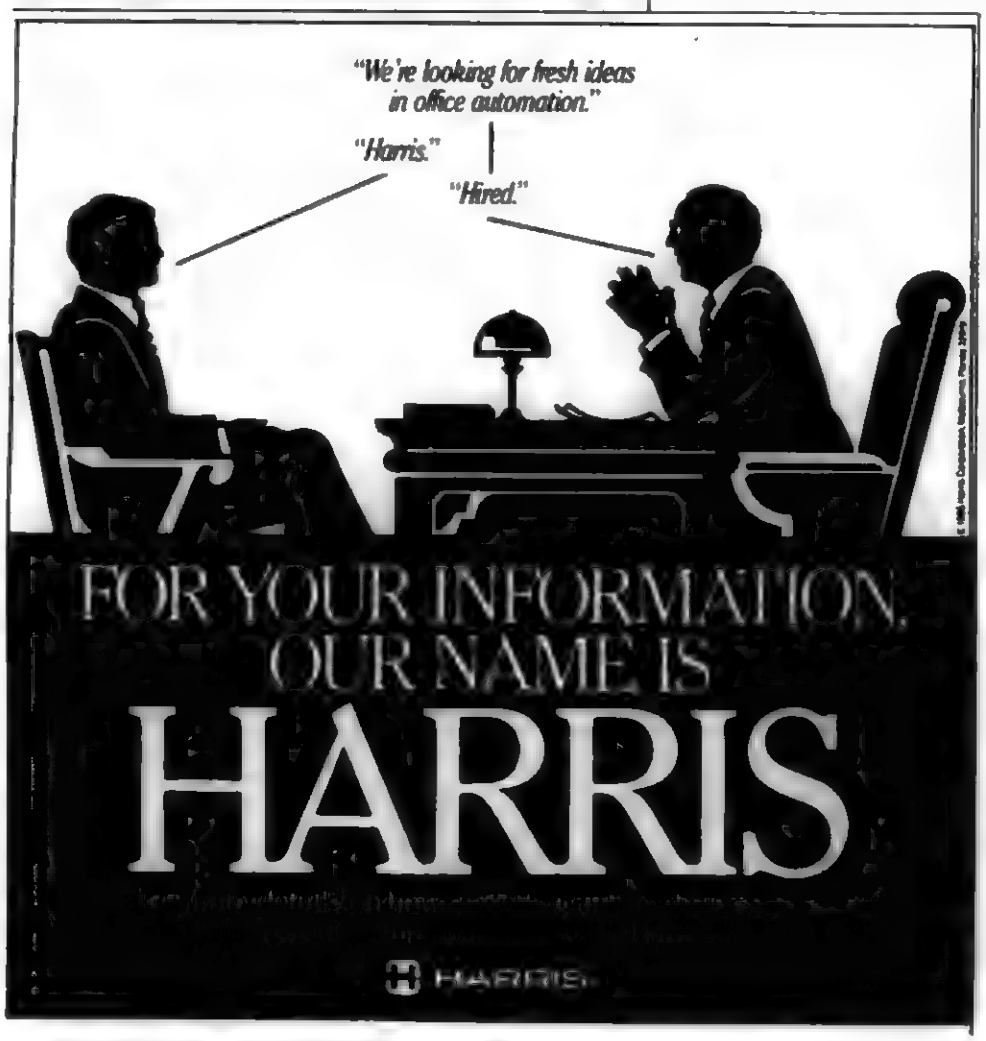


The NABE's increasing optimism about the U.S. economy was fueled by declining oil prices, a factor that reduces inflation and business costs, thus improving profit margins, according to Kathleen M. Cooper, NABE president and chief economist at Security Pacific National Bank in Los Angeles.

"We think capital spending will come back. The main reason that businesses aren't spending more than they are is uncertainty" over federal tax reform and the economy's future, she said.

Cooper said the predicted moderate growth in business spending and the declining value of the dollar will help the computer industry recover from its slump.





WORLD DIGEST
Computerworld News Service

BRUSSELS — The European Community's (EC) Esprit technology research project will triple in size next year, if a recommendation made by the EC last week is accepted by the 12 member nations.

The expanded second phase of the program would represent about 30,000 man-years of work, according to one EC official, and the new five-year budget could reach roughly $4.6 billion.

TOKYO — Mitsubishi Electric Corp. Tuesday released an artificial intelligence workstation called the Melcom Psi that executes high-speed processing in the Prolog language.

Mitsubishi claims it has incorporated what analysts call a 4.5-generation computer — a sequential inference machine — developed by the Institute for New-Generation Computer Technology (ICOT), Japan's think-tank for fifth-generation computer research.

The language for the new workstation is the Extended Self-Contained Prolog (ESP), an AI language from the ICOT project. ESP is expected to enable program modularization.

TOKYO — In the first deal of its kind with a foreign vendor, Japan's Nippon Telegraph and Telephone Corp. (NTT) inked a $250 million, five-year contract this week to purchase digitized telephone exchanges from Nashville-based Northern Telecom, Inc., beginning in 1989. Northern Telecom won the procurement deal over AT&T in a bidding battle that dates back to the summer of 1985.

For NTT, the pact with Northern Telecom was the largest supply contract with an overseas communications vendor since the leading Japanese common carrier opened its doors to foreign procurement in 1981.

PARIS — IBM, the French bank Paribas and French computer services company Sema-Matra will probably begin work next month on the value-added network announced last February.

The decision by Paribas and Sema-Matra to launch a value-added service with the U.S. computer giant's French subsidiary drew considerable attention during French elections back in March.

All European telecommunications, with the exception of those in the UK, are controlled by state-run telecommunications authorities, which are often protective of their markets and uneasy about the penetration of foreign firms.

It appears now, however, that the network, which would be one of the first value-added services in Europe, will proceed.

SYDNEY, Australia — The Australian software industry could be dealt a stiff blow if a Copyright Law Review Committee yields to lobbyists' efforts seeking to diminish copyright protection, according to Australia's largest industry organization.

"The protection is absolutely paramount for the continuing development and expansion of the software industry. Software represents vital productivity tools for other industries and our access to these products at or near world prices affects our international competitiveness in these industries," an Australian Information Industry Association spokesman said.

See DIGEST page 15

Major players' absence hinders attempt to define 80386 bus

Microsoft, Compaq, IBM stay on sidelines

By Eric Bender

BOSTON — An attempt to define a standard bus for Intel Corp. 80386-based machines, which could accelerate commercial shipments of the next-generation systems, was formally disclosed last week by Phoenix Technologies Ltd. But the absence of public backing from IBM, Microsoft Corp. and Compaq Computer Corp. created considerable skepticism about its chances for success.

Phoenix, which supplies IBM Personal Computer-compatible systems technology that AT&T and many other OEMs have built into their micros, wants to create a standard hardware architecture for Intel's new 32-bit CPU that will allow vendors to create machines within three months.

Standardizing on a bus would nail down only one major hardware aspect of the new machines, leaving many software incompatibility issues unaddressed. But it would let peripheral suppliers begin developing products, thus encouraging system manufacturers to plunge ahead, according to Phoenix Chairman Neil Colvin. "There are many manufacturers today, sitting ready, wanting to introduce the 80386 into the marketplace," Colvin said. "But there's real fear of being odd man out."

Working group

As a first step, the Norwood, Mass., company brought together 44 systems and peripherals manufacturers a month ago at the Comdex/Spring show and established a working group with members from AT&T, Chips and Technologies, Emulex Corp., Olivetti Corp. and Tandy Corp. Scheduled to meet late last week, the working group aims to produce a draft standard for discussion next month during a gathering at the National Computer Conference.

While IBM's involvement "would be nice, I don't think the people attending the meeting at Comdex thought it was crucial," Colvin declared. The general industry consensus is that IBM will not introduce any 80386-based systems for at least nine months, he added, and other suppliers feel that "to sit back and wait . . . is to lose a major advantage."

However, Boston-based Yankee Group analyst Michael Goulde was among the skeptics about prospects for the standard effort. "The 386 will not be a low-end, work-at-home machine — a Tandy machine," Goulde said. "This will be a $7,000 applications processor for corporate America. . . . These vendors may set a standard, but corporate America votes on the standard, and corporate America votes for IBM."

IBM declined comment on the standardization effort and on any product schedules. A Microsoft spokesman remarked only on the problems facing those attempting to standardize desktop systems without the active cooperation of IBM and Microsoft. "Compaq is not involved in any way, and our view is that committees don't set industry standards, markets do," said Michael Swavely, Compaq marketing vice-president.

Despite Tandy's participation in the Phoenix effort, Graham Beachum, vice-president for computer merchandising, downplayed near-term commercial expectations for systems built around the 80386: "We see the 80386 as a 1990-type event."

Late summer delivery

But Colvin, who said he has seen demonstrations of three prototype 80386-based systems, predicted that the first commercial systems will be delivered by late summer, with perhaps half a dozen by year's end.

He suggested, "On Day 1, they will look very much like turbo ATs" — systems running standard packages at greater speed, rather than software specially tailored for the 386.

In the long run, however, "very few of them will be PC clones in the sense that we think of PC clones today," Colvin said. With memory protection features built into the hardware, the 80386 can support multiple operating systems concurrently and independently.

Compaq's Swavely forecast that the 80386 machines initially will divide into two classes: extremely high-performance single-user machines and Unix systems. He would not hint at any Compaq plans, although he reiterated, "We don't feel we have to wait for IBM to do things before us. . . . We didn't wait for IBM to say that an 8-MHz AT was okay."

"I think you will see 80386-based product announcements as early as tomorrow," Swavely added. "Actual product availability may be something else. We'll start seeing first availability in the fourth quarter and volume availability in the late fourth or early first quarter."

Like many other vendors, Compaq does not expect IBM to lead the parade of computers powered by the Intel chip. "First, they've made a major investment in the next generation of PC-DOS, specifically related to 80286 architecture, so I don't think they're too anxious to move into a next-generation product," Swavely said. "Second, the 386 offers a level of performance comparable to many of IBM's mid-range products."

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Starting this issue, see page 125.

COMPUTERWORLD
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Computer designers

From page 1

person," says Pete Simpson, a development engineer for Wyse Technology, Inc., a San Jose, Calif., terminal manufacturer. "Our design evaluation process represents a cross-section of the company. The product has to be not just what we like, but what we think corporate America wants."

Much of what the computer user wants is obvious and has been well documented: products that are ergonomically comfortable and easy to use.

But behind those basic concepts is an array of factors that industrial designers must grapple with in order to earn their salaries.

"Most of what is aesthetically pleasing or not are the subtleties of proportions — the radii of the terminal's corners, the balance of the colors," says Don Donatelli, manager of product design for Sun Microsystems, Inc., based in Mountain View, Calif.

"Most of that is below what we call the perception threshold. People won't know why the machine is shaped a certain way and won't consciously be aware of it, but subconsciously, it refers back to the system. The user hasn't seen it before, but it seems familiar," he says.





Matching typefaces, keys

The keys on the Sun-3 engineering workstation, for example, use a serif typeface to match the typeface of the Unix operating system commands on the screen. The keyboard itself is a sculpted, concave design to reflect the shape of the keys.

"The dished keyboard has no real function, but it reflects the function of the keys," Donatelli says.

"It's a specific cultural comment back to the product line. The keyboard also has palm rests, which few people use, but make the keyboard look more comfortable aesthetically," he adds.

Architects of interfaces

Designers view themselves as the architects of every interface between user and machine. Those interfaces, especially in products from a large systems vendor like DEC, mean much more than than a data entry clerk's fingers on a keyboard or eyes on a screen.

A high-end VAX supermini encased in sheet metal may not have the exterior design flexibility of a VDT housed in molded plastic. But DEC designers work, in the words of Industrial Design Manager Rich Johnson, "from the inside out." These people play a large part in the layout of internal CPU boards, power supplies, cooling systems and cabling connections.

'More human interface'

"Even at the high end, there is more and more human interface inside the skins of the computers," says Bob Hanson, an industrial design supervisor in Johnson's group.

"The biggest challenge is merging all of the functional aspects — thermal, acoustic, cabling. The machine should look just as nice with the door open — like looking under the hood of a new Corvette. It looks like someone cared," he says.

For some hardware companies, such as those who make IBM-compatible terminals, product design is an essential component of differentiating a vendor from its competitors.

> ***'The machine should look just as nice with the door open — like looking under the hood of a new Corvette. It looks like someone cared.'***
>
> — Bob Hanson
> Digital Equipment Corp.

Design was neglected

Wyse executives, beginning with founder and President Bernard Tse, attribute much of the company's early success to design factors.

"The aspects of ergonomic and industrial design were neglected in this industry," Simpson says.

"Detached keyboards, for example, were unheard of eight years ago. Even in our very first products, we asked questions about who is using it, in what environment and what are his needs?"

Apple lessons

Steve Holtzman, Wyse's director of product marketing, is a former Apple Computer, Inc. marketing employee. He says that the limited corporate acceptance of many Apple products can be partially blamed on design.

"Steve Jobs used to say that we should design products for ourselves," Holtzman says, "and we developed products with small screens and a lack of cursor keys — features that the corporate community was not willing to accept."

Industrial designers often tread a thin line between a suitably creative and an overly radical design.

"The WY-50 terminal was very radical but was accepted in the marketplace," Holtzman says. "We're still trying to push the frontiers of design, to innovate and still appeal to a mass audience. But it still has to be manufacturable, and at low cost. You can't build a computer like a Ferrari, looking great and costing a fortune."

Multivendor sensitivity

When striving for a unique corporate product image, designers must also be sensitive to multivendor environments.

"Half of our business is OEM," says Sun Microsystem's Donatelli. "It's important to have an aesthetic that's not too specific so it can be used in conjunction with other systems."

Design factors can be critical in the world of IBM Personal Computer-compatible clones, where packaging and price are often the only factors distinguishing one vendor's products from another's.

"Our design goal is simplicity," says Ted Papajohn, industrial design manager for IBM-compatible market leader Compaq Computer Corp.

"Less detail means fewer specs, which means less production cost. Most important, you can't go into 21st-century designs and set yourself so far apart that you can't sell it. If you intimidate the user, you've automatically lost a sale," Papajohn says.

Design sets Compaq apart

But Compaq also sought a micro design that would set it apart from the company whose functionality it emulates: IBM. "We tried to avoid their color scheme, their forms and their configurations," Papajohn notes. "And we've tried to keep each of our products in a consistent context with the others."

Papajohn's bent toward consistency is echoed in Maynard, Mass., where DEC's "one company, one architecture" corporate message is the modus operandi of President Kenneth H. Olsen's minicomputer empire.

That philosophy touches all three design groups at DEC, but it touches graphic design most of all. From labeling a shipping box to developing an Arabic-language keyboard, the goal is product line continuity.

"There was a time when just about every DEC product looked different," says Charles Conn, who was hired as DEC's first graphics designer in 1978 and is now graphic design manager.

"Now it's important to maintain continuity in everything, even something as seemingly insignificant as a regulatory marking. We're responsible for corporate identity. Sales brochures and posters come and go, but products are the essence of the company," Conn says.

Group sets Pick standards, hopes to increase compatibility

Produces SMA/Basic, magnetic media norms

By Maura McEnaney

SAN DIEGO, Calif. — The first set of software standards for hardware manufacturers implementing versions of Pick Systems' Pick operating system was released last week by the Spectrum Manufacturers Association (SMA).

The standards are an attempt by a group of 17 hardware manufacturers, systems integrators and OEMs that license the Pick operating system to promote the use of their Pick-based hardware. Although Pick is known for its Unix-like portability across a wide range of hardware systems, a variety of implementations have diluted systems compatibility, vendors admit.

The SMA standards include the implementation of SMA/Basic, an extended version of the existing Basic language as it has been used on the Pick system. SMA/Basic includes Basic programming language definitions for programming functions such as accessing file structures, accepting input information and preparing reports.

A second category is a magnetic media interchange standard that defines the way data is written onto ½-in. magnetic tape, ¼-in. cartridge tape or a 5¼-in. floppy diskette. Under this standard, users will be able to interchange compatible media between a variety of Pick-based systems. SMA vendors will have 18 months to conform to the standards. Standards on retrieval languages, terminal services and a third miscellaneous group are expected in about a month.

For Pick users like Larry Walton, data processing manager of Family Fitness Centers in San Diego, the emergence of Pick standards means he may one day be able to run the same application across his Pick-based hardware without having to spend time making several format changes.

Family Fitness Centers uses Pick with its Prime Computer, Inc. 450-II, an Ultimate Corp. 3030 minicomputer, General Automation, Inc.'s Zebra 3750, 3500 and Zebra 2500 microcomputers and several IBM Personal Computer XTs to keep track of memberships at its 22 health clubs.

"The communication between these different computers has been very difficult," Walton notes. "The SMA standard is going to mean that I can port my applications more easily across these different systems."

Converting Pick applications from an Ultimate to a McDonnell-Douglas Computer Systems Co. machine may now take about three days, notes Gus Giobbi, president of the International Data Base Management Association, a for-profit organization for Pick users and the admistrative arm of the SMA. But once the vendors implement the standards, users of new systems will be able to convert almost automatically, he said.

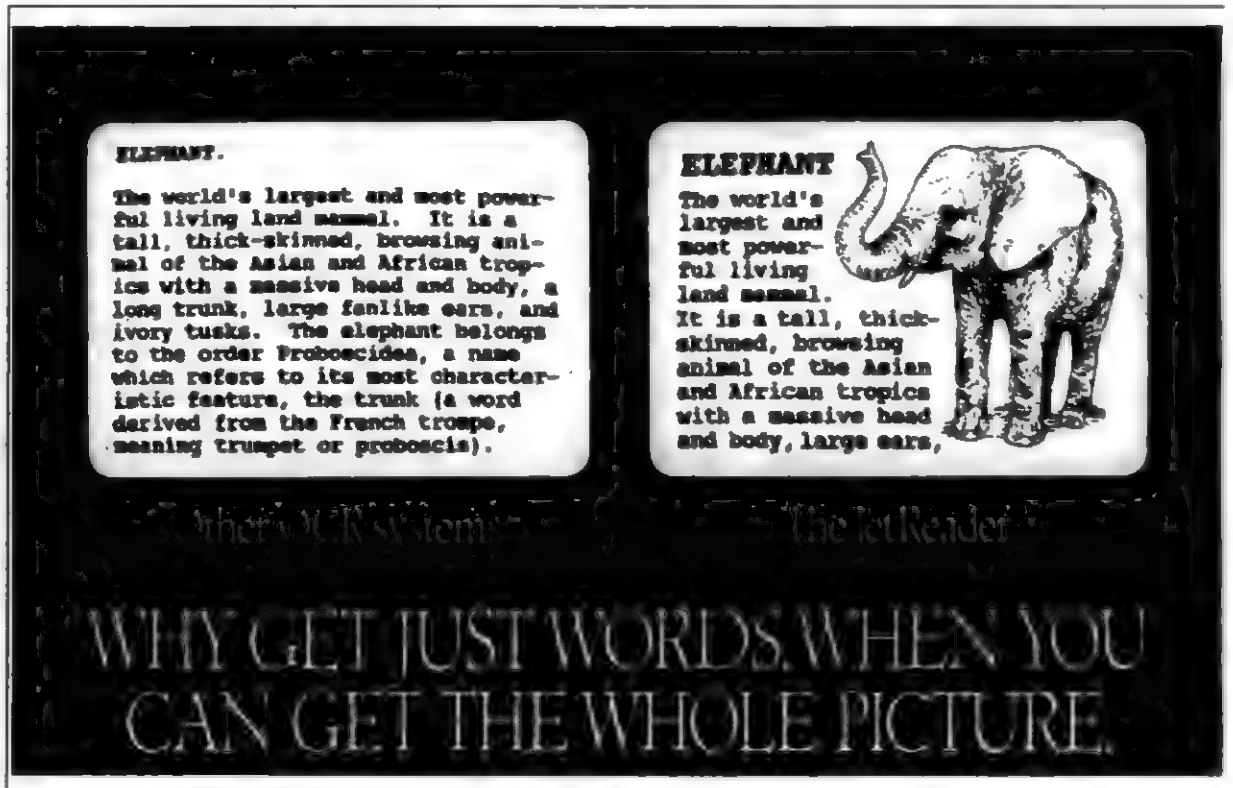
Chandru Murthi of Op Sys consultants in San Francisco says the emerging set of standards is one of the best things that has ever happened to the Pick community. "Until recently there has been a tremendous rivalry between Pick vendors to cut up pieces of the same pie. Now they are trying to make that pie bigger," he says. The SMA standards will not make current Pick systems obsolete but instead will give users more freedom to buy from different vendors, Murthi adds.

DIGEST from page 12

LONDON — UK Department of Trade and Industry (DTI) officials will hold an emergency meeting with U.S. counterparts to resolve the wrangle over a Cray Research, Inc. Cray 1 supercomputer ordered by the University of London Computer Center. The U.S. refused to issue an export license to ship the supercomputer until the university signed an agreement forbidding access to it by Eastern bloc and Chinese nationals.

But the university's computer center last week told the DTI that it could not restrict access to the computer and accused Washington of blackmail.

OSAKA, Japan — Sanyo Electric Co., a latecomer to the Japanese compact disk (CD) market, has recently doubled CD manufacturing capacity to 10 million units a year, anticipating further build-up to 1.5 million by this summer. Sanyo, which dove into CD in mid-1983, is also considering increasing the production of CD read-only memory devices.



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VIEWPOINT

EDITORIAL

Leading the charge

DP/MIS managers, haunted by memories of being bystanders rather than generals in the microcomputer revolution, like to believe they have taken to heart the battle cry, "Never again!" They are currently being handed an excellent opportunity to prove their mettle and the worth of their new role as corporate information systems managers.

The opportunity is presented by the emerging technology of in-house electronic publishing, examined at length in this issue's Executive Report. Electronic publishing has disturbing echoes of the micro experience: It, too, captures a technology traditionally outside the DP/MIS purview. It, too, raises the critical issue of who will take the lead in evaluating, choosing, installing and controlling these new systems, whether desktop or corporate wide.

There is no question MIS managers are best suited to the task. Like microcomputing and now voice communications, electronic publishing is clearly an extension of a company's information flow. Like them, it significantly affects a company's bottom line: Computer-based systems promise to cut in half document production expenditures that typically account for 6% to 20% of a company's gross revenue. And it requires the ability to link components from various vendors to create a truly workable, integrated system.

Already many MIS executives are being questioned: Personal computer users inquire about laser printers; departmental managers demand new tools to quickly update technical documents; top executives want figures on how much in-house publishing could cut costs and reduce document turnaround time.

Now is the time for MIS executives to seriously consider such questions, provide the answers and move quickly to develop a consensus within general management that effective production of hard copy is an integral part of an overall information-processing strategy. They should, in short, boldly lead the charge in adapting this promising new technology.

Seizing initiative here could do much to dispel the notion that MIS too often follows rather than leads.

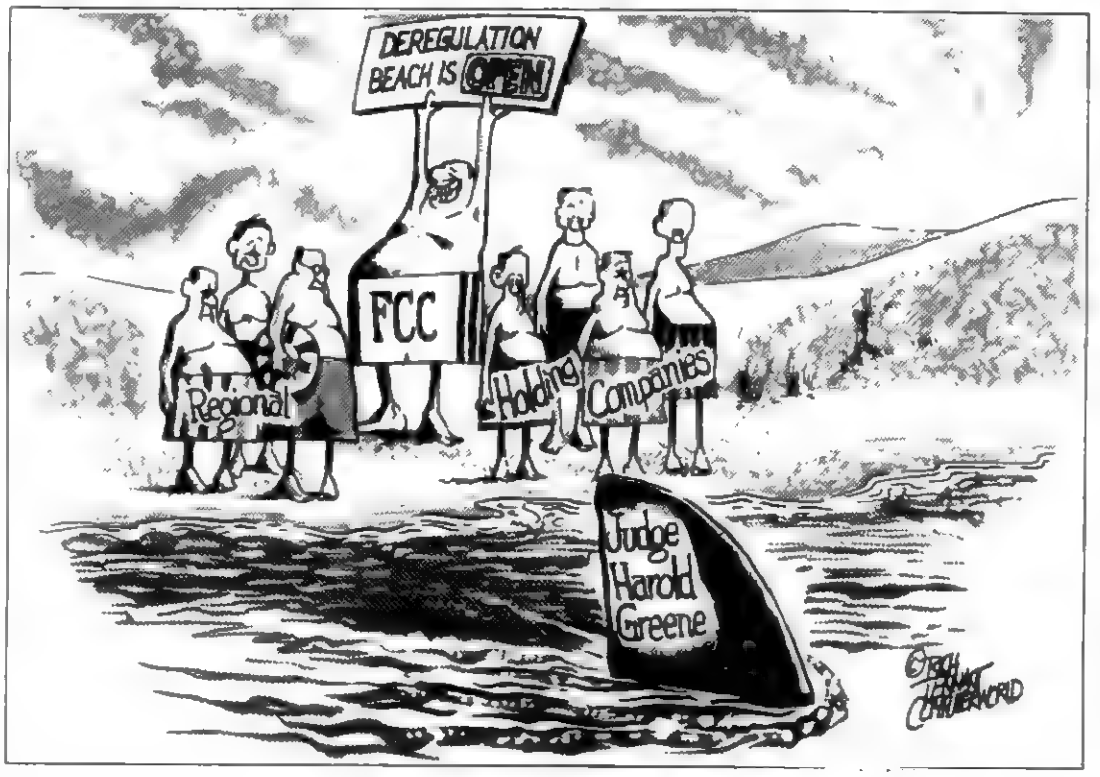
Notes & observations

Among the clear signals to the IBM user community contained in last week's exclusive *Computerworld* interview with Entry Systems Division President William Lowe were several deserving both comment and support.

The most important of these was Lowe's commitment to IBM's existing Personal Computer customer base, as the company expands its product line. "We're intent on providing a set of open interfaces, which will be on the PC as well as the intermediate and large processors," Lowe said.

His commitment to connecting the PC to larger IBM systems augurs a day when customers can have transparent data communications from the smallest to the largest IBM system.

True, all of this must be proven in the act. But given that Lowe speaks rarely in public, his considered words to *Computerworld* must be greeted with optimism and encouragement.



LETTERS TO THE EDITOR

Users, IBM see merits of System/38

It was nice to read the System/38-related articles, "Mid-line crisis" [CW, April 14] and "System/38 grows up" [CW, April 21], particularly the latter. The press has historically done a very poor job of explaining the System/38 to the data processing community. This may become more important now that IBM staff members are saying publicly in various forums that the System/38 will be assuming a more strategic role.

Several reasons have been mentioned for this new positioning aside from the merits of the System/38 itself. The System/36 is based on an obsolete design (the IBM 360, not 370) and doesn't have the power or flexibility needed. An air-cooled 4300 still requires support and staffing that is too expensive and scarce for the small and medium-size shops. Perhaps most important, the Japanese and others can produce high-quality plug-compatible versions of the 4300 for less money than IBM. By committing to the closed architecture of the System/38, which would be almost impossible to duplicate, IBM will ensure a protected source of revenue in a key market.

Many of us who work with the System/38 think that it's the best business computer that IBM makes. It just took IBM a while to realize that too.

[redacted] Horowitz
Chesebrough-Pond's, Inc.
Trumbull, Conn.

Controlling the surprise factor

The recent article by Neal Margolis, "High user overhead mars interface design" [CW, April 28], contained some excellent information.

The article's key point is an important one: In order to determine a product's success, it must be tested to the user's needs, not merely to the requirements. However, if the requirements don't represent the user's needs, who is it that is responsible for the surprise? The tester or the software producer?

Performing some sort of testing to identify the user's needs up front while developing the requirements specification (a technique that may include prototyping) is certainly a good idea. That kind of testing is a discovery process ("Try this. Did you like it? How about this?").

Testing applied during the development of a product, intended to uncover bugs, is a comparison process ("Do this. Did that happen?"). This kind of testing has to be rigorously based on the products generated during the development life cycle or else the correctness of the product degenerates into a matter of opinion. Correctness means that the downstream products do what the upstream products describe. That's high quality.

A wise software developer would be worrying about how to test the specification at the same time as the specification was being written.

But testing developed and performed after the fact will only reveal surprises — surprises that will be very expensive to eliminate. The choice of which approach to take is the software producer's, not the tester's.

Software producers are responsible for the quality of the product. The quality assurance measures they take, including deciding when and where to test, determine how much surprise a software product will carry.

I realize that software developers may be tired of hearing about quality assurance. Worse than auditors who at least have the law behind them, quality assurance people (a.k.a. the program police) depend on moral imperatives to induce software producers to make decisions about the level of surprise their products will carry. These days I've taken to calling quality assurance "surprise control."

How much surprise can a product contain and still sell in the marketplace? That's the key question that software producers have to answer. The more differences between what the product does and what they specified it would do, the more inherent surprise there will be in the product. That surprise costs more to the producers in support and more to the users in overhead. And it may mean the difference between a product that sells well and one that sits on the shelf.

It's not the tester's responsibility to set the level of surprise. That's the software producer's job.

Margolis is correct: The focus of the software producers should be on the performance of the users. If they can't express the users' needs in a complete specification of the users' requirements, then the best product will not be built, despite the best efforts of testing. Don't blame poor quality on bad testing. It's more likely to be the result of poor product definition (too much "surprise allowance"), clearly the software producer's responsibility.

Marc Patrick
Pacific Bell

VIEWPOINT

Retrofitting employees: Human costs of automation

It's hardly news that automation destroys some jobs. One of the prime motivations for automating, after all, is to cut labor costs. It's true, too, that automation creates new jobs: If automation only destroyed jobs but didn't create any, then we'd expect to find most people out of work today, since a high percentage of the jobs of two and three decades ago have been changed or eliminated through automation.

Some of the people who are paid to worry about social, political and economic issues, however, fear that the rate at which automation will destroy jobs is going to increase and that newly created jobs will be offshore. In fact, few of us are immune to automation. Job loss in the future could conceivably grow to include us so-called knowledge workers. Fourth-generation languages probably haven't made any programming jobs disappear yet, but as artificial intelligence becomes a real, money saving tool in more jobs, it's sure to displace some white-collar professionals. The finance field, for example, is ripe for AI tools to replace some money managers, investment analysts and merger-acquisition specialists.



By HOWARD A. KARTEN

The U.S. is becoming more and more an information society, in which the basic commodity employees produce and manipulate (that is, add value to) is information. And communications technologies, such as satellites and fiber optics, make it much easier than in the past to move those jobs offshore.

How do we — employers, government, unions, employees and citizens voting on social policy legislation — deal with these realities?

Blind resistance won't work. In the long run, it's self-defeating, a guaranteed way of pushing jobs offshore.

In the 1950s and 1960s, for example, auto workers' unions tried to preserve members' jobs via a strategy that was, in practical terms, near-blind resistance to automation. Look out your window into the company parking lot if you want to see how well that strategy worked. We have only to look around us to see how many products — particularly those containing any kind of electronics technology — are produced offshore by foreign workers. In my office, for example, my IBM Personal Computer is one of the few products I see that was made here. Many jobs — by no means unpleasant, dangerous jobs — have been moved offshore permanently.

The reasons are simple. Production and technology are mobile. Competition today is no longer merely nationwide, it's worldwide. It's no more expensive (and frequently less so) to produce a product in, say, South Korea, as in South Bend.

Fortunately, there are indications that all segments of society are beginning to look at automation and job loss much more pragmatically. An AFL-CIO official told me that the trend in union contracts has been for more of them to include some provision for employer-paid retraining.

One reason that formal recognition of the need for retraining is significant is that it's becoming more clear that in the future, some of us might have as many as six or seven careers during our work lifetime. In other words, it will behoove us all to start thinking about some form of retraining for the future.

I suspect that within the next decade, we'll regard it as an employer's obligation to make some provision to retrain technologically displaced employees; many companies today regard it as a good business practice.

IBM is probably the example that comes to mind most readily. According to an IBM spokesman, IBM's policy from its founding, called the Full Employment Practice, has been that no worker will be let go for economic reasons such as a general downturn in the economy or plant automation. IBM's average spending last year for employee training and retraining was somewhere in excess of $2,200 per employee — for a total training bill in the hundreds of millions of dollars. (That figure includes all training, not only retraining of those displaced by automation.) Digital Equipment Corp. has a strong tradition, though not a corporate policy, of no layoffs arising from economic considerations such as automation, according to a DEC spokesman.

'We'll retrain you at our expense'

Look at the message implicit in a retraining commitment by employers. In effect, it says to employees, "Talk is cheap. Here's a concrete demonstration that we think you were all valuable contributors in the past. We don't want to lose any of you as a result of automation, so we'll retrain you — at our expense."

Indeed, if you believe that money talks, you could reasonably argue that IBM cares more about its employees than some states do about their citizens, in terms of per-capita spending for education.

Some very significant labor-saving, job displacing products from AI, robotics and other computer-based technologies can be expected to appear in the marketplace in the near future. Unless our society has thought through a coherent, practical, equitable policy for dealing with job loss, these technologies will be impeded — in which case, we'll all be losers one way or another.

Now a writer and consultant, Karten has been involved with computers for two decades as a programmer, systems analyst and DP manager.

When bankruptcy threatens software service contracts

Source code considered property to secure debt

READER'S PLATFORM

By IRWIN B. SCHWARTZ

Current bankruptcy laws' debilitating effects on software service contracts are demonstrated by a hypothetical example. Assume an OEM, Digital Business Technologies (DBT), wishes to acquire for sublicensing a computer program developed and owned by Thirty-One Flavors Software House.

DBT seeks assurance that Thirty-One Flavors will provide prompt debugging if necessary. To ensure continued service after fire, bankruptcy or other disruption, an escrow agreement calls for a third person or agent to hold copies of the source code. The source code will be delivered to DBT should Thirty-One Flavors fail to meet its service commitments.

Now assume Thirty-One Flavors goes bankrupt. A trustee in bankruptcy is appointed to collect property for either reorganization or liquidation. If the source code held by the agent belongs to Thirty-One Flavors, it may not be transferred to DBT, and the trustee may demand its return. Further, any license or escrow agreement purporting to transfer the source code upon insolvency or bankruptcy may be voided.

Disruptive effect rooted in insecurity

Bankruptcy's potentially disruptive effect on software licensing is rooted in the developers' insecurity over their products: Software is vulnerable to piracy.

Software users and OEMs, however, require prompt service for developers' products that, in turn, may require source code access. The tension resulting from the developers' fears and the users and OEMs' service requirements has produced tortured licensing contracts and voluminous escrow accounts.

Most solutions seeking to avoid bankruptcy's disruptive effects attempt to characterize the source code as outside the bankruptcy process. The problem is that unless there has been a transfer of ownership before insolvency, Congress intended these transactions to be run through the bankruptcy process.

Use available protections

Another as-yet-untried alternative would utilize protections available in bankruptcy law to provide access to the source code for the user and OEM.

First, create a standard escrow agreement to hold the source code. Second, execute a security agreement, similar to the kind that pledges ownership in a house as guarantee for the obligation to pay a mortgage. Instead of using real property to secure a debt obligation, however, the developer uses intellectual property to secure a service obligation. The developer's speedy service of the software is the obligation.

The intended effect of this legal contraption is best demonstrated through our hypothetical example. Assume the security agreement is executed and properly filed. DBT holds the limited-use license and access rights as a creditor in possession, meaning it cannot exercise the rights unless the developer defaults on its software service obligation.

The source code is safely in the hands of the escrow agent. Thirty-One Flavors is at no greater risk than under the old escrow-type agreements because no ownership rights have been transferred, and DBT may only see the source code if the software service obligation is breached.

Now assume Thirty-One Flavors goes bankrupt. DBT may first attempt to exercise the limited-use license and access rights to service the software itself. Because the developer is protected from piracy by the license terms and no ownership interests in the source code are being affected, the trustee might permit access and the agreements work as planned.

A wily trustee may, however, attempt to block DBT's access to the source code through a turnover order against the escrow agent. Alternatively, an automatic stay may prevent DBT from exercising the license and access rights because they are the developer's property being transferred to the user or OEM at bankruptcy. Under either a turnover order or an automatic stay, the true value of DBT's "secured creditor" status comes into play.

Entitled to adequate protection

However, as a secured creditor, DBT is entitled to adequate protection under bankruptcy law when either the turnover or automatic stay provisions operate against Thirty-One Flavors' pledged property. While this provision is not entirely clear, it seems to guarantee the creditor that pledged property will not depreciate in value during the bankruptcy.

Turnovers or automatic stays lessen the value of the pledged license and access rights. Should the adequate protection concept apply, the court must fashion a remedy to leave DBT on the same footing as before Thirty-One Flavors' bankruptcy. Such an equitable remedy might include permitting DBT to exercise its access rights, designating a third party to perform the software service or ordering payments to DBT for costs of replacement software.

With the secured creditor alternative the user or OEM receives immediate judicial attention and has some legal leverage to argue for immediate access to the source code, and thus the onus is on the developer's trustee to justify denial of the license and access rights.

Schwartz is a third-year law student at Boston College and a law review editor there.

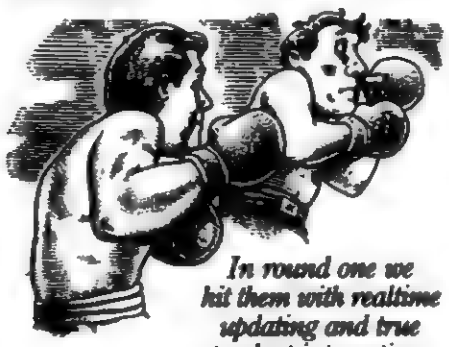
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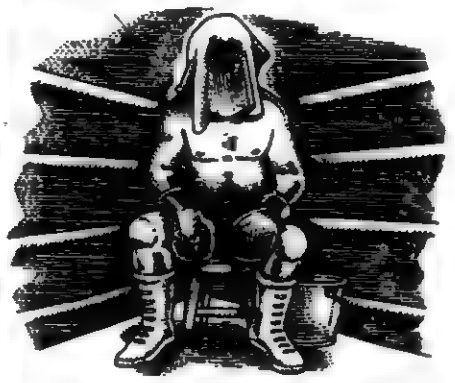
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SOFTLINE
Bob Didner

Changing the programmer

Programmer productivity is like the weather: People often discuss it, but to date, very little has been done about it.

Why have the so-called fourth-generation languages not delivered on their promise of a tenfold improvement in programmer productivity? And why is it that a profession that has learned to make programs run faster cannot do the same thing for the application generation process?

Perhaps it is because we are not applying the same techniques to programmer productivity as we have to program efficiency.

Programmers approach enhancing program efficiency by identifying the part of the code that the computer spends the most time executing. Perhaps the same approach can be applied to the realm of programmer activity. The industry has generally agreed where most programmer activity is spent. Between 50% and 80% is spent with non-bug-related modifications, including maintenance and user interface coding.

User interface changes in particular are one of the greatest causes of nonbug maintenance. Consider two ways that this time-consuming area of user interface design may be improved.

The first way is to use a fourth-generation language, or prototyping tool, that allows the designers to define

See CHANGING page 25

Didner, president of Decision Information Designs of Morristown, N.J., is a consultant specializing in systems analysis and human factors engineering.

SI adapts software to VAX

Masterpiece series merges data between applications

By Charles Babcock

ANDOVER, Mass. — A family of on-line accounting and business applications software formerly restricted to IBM mainframes and System/38s has been converted for use on Digital Equipment Corp.'s VAX line.

Software International Corp., the $40 million-a-year software subsidiary of General Electric Information Services Co., announced today that its general ledger, accounts payable, accounts receivable, fixed assets and payroll applications will be offered as the Masterpiece Series VAX at prices ranging from $16,000 to $42,000 per application.

Although Software International previously marketed some applications for the VAX line, its Masterpiece Series VAX is made up of mutually interfacing products, said Frances Y. J. Wheeler, a company spokesman.

When Masterpiece is combined with the version of Masterquery designed for the VAX, a user can access information in one application and merge it with information from another in a report or query, according to Wheeler. Masterquery uses English-like statements to access data in applications and make up reports.

Spokesmen said DEC is a user of Software International's financial software, and the two companies have jointly marketed applications for several years. Masterpiece Series VAX can run on any VAX from the 8600 series to the Microvax II.

Jeff Papows, marketing manager, said the Masterpiece general ledger application takes full advantage of the on-line capabilities of the VAX. Last-minute closing entries can be made, with the effect on postings at all levels quickly evident, he said.

The Masterpiece accounts payable application offers on-line data entry and cash requirement and commitments. Accounts receivable offers on-line access to comprehensive account activity and history to support the credit approval and collections processes.

Also included in Masterpiece is VAX Masterasecurity, which gives authorized users access to multiple applications

See SI page 25

SOFTWARE NOTES

Unix release takes aim at business

Release 3.0 of AT&T's Unix System V, due out in mid-June, has been designed to make Unix more attractive to business users, according to Bill O'Shea, executive director of the Software Systems Division at **AT&T Information Systems**. Release 3.0's Streams feature will enable users to run applications independent of the underlying network. It separates the application interface from the protocols for communications and networking, so an application running on AT&T's Starlan one day can run

See ADS page 23

Orion unveils development aid

By Eddy Goldberg

BERKELEY, Calif. — The Orion Group, Inc. has released the Orion DIA Facility, a software package that will enable third-party vendors to develop business applications that support IBM's Document Interchange Architecture (DIA) directly through LU6.2.

The product represents the emergence of software applications for IBM's LU6.2 peer-to-peer communications protocol.

"Many people have been concerned that LU6.2 without any software only represents a potential. With IBM's current offerings, there are no applications to run on Advanced Program-to-Program Communi-

See ORION page 23

INSIDE

New programming tools are coming out aimed at increasing corporate use of expert systems/**24**

NEW THIS WEEK

- Swanson Analysis Systems ports Ansys to DEC Vaxstation II/GPX

For more on this and other new products, see pp. 85-107.

INSTANT ANALYSIS

"IBM throws grenades over the wall, and you just have to keep throwing them back."

— John Cullinane, chairman of Cullinet Software, Inc., on DBMS product competition at a recent Hambrecht & Quist, Inc. security analysts meeting

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ADR plans to convert tools

From page 19

without changes on Ethernet the next by swapping Streams modules. It also features Remote File Sharing, which treats all files on the network as if they were a local file system, O'Shea said.

■

Applied Data Research, Inc. (ADR) has made it official. It says it will convert its Dataquery end-user query language and Ideal fourth-generation applications development system to be used with **IBM's DB2** and **SQL**. At the same time, President Martin A. Goetz says ADR's data base management system Datacom/DB and Ideal "has a number of proven, superior capabilities over DB2."

■

IBM's mainframe security product **RACF** has been improved recently, thanks to the pressure of competing products and the lobbying of RACF users' groups, says Stuart C. Henderson, organizer of a new RACF users group in New York. The **New York RACF User Group** is the third such association in the country, joining groups in Chicago and Southern California, according to Henderson, who is vice-president of Prudential Bache Securities, Inc. Henderson can be contacted at 57 Fairfield Ave., Cranford, N.J. 07016.

■

Uniq Digital Technologies Co. of Batavia, Ill., will support Digital Equipment Corp. VAX sites that are running **Unix System V** purchased in source code from AT&T. It will also port future releases of AT&T Unix System V to the VAX series. AT&T Information Systems has announced its intent to end support to VAX System V source code customers on March 31, 1987, Uniq Digital Technologies officials said.

Bank of America is offering a treasury management package for mid-size companies, the $995 **Microstar Corporate Cash Planner**. With the addition of communications software, the package allows a corporate treasurer to produce up-to-the-minute reports on cash balances on an IBM Personal Computer.

The package was developed by Seafirst, a Bank of America subsidiary, which has marketed it since last year. Bank of America and other banks compete to provide software to corporate treasurers as a way of building long-term customer relationships.

■

Tricom Automotive Dealer Systems, Inc. of Hayward, Calif., is a little company with a big break. Tricom has signed a long-term, **exclusive vendor agreement** with **IBM** under which IBM will market Tricom's System/36 Automobile Dealership Management System in the U.S.

Dallas Talley, Tricom president, said the value of the agreement over its undisclosed term "represents potentially 10 times the size" of the firm's revenue last year.

■

BMC Software President John Moores told the first meeting of the **BMC User Group** in Houston on May 16 that BMC has begun work on enhancement products for IBM's DB2. Its product line, to date, has sought to enhance CICS, IMS, VM and VTAM.

The second BMC User Group meeting is scheduled for April 29 to May 1 in Houston, according to Marianne Levandoski, steering committee spokesman and senior systems programmer at AT&T in New Jersey.

Orion offers facility

From page 19

cation," said Orion President Paul Rampel.

The Orion DIA Facility provides distribution services, which allow documents to be distributed to network users; access to library services, which provide connectivity with IBM's Distributed Office Support System (Disoss)/370; and applications services, which allow documents to be transformed at the host site by an applications program.

The facility also provides file transfer services, which enable documents to be exchanged directly between network nodes without requiring the services of the central host.

Rampel said the Orion DIA package provides OEM customers with a menu-driven end-user interface. "You don't even know you're using DIA, except that you're talking to computers that use it," he said.

Rampel added that LU6.2 is the most efficient way to access Disoss.

Optional enhancement

The package is offered as an optional enhancement to the Orion Peer Communications Facility, which was introduced last September and supports IBM's LU6.2 and Physical Unit 2.1 [CW, Sept. 23, 1985]. However, it can work in conjunction with other LU6.2 products, such as IBM's Token-Ring, Rampel said.

Included in the package is a completed application, written using DIA function calls, that emulates the electronic distibution system of the IBM Displaywriter.

The package is available immediately for Unix-based systems and can be adapted for other operating environments.

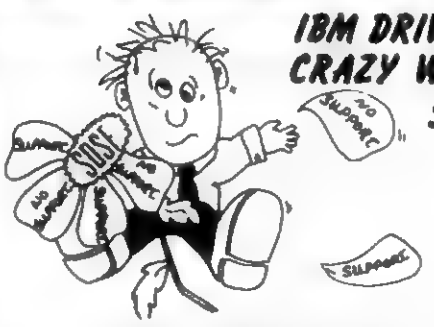
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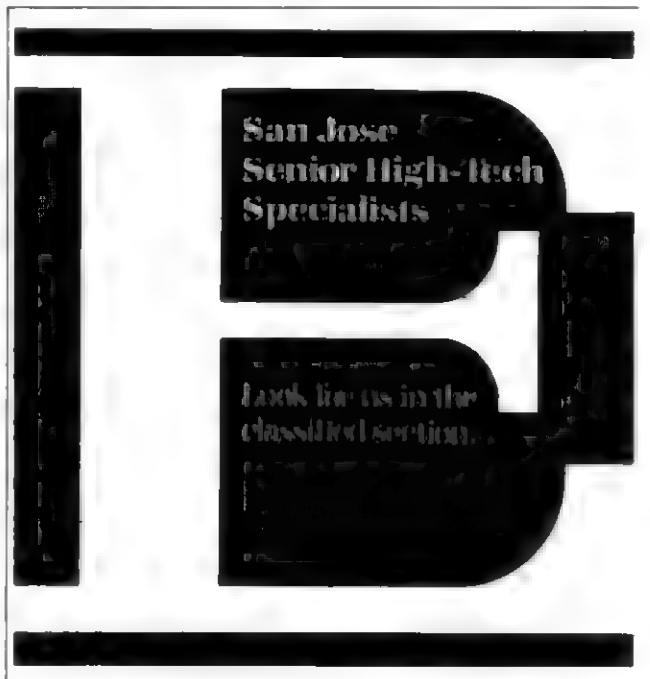
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AI offerings aim to accelerate adoption of expert systems

Language rewrites ease integration

By Eddy Goldberg

Artificial intelligence companies are offering a set of products intended to speed the use of expert systems in corporations.

Teknowledge, Inc., in a move to bring its expert system software products into the commercial mainstream, has rewritten its product family in the C programming language. The new versions are intended to help create expert systems that work with a company's business applications.

One Teknowledge product, S.1, rewritten in C from a LISP version, is aimed at developing large-scale expert systems. It executes faster and uses as little as 10% of the memory needed by its LISP version, according to Earl Sacerdoti, vice-president.

S.1 development software for minicomputers and workstations is priced at $25,000 in a single-user version.

Integrated environments

Carnegie Group, Inc. of Pittsburgh announced it has integrated Knowledge Craft and Language Craft, its AI software development environments, into Version 3.1 of both products.

Knowledge Craft is a productivity tool kit for building large-scale, knowledge-based systems. Language Craft is an environment for building natural language interfaces to operating systems, expert systems, data bases and conventional software applications.

Integrating the two is intended to allow programmers greater access to natural language processing when developing expert systems and to provide users with natural language interfaces, company officials said.

Version 3.1 of Knowledge Craft, $50,000, and Language Craft Version, $25,000, are scheduled for release during the third quarter to run on Texas Instruments, Inc. Explorer, Digital Equipment Corp. VAX and Symbolics, Inc. systems.

Concurrent Common LISP

Intel Corp. of Santa Clara, Calif., and Gold Hill Computers, Inc. of Cambridge, Mass., introduced Concurrent Common LISP (CCLISP) for Intel's IPSC-MX family of concurrent computers. The companies claim this combination is the first commercial large-scale, parallel processing LISP system.

CCLISP also provides debugging tools, a display interface to each node and network services to LISP workstations.

CCLISP provides a Common LISP environment on each of the multiple microprocessor nodes of the IPSC. Sixteen to 64 nodes, each with 4.5M bytes of memory, can be connected.

Prices for the IPSC with CCLISP are $175,000 for the 16-node IPSC-MX/D4 system, $305,000 for the 32-node IPSC-MX/D5 system and $555,700 for the 64-node IPSC-MX/D6 system.

CORRECTIONS

A story in the Software and Services section of the April 28 edition of *Computerworld* should have noted that only the Digital Equipment Corp. VMS version of Software AG's Adabas data base has been enhanced with the addition of the continuous processing option (CPO). The other version of Adabas, for IBM systems, already features CPO.

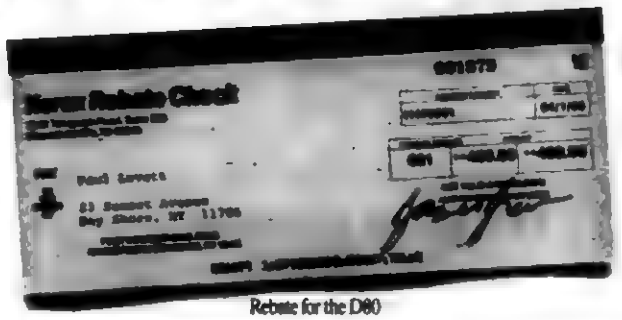
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SEE PAGE 125



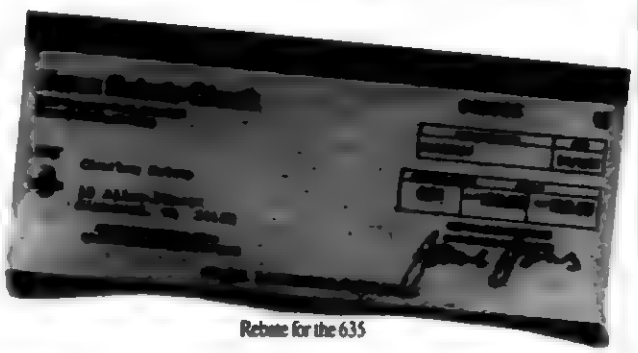
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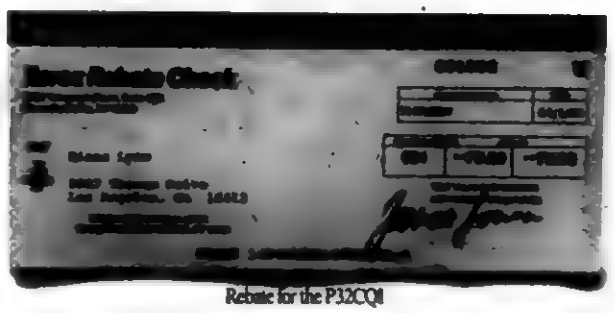
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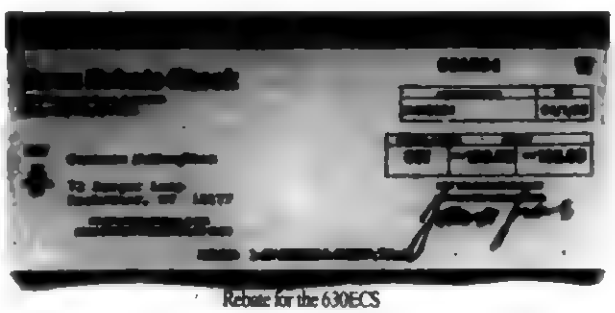
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Changing the programmer

From page 19

the user interface before the defining the data base, including the data dictionary.

The user interface and data base are two separate but interrelated entities. Data or information items whose constituents are not stored in the data base cannot be displayed. Conversely, information or data items that should not be displayed should not be stored.

The important thing to consider here is that whichever is designed first — the interface or the data base — will constrain the design of the second. Most fourth-generation languages are oriented toward application data bases rather than the interface, in that they require the data dictionary to be defined before the interface.

The second, and perhaps most important, way to improve user interface design is to improve the system design and requirements phase that occurs before application coding takes place. If a system is approved that requires up to four times more modification than original development effort, the requirements vehicles are not communicating properly.

Most requirements vehicles are paper documents containing a verbal narrative of how system components will interact and what volumes of data will be stored and processed. These documents also contain a paper representation of what reports and CRT screens will look like.

This form of requirements vehicle does not create a complete description of the resulting system. The following are some hypotheses on why this may be.

A paper representation of a CRT screen does not accurately reflect what the screen will look like, because the real screen will tend to appear more cluttered.

Perhaps most important, prose statements are inherently ambiguous, and it is unlikely that an evaluator/approver and the programmers will interpret a given requirements document in the same way.

An approach that makes more sense is to prototype the interface again and again until the evaluators and potential users are satisfied the resulting system will be both usable and useful. A faithful working model is much less ambiguous than any verbal abstraction.

In an ideal environment, the resulting prototype will be mechanically convertible into the interface of the production system.

Visual screen editor ideal

The ideal prototyping tool will have a visual (what you see is what you get) screen editor. This screen editor should be so easy to learn and use that nonprogrammers can master it with very little instruction.

The only problem with rapid prototyping tools is one of misunderstanding on the part of prospective users and clients. These individuals must be made to understand up front that in a short time they will experience something that will behave and look like the system they will ultimately receive. They must know, however, that the actual system will require several more months for creating and testing the real innards before it is available.

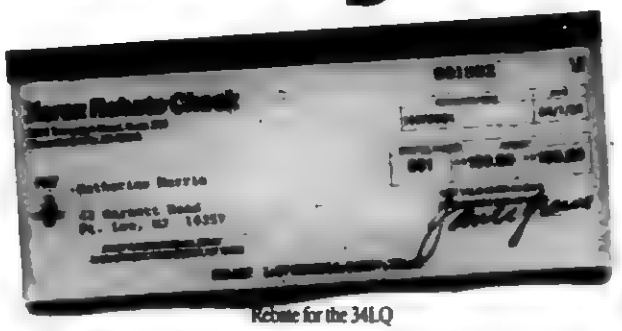
By combining these two proposals for improving programmer productivity, we can generate the requirements for an improved fourth-generation language.

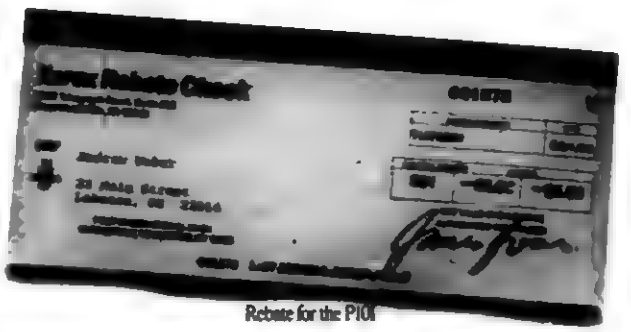
This language would include a prototyping tool that permits a tenfold coding advantage over conventional languages and permit a fully functional prototype to be developed before a data dictionary is defined.

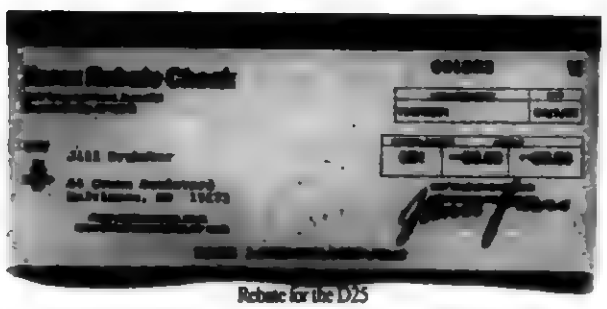
The approach described here will permit us to do more than talk about programmer productivity.

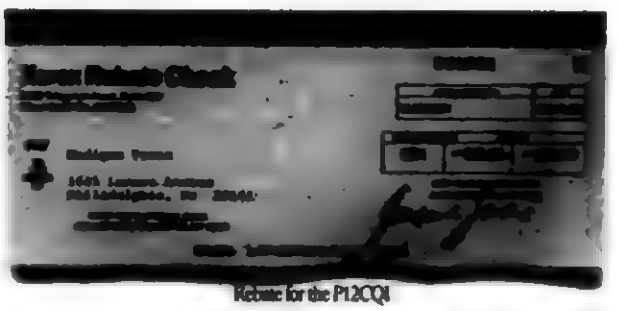
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SI adapts tools to VAX

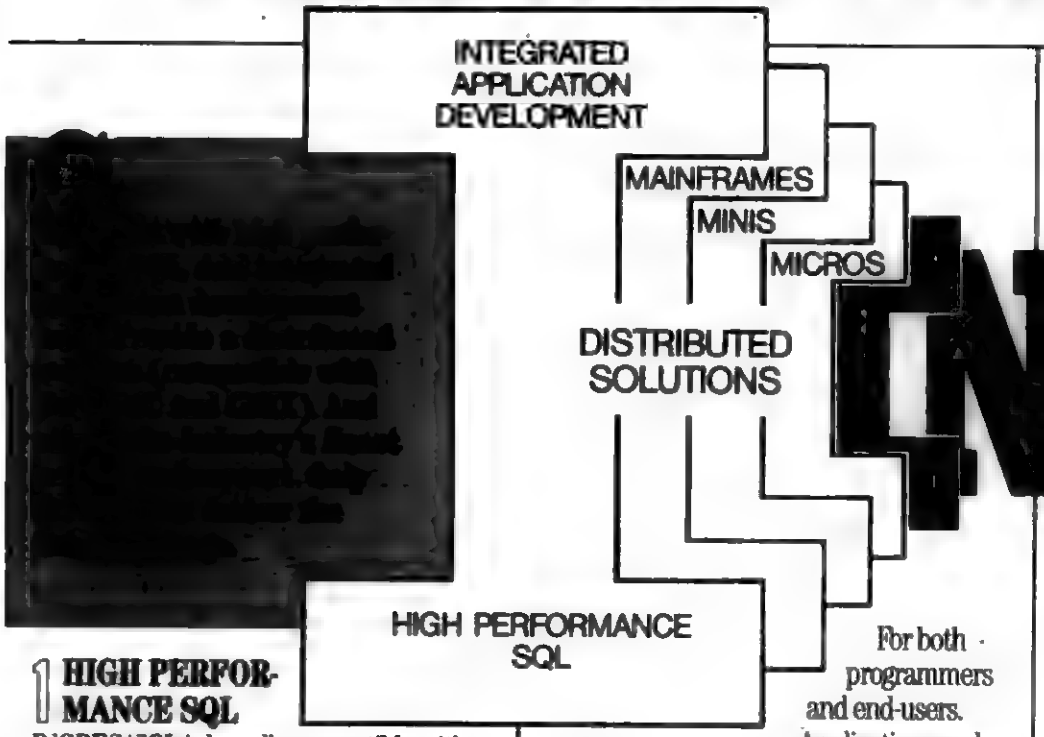
From page 19

with a single sign-on. It provides multiple levels of security.

VAX Navigation allows users to move from screen to screen within each application without passing through screens they wish to avoid.

The applications are available immediately, spokesmen said.

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SMALL TALK
William Zachmann

Hardware pick: Quietwriter

Although widely (and sometimes uncritically) admired as a company, IBM has a persistent reputation for not really being very innovative. The conventional view is that IBM's marketing and management, not its position at the leading edge of technology, makes the company so successful.

In fact, while IBM's performance is not nearly as flawless as many seem to think, its record in real innovation is much better than is conventionally believed.

Floppy disks, for example, originally were an IBM innovation. Winchester disk drives are called such after the IBM code word for the original "Winchester" disk drive product while it was in development. And the IBM Personal Computer was a much more innovative product than the consensus view would have it.

The IBM Quietwriter Printer Model 2, my personal computer hardware product pick for May, is an outstanding example of IBM innovation in action. The Quietwriter 2 uses a proprietary IBM multilayer resistance ribbon thermal-transfer technology with a 40-pin print head. The result is superb letter-quality text — better than standard letter-quality output — combined with very high-resolution graphics that rival the best that any laser printer can produce.

Until recently, personal computer users had to choose between true letter-quality character-impact printers on the one hand and dot matrix printers on the other. The former, using print wheels or thimbles, are not only very noisy but pathetically slow for graphics. The latter are simply noisy, but even the most costly of the near-letter-

See HARDWARE page 32

Zachmann is corporate vice-president for research at International Data Corp. in Framingham, Mass.

Javelin announces range of corporate licensing options

By David Bright

CAMBRIDGE, Mass. — In response to the growing demand for the "selective elimination" of copy protection, Javelin Software Corp. last week announced a corporate licensing and support program for its Javelin business analysis and reporting software.

Pricing begins at $20,000 for the minimum 50 units, whether protected or unprotected, representing a 43% discount on the $695 list price. For volumes of 100, 250 and 500 units, the respective discounts are 53%, 56% and 60%. Discounts on larger quantities are negotiable, said Javelin Chairman Robert Firmin.

According to Javelin Marketing Vice-President Dick Bonzagni, corporate users want a mix of copy-protected and unprotected software. "In developing a sales and support program for the corporate market, we first polled many of the largest personal computer user sites," he said. "We learned that most corporations want a combination of both copy-protected and unprotected versions of the software they buy in volume."

In companies with ad hoc software use — such as laboratories, in which each user may not have his own machine — there is a need to prevent the less experienced users from unknowingly violating a licensing agreement, Bonzagni said. However, more knowledgeable users with their own dedicated personal computers may need to make copies for backup or for working at home, he added.

The first user taking advantage of Javelin's new program is the Management Systems Department of Hughes Aircraft Co. of El Segundo, Calif. "Javelin is the first software vendor to recognize how PC resources are actually managed in a large corporation," claimed B. J. Garnett, manager of the department, in a prepared statement released by Javelin.

Garnett said that instead of losing sales through the site licensing agreements, Javelin should actually profit in the long run. "Ironically, other vendors have been afraid of losing sales from a program like this, when in fact the opposite will more likely be the case. We expect to purchase more copies of Javelin because the multiple-unit licensing program will be so much easier for us to administer."

Firmin agreed that the new arrange-

See JAVELIN page 34

Intel pits graphics chip against TI

Micro software vendors supporting both devices

By Douglas Barney

Intel Corp. last week announced its 82786 very large-scale integration graphics coprocessor, a product aimed at speeding graphics applications, that will compete head-on against the 34010 graphics processor from Texas Instruments, Inc. Judging from the reception of microcomputer software vendors, there may be room for both devices.

Both Intel and TI will ship their products in volume in the fourth quarter and expect the devices to speed graphics 10 to 100 times by off-loading graphics functions from the main CPU. This will be especially useful on future machines that use extensive multitasking and windowing, as well as personal computers performing computer-aided design and engineering.

In addition, both devices support laser printers, giving each a shot at penetrating the desktop publishing market. Unlike the Intel device, the TI 34010 can act as a complete CPU for a laser printer, said Brent Wientjes, TI's 34010 program manager.

Both products will sell for less than $100 each in quantities of 1,000 or more.

The Intel 82786 coprocessor will be compatible with the IBM Color Graphics Adapter and the ANSI Computer Graphics Interface (CGI) standard. It is supported by Digital Research, Inc.'s GEM and Microsoft Corp.'s Windows operating environments as well as device drivers from Graphics Software Systems, Inc.

In addition, Ashton-Tate and Lotus Development Corp., have announced 82786 support.

Graphics Software Systems, however, has also reached an agreement with TI to

See INTEL page 34

INSIDE

Zenographics presentation graphics software reportedly offers 360 million colors on IBM Personal Computers/**30**

Cauzin Systems upgrades its Softstrip Reader with output ability/**30**

NEW THIS WEEK

- Samna Corp. offers Samna Decision Graphics software for the IBM PC
- Tandy introduces new model of IBM Personal Computer AT compatible

For more on these and other new products, see pp. 85-107.

INSTANT ANALYSIS

"Every time somebody finds a bug in a new version of MS-DOS, there's all this speculation over whether it's really a bug or some sort of window to the future of the operating system."

— Dave Moin, Microsoft Network product marketing manager, Microsoft Corp.

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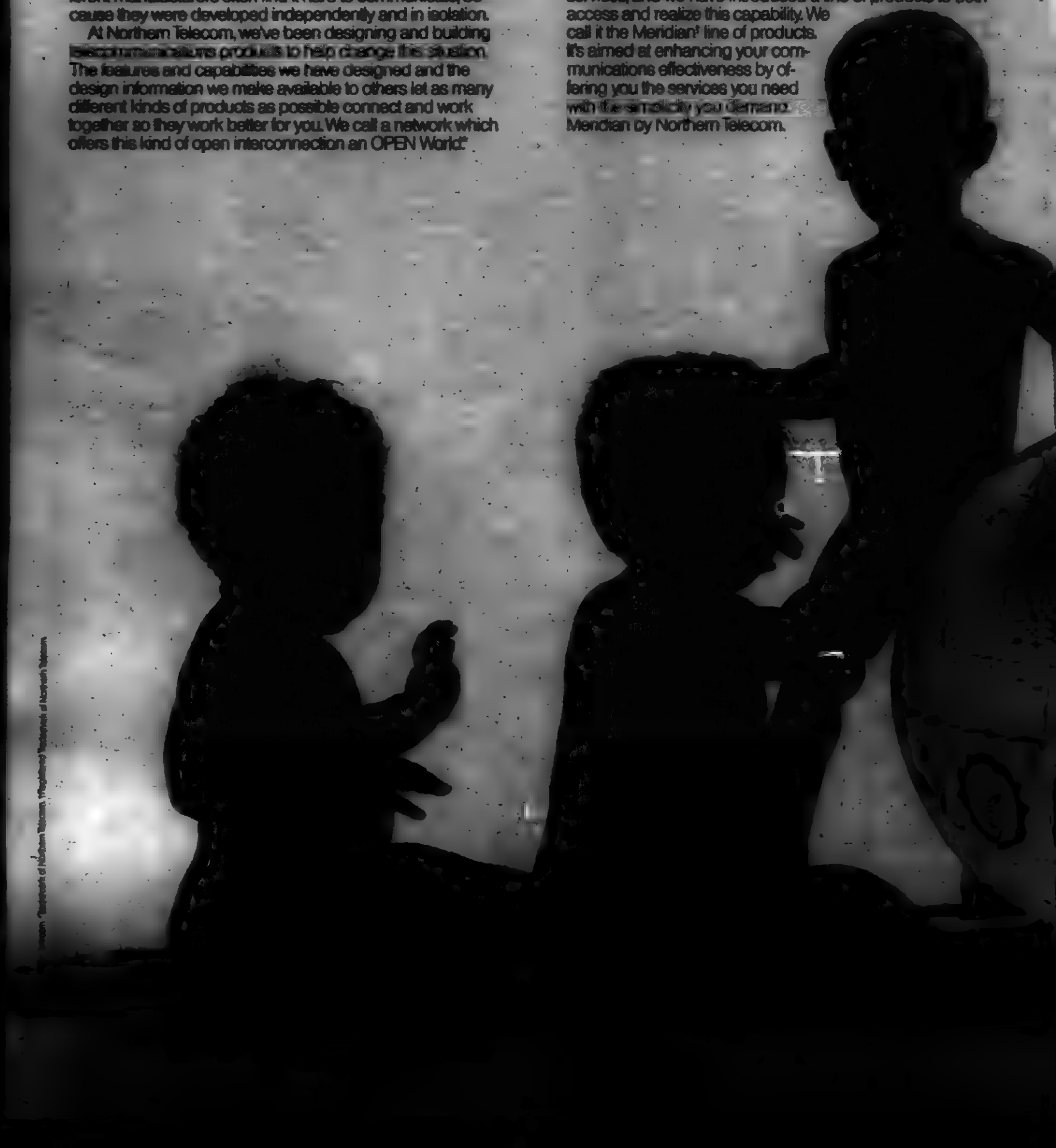
INTEGRATED—People in different parts of the world have different customs and speak different languages. That's because they were relatively isolated, and their cultures developed independently before the days of radio, television, telephones and fast, easy transportation. Sometimes, it's hard to communicate.

Similarly, computers and other equipment made by different manufacturers often find it hard to communicate, because they were developed independently and in isolation.

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DIGITAL—Most people find that the best approach to solving a problem is the simplest approach. In telecommunications, the simplest way of carrying information is to convert it to a series of 1's and 0's—a digital bit stream.

A digital bit stream can mean anything—it can be your voice, a letter, a television picture, or the manufacturing diagrams for a new car.

At Northern Telecom, we've been designing and building telecommunications products based on the simple digital bit stream for two decades. We call a network that handles all information in digital form a Digital World.

NETWORKS—In sports, a winning team starts with a good game plan, and adapts it in real time based on the changing flow of the game.

Up to now, telecommunications networks have followed a very static game plan. They were built mostly of separate elements to handle predictable changes in needs on a long-term basis. There was almost no way of controlling them in real time, so they provided little current information about overloads or breakdowns or anything.

At Northern Telecom, we have developed a new way of designing and controlling telecommunications networks. It's a game plan for public or private network architects who want to design and run their whole network like a winning team. It also lets networks carry different kinds of information more easily and economically and thereby provide the basis for supporting new services and capabilities for you.

We call it Dynamic Network Architecture.



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Zenographics software rivals graphic power of mainframes

Produces 360 million colors using IBM PCs

By Douglas Barney

ANAHEIM, Calif. — At the National Computer Graphics Association show earlier this month, new versions of Zenographics, Inc.'s Mirage and Autumn presentation graphics programs, said to rival the output of mainframe graphics programs, won the "Graphics Software Shootout."

Both the $895 Mirage package and the $595 Autumn package can produce up to 360 million colors using standard IBM microcomputers with color displays and 64 shades of gray and black on computers without color capability, according to Zenographics.

These products also support most popular brands of graphics output devices, including laser printers, inkjet printers, thermal ink printers, film recorders, graphics cards and plotters.

In many cases, the graphics output of these devices is enhanced by using Zenographics software. "We extended the color capabilities of output devices," said Michael Behnke, vice-president of marketing.

Mirage is an integrated package that can receive data from either a mainframe or microcomputer and includes a file manager, graphics editor and charting module.

Autumn is said to be an easier to use package that provides more than 100 predefined chart formats that allow novice users to easily create charts and graphs.

In addition, Zenographics announced two add-on products for Mirage and Autumn. The $95 Typefaces software provides a family of typographic quality, bit-map fonts that are geared toward lower resolution devices and smaller type sizes, as well as polygonal fonts, which are geared toward larger characters and high-resolution devices. Both Helvetica-like fonts and Times-Roman-like fonts are included. The $95 Symbols package provides hundreds of scientific and business images, the firm claimed.

Mirage and Autumn run on IBM Personal Computers and compatibles with at least 320K bytes of random-access memory.

Zenographics also offers the software on larger systems. "It was designed to be portable," Behnke said. "We don't just run on the PC, XT, AT; we also run on VAX, Prime Computer, Inc., IBM CMS, IBM MVS, and we have prototype systems on Univac [Sperry Corp.] and International Computers Ltd."

Prices of the software on larger systems range from $15,000 to $30,000.

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Softstrip lets PCs trade files

By David Bright

WATERBURY, Conn. — With new software from Cauzin Systems, Inc., personal computer users equipped with the vendor's Softstrip Reader can store programs and files as printed strips on plain paper. The strips can then be read by any other personal computer.

Available now, the $19.95 Stripper software reportedly encodes any file and allows it to be printed on a dot-matrix or nonimpact printer as a ⅝-in. by 9½-in. strip. Connected to a personal computer via an RS-232 port, the $199.95 Softstrip Reader then can transfer the information to another microcomputer.

When the Softstrip System was introduced last fall, it had reading — but not storage — capabilities.

Key applications for the software include the transfer of word processing files, spreadsheet templates, bank statements and hospital information, said Cauzin Marketing Vice-President Neil Kleinfeld. In addition, over two dozen magazine and book publishers will soon be printing free strip programs in their publications, Kleinfeld claimed.

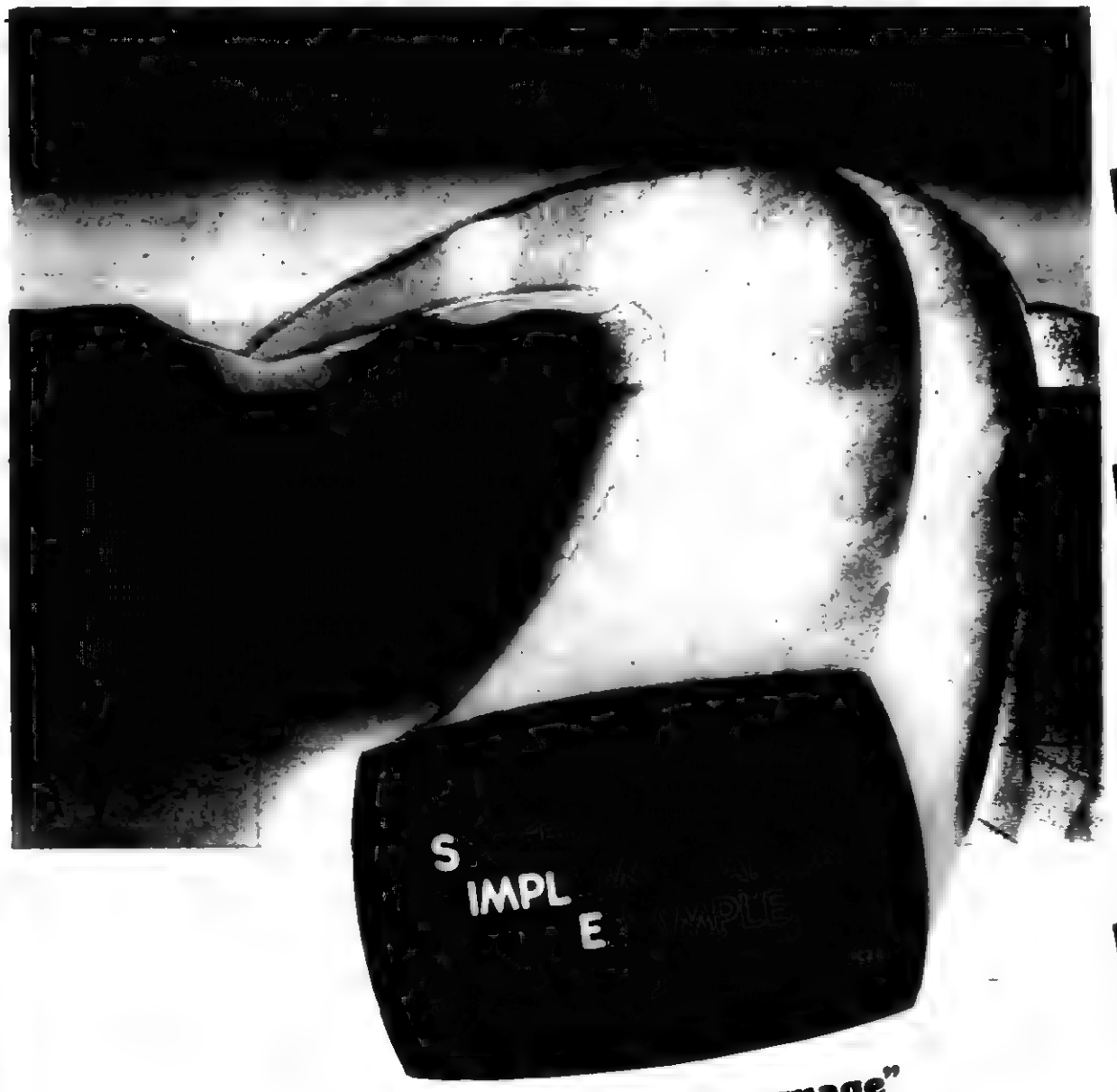
Kleinfeld stressed that the equipment is not intended to duplicate copyrighted programs or be an alternative to disks. "It will not replace magnetic disks," he said. "It is a complement to disks, rather than a replacement."

For example, if users of the IBM Personal Computer or Apple Computer, Inc. Macintosh need to work with one particular template created with Lotus Development Corp.'s 1-2-3 or Jazz, "you just print up one strip and everyone can use it," Kleinfeld claimed.

Actually, since each strip contains between 900 and 5,500 bytes, depending upon the resolution of the printer, several strips may be necessary. But the software will sequentially number the strips.

According to Kleinfeld, operation of the menu-driven software takes five minutes to learn. The user does not have to specify the computer models being used; when the strips are printed, the software includes information about the originating computer.

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AT&T, Samna offer OA tools

MORRISTOWN, N.J. — A joint development effort between AT&T Information Systems and Atlanta-based Samna Corp. has produced two office automation packages for the AT&T Personal Computer 6300 and other IBM-compatible microcomputers. Both packages will be marketed by AT&T.

According to AT&T, the Write Power 1 package offers standard word processing features plus DIF, ASCII and IBM Document Content Architecture translation; a pop-up message window to record telephone messages; mail merge; and forms creation and mapping capabilities. The package can also use the new AT&T Model 7500S Electronic Typewriter as an I/O device, the company said. Write Power 1, currently available, is priced at $495.

AT&T's Write Power 2 incorporates Write Power 1's features along with an integrated spreadsheet and the Wordbase Manager, which reportedly searches through all files on a disk to locate any word or group of words and reports the file that contains them. The software also provides automatic table of contents and index generation. Write Power 2 will be available in July for $745.

Both packages feature hot-key connectivity to Digital Communications Associate's Irma card and compatibility with AT&T's Starlan local-area network, AT&T said.

Hardware pick: IBM Quietwriter

From page 27

quality dot matrix printers still produce rather distinctive dot matrix-style output.

Within the past few years, laser printers have begun to offer an attractive alternative. But these are not only expensive, they are relatively complex devices as well. "Relatively complex" translates, unfortunately, into relatively prone to failure and extremely difficult (if not downright impossible) to repair when broken.

The IBM Quietwriter 2 offers the simplicity and reliability of a dot matrix printer, the text and graphics quality of the best of the laser printers, extremely quiet operation and reasonably high speed, all at a price ($1,595) comparable to that of a good printwheel or thimble-impact printer.

For my money, it may be the best choice for an all-around personal computer printer these days.

The Quietwriter 2 printing technology is the same as that used in IBM's high-end Quietwriter 7 typewriter. Like the earlier Quietwriter Printer Model 1 (which lacks graphics capability), it works with the same ribbons, type font cartridges and user-replaceable print heads as the typewriter. This should ensure ready availability of supplies.

In character mode, the Quietwriter 2 operates in the range of 40 to 60 char./sec. Although relatively slow compared with high-performance dot matrix printers, this is fast enough for most users and much faster than most character-impact printers.

In the all-points-addressable graphics mode, the Quietwriter 2 is not exactly a speed demon. However, it is much faster than a printwheel printer in comparable applications. While volume production applications would require a faster (and much more expensive) device, I find the Quietwriter 2 quite adequate for personal use for graphics output.

The Quietwriter 2 high-resolution graphics mode offers a choice of 60 by 60, 120 by 120 or 240 by 240 dot/in. Another mode offers compatibility with the IBM Graphics Printer and Proprinter at 72 by 60, 72 by 120 or 72 by 240 dot/in. In the higher resolutions, the Quietwriter 2 offers graphics quality that exceeds that of most laser printers.

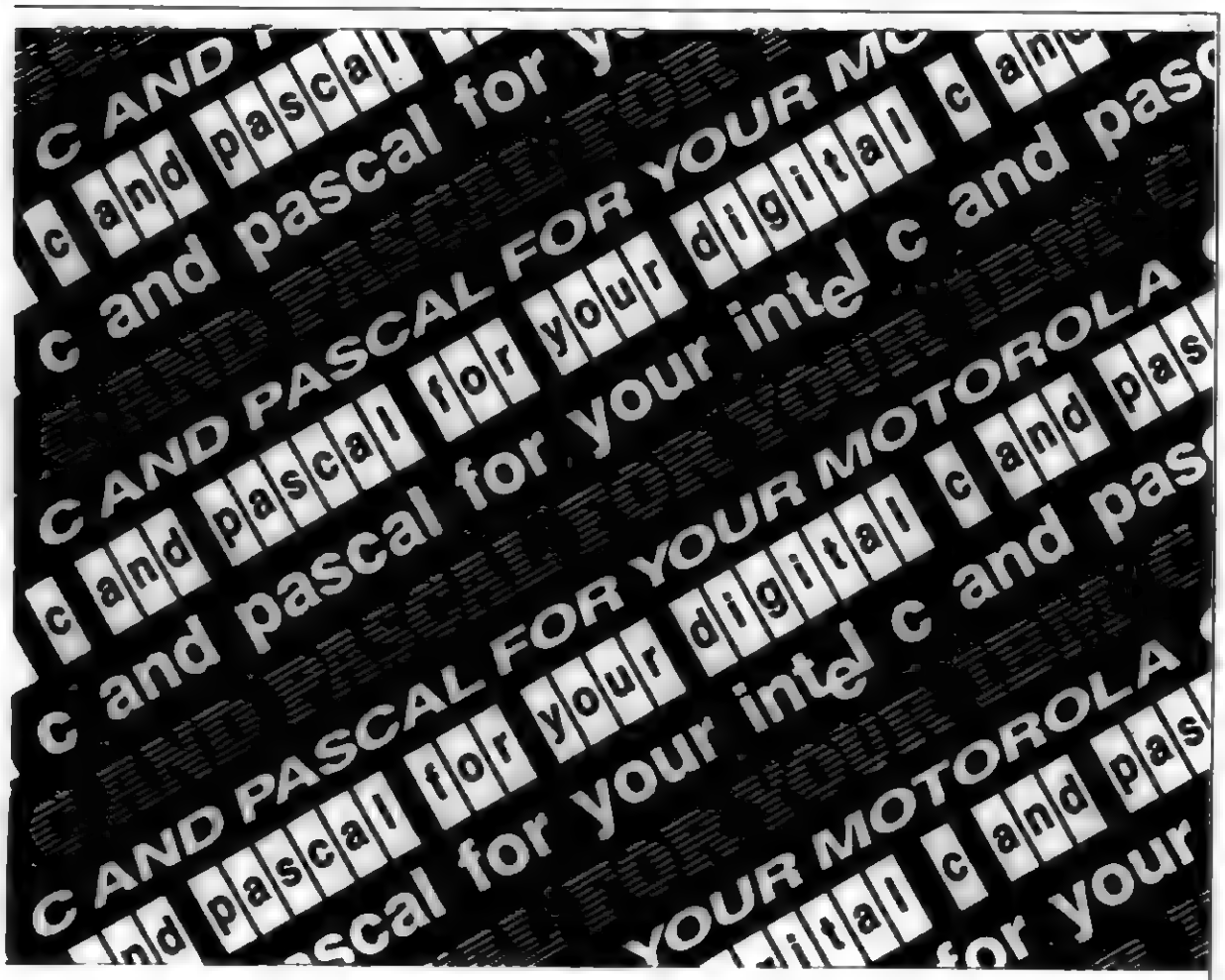
Caution about software compatibility

But a note of caution is in order about compatibility with current software. Despite the compatible features it shares with the IBM Graphics Printer and Proprinter, the Quietwriter 2 does not typically work directly with software drivers written for those devices.

At a minimum, printer control codes must be sent to the printer to put it into compatibility mode. This can be done with software that includes provisions for sending printer setup strings. However, much popular personal computer software not only lacks such provisions but does not even allow for user-provided device drivers. As a result, the Quietwriter 2 cannot be used with many software packages until the software vendor provides a driver.

This is really only a short-term problem, since software vendors will certainly provide drivers for the IBM Quietwriter in the near future, if they have not already. However, it can certainly be a short-term annoyance for a user who expects (as the IBM product literature implies) that the Quietwriter 2 can be directly substituted for an IBM Graphics Printer without modifications to existing software.

Overall, the Quietwriter 2 is an excellent device offering what will strike many as the best compromise between price and features for a general-purpose personal computer printer. Available options include a sheet feeder as well as a continuous form feeder and a large selection of character type font cartridges. The device prints on transparencies as well as on plain paper stock.



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DBMS reads Dbase directly

By Douglas Barney

BURLINGTON, Mass. — Alpha Software Corp. this month released Alpha/Three, a $395 menu-driven data base manager that uses the same file format as Ashton-Tate's Dbase III, currently the leading microcomputer data base product in large corporations.

Alpha/Three can read and write to Dbase disks directly, avoiding the format conversion process that tends to create redundant and inconsistent data files. "File conversion is a pain in the neck," Alpha President Richard Rabins said.

Alpha expects its new data base to complement Dbase within corporations. "Data bases fall into two classes, menu driven and command driven. We are sure that we are the first to come out with a powerful menu-driven product that uses the Dbase files natively," Rabins claimed. "A company that has standardized on Dbase in the high end is given a compelling reason to choose Alpha/Three for their menu-driven product."

Alpha believes the product can stand on its own merits as a stand-alone package. According to Rabins, Alpha/Three has sophisticated report writing, form generation and mailing list capabilities.

"You can do very sophisticated reports without programming. It is a very visual, free-form report writer," Rabins noted.

Alpha/Three also offers a built-in form letter generator and basic word processing capability. "We have built logic into the form letter; you can make the text vary depending upon the status of one of the fields," Rabins said.

Alpha/Three runs on IBM and compatible personal computers with at least 320K bytes of random-access memory. A hard disk drive is recommended.

True Basic Programming Libraries get six 'volumes' for IBM PC use

HANOVER, N.H. — True Basic, Inc. this month announced six additions to its True Basic Programming Libraries, a set of tool and utility companion products for the True Basic language on the IBM Personal Computer.

The additions, each priced at $49.95, include The Developer's Toolkit, Communications Support, Forms Management Library, Btrieve Interface, Sorting and Searching and Advanced String Library.

According to the company, The Developer's Toolkit provides routines for creating, reading and removing subdirectories; hiding and unhiding files; switching between displays; loading registers and triggering interrupts.

Communications Support reportedly allows simultaneous use of two communications ports at up to 19.2K bit/sec., along with interrupt-driven operation with fully buffered input and output.

Forms Manager Library is said to offer a group of easily modified forms and input checking routines.

According to the company, Btrieve Interface allows programmers to access Softcraft, Inc.'s Btrieve file management package, permitting the management of data bases with up to 4M bytes per record and 24 key fields per file.

Sorting and Searching gives 14 subroutines for both string and numeric sorting, including quick sorts, heap sorts and multikey sorts, the company said.

Advanced String Library offers pattern matching, expression scanning, parsing, text manipulation and a 38,000-word English dictionary, according to True Basic.

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Intel pits graphics chip against TI

From page 27

make the 34010 compatible with the CGI graphics standard. TI also has been negotiating with Microsoft and is completing a port to make Windows compatible with the 34010.

The success of both devices is likely to be tied to that of environments such as Microsoft Windows. "If Windows is hot, this also has to be into the same category," said Ron Goldfarb, manager of office automation for Pratt & Whitney Administration, of East Hartford, Conn. "If we jump through the window with both feet it will be a helluva product."

"TI is probably our biggest competitor right now," admitted Mark Olson, product marketing manager in Intel's graphics component operation. Intel's device is essentially self-contained, and nonprogrammable. The TI device has fewer built-in instructions. "The TI product does have a certain amount of flexibility, but it is still software that executes the drawing instruction set, and ours is tuned hardware that executes it much faster," Olson claimed.

But TI argued for the programmability of its chip. "As algorithms evolve or user interfaces evolve or standards evolve, you can migrate with the product," Wientjes said.

The Intel device will work with all Intel microprocessors, Digital Equipment Corp.'s Microvax, Zilog Z80-based machines and Motorola, Inc. 68000-based machines. TI's 34010 also will work in many architectures. "We are independent of the host processor. We work equally well with a Motorola 68000-based bus or an Intel 8086-based bus," Wientjes said.

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Imrex Computer Systems, Inc.

Javelin offers licensing options

From page 27

ment would give Javelin "much more leverage per sales call," adding that his company would make a good return on a minimum license for 50 units.

At press time, Hughes Aircraft was the only licensee, but Firmin said Javelin was in the process of closing several other deals, most covering 100 or 250 units.

In addition to discounts, the new arrangement gives corporations uniformity of software releases, Firmin pointed out.

The unprotected version of Javelin can be copied using standard IBM PC-DOS commands. Under the corporate purchasing agreement, the software customer must record specific users of unprotected Javelin along with the software's particular copy number. Furthermore, individual users must also agree in writing not to make copies for others to use, according to the Javelin purchasing agreement.

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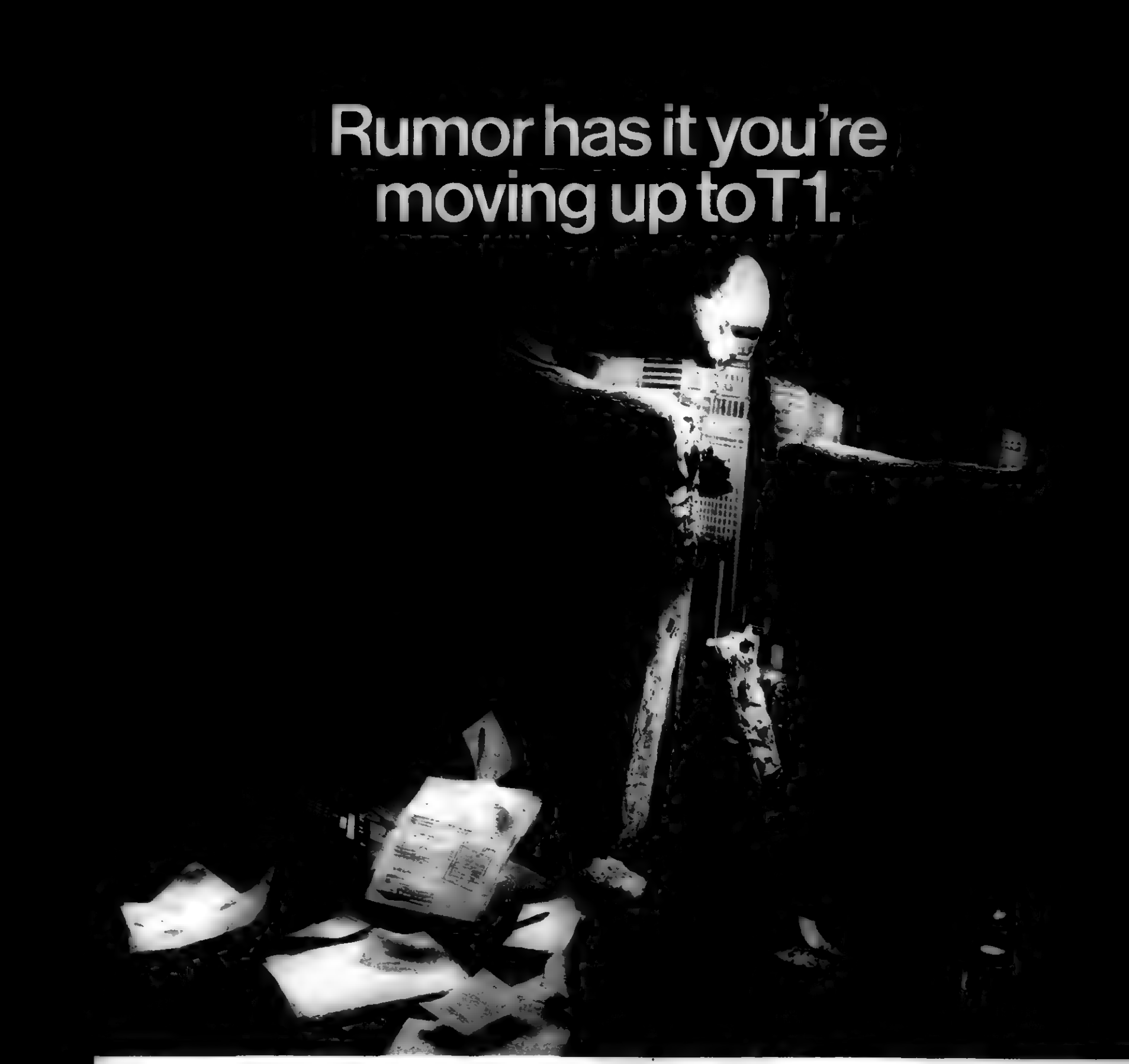
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DATA STREAM
Elisabeth Horwitt

Having a say in standards

This is the year that standards bodies will be making decisions about the way companies will link their computers for the next decade or so. The Corporation for Open Systems (COS), the MAP/TOP Users' Group and the rest have encouraged participation from the user community. Why, then, are the small- to medium-size companies not exercising their right to take part in the process?

I noticed it at the recent MAP/TOP Users' Group meeting in Seattle: non-Fortune 500 user companies were scarce to nonexistent. The corporate communications and DP managers I encountered at the sessions all seemed to come from the same select group of Fortune 500 aerospace and automobile manufacturers. Smaller businesses — and I don't mean 12-person firms but sizable companies with multimillion-dollar revenues — seemed to have kept their people home.

Of course there were exceptions. I spoke to William Shurtleff of Sandia National Laboratories, an Albuquerque, N.M., company that develops nuclear weapons. He said his company sent him to the conference because "we have a bunch of computers we want to link, and MAP is the only game in town; it isn't a network just for the factory, it just started there."

I also ran into a Michigan Bell representative who said his company wants to figure out how to interface its transmission services with the growing number of corporate MAP networks in the Detroit area. And of course, there

See HAVING page 40

Horwitt is Computerworld's senior editor, communications.

Intellihub gets trial run

Network service said to get users on road to ISDN

By Stanley Gibson and Elisabeth Horwitt

Intellihub, the latest in a series of dedicated, digital network services introduced by New York Telephone Co., will take users "another step on the road to ISDN," a company spokesman claimed. The service will be provided to Manhattan, N.Y., brokerage house L. F. Rothschild, Unterberg Towbin for a 12-month trial period if a contract currently under discussion goes through, according to New York Telephone. Based on the Northern Telecom, Inc. DMS-100 digital central office switch and Dynamic Network Controller, the service will become a tariff offering sometime in the first quarter of 1987, the operating company said.

According to a Rothschild telecommunications staff member, the Intellihub system will both save the company money and make its current system easier to use by eliminating tie lines and some 16 WATS lines. As the only so-called "first application" customer, Rothschild will not pay for Intellihub services, he noted. While the initial offering will only support voice communications, data transmission will be added in the third quarter of this year, according to New York Telephone.

Intellihub is based on four Pathways digital customer-to-central office transmission services introduced by New York Telephone in the spring of 1985. These include the Superpath 1.5M bit/sec. Service; Flexpath Digital PBX Service, which provides a 24-channel, T1 link between a customer's digital private branch exchange and central office facilities; Infopath Packet Switching Service; and Switchway 56K bit/sec. Service, which offers 56K bit/sec. transmission over ordinary, circuit-switched lines.

According to Intellihub Project Manager Sergio Cruz, the Pathway services offer customers "an easy migration path to ISDN." The service offerings will run on dedicated private lines between customer- and central-office facilities until the operating company's all-digital network is complete. "Then everyone can use virtual private circuits instead of dedicated

See INTELLIHUB page 44

NCR Comten aims to outgun IBM's SNA, adds VLSI, cache memory to 5660 line

By Elisabeth Horwitt

Continuing to challenge IBM in the mainframe communications processor market, NCR Comten, Inc. last week introduced Comten 5660, a line of communications processors that reportedly are three times faster and offer more line connectivity than any other Systems Network Architecture (SNA)-compatible communications processor on the market.

"We believe that the 5660 represents a new generation of communications processors," said David Anderson, NCR Comten marketing strategy and planning manager.

Added logic features such as very large-scale integration (VLSI) and cache memory give the 5660 approximately three times the processing power of the IBM 3725 communications processor, he added. This enables the system to support up to eight mainframes and 1,024 full-duplex communications lines, compared with a 256-line upper limit for the IBM 3725, according to Anderson. The 5660 can also support 1.54M bit/sec. T1 lines while performing other tasks concurrently, an NCR Comten spokesman said.

"Having that much power and connectivity in a box means you can get by with fewer communications processors with a big network," Anderson said. "That means you save on manpower and software, since every time you add another processor you have to do another system generation."

The 5660 features up to 16M bytes of main memory, compared with 4M bytes for the older Comten 3690 communications

See NCR page 40

NEW THIS WEEK

- Honeywell offers an electronic six-wire key telephone system

For more on this and other new products, see pp. 85-107.

INSTANT ANALYSIS

"Our strategy is to encourage other network vendors to interface with our network management system, to give end-to-end management capabilities to our customers, whose complex networks, we realize, often contain non-IBM equipment."

— William Warner, manager, network management products, IBM

Texas department puts cart before horse in choosing network

Selects micro software tools before hardware

By James A. Martin

AUSTIN, Texas — "Our decision to pick the software before the hardware for our new networking system was like putting the cart before the horse," said Terry Parmley, administrator of the applications support division of the Texas Department of Human Services (DHS).

DHS hopes by early 1987 to bring on-line a data network linking some 3,000 IBM Personal Computer ATs, which have yet to be installed at the 90-odd DHS branch offices throughout Texas. PC ATs within each office will share files and send messages over a local-area network. A communications processor installed on each network will act as a gateway to a remote link to Sperry Corp. 1184 and 1191 mainframes located at DHS' Austin headquarters.

While some companies would consider the personal computer network to be the key element in this system, DHS' first priority was to find the right fourth-generation language to facilitate caseworkers in accessing and maintaining the information they need to deal more effectively with clients.

"We decided three years ago to put automation in for caseworkers in dealing with clients," said L. D. England, deputy commissioner for information systems. "This would help us achieve productivity with heavy work loads and give caseworkers the opportunity to determine benefit eligibility while the client is there."

An agency with a $2.4 billion budget, DHS wants to enable caseworkers at its branch offices to maintain client files locally and also access the mainframe files in Austin. "The mainframe holds the rules and regulations governing benefit eligibility requirements, which are constantly changing," Parmley said.

Under the current system, client information used to determine eligibility for state welfare programs is taken down by the caseworker, then sent on as hard copy to data entry operators, who enter it into the Sperry mainframes on some 200 Sperry UT8400 terminals. The client sometimes waits two weeks to find out if he is eligible, Parmley said.

The new system will enable caseworkers to bypass the paperwork and the data entry operators and directly input the data on PC ATs. Caseworkers will also be able to "determine eligibility on the spot" by obtaining pertinent data on the mainframe in real time, Parmley said.

Caseworkers will maintain their client files from the last two years in file servers at each branch office. "Things that have been sitting in file drawers will gradually be keyed into the system. We should have 35G bytes of on-line client information by 1990," Parmley noted.

DHS projects it will save $130 million in expenses during the next five years by eliminating the clerical

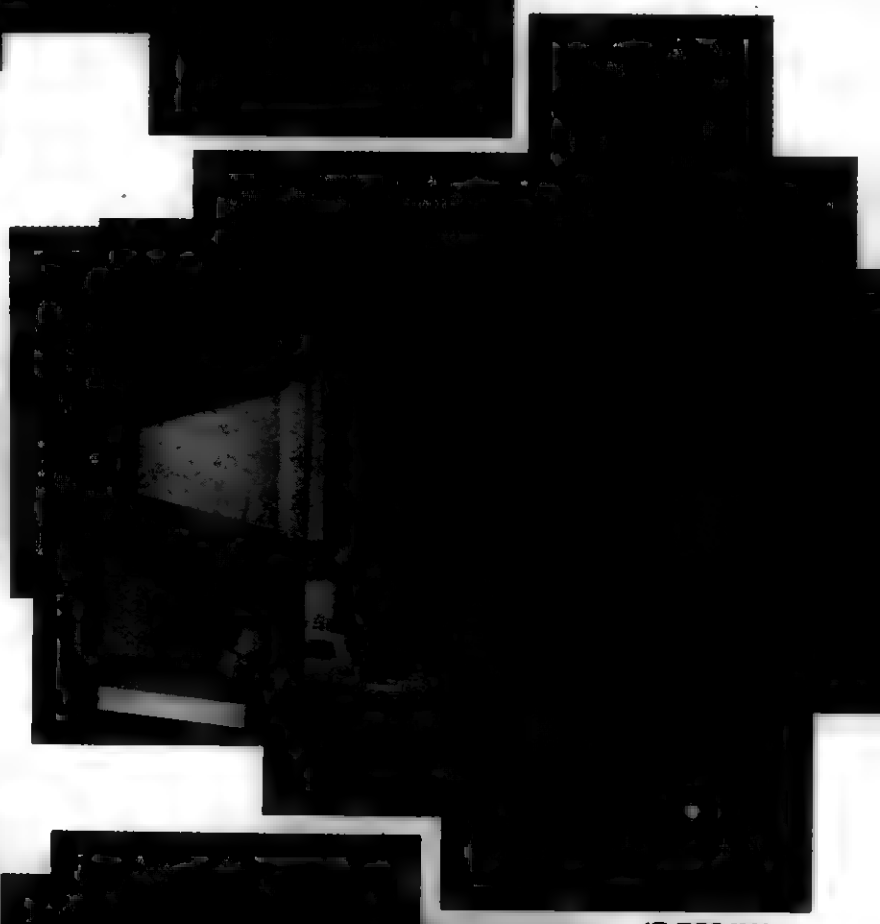
See TEXAS page 40



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Having a say in standards

From page 37

was a sizable contingent of consultants and vendor representatives.

But the majority of corporations represented at the MAP/TOP Users' Group were the manufacturing and financial giants on the leading edge of networking technology. The same applies to COS, now that it is open to user organizations. And, while I have seen no membership roster for the American National Standards Institute, I would bet the users that sit on its working committees have similar affiliations.

According to Richard Miller, president of Palo Alto, Calif., consulting company Telematics International, participation in the direction of evolving standards is "too expensive a franchise for low-end users. They just can't afford to send their own representatives to these meetings on a regular basis."

The question is whether they can afford not to. More and more MIS and DP directors are saying that data communications is a top priority at their companies.

At the same time, the emphasis has moved from isolated local-area networks linking a department's or branch office's IBM Personal Computers to "enterprise networks" that link the resources and users of an entire corporation, then extend to suppliers, distributors and customers. This makes networking standards a key issue, because the wider a company casts its networking net, the more diverse the range of systems with which it needs to communicate.

Any company that plans to make data communications part of its competitive strategy can benefit from participating in, or at least hearing about, the standards bodies' latest activities. But the price is high.

Who but someone like General Motors Corp. or McDonnell Douglas Corp. can spare MIS executives to sit monthly on a committee that is hammering out specifications for sending commands to robots? What small company can afford to fly its managers cross-country to a users' conference, where they do nothing productive except listen for three days?

Miller suggests that smaller companies can get around the financial problem by pooling their resources. He suggests they form a consortium of businesses from the same geographic region with similar networking priorities and send a representative to the standards group meetings that seem most relevant.

This sounds like a fine idea to me. The consortium could jointly hire a consultant whose sole job would be to participate in the standards development process.

Regular attendance is a must if your envoy is to keep abreast of new issues and not be swamped by the rapidly proliferating jargon that technical committees love to use. I hesitate to accuse one TOP working committee of being deliberately esoteric. But was it really necessary — particularly during a presentation that was purportedly for the edification of the MAP/TOP user community at large — to refer to 5M bit/sec. baseband cable as "5base36"?

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NCR Comten to outgun IBM SNA

From page 37

processor, Anderson said. This enables the 5660 to support value-added capabilities, such as mixing SNA and non-SNA switching on the same trunks, he added. "Plus, NCR Comten will be expanding our network management control capabilities in the future, and we need that memory space."

The product incorporates a service subsystem with built-in self-testing and remote diagnostic capabilities, according to NCR Comten.

A Comten 5660 system supporting eight mainframes and 780 communications lines costs $1,230,000 plus $4,570 monthly for maintenance. The product will be available in the fourth quarter of 1986.

Texas DHS puts cart before horse

From page 37

work of storing and accessing hard-copy files at branch offices and by helping workers to estimate benefits more accurately. "We have been awarding benefits that people are not eligible for," Parmley admitted.

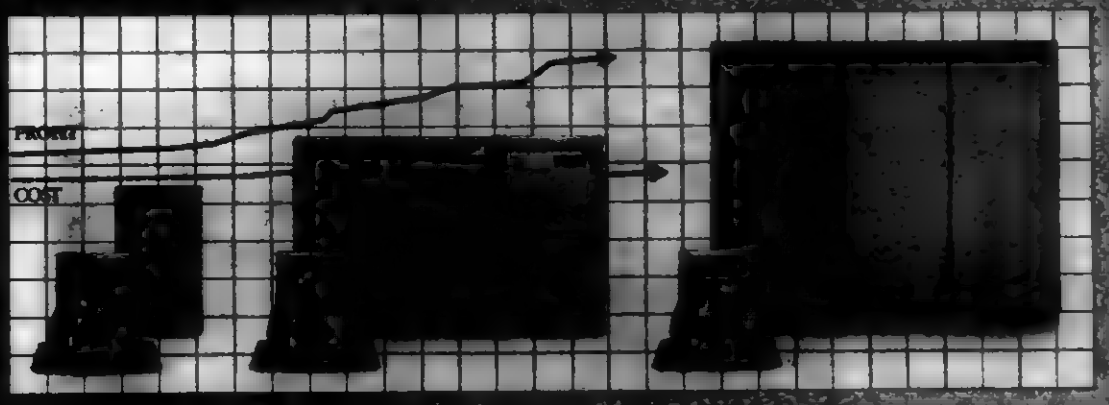
In September 1985, DHS tested and selected Revelation, a fourth-generation language from Cosmos, Inc. "Revelation met our requirements for handling large records," Parmley commented. "It has a flexible development environment and a good data base management package."

Revelation works with a wide range of networking products, including IBM's PC Network and approximately 30 network offerings that run under Novell, Inc.'s Netware software.

DHS will not know until August what vendors will be selected to supply the local-area network, communication interface as well as other hardware.

The agency gave no network cost projections. "Since there are bids still out, the less the vendors know how much we have to spend, the better off we'll be," England said.

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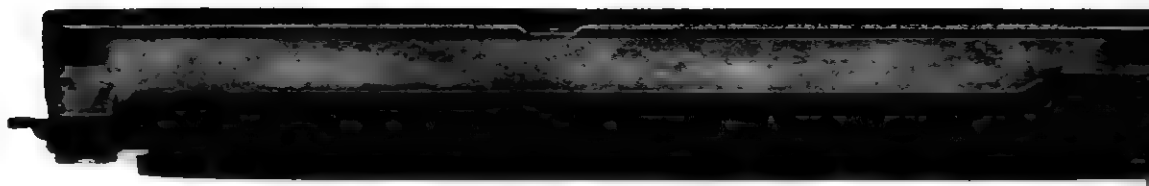
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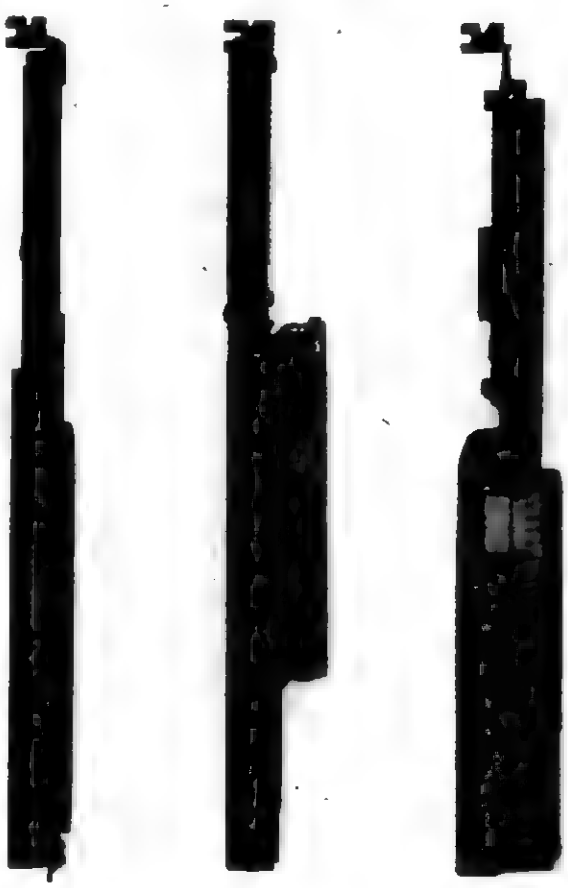
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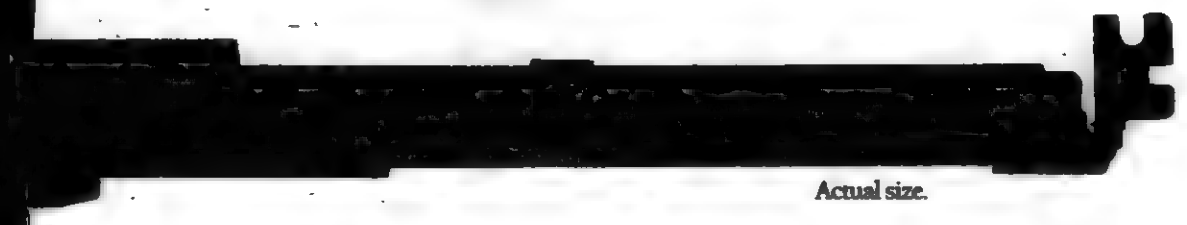
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Intellihub gets trial run

From page 37

lines."

Intellihub adds to the Pathway offerings two capabilities that reportedly will be standard Integrated Service Digital Network (ISDN) features, Cruz said. The first is dynamic network reconfiguration.

Through a terminal at the customer's premises to the Dynamic Network Controller at the local central office, customers can make real-time routing choices as to which long-distance carriers and services will be used as primary and backup links between New York Telephone premises and various area codes.

New York Telephone's Centrex customers can also make routing changes, "but they have to put in a change order, which can take five days or two weeks to go through," Cruz said. "With Intellihub, it goes in instantly so you can take immediate advantage if, say, MCI Communications Corp. is giving a special discount for the month of June."

Intellihub customers also can enter a command to pull a faulty circuit off the line. One feature ISDN reportedly offers that Intellihub does not is dynamically reconfiguring customer premise-to-central office bandwidth.

Call accounting gathers data on the length and frequency of both completed and unanswered calls handled by each circuit. Because New York Telephone is barred by Computer Inquiry II regulations from offering processing services at its central offices, users download the data over a Switched 56 circuit to their own systems for report generation.

New York Telephone, Northern Telecom and L. F. Rothschild representatives appeared to have conflicting view about how Intellihub relates to the operating company's future ISDN services.

"Conceptually, it is ISDN," said the Rothschild telecommunications staff member, adding half-humorously, "But who knows what ISDN is?"

According to Northern Telecom, Intellihub offers the full range of ISDN capabilities, except for out-of-band signaling. The currently dominant ISDN specifications divide bandwidth into clear 64K bit/sec. B channels that transmit voice and data and separate D channels that carry signaling.

New York Telephone's Pathway service offerings use the T1 channel specifications that divide a 64K bit/sec. channel into 56K bit/sec. for voice and data and 8K bit/sec. for signaling. The Northern Telecom spokesman added that New York Telephone will be converting to the ISDN "Clear 64" standard in 1987.

> ***'Conceptually, it is ISDN, but who knows what ISDN is?'***
>
> — Rothschild telecommunications staff member

Cruz said that the Northern Telecom DMS-100s that handle the digital services already support Clear 64. He added, however, "I'm not sure that the U.S. will adopt Clear 64 or stick with 56K. The problem relates to the cost of converting existing wiring plants."

"The idea that 56K will become the ISDN standard is nonsense," said Daniel Rosenbaum, editor of "Wiretap," an information industry newsletter based in Morristown, N.J. He added that he thought that migration from 56K bit/sec. transmission to Clear 64 is "largely a matter of software. AT&T is already ready to do it."

For customers thinking about installing networking equipment before the industry completes its migration to ISDN, Rosenbaum suggested, "Leave yourself in the position to write it off. Changing from 56K to 64K will be largely a matter of changing multiplexers or coders/decoders; how expensive it gets to be depends on whether you lease or buy."

Rosenbaum suggested that New York Telephone is starting out by offering ISDN-like services on existing 56K bit/sec. channels, planning to convert to ISDN specifications when the standards are in place.



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HARD TALK
Donna Raimondi

Thin-film woes finally aired

IBM and the plug-compatible manufacturers have been as open about IBM 3380-type thin-film head disk problems as the Soviet Union has been about Chernobyl. Big Blue and others pretty much follow the philosophy that if the users are not screaming to the press about it, it need not be aired publicly.

MIS managers have been complicitously quiet about thin-film technology problems. As long as the vendor will fix the problems, customers remain hushed in order not to embarrass or antagonize their vendor.

Now one company — Memorex Corp. — has decided to step out of the thin-film problem closet.

The company recently exposed a number of problems that have plagued it since it started offering the thin-film devices in 1984.

From the beginning of Memorex's disastrous experience with thin-film head disk interference — when the head hits the spinning disk — the company kept meticulous records of where, how and why the interferences occurred, said Cleayton Mills, vice-president of quality assurance.

The company discovered there were three basic flaws related to its 3680 disk drives: in parts of the head disk assembly design, in the architecture of several printed circuit boards and in customer computer room environmental specifications that were stringent enough for traditional disk architecture but not for thin-film head technology.

See THIN-FILM page 47

Raimondi is a Computerworld senior writer.

Ridge to roll out high-end work group network server

By James Connolly

SANTA CLARA, Calif. — Ridge Computers Co. today is expected to announce a high-end system providing high availability while operating as a network server for scientific and engineering work groups.

Ridge's 3200 Model 90 system was designed to provide superminicomputer performance with a reported processing speed of 5 million instructions per second (MIPS).

The high-end 3200 Model 90 system supports more than 100 users on workstations from Digital Equipment Corp., Apollo Computer, Inc: and Sun Microsystems, Inc. and personal computers such as the IBM Personal Computer AT and RT Personal Computer and Apple Computer, Inc. Macintosh.

Includes high-availability features

The Model 90 reportedly includes high-availability features not found on earlier models of Ridge's reduced-instruction-set-computer-based systems. Components such as CPUs and disks are redundant. The system also features a microprocessor-based service processor that manages remote diagnostics.

Ridge President Vernon Anderson said the Model 90 was designed to reduce downtime and the delays associated with time-sharing systems and that it offers the power to perform computationally intensive tasks such as simulation, which many network servers do not perform.

Ridge claimed that the Model 90 operates at 5 MIPS for integer applications and performs 4.3 million single-precision Whetstone calculations per second and 2.4 million double-precision Whetstone calculations per second.

Features 128M bytes of memory

It also features a maximum memory of 128M bytes and a sustained I/O transfer rate of 18.3M byte/sec. in burst mode, according to the company.

According to Ridge, the basic configuration of the high-end system includes 4M bytes of memory, a 78M-byte hard disk drive, eight RS-232 ports and a cartridge tape backup and costs $36,650.

A more typical configuration, the company said, includes 8M bytes of memory, eight RS-232 ports, the ability to expand to 32 ports and a 160M-byte disk drive. That configuration costs $49,900.

Plexus system targets small offices

By David Bright

SAN JOSE, Calif. — Targeting small departments that may be cramped for space, Plexus Computers, Inc. has rolled out a 16-user, Unix-based desktop system.

Called the P/55, the entry-level, Motorola, Inc. MC68020-based system can be expanded to accommodate 32 users. Multiple P/55s can also be linked to form a local-area network.

Available now, the system is intended for small to medium-size businesses as well as departments in Fortune 2,000 corporations and government agencies. "The P/55 offers smaller offices expandability at a much lower price than the P/75 while retaining the benefits of speed, reliability and broad communications capabilities," said Kip Myers, vice-president of marketing. Prices for the P/55 begin at $25,250, compared with $36,000 for the larger P/75 system. The new system is software-compatible with the P/75.

In its minimum configuration, the P/55 has 1M byte of memory, a 72M-byte disk drive and a 60M-byte tape drive and can be expanded to include 8M bytes of memory, 435M bytes of disk storage and a Motorola 68881 floating-point coprocessor. A network of P/55s can be created with the addition of intelligent Ethernet controllers and Plexus' Network Operating System.

INSIDE

Steven Jobs' Pixar announces shipments of its Pixar Image Computer/46

Burroughs introduces a printer for the financial market/46

International Power Machines offers a convertible power supply for mainframes/46

NEW THIS WEEK

- Houston Instruments offers plotters and digitizers

For more on this and other new products, see pp. 85-107.

INSTANT ANALYSIS

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TOWER SYSTEMS INTERNATIONAL

UPS maker offers 60Hz frequency conversion

By Stanley Gibson

DALLAS — While current mainframe computers, such as the IBM Series 3080 and 3090, require 400Hz power supplies, future computers may revert to the more common 60Hz frequency, according to International Power Machines Corp.

To cover that contingency, the Dallas-based maker of uninterruptible power supply (UPS) systems recently introduced a convertible frequency capability on its Endless Power UPS systems.

The enhanced Endless Power product can convert frequencies from 400Hz to 60Hz, and vice versa, maintaining a voltage tolerance of 1% with either frequency. In order to change the frequency, a service call of an hour or less is needed to exchange circuit boards and make some minor adjustments, according to an International Power Machines spokesman.

"Today's rapidly changing computer requirements mean that the data processing manager must have as much flexibility as possible. For example, his present IBM 4381, which operates on 60Hz, will be a 3081 or 3090 tomorrow and operate on 400Hz. And, who knows what the next generation will be?" said James deVenny, marketing vice-president at the firm.

"We're not predicting anything. We're just making it possible to change," offered Lou Weit, marketing communications manager.

The new Endless Power systems, which are compatible with other Endless Power products, are priced from $50,000 to $65,000.

Jobs' Pixar ships image computer

By James Connolly

SAN RAFAEL, Calif. — Pixar has announced the shipment of its Pixar Image Computer to commercial and scientific accounts, three months after the company was acquired from Lucasfilm Ltd. by Apple Computer, Inc. founder Steven P. Jobs.

Pixar officials said the image computer is a high-performance, general-purpose graphics computer. A key component of the $122,000 system is its Chap channel processor, which uses a block-structured programming language and four parallel processors in a single-instruction, multiple-data architecture.

The company claims the processor performs 40 million instructions per second. The system also has a 24M-byte, 2,000- by 2,000-pixel picture memory, expandable to 2,000 by 4,000 pixels.

In announcing shipments, Pixar said it has signed multimillion dollar OEM agreements with Symbolics, Inc. of Cambridge, Mass., and with Philips Medical Systems, Inc. of Shelton, Conn.

Printer targets financial mart

By James Connolly

DETROIT — Burroughs Corp. has introduced a near-letter-quality printer designed to be shared by multiple workstations.

The EF 4560 Advanced Multifunction Printer is said to feature an automatic alignment system that properly positions a document no matter how it is placed on the transport belt.

The printer is targeted at the financial market because of its ability to handle a variety of document types such as deposit tickets, legal-size documents, passbooks, signature cards and business envelopes. It also can read and print optical character recognition documents.

It can be shared by two intelligent workstations, such as the Burroughs B25 and EF 7000, via two RS-232 ports or shared by multiple workstations under software control.

Available now, the EF 4560 printer has a base price of $3,600.

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Thin-film woes aired

From page 45

The company focused its preliminary efforts on the head disk assembly. It discovered several flaws, including the fact that the lubricating film that sits on top of the disk was spinning off. The lubricant is supposed to reduce the heat and friction that comes from the closeness of the head to the spinning disk.

The company made several fixes to its head disk assembly system by May 1985, and they incorporated the changes into their manufacturing process. For a while, all was well.

Then, in the summer of 1985, incidences of head disk interference increased again. Memorex claims that most of the incidents were caused by disks from its OEM supplier, Data Media, Inc. Memorex severed its relationship with that company and replaced most customers' Data Media disks with Memorex disks, a company spokesman said.

Fixes lubrication problem

By the fall of 1985, Memorex had come up with a lubricant system that it says permanently fixed the lubricant-loss problem.

After all the hardware fixes, some customers continued to have problems with head disk interference. Memorex, puzzled by the fact that the systems that came uniformly off its production line could act so differently at customer sites, started examining computer rooms.

The company found that the computer room environmental guidelines that worked a few years ago no longer provide the requisite safety for the new thin-film technology.

Memorex now urges customers to pay strict attention to staying well within vendor- and government-recommended guidelines for temperature, humidity and cleanliness. But customers may even have to go beyond those guidelines.

One key factor Memorex discovered is the importance of covering the computer room subfloor with an encapsulating paint to prevent miniscule particles of concrete dust from blowing in between the disk and head.

Memorex also found that computer rooms have hot spots, differing levels of humidity from one end of the room to another and minute particles of dust blowing in from air-conditioning systems.

The particles, which caused no problem with the traditional technology that kept the old ferrite heads flying 20 to 25 microinches above the disk, are a severe test of the new thin-film systems, in which the heads come as close as 11 microinches above the disk.

Mildly reluctant to talk

At first, Memorex was a little reluctant to talk about its findings, one staff member said. The company was afraid it would look like only Memorex was experiencing these environmental problems; that IBM and the plug-compatible manufacturers were not.

But from *Computerworld* discussions with users of thin-film disk systems that came from different vendors, it appears the problems are universal.

Users who experienced mysterious head disk interference fixed the problem by renovating the computer room. Indeed, they found that painting the subfloor, correcting heat and humidity regulators so the room was evenly balanced and establishing a proper airflow virtually eliminated thin-film head disk problems.

It is a good day when a vendor comes out in the open with revelations of this nature. Memorex's confessions should enable thousands of MIS managers — not just Memorex customers — to avoid the headaches and the financial burden of living with head disk interference.

Now, wouldn't it be nice to hear from IBM and the other manufacturers about their experiences with thin-film technology?

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In-house publishing

DP can prosper by tapping print systems' potential

By MICKEY WILLIAMSON

Computer-based publishing presents MIS managers with both tremendous opportunity and great challenge.

The opportunity is to take the lead in adopting an emerging technology that can show a striking impact on the bottom line. Without knowing much at all about the technology, companies can easily achieve a 30% annual return on investment, according to Paul Lewis, director of operations at Interconsult, Inc., a market research organization based in Cambridge, Mass. With good management, Lewis says, the annual return can reach 50% to 60%.

The challenge is to overcome traditional views of the MIS department and its managers, who often appear averse to innovation and uninterested in business beyond the collection and reporting of data. MIS managers often look at in-house publishing as a necessary evil, according to Keith Davidson, executive director of Xplor, an association for users and managers of advanced electronic printing equipment. "You do printing to get the data out of the way of the mainframe so you can get back to processing data," he says.

But electronic publishing seems destined for glory, with the production of hard copy emerging as an integral part of information management. Most experts agree that those MIS managers who do not want to preside over the gradual erosion of their department's importance must start now to learn about computer-based publishing and introduce it to other people in their companies.

Davidson states the case forcefully: "I don't think MIS managers can afford to wait for management initiative if they intend to remain in the forefront of their company's requirements for managing information resources," he says. "I think they should lead the charge."

Electronic publishing is attracting considerable attention throughout the corporate hierarchy:

- Executive managers who want to minimize costs, cut document inventories and improve turnaround time are quick to see possibilities in computer-based publishing.
- Technical managers find it attractive because it meets a critical need for keeping proposals and technical documentation open to change.

Companies can save 50% and more if someone coordinates document production efforts. MIS managers seem well suited to the task.

Williamson is a technical journalist based in Warwick, Mass. She is the author of Artificial Intelligence for Microcomputers *(Simon & Schuster, Inc., 1986).*

MIS can tap print systems' potential

Continued from previous page

• People with personal computers on their desks hear about desktop laser printers and the software that drives them. If these users have not already done so, they are probably scheming to tuck funds for personal publishing capabilities into next year's operating budget.

All of these people will need advice and guidance in using their computers, and where better to get it than from the computer room?

Few companies know how much they spend to publish the forms, reports, brochures, proposals, catalogs, parts lists, instruction manuals, telephone directories and employee newsletters without which commerce would grind to a halt. This year, the expense will equal between 6% and 20% of gross corporate revenues. Increasingly each year, publishing is the second line of business for virtually every corporation.

Typically, funds for document preparation and production are spread among a dozen departmental budgets, controlled by a dozen managers, none of whom know what the others are doing. By pooling these efforts through a centralized electronic publishing system, companies can realize savings of 50% and more in their document production costs.

At Standard Motor Products, Inc. in Long Island City, N.Y., MIS manager Ashok Dudakia presides over a well-coordinated operation. Electronic typesetting machines draw directly on a corporate data base of thousands of automobile parts to produce polished catalogs and price sheets.

In the shop, clerks maintain the data base using Data General Corp. 10XP microcomputers and IBM Personal Computer XTs and ATs. A local-area network links the micros to two DG minicomputers, a disk storage device and a typesetting machine — Autologic, Inc.'s Micro V.

EIT, a software package from Electronic Information Technology, Inc. ties the auto parts data base to a data base of typesetting codes, thereby coordinating the two. "You can pull a field from the data base and automatically put in the codes you need," Dudakia says.

With the system, Dudakia's staff can automatically merge enough text elements to produce simple finished pages, a process known as pagination. More complex pages require some manual page pasteup.

The in-house electronic publishing operation lets Standard Motor keep its annual typesetting costs very low.

"If we went outside to typeset our catalogs, it would cost us about $475,000 for everything that I'm doing," Dudakia says. "Doing it in-house costs $215,000, including employee benefits."

Another user organization, Bank of the West in San Jose, Calif., has also taken advantage of electronic publishing to shave costs. Most of the bank's savings come not from bringing typesetting in-house but from automating previously manual design tasks and making revisions easier.

Bank of the West publishes 650 different forms and seven manuals for in-house use. Before the bank acquired an an Interleaf, Inc. electronic publishing system in November 1984, it relied on manual pasteup, a highly labor-intensive process, for the production of the documents. Every time new banking laws and regulations forced changes in the forms' contents, the bank had to repeat the entire pasteup process, starting from scratch.

With electronic page makeup, legislative and regulatory changes pose less of a problem, according to Susan Meaches, a bank vice-president and manager of administrative services. Bank of the West can store the forms it creates electronically and recall them when necessary for quick, inexpensive on-screen revisions. Meaches estimates that the cost of producing proof pages has dropped by a third.

Bank of the West paid $60,000 for the Interleaf system and expected full payback within five years from savings of $13,500 a year. At the end of the first year of operation, savings had already reached $18,000, Meaches says.

Cost savings are not the only benefits. In-house electronic publishing lets a company take firm control over its document production. Publishing systems support on-demand printing, where a system produces only the number of documents needed at a particular time; in addition, they allow printing to take place at the last possible moment, to incorporate the latest information.



"The MIS guy has never given consideration to esthetics. How he's going to change all of a sudden, I haven't the foggiest idea."

Thomas Dunn
Dunn Technology, Inc.



"That's a good point. But it's just as valid to say the print shop should stay out because of the programming involved."

Keith Davidson
Xplor users' group

Computer-aided publishing also provides nearly effortless merging of text and graphics and allows companies to produce documents that look professionally typeset.

Graphics are becoming a necessity in business communications. Executive managers expect data to be accompanied by images, and assembly and repair manuals require a liberal sprinkling of illustrations in order to be effective.

Typeset text can be read faster and comprehended more easily than typewritten text or text produced on a matrix printer. The typeset page holds more words, making documents less bulky and, to complete the circle, saving money on paper and paper handling.

Beyond these organizational benefits, electronic publishing satisfies individual users' gnawing desire for creativity. "Users want to express ideas," says Bernard Peuto, president of Concord Consulting in Menlo Park, Calif. "They want power and control."

These users, intent on their own performance, will not wait for long. Frank Yee, a salesman for Symbolics, Inc. in Los Angeles, is typical. Yee uses an Apple Computer, Inc. Macintosh and Laserwriter with Boston Software Publishers, Inc.'s Macpublisher II software to publish a new-product newsletter for his customers, gleaning the information from company memos. "If I didn't do it this way, I couldn't keep them up-to-date," he says.

Yee paid for the hardware and software out of his own pocket. "I'm just a guy who has a job that has to get done," he explains. "If I tried to do this through regular company channels, it wouldn't happen."

Yee's lament may seem familiar to anyone who sat in charge of MIS when personal computers started making their way into the corporate environment.

"I suspect that what will happen is basically the same thing as the way PCs and Macs sneaked in the doors," says Zack Deal, coordinator of electronic publishing at Harvard University's Office for Information Technology. "You'll have people bringing in fancy laser printers and doing more and more of their own publishing before the MIS managers have anything to say about it."

The personal computer experience of the past bears directly on today's electronic publishing experience, according to Andy Plata, president of Computer Output Printing, Inc., a service bureau based in Houston that consults in electronic printing.

"If not for the infiltration of PCs, most data processing managers would not even allow this to be discussed

Continued on page 88

Expert Advice

Don't wait for standards

After their experience in trying to get personal computers to communicate with each other and with the rest of the corporate computer system, MIS managers may worry about the widespread lack of standards in electronic publishing.

But they should not let that stop them from forging ahead, according to many experts. In the field of corporate electronic publishing, he who hesitates loses out.

"Wait for standards and you'll never get in," advises Toby Cobrin, president of Xplor, an electronic printing users' group, and vice-president of Comvestrix Corp., a service bureau in Lyndhurst, N.J. Cobrin feels strongly that the lack of standards should not deter companies from adopting the technology today.

Paul Lewis of the market research firm Interconsult, Inc. in Cambridge, Mass., agrees. "Whatever investment people make today will be well worth the buck, even though they may decide two or three years from now to make a complete change," Lewis says. "It's not a good idea financially and in many other respects simply to sit back and wait for things to happen."

Lewis does feel, however, that each company should be concerned with compatibility among its purchases. Unless every component in a publishing system uses the same codes for specific tasks, chaos is sure to result. Compatibility is a serious issue.

Alphanumeric characters present no problem; all computer-aided publishing systems understand standard ASCII code. But other elements can cause trouble.

• Formatting codes — for page headers and footers, centering, column alignment and so forth — vary from one vendor to another, and few of them work reliably together.

• Codes for describing the printed page to the printer also vary across systems. Xerox Corp.'s Interpress and Adobe Systems, Inc.'s Postscript are currently more popular than most page description languages. System vendors tend to support one or the other — not both.

• Disparate codes for storing and producing graphic images make matters worse.

Eventually, a couple of sets of standards will emerge, and integrating a system will be considerably less difficult, but standardization still lies at least three years away.

Zach Deal, coordinator of electronic publishing at Harvard University's Office for Information Technology, thinks that's too long. "If you wait for standards, you're talking about three years of lost possibilities," he says. "I would not be surprised if the cost of lost possibilities is greater than the cost of buying something now and having to buy something else a few years down the road. Besides, you get much further up the learning curve if you jump in now."

— MICKEY WILLIAMSON

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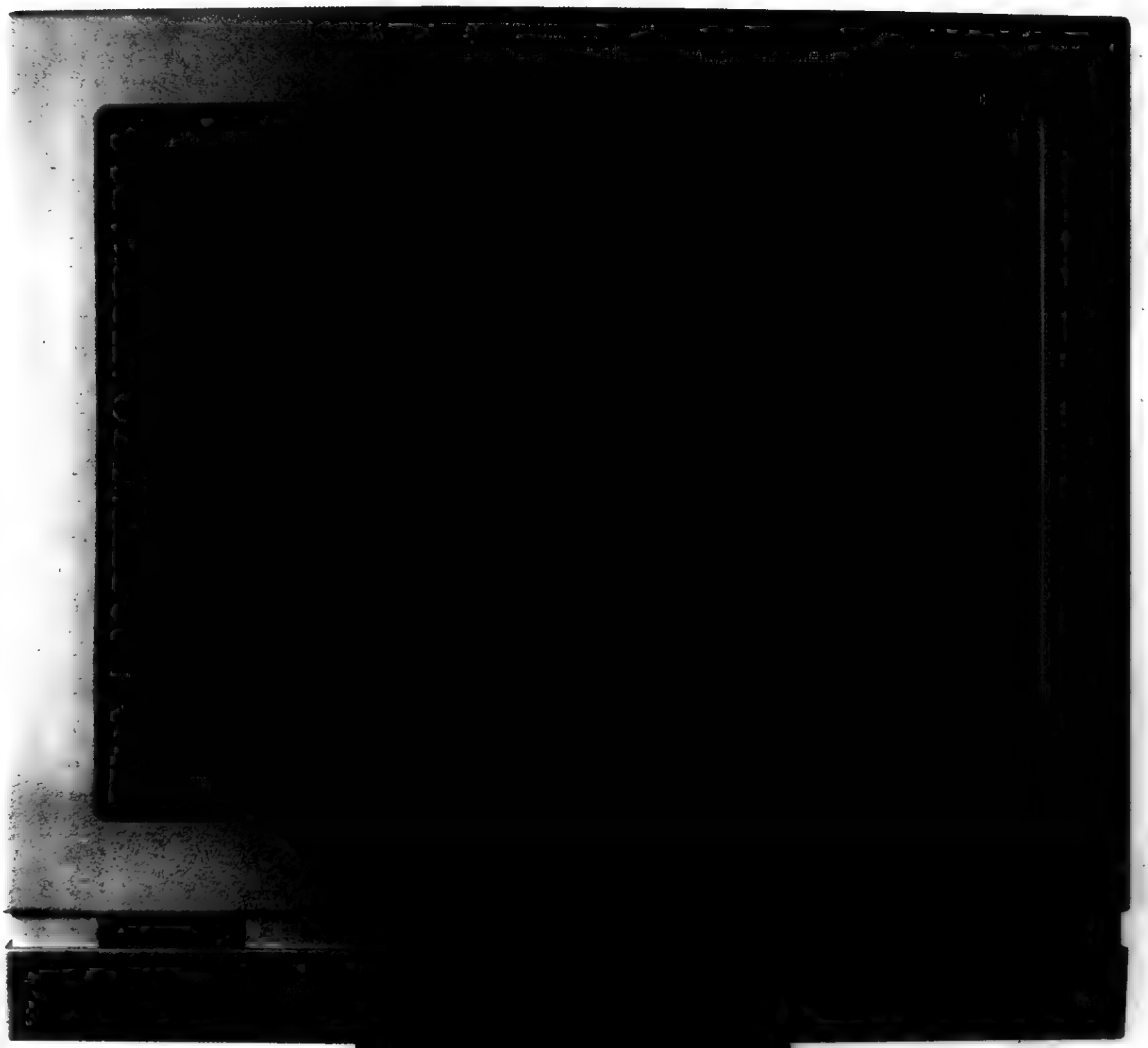


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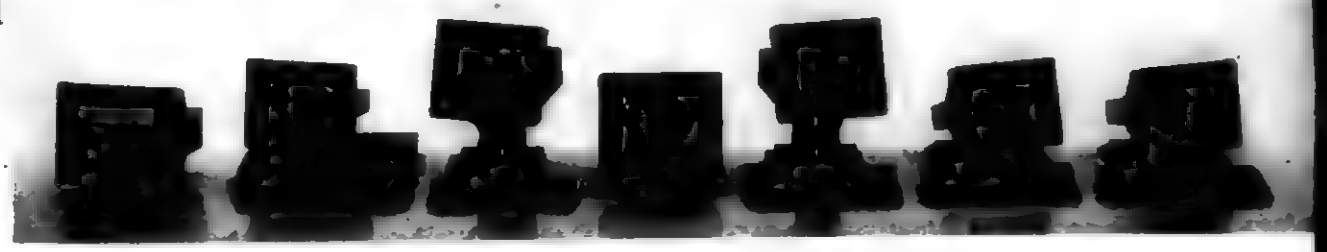
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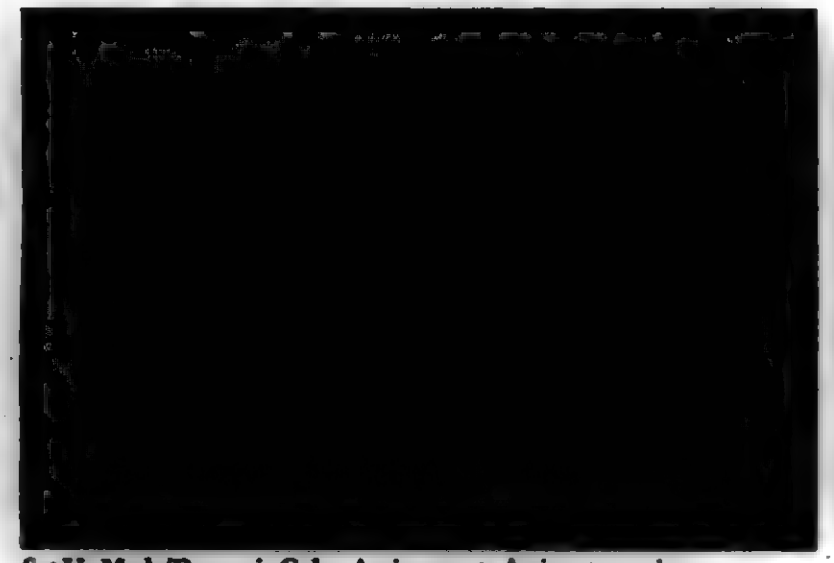
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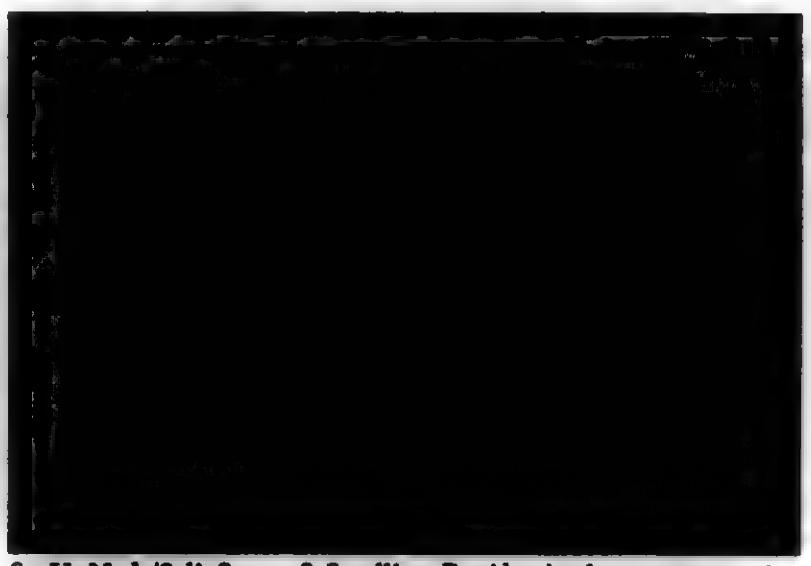
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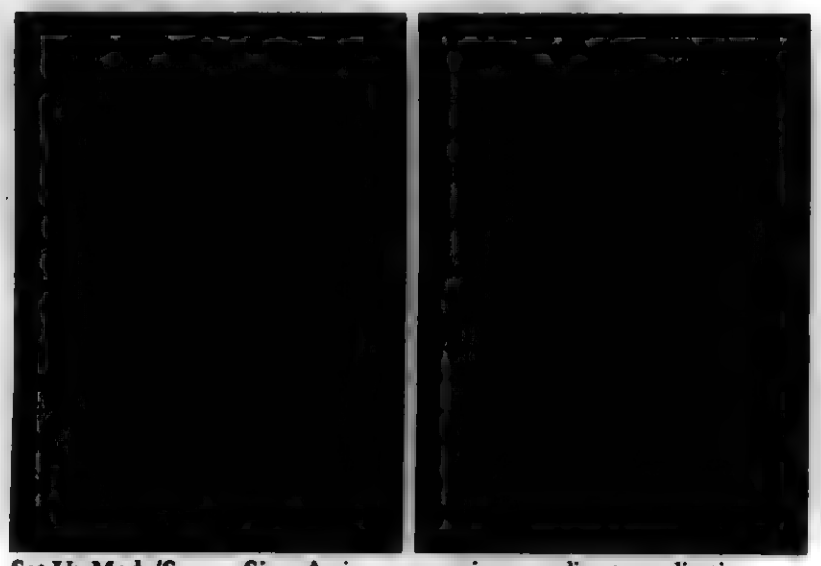
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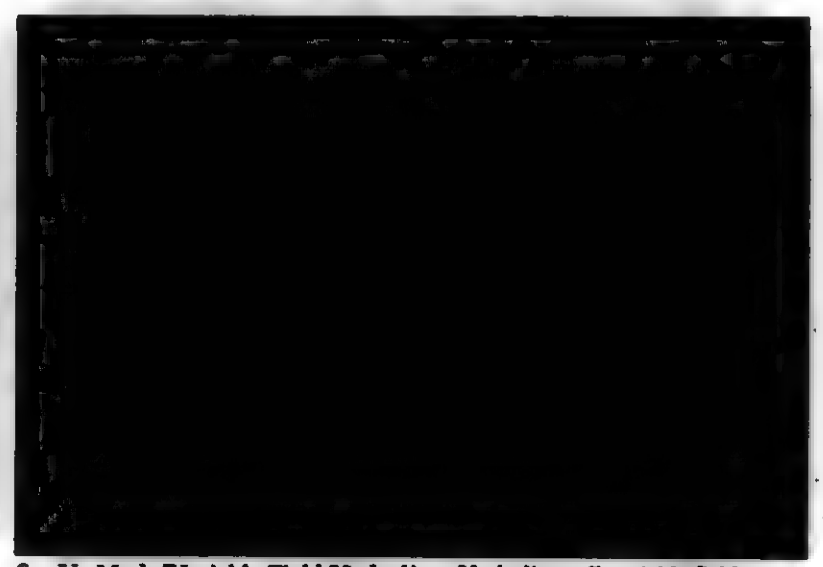
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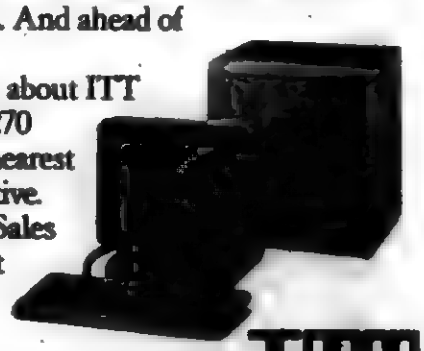
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ITT COURIER ITT

Continued from page 50

around them," Plata says. "Today, they realize that unless they do get involved in figuring out how to use this equipment and integrate it, people will have stand-alone systems in their offices."

Indeed, Plata tells of one company in which five laser printers do the work that one could handle because the DP department refused to step in and manage.

Xplor's Davidson thinks there is a lesson to be learned from the advent of personal computers. "I believe that the proliferation of PCs in most corporations probably exceeded management's best judgments about how it should have been done — that there are too many of them and too many different types," he says. "If they had it to do over again, most corporations would try to be more consistent."

Davidson recommends that MIS managers coordinate the acquisition of electronic publishing equipment with an eye toward users' needs, paying careful attention to the requirements of each operating department.

□ □

A four-step plan for decisive action

Another relevant lesson from the history of the corporate PC is that MIS managers who do not get involved in the adoption of new technology get bypassed as the technology takes hold. MIS managers need to recognize computer-based publishing as a mainstream information processing technology and approach it as such.

Getting involved in the implementation of an electronic publishing system means taking a number of actions right away:

Step 1. Find out how the company currently publishes its documents.

The manager who seeks to implement an in-house electronic publishing system needs to know exactly how his firm's document production works right now. To find out, he should ask the following questions:

- What documents are being published, by what departments, in what quantities and through what processes?
- Where do each document's text, data and graphics components originate?
- How do the various components get incorporated into the document?
- What are the costs in labor and materials?
- Are documents printed within a centralized in-plant print shop, on departmental laser printers, at a commercial printer or service bureau or in a variety of locations?
- How long are lead times for printing documents?

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Debate

What micro should MIS sanction for desktop publishing?

IBM's PC: Use what you've got

By ARLENE HARSH

Apple Computer, Inc.'s Macintosh holds an early lead in the desktop publishing race, but the IBM Personal Computer keeps gaining ground. And, in spite of its bad rap as a nongraphic, nonaesthetic, data-driven box, the PC will ultimately emerge as the winner.

Whereas Apple pioneered desktop publishing as a specialized application for graphics designers, its real potential lies in the broader office and business market. In this market, the IBM Personal Computer is already the workstation of choice.

Millions of PCs and compatibles operate in American businesses. Common sense dictates against bringing in additional hardware dedicated exclusively to creating documents. Moreover, vendors are devoting considerable energy and money to ensuring that the mainstay of the business community adapts to the rigors of producing aesthetically appealing documents.

Recent developments in operating environments, page composition software and peripherals give the IBM PC the highly graphic, interactive, user-friendly attributes associated with the Mac — all de facto requirements for page composition.

- **Operating environments.** Products like Windows from Microsoft Corp., Topview from IBM and Graphics Environment Manager from Digital Research, Inc. provide the IBM PC with multiple on-screen windows, pull-down menus, pointing devices and zoom and pan capabilities. These features all come in handy for integrating and viewing the many text and graphics images required for page composition.
- **Page composition software.** Many of the major suppliers of Mac-intosh desktop publishing programs are expected to release IBM PC versions within the year. Other software developers, including Ventura Software, Inc., T/Maker Corp. and Bestinfo, Inc., have already displayed impressive preview versions of easy-to-use page composition programs for the PC; these programs should ship soon.

Established publishers of IBM Personal Computer software like Microsoft, Micropro International Corp. and Lotus Development Corp. also seem poised to enter the PC-based desktop publishing arena.



- **Peripherals.** Page description languages allow PC software to produce full-page text and graphics output on a wide variety of printers, including the highly touted Apple Laserwriter. And software packages from vendors like Bitstream, Inc. and Compugraphic Corp. give Personal Computer users access to many typographic fonts that provide professional hard-copy output, despite the standard PC's relatively poor screen resolution.

The PC's open architecture encourages these and other efforts and will allow the machine to expand as a publishing system. Thanks to its ubiquitous presence in business and vendors' intent to keep it that way, the PC will flourish as a platform for office desktop publishing.

The real contest, in fact, is not between the Macintosh and the PC. Rather, it involves the many emerging vendors that hope to provide the most successful desktop publishing solutions for the IBM PC. ■

Harsh is director of the Computer Publishing Systems Market Requirements Service at C. A. Parks Associates, Inc. in Merrimack, Mass.

Apple's Mac: Use what works

By JAMES CANUTO

Corporate edicts that say "Buy IBM" have thwarted many would-be in-house publishers. Apparently, some DP managers feel that the desire for the graphics interface afforded by the Apple Computer, Inc. Macintosh's mouse and pop-down menus is nothing more than an affectation.



This attitude is counterproductive — and unprofitable — for American business. If a company wants to accomplish its goals, it needs to use tools that work. And as matters stand right now, those tools are the Apple Macintosh and Laserwriter and associated page layout software packages.

The Apple system works right now. It works better than any other option. And it works for the lowest amount of money.

The Macintosh's design makes it the most appropriate personal computer for publishing applications. The machine features a high-resolution graphics display and internal support for multiple type fonts and sizes. It offers a consistent and easy-to-use mouse interface, and it runs on a high-performance Motorola, Inc. 68000 processor.

In contrast, the IBM Personal Computer supplies only an 80-column, monospaced display. Its character set is missing several important publishing symbols such as the em dash (—) and bullet (•). And it lacks a standard graphics display and printing environment — factors that impede software development.

Admittedly, several IBM PC-based programs under development promise much of the performance of a Mac. But six to 12 months will pass before these programs are readily available and debugged.

In the meantime, many users can easily save the cost of a Macintosh (about $2,000) by using it to produce documents that would otherwise require expenditures for typesetting, graphic design, revisions and reproduction. Even if better software for the IBM PC arrives a year from now and a company needs to throw away its Macintosh, the machine's temporary use would be cost-justified.

Companies cannot write off the $6,000 Laserwriter printer as quickly, but they have no pressing need to do so: It will not be a candidate for the garbage can for quite some time. No matter which microcomputer it supports — the Macintosh or the IBM PC — it is now and will continue to be the best laser printer available for desktop publishing.

Because of the powerful and flexible Postscript language from Adobe Systems, Inc. built into the printer, many software packages for the IBM Personal Computer — including Microsoft Corp.'s Microsoft Word, Ventura Software, Inc.'s Ventura Publisher, Studio Software Corp.'s Do-It and Bestinfo, Inc.'s Superpage — will support the Laserwriter without any modification.

But these are future concerns. For now, the bottom line should serve as the guiding force in office publishing. Users of desktop publishing systems and the managers that oversee purchases should concern themselves with supplying a cost-effective solution, not with satisfying corporate requirements for standardization. ■

Canuto is editor and publisher of "Micropublishing Report," a monthly newsletter. He works out of Redondo Beach, Calif.

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From the answers, the manager can uncover inefficiencies and determine exactly what benefits might accrue from the relatively inexpensive, on-demand print capabilities that an in-house system provides.

At this stage, the manager should also seek the answer to one highly strategic question: If publishing operations are already distributed throughout the company, is it too late to coordinate them?

Step 2. Learn as much as possible about electronic publishing technology and techniques.

To use the information he gathers in the first step, the manager needs to find out how electronic publishing systems work and how they can improve his firm's operations.

He should read enough magazines, newsletters and books to gain familiarity with the terminology and trends in document design and production, and he should explore vendor literature as well.

Lest all this study remain in the abstract, the manager should sit down in front of a personal computer and work with a desktop publishing package. "Education is the most important thing," says Standard Motor's Dudakia. "Get it on your desk and learn, and you'll be way ahead of the game."

The process of self-education should run parallel to the fact-finding mission so the manager can get through both steps as soon as possible and move on to more concrete action.

Step 3. Seek preliminary support from upper management.

Armed with some knowledge of the company's needs and of solutions currently available in the marketplace, MIS can approach management with a recommendation that a task force be formed for further exploration of electronic publishing.

The group should draw members from every department that holds an interest in producing readable documents. Discussions should focus on determining what documents the company produces and meeting the needs of the people who produce them.

Once task force members agree on what they want, they should draw up a wish list for a corporate publishing system, leaving nothing out. They can then call in the vendors to find out what the company can reasonably accomplish with an expenditure that will pay for itself within three years.

Step 4. Establish MIS as the coordinator of system installation.

If the MIS manager follows the first three steps, he should be able to convince top management of his ability to handle the business and technical considerations of corporate electronic publishing. With management's sanction, he can position MIS to lead the charge.

If he cannot sell corporate executives on his shop's abilities, management may assign the task of installation and integration to someone less capable, and the system may fail miserably.

The experience of one military contractor is instructive. The contractor in question tried, without success, to integrate its text and graphics publishing capabilities. Two members of its electronic publishing task force told the firm's story on condition that no names be used.

The company makes military equipment — machines with as many as 20,000 parts, requiring operations and service manuals that are 5,000 pages long. Employees from a variety of departments contribute to production:

- Writers and editors in the technical publications department produce text on Wang Laboratories, Inc. word processors.
- Engineers and technical illustrators use computer-aided design and manufacturing (CAD/CAM) systems to produce some drawings, but they draw highly complex designs by hand. (One of the major benefits of the firm's proposed computer-aided publishing system was the ability to scan these drawings digitally into the engineering data base.)
- The copy center and reprograph-

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What to seek in software

To a great extent, software determines the visual quality of electronically published documents and the ease with which they are produced.

Publishing software should allow the person responsible for the document to see what each page will look like before it is printed, a phenomenon known as WYSIWYG (pronounced wizzy-wig): What you see is what you get.

Generally, good publishing software should meet four other criteria as well:

- It should allow users to arrange text in columns and insert graphic images.
- Material should flow automatically from one column to the next or from one page to the next when editorial changes are made.
- Footnotes should stay on the same page as the text to which they relate.
- When the user moves a figure from one place to another, the software should automatically renumber both the figure and all references to it in the text.

— [illegible]

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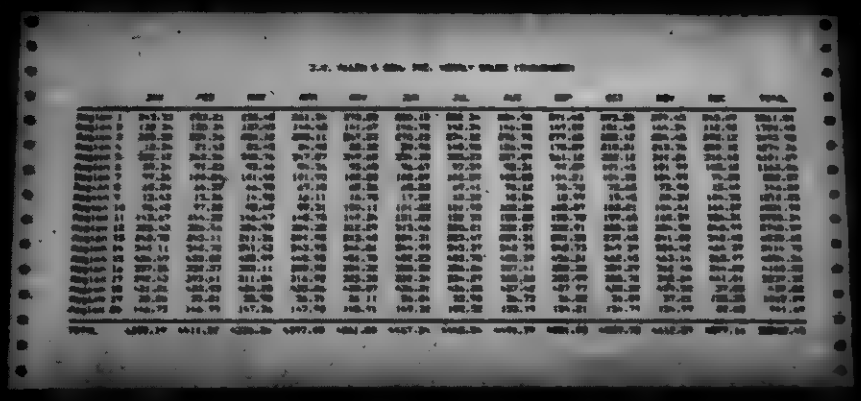
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IBM Personal Printers. The Finishing Touch.

Continued from page 58
ics department takes camera-ready copy and produces finished documents.

• The office automation department has budgetary responsibility for equipment used by the engineering and technical publications departments.

When the firm started its project to integrate text and graphics production, it formed a task force that included people from all relevant departments. Initially, the members felt eager to cooperate and share resources. Unfortunately, future events wrecked the team spirit.

"When we presented the project to management, it was too complex for them to understand. They couldn't tell which pieces represented the most benefit for the business," says one member of the task force. "They asked for it to be taken apart, so we unbundled it and presented it a piece at a time."

As the task force prepared the revised presentation, members from the various departments became reluctant to give up control. Before long, an interdepartmental struggle arose over who would integrate the system. Despite the objections of both the MIS and office automation departments, the struggle ended in the selection of a vendor that lacked the requisite know-how.

As a result, text and graphics for manuals and proposals are still being produced separately and pasted up by hand to produce camera-ready pages.

Sadder and wiser, the company will eventually integrate text and graphics. But implementation will come slowly. "It's going to take some sensitivity and awareness, which now we have," one participant says.

□ □

Making the case for the MIS manager as czar

Computer-based publishing draws from a variety of disciplines. Word processing, data processing, applications development, graphic design and printing all come into play in the production of almost any corporate document. Other functions, such as telecommunications and CAD/CAM, may also get involved.

Among operating departments,

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The high end: Performance, sophistication

By BARBARA MCLEAN and BERNARD PEUTO

No one electronic publishing system can handle all of a typical Fortune 1,000 company's publications. As a consequence, there are a variety of electronic publishing systems being used for those tasks:

• Low-end, single-user desktop publishing systems effectively produce shorter newsletters and reports (see story page 60).

• Mid-range systems process long documents but with limited typographic quality. These systems most often work well where office automation systems are used today.

• High-end systems produce sophisticated documents of unlimited length, composition or typographic quality. High-end systems work well in companies in which the internal publishing group already has a typesetter.

Where mid-range and high-end systems differ from desktop publishing systems is in their ability to offer multiuser facilities to corporate professional publishing groups of three or more people. The primary distinction between mid- and high-range systems is their level of pagination sophistication. A high level of pagination sophistication usually indicates an accompanying high level of typographic sophistication.

Mid-range systems. The cost to configure a mid-range system that includes a workstation, usually an IBM Personal Computer AT or equivalent, with laser printer and all software is between $15,000 and $25,000. By replicating the workstation and adding a network, these systems can support four to six people.

In this work group environment, some of the workers will use standard word processors to generate text. Someone will be using a drawing package, and the graphic artist in the group will be using a page makeup program. All software will be running on personal computers.

These systems are ideal for mid-size documents of 20 to 100 pages with fixed formats that can be stored as style sheets (formats for each type of page) and for a batch pagination approach, where the entire document is composed according to a set of predefined rules and commands.

Mid-range systems typically support low-resolution graphics because of the low-resolution (200 by 200 to 300 by 300 dot/in.) scanners and laser printers that they support.

Graphics most often must be fixed — that is, assigned to a specific area on the page — unlike high-end systems, which permit graphics to float

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McLean and Peuto are the founders of Concord Consulting, a Menlo Park, Calif.-based consultancy that specializes in the computer-aided publishing industry.

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along with text from page to page during the pagination process. Typography sophistication is usually limited to the capability of the laser printer.

Justification (right, left and center) is supported, accompanied by hyphenation based on a dictionary. Widow and orphan control is supported, as are running heads and footers. Some systems support automatic tables of contents.

As far as hardware is concerned, the distinction between high-end desktop systems and workstation systems is blurring now that personal computers are increasing in performance and workstations such as Sun Microsystems, Inc.'s recently released line are dropping in price.

The mid-range options include both of these desktop or workstation platforms. Enhanced PC AT Microsoft Corp. MS-DOS-based systems include Digital Composition Systems, Inc. and Corporate Data Sciences, Inc. offerings. Both provide bundled turnkey systems.

Basic system pricing for mid-range systems, including a workstation, laser printer and software, are as follows:

Corporate Data Sciences is currently the cheapest with its $7,000 to $13,000 price tags. Amgraf, Inc. offers a Unix-based system in the $9,000 to $16,000 range. NBI, Inc. provides its entry-level systems at $13,000 to $16,000. Digital Composition Systems bundles its system with a Datacopy Corp. scanner for $23,000.

One can also buy a Sun Microsystems workstation or an IBM RT Personal Computer with Interleaf, Inc.'s Workstation Publishing Software for less than $25,000.

Options for these mid-range systems include low-resolution scanners from vendors such as Dest Corp., with PC Scan ($2,000); Microtek Labs, Inc., with MS-200 or MS-300 ($2,500); and Datacopy, with Model 620 ($14,950), Model 700 ($3,940) or the just-introduced Jetreader, which sells for $2,900.

Other options include laser printers from Hewlett-Packard Co., namely the Laserjet ($4,000) and the Laserjet Plus ($5,000), and Apple Computer, Inc.'s Laserwriter ($6,000 to $7,000).

Interfaces to computer-aided design systems like Autodesk, Inc.'s Autocad cost between $2,500 and $5,000, depending on which exchange format is to be used.

Typesetter interfaces cost between $2,500 and $6,000, depending on the typesetter and font requirements. Typesetters range from $9,000 (Compugraphic Corp.) to $30,000 (Linotype Co., Itek Corp. and AM International, Inc.'s Varityper).

High-end systems. At the high end, systems are not limited in performance and sophistication. They support long documents of hundreds of pages and usually require a Sun Microsystems-like bit-mapped workstation.

In addition, these systems typically offer both batch pagination and interactive page makeup, with features that include all those found in mid-range systems and additional ones such as vertical justification, side notes, straddle drawings and text, text runarounds, floating drawings and tables, automatic tables of contents and indexes, overflow pages, automatic numbering of lists and section heads, annotations, change bars and listing of changed pages.

A few of these high-end systems are beginning to feature data base management facilities. These include products from Caddex Corp., which offers a Digital Equipment Corp.-based system for three users that costs $100,000; Context Corp. (the offspring of Mentor Graphics Corp.), which sells an Apollo Computer, Inc.-based system with Apollo's Domain, serving up to 12 users (a three-user system costs around $100,000); and Intergraph Corp., offering a DEC VAX-based system priced at a minimum of $120,000.

All of these vendors have technical roots and are pursuing markets such as aerospace technical manuals. These are the systems that are most likely to offer the automated changed-pages features so important to often-revised documents such as product manuals.

Others offering high-end systems that integrate graphics and offer typographic and pagination sophistication include the following companies: The Datalogics Corp. 6300 ($140,000), The Eastman Kodak Co. Kodak Ektaprint Electronic Publishing System ($35,000) and Interleaf's Technical Publishing Software system ($30,000). These prices are for typical entry-level workstations, laser printers and software.

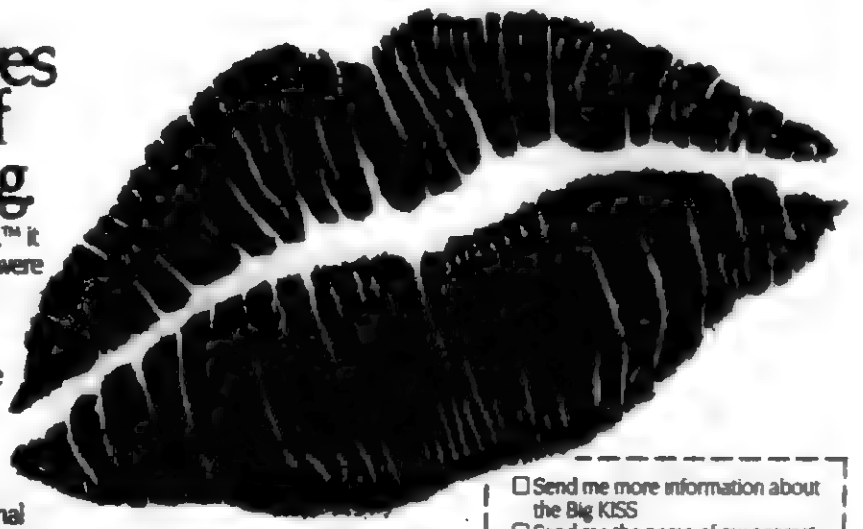
In addition, the following companies offer products in the price ranges listed: Penta Systems International, Inc. ($50,000), Texet Corp. ($55,000), Viewtech Corp. ($50,000), Xerox Corp. ($90,000) and Xyvision, Inc. ($60,000). Add-on workstations generally cost $15,000 to $50,000.

The options for these systems include all the laser printers listed above as well as high-resolution laser printers from Data Recording Systems, Inc. and Tegra, Inc., which sell for about $35,000.

High-resolution scanners and scanning systems at the 1,000 by 1,000 dot/in. level are available from Imagitex, Inc. ($25,000 to $170,000), ECRM ($50,000), Eikonix Corp. ($35,000 to $45,000), Compugraphic ($60,000) and Autologic, Inc. ($60,000 to $150,000). Extremely sophisticated products are available from Information International Co. and Hell Graphics Systems, Inc. These products are priced between $150,000 and $250,000. ■

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marketing, sales, engineering, investor relations, employee relations, technical publications, finance and others have a stake in the way in which documents are created and produced. Each may think it should control its own publishing projects, either by setting the standards in equipment and format that all others should follow or by disregarding what is going on in the rest of the company.

There is no formula for deciding who will take the lead in developing a coherent approach to computer-based publishing. But someone needs to coordinate corporate efforts, and MIS managers seem well suited to the task.

"They usually already have the prestige and power in the corporation and the necessary kind of budget, so they can make things happen more easily than people who manage other functions," says Xplor's Davidson.

Interconsult's Lewis backs him up. Where issues of data management, integration and new technologies are concerned, "MIS people are right smack dab in the middle of what's going on," Lewis says. "MIS is the logical choice for computer-based publishing because it's an integrating process."

Arlene Karsh, who directs the computer publishing systems market requirements service at C. A. Pesko Associates, Inc. in Marshfield, Mass., looks at the issue from another angle. According to her, MIS managers need to get involved "if they want to continue to be the czar of information handling.

"Especially where you have lots of central control and authority within the MIS area, it makes sense to get involved," she says. "It's going to come in through the back door, anyway."

The growing decentralization of document publishing is likely to put pressure on the MIS function in direct proportion to the amount of control the department has had in the past on how data looked coming into and going out of the corporate mainframe.

Whether MIS will be able to maintain control depends to a great degree on how well managers can overcome the traditional view of their abilities and attitudes.

Thomas Dunn, president of Dunn Technology, Inc. in Vista, Calif., and publisher of the "Dunn Report" on electronic publishing systems, is one who doubts that MIS can play a significant role in corporate publishing.

"The MIS guy has hardly ever been related to any product that somebody liked," Dunn says. "He has never given any consideration to the aesthetic quality of his data. How he's going to change all of a sudden, I haven't the foggiest idea."

Confronted with that argument, Davidson, whose organization's membership is drawn largely from MIS departments, replies, "I suppose that's a good point. But it's just as valid to say the print shop should stay out because of the programming involved, and the office manager ought to stay out because he doesn't know anything about either one. So nobody should do it.

"There isn't anybody prepared to do this," Davidson adds. "Traditional backgrounds and capabilities make no one qualified, and all of them have to be." ■

Desktop publishing: Easy, inexpensive

By RICHARD SHAFFER

Assembling an appropriate desktop publishing system requires finding three components — page composition software, a laser printer and a personal computer — and pulling them together.

Page composition software packages. These programs resemble word processing packages in that they let a user create and edit text, but they were designed primarily to make it easy to merge text and graphics on the computer screen. Text that has been created with word processing sofware can be combined electronically with artwork that has been generated with a drafting package or input with a scanner or digitizer.

The process requires no cutting, pasting, razor blades, wax machine or paste pot. Moreover, users can resize, scale and crop drawings and can format text and make it flow around artwork — all tricks that used to require the services of skilled graphics artists and typesetters.

Software packages fit into two categories: those that run on the Apple Computer, Inc. Macintosh and those that run on IBM Personal Computers and compatibles.

The three most popular packages for the Macintosh are Macpublisher II from Boston Software Publishers, Inc. ($195), Ready-Set-Go from Manhattan Graphics Corp. ($195) and Pagemaker from Aldus Corp. ($495).

On the IBM Personal Computer, the software choices are primarily Do-It from Studio Software Corp. ($1,895) and Microsoft Word from Microsoft Corp. ($195), but the selection keeps widening. T/Maker Co. just started shipping Personal Publisher, a $195 program, and Xerox

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Shaffer is editor and publisher of "Technologic Computer Letter," a weekly newsletter published by Technologic Partners of New York.

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Corp. will start marketing a $695 program from Ventura Software, Inc. sometime down the road.

Software Publishing Corp., well known for its PFS series of personal computer software, is also coming out with a $495 program, Superpage, which the firm is remarketing for Bestinfo, Inc.

Page composition software packages' capabilities vary widely. Microsoft Word, for example, will format text into columns, but the columns will not run side by side on the screen. And although the package can incorporate charts into the text, it cannot merge picture or line drawings. Do-It will accept line drawings but not digitized pictures.

Laser printers. The most important requirement for a printer is that it work with the composition software the user wants to buy. Composition software works just fine with even a dot matrix printer, but this rudimentary configuration misses the point of elegant output. Most office users will want a laser printer.

Any laser printer will do desktop publishing, but some are more equal than others. A user's choice will depend primarily on the amount of line art or other graphics he wants.

At 300 dot/in. (the standard resolution of laser printers), a printer requires about 1M byte of memory to digitize an 8½- by 11-in. page. A laser printer with less than 1M byte of memory cannot print an arbitrary shape anywhere on the page.

The standard Hewlett-Packard Co. Laserjet, for example, supports full-resolution graphics, but only on a quarter of a page. The Laserjet Plus supports full-page graphics, but only at a resolution of about 150 dot/in.

These capabilities make the Laserjet adequate for simple jobs, but more complex documents require an Apple Laserwriter. The Laserwriter not only has more memory but also features greater microprocessing power than the Laserjet.

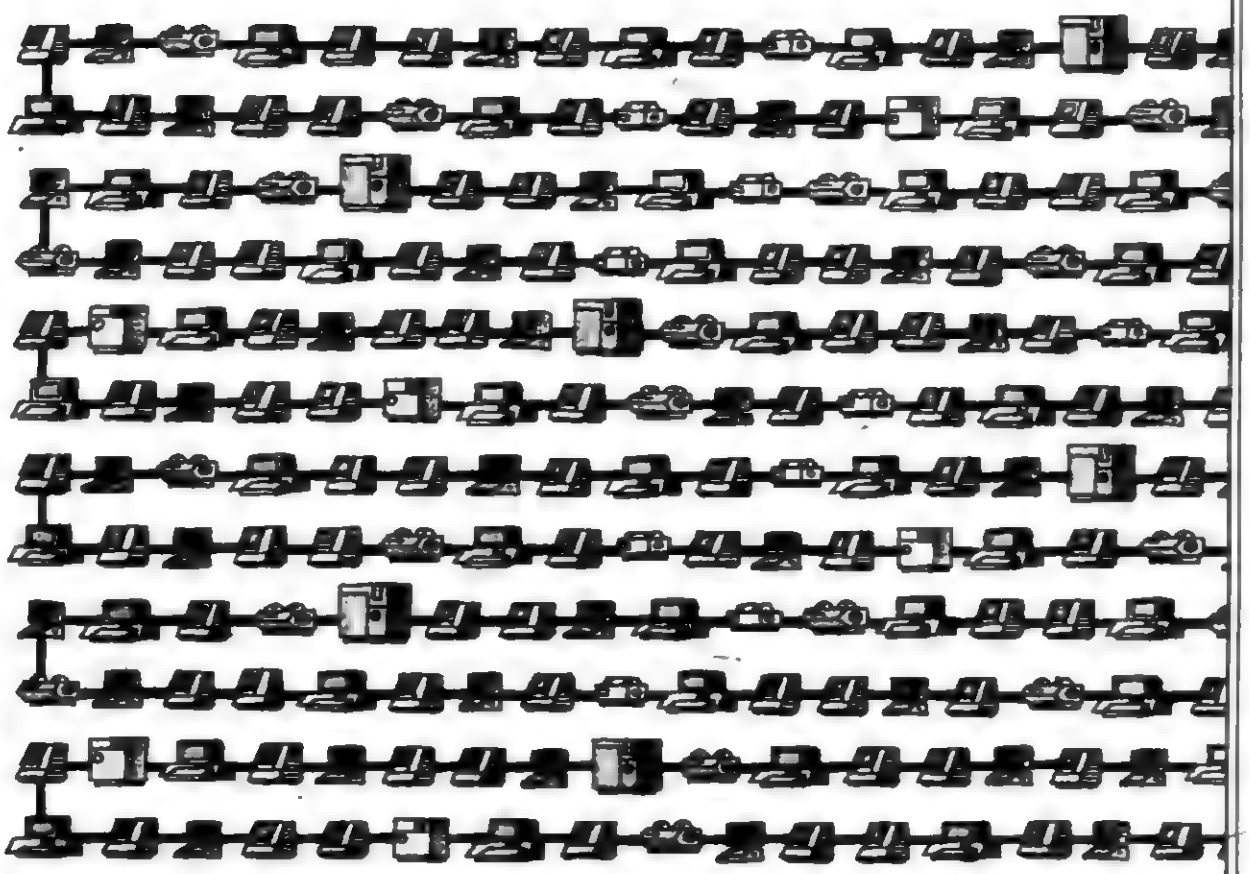
The standard HP Laserjet sells for about $3,000; the high-end version costs about $4,000. The Apple Laserwriter lists for $5,999, but it can be acquired for about $4,800. The Laserwriter Plus, which provides more type styles, costs $800 more.

Personal computers. The Apple Macintosh features the well-known benefits of being easy to learn and use. In addition, what you see on the screen of the Macintosh is generally much closer to what you get out of the printer compared with what is viewed on the screen of an IBM PC or compatible. But although the IBM PC is currently limited in its desktop publishing powers, it can drive the Apple Laserwriter.

If a company decides to go with Apple for desktop publishing, it may want to consider buying a Macintosh Plus rather than a basic Mac. Some composition programs work with a single-drive, 512K-byte machine, but for documents longer than a few pages, disk swapping gets to be an irritation.

Complex work requires a bigger machine. Any user department in which bills for typesetting, transparencies or other graphic arts services run above $500 a month should be able to justify the price of a double-drive Macintosh Plus quite easily. ■

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Beware of system shortcomings

The desktop publishing process seems so simple and appealing that a few caveats are in order, especially if one expects to gain corporate achievement rather than personal amusement.

First, to say that $10,000 desktop publishing systems perform like $100,000 commercial-grade publishing systems is to engage in the sort of hyperbole that has caused so many consumers to dismiss all claims about personal computers as so much malarkey.

Most desktop publishing systems resemble cheap guitars: Almost anyone can quickly learn to do something simple and pleasing with them, but making real music still takes talent. And, for the experts, the instruments are much too limited.

One shortcoming is that desktop publishing systems usually lack full-page displays. On most systems, the screen does not display the text as it actually will be printed.

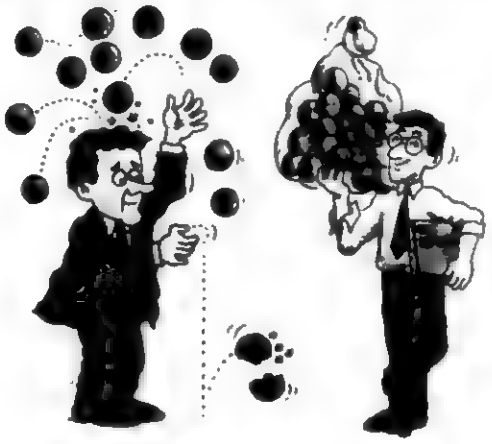
Moreover, some systems still require users to master tricky codes, and most still have a rudimentary networking capacity.

Compared with professional publishing systems, desktop versions are agonizingly slow. And they tend to permit only the most limited use of images from scanning machines. Layout can take hours, especially for beginners.

Also, electronic page layout will have the same double-edged effect on corporate users that computerization of the newsroom had on reporters and editors. Certainly, it will provide more control over the creative process, but it will also transfer low-paid clerical jobs (typesetting and proofreading, in the case of newspapers) to more highly paid, nonclerical workers.

Like word processing equipment, desktop publishing equipment will also permit — even encourage — professionals to spend a lot of time redoing their work and perfecting its appearance. One has to ask whether that is really an increase in productivity.

— RICHARD SHAFFER



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Survey

How to choose your first in-house publishing system

Users offer advice on getting started

By ERIC GOLDBERG

The purchase of an in-house electronic publishing system can be likened to the purchase of any other computer system — with one major difference. The comparative newness of publishing systems has left potential buyers confused.

Advice from current users who have implemented electronic publishing solutions — ranging from desktop to mainframe — can help those considering a system.

• **Define your needs.** Publishing requirements vary greatly from one company to the next. Where an Apple Computer, Inc. Macintosh may be more than adequate for one company, an IBM mainframe may be needed in another.

Who reads the output will determine whether a 300 dot/in. laser printer or a four-color press producing typeset-quality documents is appropriate. The level of computer expertise, ranging from highly trained DP personnel to writers who refuse to learn format codes and commands, determines what kind of front end the system should have.

• **Consider a mainframe solution.** When considering automating the publishing function, Pete Murphy, second vice-president in the DP department at the Travelers Insurance Co. in Hartford, Conn., recommends looking at the "big picture."

At Travelers, the vast store of data used in printing insurance policies resides on the company's mainframe. Not counting field offices, Murphy estimates that about 20 million pages a month fly off eight IBM 3800 laser printers, each of which puts out 215 pages every minute.

"It's very natural to meld the two technologies of DP and printing," he says. "With 300 million instructions per second of computer power in the data center, it would be foolish for us to go down separate paths."

Murphy says that although both the cost and associated risk of buying a desktop-based publishing system are small, so is the return. "There are a lot of companies like us," he says. "With large volumes of publishing, the payoff is greater with a larger capital investment. The place you have the big payoff is where the printing and data processing are compatible."

• **Use multiple solutions.** According to Vijay Mohan, manager of electronic publishing at J. C. Penney Communications, Inc. in New York, desktop publishing systems can complement conventional installed systems.

"We have both conventional phototypesetting capability and in-house laser output," he says. "My reason for getting the desktop publishing system is that it complements, not substitutes for, typesetting."

Mohan's operation uses Eastman Kodak Co.'s Kodak Ektaprint Electronic Publishing System (KEEPS) for internal documentation that includes manuals, forms and bulletins.

For work requiring phototypeset output, he has a separate Atex, Inc. system. Keyboarding, editing and page composition is done in-house, but the phototypesetting output is performed by off-site vendors via 9.6K bit/sec. modems. "The desktop system is not for refined work," he says.

• **Involve everybody.** Bringing in as many people as possible throughout the decision-making process is critical, says David Becker, automation manager for Boeing Aerospace Co.'s Graphics Electronics Publishing Project. During an exhaustive examination of publishing needs undertaken about three years ago at the Seattle company, user input and technical expertise provided by Boeing Computer Services Co. played a key role in the adoption of a new system.

Becker coordinated the search and arranged for the demonstration in early 1984 of an early version of Interleaf, Inc.'s workstation-based publishing software, once he determined the product had potential for Boeing Aerospace's 230 graphic artists. Although he encountered some internal resistance to dealing with a small start-up company with a new



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'Make sure everybody in the organization who has any influence sees the product. Start with the users, who tell their bosses, until it gets to the top.'

— David Becker
Boeing Aerospace Co.

Goldberg is a Computerworld senior writer.

Executive Report In-House Publishing

product and an uncertain future, the demonstration was a key factor in selling the system inside Boeing.

"Make sure everybody in the organization who has any influence sees the product. Start with the users, who tell their bosses, until it gets to the top," he suggests. Becker adds that it helped a great deal when the president of Boeing saw and liked the Interleaf system.

• **Solicit user input.** Bob DeFord, manager of technical documentation at John Fluke Manufacturing Co. in Everett, Wash., is the first customer for the technical publishing system offered by Caddex Corp. of Woodinville, Wash. He underscored the value of involving the users in the purchasing decision: "It's important to work with your people. A lot of the success or failure with an automated publishing system comes from involving them."

DeFord claims that managers do not always attempt to understand the user's viewpoint or look at the impact that these systems will have on departmental culture. "Most managers ignore this and get hit with it later."



"*'Prospective users should keep in mind that anything with less than a 32-bit CPU won't be fast enough for serious electronic publishing.'*

— Norton Johnson
Micro Component Technology, Inc.

• **Be clear about performance requirements.** For Norton Johnson, communications supervisor at Micro Component Technology, Inc. in St. Paul, Minn., the key factor in choosing a system was performance. Johnson is an early user of Interleaf's Technical Publishing Software running on Sun Microsystems, Inc. workstations.

One key factor for Johnson in considering different systems is the size of the documents they will handle comfortably. "Anything with less than a 32-bit CPU won't be fast enough for serious electronic publishing," he says. Also, "having a CPU available for each machine means that adding users does not degrade performance," he adds.

• **Fit the system to the users.** Johnson also wanted a system that was responsive to nontechnical users. "Ease of use by the operators translates into productivity," he says. "I wanted a software program that would insulate the people from whatever the machine was doing. Non-computer types tend to be less forgiving. They won't understand why a machine is slow and will lose interest if a machine is not responsive."

• **Don't overbuy.** Michael Bosniak, manager of reprographics at NBC in New York, cautions against buying systems that are too sophisticated for typical corporate users.

"Some systems are quite sophisticated and could solve every one of our needs. Unfortunately, they are designed for heavy production. It's possible that these systems are too sophisticated and too costly for the in-plant or corporate market," Bosniak warns.

After testing a number of solutions, Bosniak decided to use a Compugraphic Corp. Powerview 8600 system for high-quality text output and a Kodak KEEPS system for graphic output that includes charts and graphs. He plans to hook the Compugraphic and Kodak systems together in the future.

• **Choose open architectures.** Choosing a single vendor with a dedicated proprietary system may not only inhibit multivendor connectivity but may prevent a company from taking advantage of a still-evolving technology, says Boeing Aerospace's Becker.

"In other words," he adds, "favor open architecture implementations that adhere to or that are compatible with de facto, industrial, national and international standards."

• **Investigate start-ups before you invest.** Although most users recommend going with an established company that has a proven product, there can be advantages to getting involved with a smaller company still developing its product. In short, you get a bigger vote.

If you do bet your money, and perhaps your job, on a small, promising company, be sure to thoroughly investigate its management and financing. Above all, visit and talk to its users.

In late 1983, David Tamminen, manager of printing services at Union Mutual Life Insurance Co. in Portland, Maine, was one of the first customers of Xyvision, Inc. of Wakefield, Mass. "I went with a new company at its beginning, instead of an older product at the end of its development cycle," he reflects.

• **Don't neglect service and support.** The assurance of prompt, reliable service is a key factor in choosing a system, especially when dealing with a new technology. For Tamminen, whose company is located in the northeast corner of the country, simply finding someone willing to come up and service his system immediately eliminated many vendors.

Telephone support also can be helpful. Kodak, for instance, offers an on-line diagnostics system that can come in handy when a piece of equipment breaks down. ■



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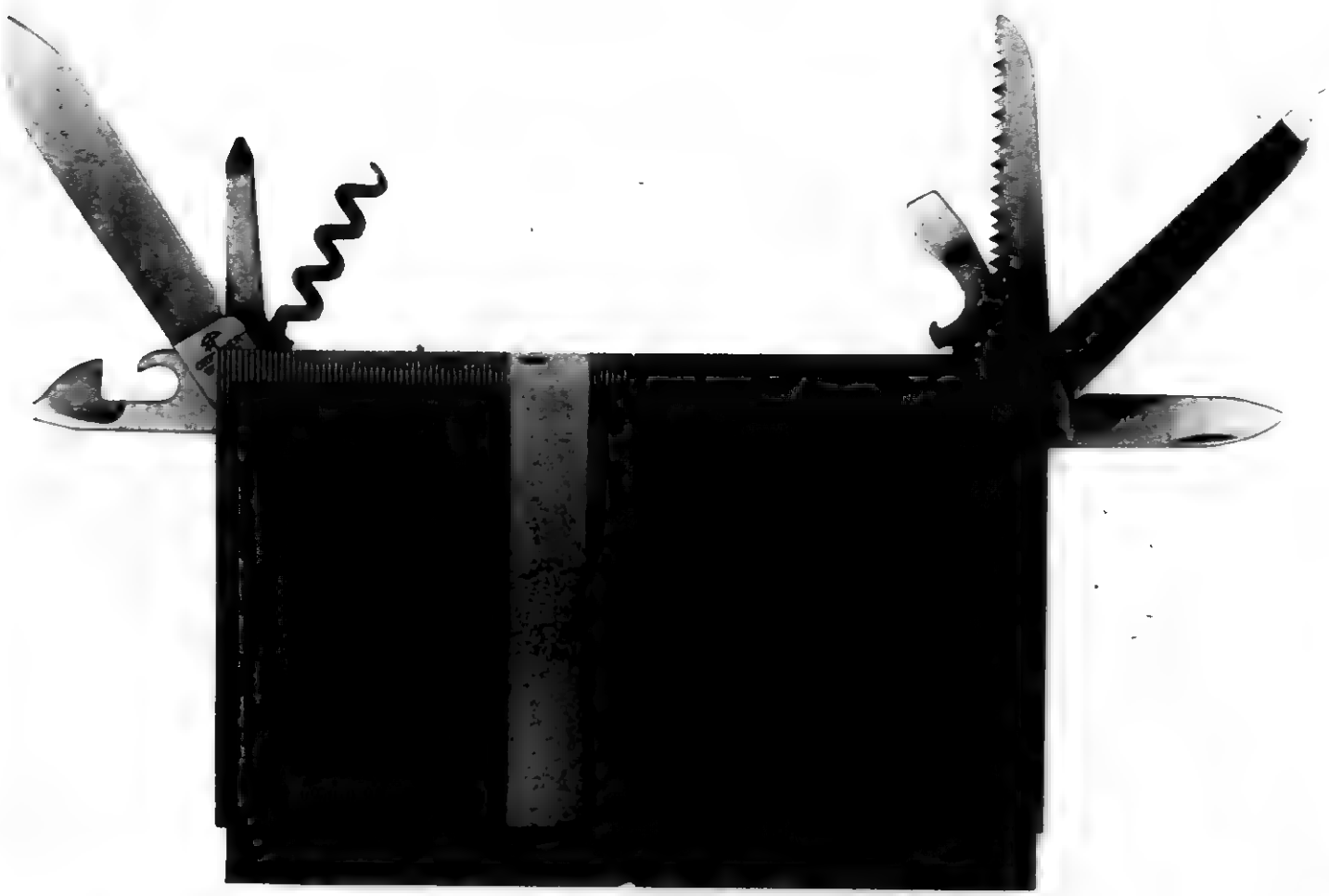
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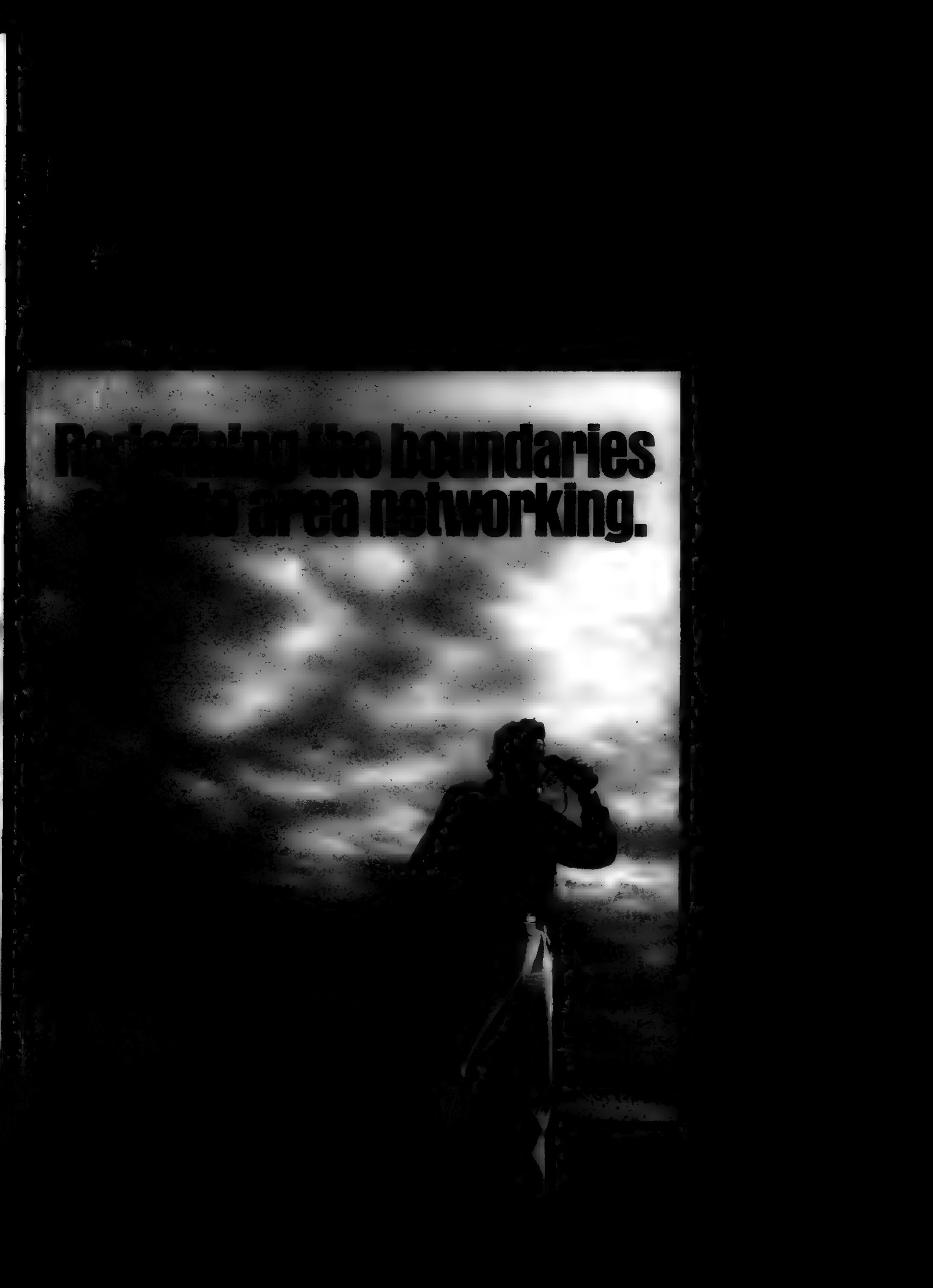
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In Depth

Building a better project manager

The question is not whether a project manager development program is affordable but rather whether MIS can afford not to have a source of excellent project managers.

By DIANA BANDER

For the MIS organization, project success creates real dollar impact, and the project manager drives that success. But top-performing project managers are hard to find. Most MIS directors and vice-presidents, when asked for the number of high-performing project managers in their own shops whom they could trust with a high-leverage project, came up with one, maybe two names.

What makes these project managers superior? More important, how can MIS/DP organizations systematically reproduce this precious talent so the systems operation can confidently handle the increasing number of large development efforts that have such dramatic impact on the corporation's bottom line?

The good news is that you can develop them. You can cultivate your own cadre of excellent project managers who can be deployed when and where needed to manage the design, development and installation of software systems throughout your organization.

The best news is that you can do this in-house. When trained within the corporate structure, project managers will develop according to a validated model of outstanding performance and will reflect the organization's norms, culture and standards. They also will gain an in-depth understanding of your business and the internal tools and methodologies that form the fabric of your information systems organization.

Bander is manager of project manager services at Keane, Inc. in Boston.



ILLUSTRATION BY CHRIS DEMAREST

Job competency analysis

Industrywide, intensive qualitative investigation into the behavior of the outstanding project managers has yielded data that defines the distinct roles, functions and critical competencies that are demonstrated by superior software project managers and that are necessary to develop average and potential performers for that job. Assembled into a behavioral model, the data reveals both the fundamental functions of the project manager's job in the MIS environment and specific competencies that drive outstanding performance of these functions.

This behavioral research process, called job competency analysis, differentiates the basic behaviors — the job functions — that actually define that particular job and make it different from any other job from the specific behaviors — those that drive the outstanding execution of the functions — that exemplary performers bring to the job. These behaviors that result in superior performance are called competencies.

The results of the analysis reveal five basic functions of the MIS project manager:

- Planning.
- Managing tasks.
- Managing the project team.
- Interfacing with the user.
- Interfacing with the rest of the organization.

These five functions must, by definition, be performed in order for the project manager job to exist. They become a performance standard against which the person in the target position is measured.

Planning involves analyzing the technical and environmental aspects of a project for its human resource, cost, time and schedule needs. The subtasks in this function rely on standard planning techniques that many project management software packages offer.

Managing tasks includes maintaining a project overview and control book, tracking changes and conducting audits and walk-throughs. Essentially, this function requires the application of all behaviors involving technical

knowledge and control techniques. Again, software packages and typical project management seminars focus on this and the planning function.

Managing the project team moves more heavily into the people side of project management and requires that the project manager orient, motivate and deliberately develop the project team as well as provide continuous feedback and communication to them.

Interfacing with the client, or user, recognizes the absolute need to be involved with and responsive to the part of the organization "buying" the system — that is, the user, or client, for whom the MIS organization is developing the system. This client involvement and responsiveness manifests itself throughout all project phases from definition to design and ultimately to user takeover of the system.

Interfacing with the organization focuses on the project manager's relationship with the rest of the company. It involves negotiating for staff and resources as well as continuing to build the DP function within the corporation.

In the job competency model, each function is precisely broken down into subtasks so that the functions are behaviorally defined. This allows an organization to look diagnostically at the project management function and determine if, in practice, these fundamental functions are being executed; determine who is performing them — systems, the user or both — and how well they are being done; and, very critically, determine functions that are not being done.

By isolating and defining these behavioral functions, the MIS organization can impose a more precise structure and standard on its project management environment and identify where and by whom these essential behaviors are being executed.

Competencies

The second half of the project manager model identifies the qualities and attributes that characterize the superior performer. Called competencies, these behaviors are organized into clusters that have a dominant theme or focus (see chart below). Some of these competencies must be uncovered in the hiring process; others are developed through coaching, on-the-job training experiences and professional development programs.

Regardless of a company's size, industry, DP shop size or structural relationship with users, outstanding project managers bring four major behavioral skills to their job function:

- Problem solving.
- Managerial identity.
- Achievement orientation.
- Strong influence.

These skills, used more often and more completely to achieve better results, are the hallmarks of the excellent project manager.

These behavioral competencies are striking because they confirm what most MIS vice-presidents intuitively know — that the superior project manager is more than a master at cookbook techniques and methods and that program evaluation and review, critical path management and other project control techniques are necessary but far from sufficient for excellence.

The MIS world gravitates all too easily toward tasks and functions. Superior performance arises from prerequisite behavior that develops from an important combination of focused and deliberate managerial coaching, on-the-job experience and ongoing training.

Problem solving

Perhaps the single most important and most frequently displayed competency DP project managers exhibit is their ability to solve problems. This is demonstrated by skill in logically analyzing information and identifying patterns from which conclusions may be drawn.

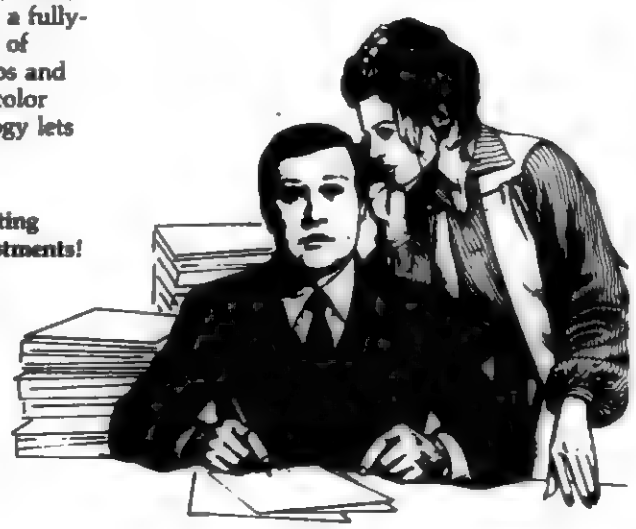
Problem-solving behaviors require project managers to go through the same mental steps they use in the systems development process:

- Study and diagnose project-relevant activities, problems, concepts or alternatives and accurately define them.
- Apply systematic thought processes to break larger parts into manageable pieces.
- Apply creative and conceptual

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Project manager competency model

Problem-Solving Cluster
- Diagnostic thinking
- Systematic thinking
- Conceptual thinking
- Monitoring and information gathering

Managerial Identity Cluster
- Strong project manager identity
- Self-confidence
- Flexibility

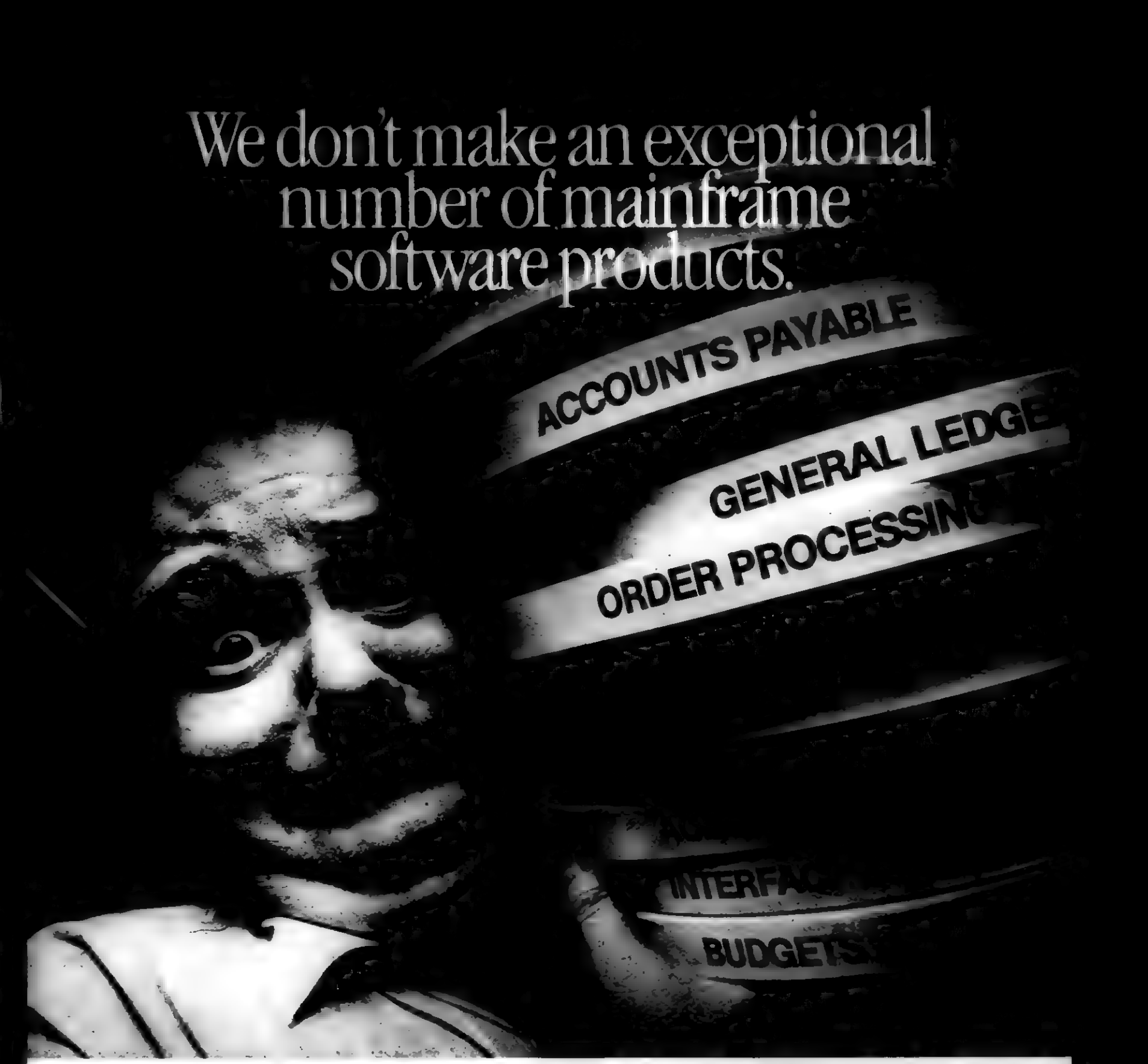
Achievement Cluster
- Concern for achievement
- Results orientation
- Initiative
- Business orientation

Influence Cluster
- Organizational and interpersonal astuteness
- Skillful use of influence strategies
- Team building
- Team member development
- Client or user orientation
- Self-control

Information provided by Keane, Inc.

Four areas of competency distinguish the excellent project manager, according to nationwide interviews conducted by Keane, Inc. over the past two years with project managers and MIS directors and vice-presidents.

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solutions to problems.

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For example, competency in diagnostic thinking was shown by one project manager who told the user that she "would not embark upon designing a system that neither of us really understood" and withstood management pressure to begin coding prematurely.

Another project manager in a manufacturing organization used diagnostic thinking when he realized that a study on upgrading a production process had focused on nonessential issues, while the key problem was the organization's reluctance to budget for and select a vendor for new equipment.

Systematic thinking was demonstrated by the project manager who, with his boss, reviewed all the levels of the division they would have to deal with concerning different aspects of gaining approval for new equipment.

Another project manager, when asked to release a particular employee from a project, convinced his manager to think through the cost to the project, the effect on other team members and so on.

The problem-solving cluster essentially links those methods and strategies of considering, analyzing and gathering information that are critical not only at the early stages of a project but also throughout the project life cycle.

It is the impetus behind the outstanding performance of the planning and task-managing functions of the project manager's job.

Managerial Identity

As project managers expand their professional experience and move into different project phases, different skills and competencies demand development. Less emphasis may be placed on basic problem solving and more on requirements to demonstrate managerial behavior.

Collectively, these competencies are referred to as the managerial identity. They are principally demonstrated by the following characteristics:

• A strong project manager identity — "I am in charge."

• Confidence in one's own ability and judgment.

• A high level of flexibility that permits consistent allowances for alternative approaches.

One manager exhibited strong project manager identity by staying out of individual contributor-type tasks. He saw his role as ensuring that the client's needs were satisfied and that he was on schedule.

Another manager exerted managerial identity when he realized that he had been unwittingly drawn into an individual contributor role and steered himself back onto the critical path.

One critical competency in the managerial identity cluster is flexibility.

For example, a project manager found that the user would not sign off on large pieces of the project. Instead he submitted for consideration small pieces that took less of the user's time to review and were also easier to maneuver through the budget approval process.

Flexibility also manifests itself in the project manager's ability to apply different managerial styles according to the needs of various team members.

Take, for example, the project manager who wanted to convince his team to use structured design. He spent time explaining its history and rationale to one team member who wanted that level of detail.

However, by contrast, he merely demonstrated how to use structured design techniques to another team member who preferred simply to be told what to do.

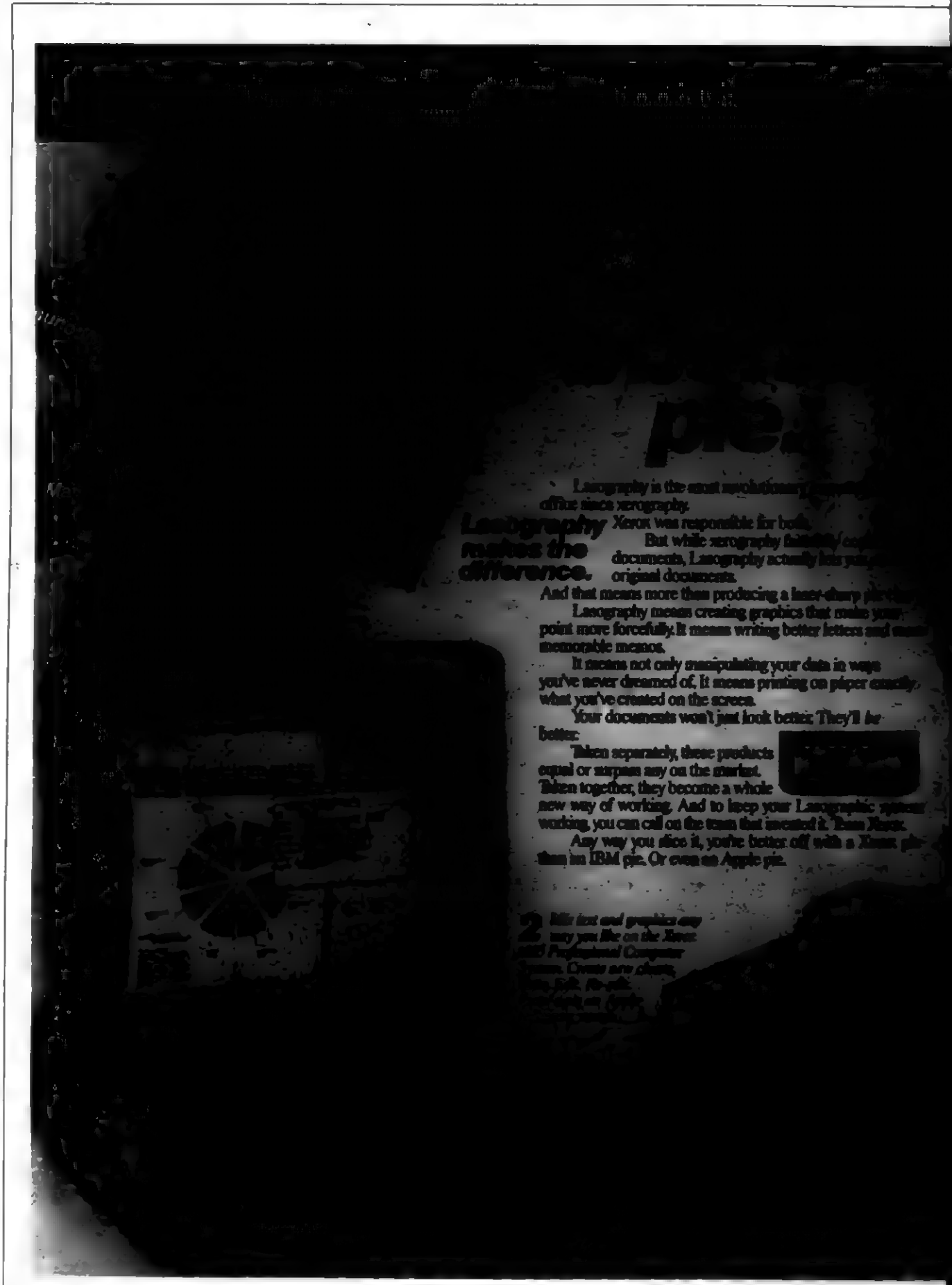
The managerial identity cluster contains competencies that sit at the core of a superior project manager's self-concept. These competencies have a strong impact on the managing project team and client and organizational functions interfaces.

When necessary and appropriate, effective project managers assert their authority and control with confidence and are flexible in their approach.

Achievement

Successfully achieving project goals while simultaneously optimizing profitability are central to the results and business orientation of the superior project manager. These behaviors, as well as a high degree of initiative, make up the achievement cluster.

High-performing project



> ***The superior project manager is more than a master at cookbook techniques and methods, and program evaluation and review, critical path management and other project control techniques are necessary but far from sufficient for excellence.***

managers demonstrate a strong focus on accomplishing tasks. They identify clearly defined goals and devote the effort necessary to meet these goals. A consistent and well-articulated set of standards governs their own performance and that of their project team. A business orientation makes project managers recognize the relationship of their projects to strategic business objectives, including marketing and profitability.

A high level of concern for achievement is one trait demonstrated by exemplary project managers. In one example, a project manager viewed his team's job as constantly improving operations. In the team's slack time, he initiated a project that resulted in lowering the billing cycle runtime. A second project manager found a way to piggyback billing information onto another part of the system, thereby eliminating redundancy, saving money and making the data more accessible.

MIS directors and vice-presidents rely on their superior project managers' business orientation to turn a systems development investment into bottom-line profits. Unlike the average performer, who tends to view the project as a series of tasks to complete, our exemplary performers saw their projects as miniature business opportunities to which they could bring entrepreneurial talents and relish the financial and marketing payoffs that their projects brought to the organization.

One business-oriented project manager expressed the importance of his billing programs in terms of the potentially drastic effect on company revenue if the programs failed. Another project manager conceptualized system priorities in terms of how they would benefit large groups of internal users in making their jobs — and the company — more efficient. The project manager who wanted to build the best billing system because it was a flagship system critical to the MIS organization's image and objectives also exhibited a business orientation.

Influence

As individuals grow in their management careers, they must develop the facility to get work done through others. This is especially important to project managers who rarely "own" the resources they need to accomplish their project.

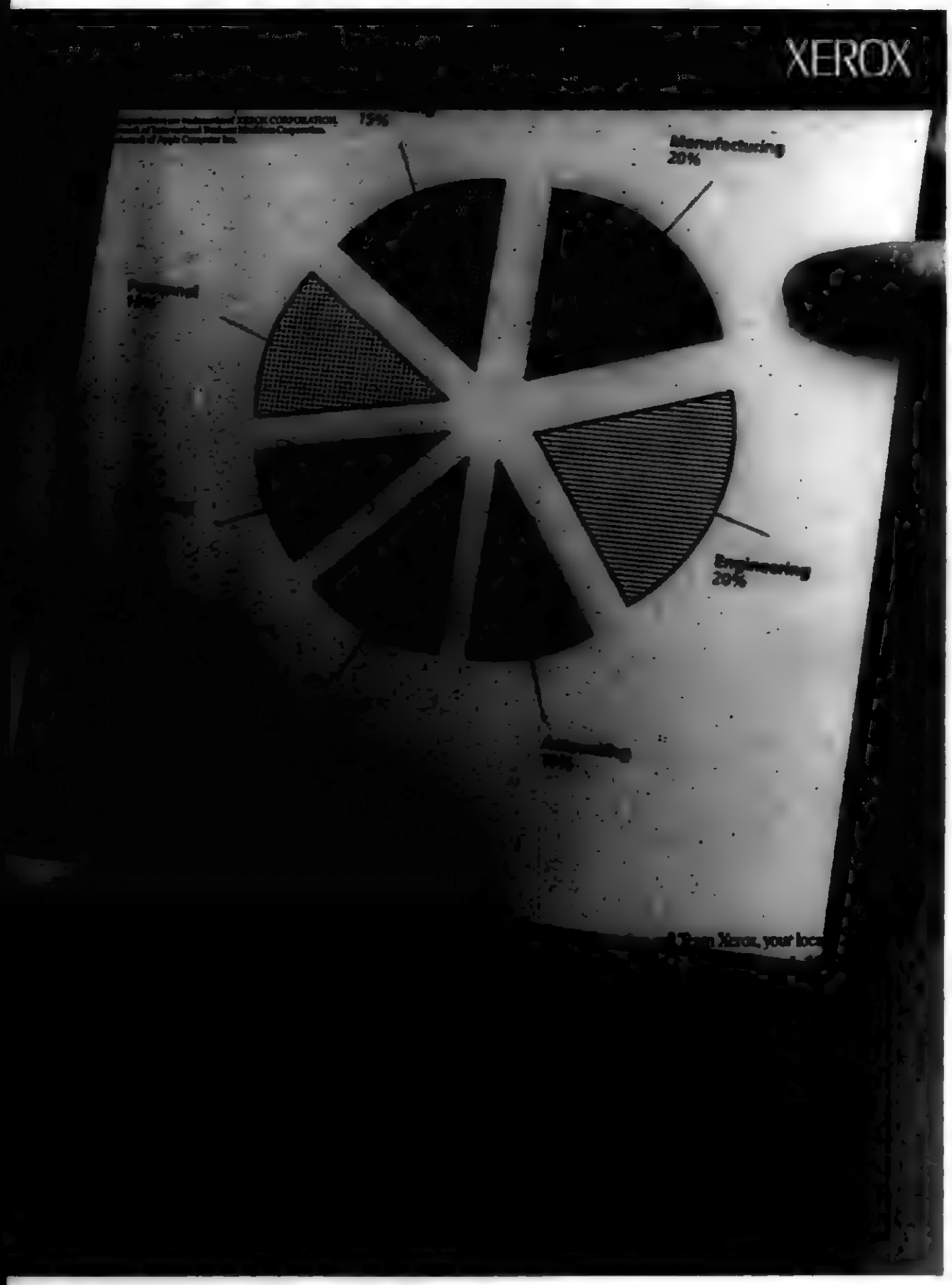
Successful project managers demonstrate several clearly defined behaviors that address the ability to influence:

- Organizational and interpersonal astuteness.
- Compromise negotiation.
- Team building.
- Team member development.
- Well-defined user orientation.
- High level of self-control.

The superior project manager knows that possessing technical ability or asserting raw authority is often not sufficient to be successful. Top project managers use their interpersonal skills to understand and influence the user, project team members and their own MIS management.

The influence cluster includes those competencies that, guided by basic interactive management principles, enable the project manager to communicate effectively, build a strong project team and win the confidence and trust of both the user and the MIS organization.

Organizational astuteness, for example, was clearly demonstrated by the project manager who knew that the



company president "shoots from the hip" and was easily "set off." The manager used this to his advantage by getting the president excited and involved at strategic points when the project needed a push forward.

Both organizational astuteness and skillful use of influence were implemented by a project manager who used his knowledge of the system to select those parts of the organization that would be affected by a rate change. He then used this political expertise to get specific people assigned to the rate change project.

User orientation

The ability to bring a client or user orientation to their work was common to exemplary project managers. One project manager evaluated and modified his system according to the needs of the field staff that eventually would use it.

Another project manager made a strenuous effort, whenever one of the products was finished, to contact users and ask them how they felt about the product. Still another manager wanted users to share a sense of ownership in the test plan and therefore talked through with the users what they thought was necessary to test different functions.

One might conclude from these examples that none of these behaviors are in and of themselves unusual; and, indeed, they are not. What is unique and important, however, is the process of isolating, identifying and grouping specific behaviors that result in exemplary job performance.

That process results in a behavioral model and becomes the crucial first step toward developing a performance standard and structure. From there, the organization can begin to train and develop its current and potential personnel and encourage them to be conscious of the behaviors they automatically bring to the job, those that currently are not part of their repertoire and those that need improvement.

Basic drive

Job competency analysis provides a powerful tool to address the business objective of hiring and developing staff for maximum effectiveness. Harvard University psychologist Robert White provided the contemporary notion of competence when he defined it as "a basic drive for effectiveness."

Interest in competence is currently growing because of its direct link with behavior. The American Management Association, for example, has outlined basic behavioral competencies for the general line manager. Also, the American Society for Training and Development, drawing on its own extensive research, has recently published a list of behavioral competencies necessary for training and developing professionals.

The job competency analysis model becomes a performance standard by which competencies can be identified in prospective and current holders of a job. It also is valuable in evaluating current performance, measuring training progress and identifying high-potential performers as well as in assisting current jobholders' self-assessment of their own performance.

MIS organizations can use this process to define any of its discrete jobs, from the technical programmer to the analyst and the senior programmer analyst. Exemplary performers in each job category are nominated and become the experts who contribute their personal experiences about what it takes to perform that job.

In building the project manager model, superior project managers were asked to discuss, in depth, critical activities and incidents in their management careers. They were to focus precisely on their behaviors and on what they actually do in their jobs rather than to focus on their espoused theories of what they should do.

The resulting data reveals the underlying motives, abilities and knowledge used by top performers, uncovering social as well as technical knowledge and skill factors critical to job performance.

The ensuing competency model contains three major components:

- The behavioral competencies that are critical for outstanding performance.
- Definitions of each competeney in observable behavioral statements.
- A road map that shows the relationship between each competency and the core tasks and functions that make up the job.

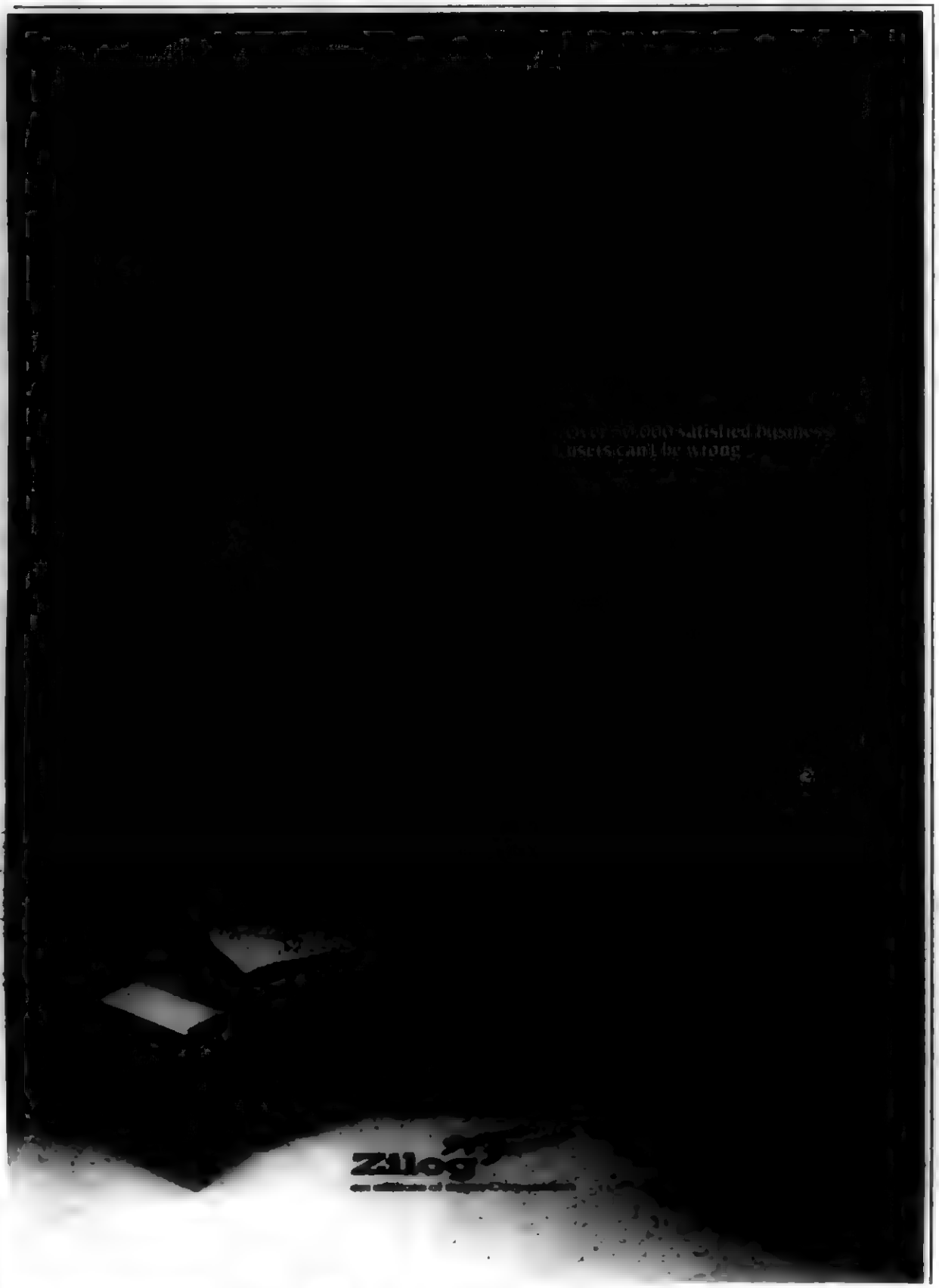
The organization can then develop customized standards for both the technical and managerial rungs in the MIS job ladder.

Benefits and options

The competency model provides benefits to both the MIS and training and development departments. With this capability, all training and development efforts become much more focused, since they can be mapped directly to the specific job functions and competencies that drive exemplary performance. This is particularly persuasive when budgets are being set and training and development plans for the coming year are being developed.

Using this process, the training and development department can justify adding or not adding courses based on the functions and competencies specifically addressed and by mapping existing curriculum offerings to the competency model for each job. The MIS organization gains a powerful tool for selecting new people into the job, making decisions about the functions and configurations of specific jobs and improving the supervisor-subordinate coaching and development relationship.

Once an organization develops its competency model, several options are available to put the model to work. The group can build a





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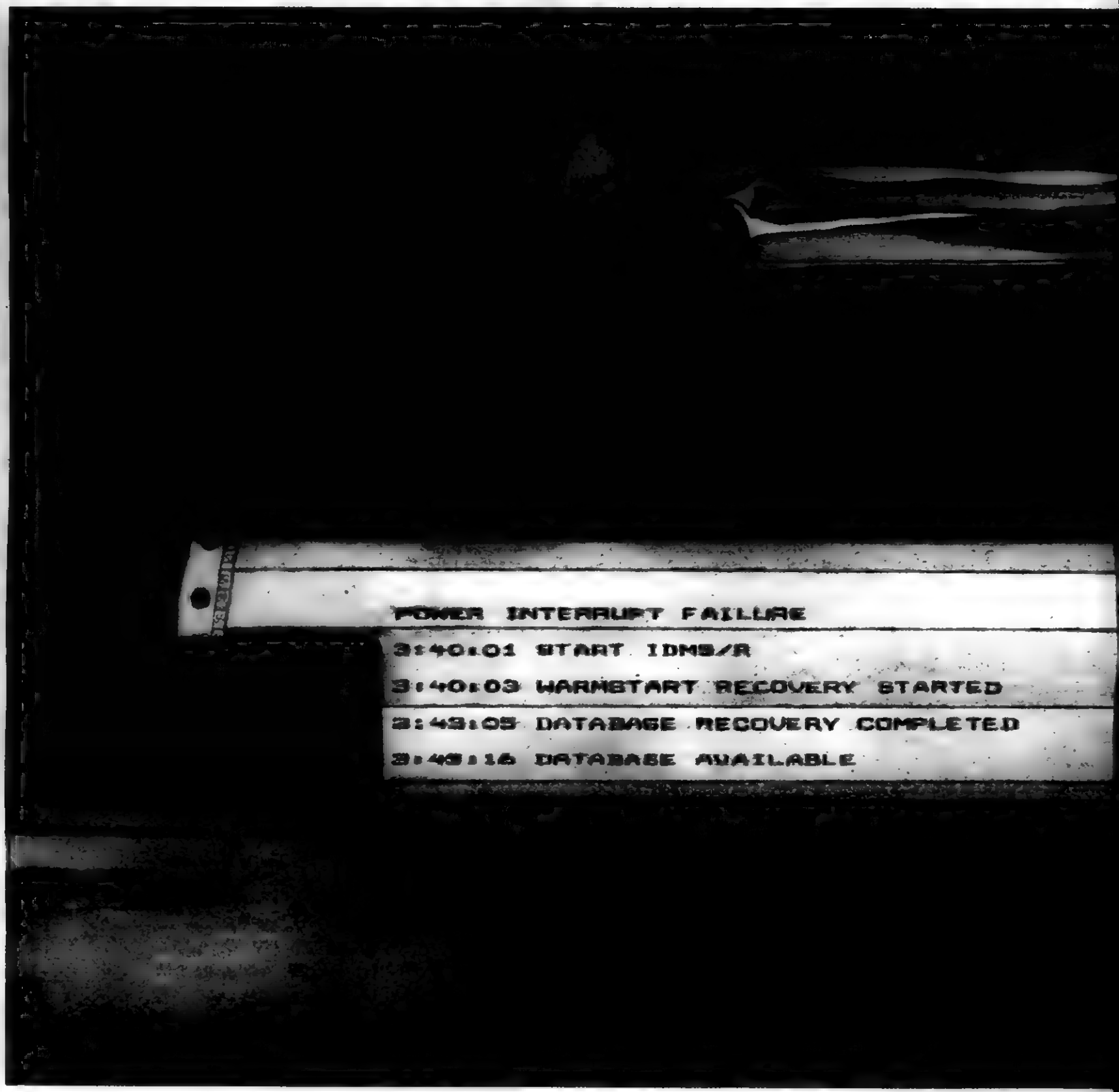
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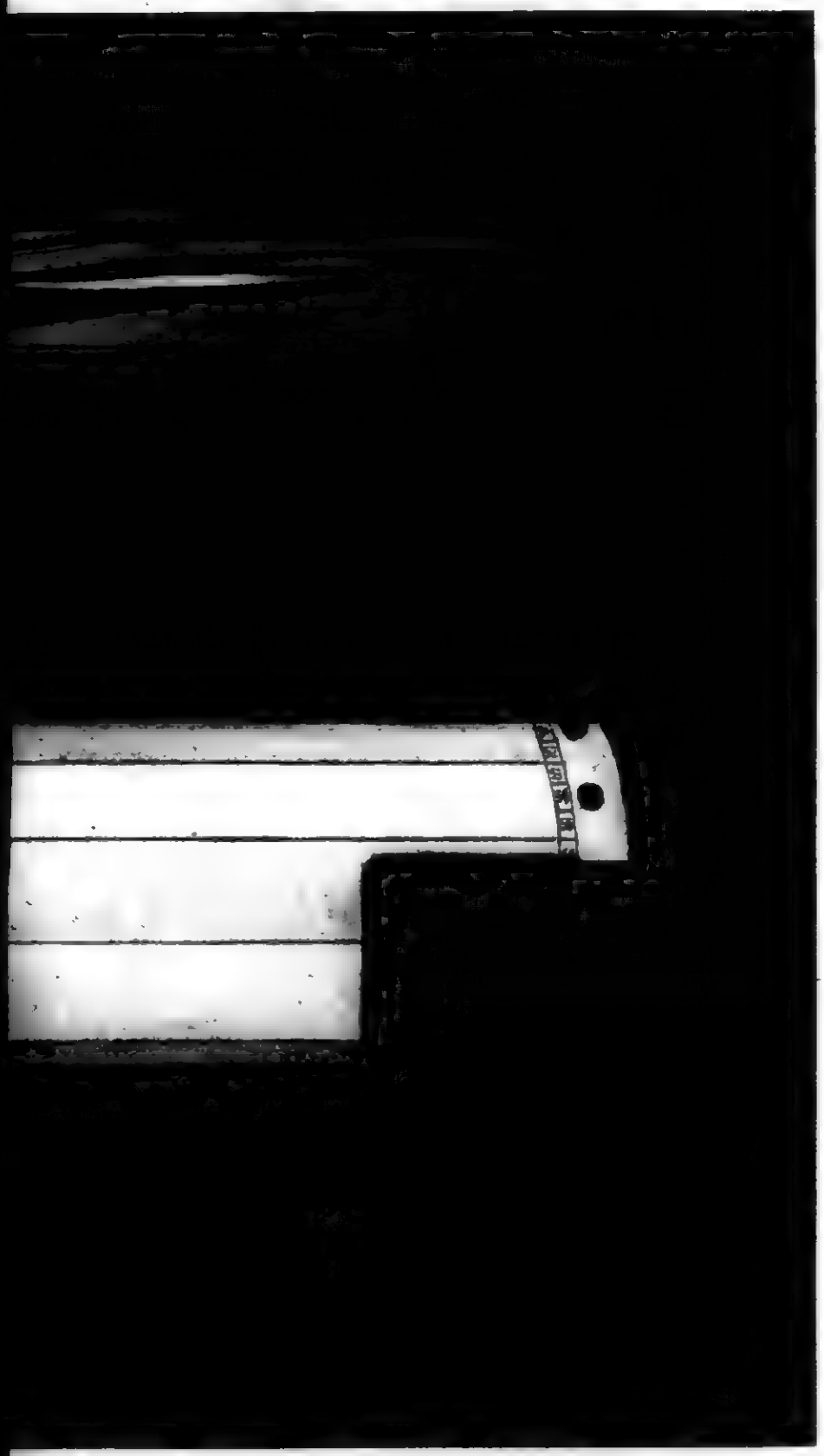
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simulation or case study in which the participants are required to demonstrate the functions and competencies in a real-life business problem. This becomes part of a classroom-based assessment process that enables jobholders to get a profile of the extent to which they bring the behavioral competencies to their jobs. The jobholders also receive important data on which functions and competencies they need to develop.

An additional useful tool is a series of informal assessment questionnaires that tap into how well individuals perform basic functions and tasks, the competencies that they naturally bring to the job and, in the context of specific assignments, the competencies that each assignment requires. The questionnaires help construct a profile that looks at the competencies demanded by the particular job matched against those brought by the person. Gaps in the profile become targets for development through courses, coaching and on-the-job experience.

> ***"The competency model permits description of the fundamentals of a job and the skills of those individuals who do the job very well. A common language is brought to those who hold the job or aspire to it, as well as to those who manage it."***

Some organizations may choose to focus on developing the coaching competencies required by managers. Seminars are designed to teach supervisors and managers how to coach and develop others more successfully. For project managers, this is particularly critical, since virtually all of the exemplary project managers involved in the model's development addressed the importance of focused, on-the-job experiences and the presence of a coach and mentor.

In contrast, none of these project managers attributed their successes to the typical two- or three-day project management course in planning and control techniques. Almost unanimously, they addressed the role of their manager in helping them develop the behavioral competencies that distinguish average from superior performers.

More benefits, fewer surprises

An organization can reap major benefits from using a job competency approach. The project manager competency model, for example, permits description in specific behavioral terms of the fundamental elements of the job and the characteristics and skills of those individuals who do the job very well. A common language is brought to all those who hold the job or aspire to it, as well as to those who manage it.

The behavioral indicators can be used in many personnel or human resource development functions. Nondiscriminatory selection tests and interviewing programs can be developed. The performance appraisal process can be made more behavioral and objective.

Training and development programs can be built to address specific behaviors and thereby be far more cost-effective. The department or organization in which the job function resides — in this case MIS — can make important strategic decisions about its relationships with other functional areas of the organization.

A project manager competency model brings these additional benefits to the MIS organization:

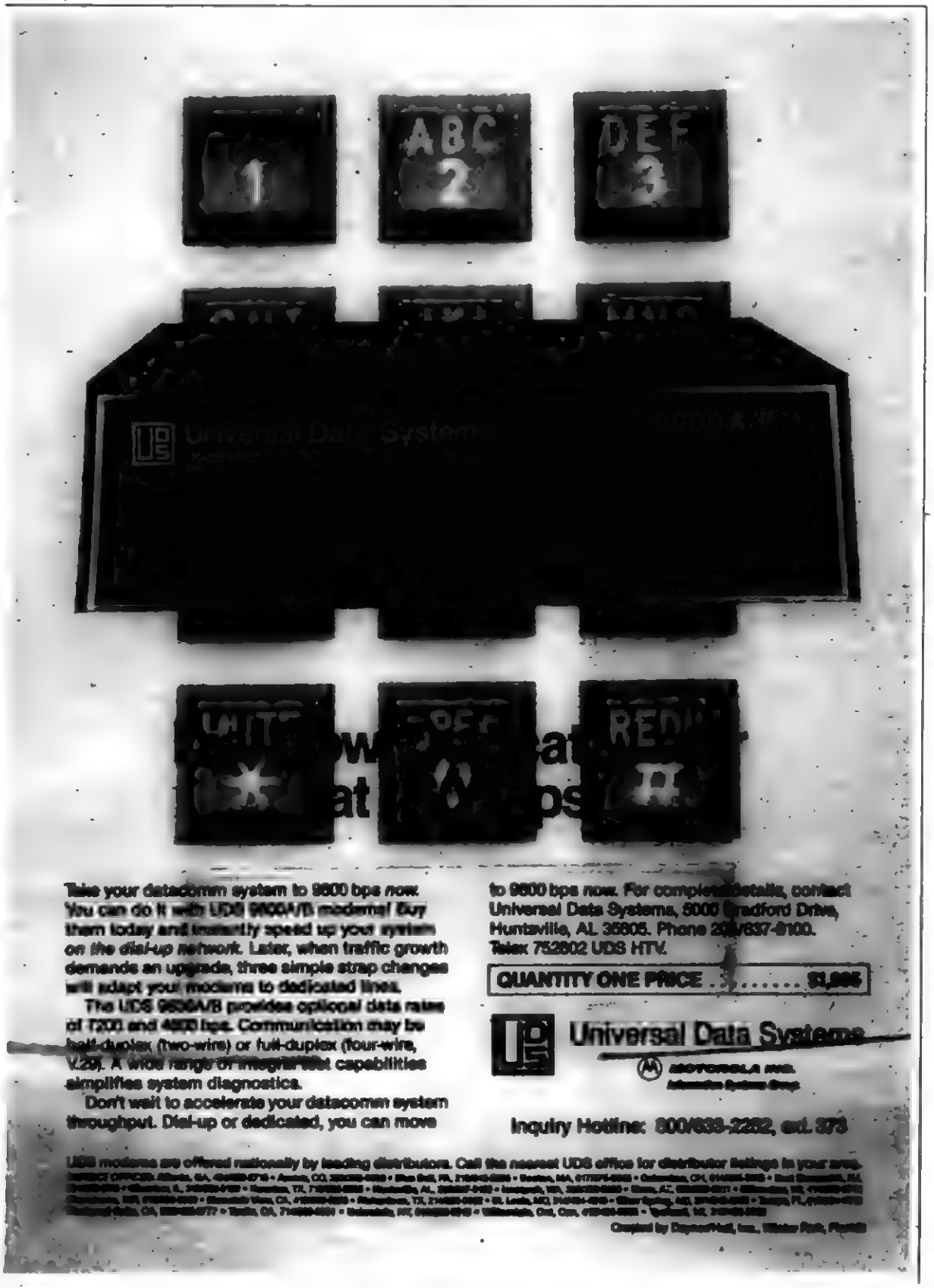
- A valuable behavioral screen for the project manager hiring process.
- A diagnostic tool that enables the MIS organization to analyze a project assignment in terms of its critical success competencies and match that assignment with a project manager strong in those areas.
- A structured, individualized coaching and-development program that arises out of discrepancies between the project's demands and the manager's competency profile.
- A succession-planning tool that enables the MIS director to analyze systematically current and anticipated staffing and training needs for systems development efforts.

Project leaders who participated in a project manager development program built from the competency model cited several bottom-line results for their MIS departments. The first of these was visible improvement in the work product. Better communications, scheduling and testing have led to a better quality product with fewer errors. This is particularly true for large projects.

Further, errors were noted at earlier stages of the project. Fewer surprises were uncovered because of more careful preplanning and discussion of all involved parties. As one project manager put it, "If there are misunderstandings, oversights or errors, we're catching them at the beginning."

The project manager development program offers MIS a strategic tool that ensures its successful project management capability. The MIS vice-president setting out strategic objectives for the coming year might ask, "Is the development program worth it? Can I afford it?"

Instead, ask an even more fundamental question: "Can I afford not to have a pipeline of superior project managers?" The answer, of course, appears on the bottom line. The mystique is a mistake — you can make excellent project managers. ■



In Depth

Existing information resources can give you the competitive edge



MIS directors are learning to use already available information resources to extend corporate business strategies and services — thereby adding value to their companies.

By DONALD MARCHAND and FORREST HORTON JR.

It is one thing to use information resources strategically inside the firm for cost leadership or product differentiation. It is another matter to find new and creative ways to use information resources in pursuing business strategies.

Increasingly, leading firms are using existing information resources in new ways — that is, reinventing and adding value to investments that have already been made.

For example, in California, Mobil Oil Corp. is marketing gasoline by installing point-of-sale terminals at the gas pumps that can be used with the automated teller machines of two leading banks.

Sears Roebuck & Co. and J. C. Penney Co. are using videodisks and personal computers to automate their customer order catalogs and extending the use of their walk-in services by offering the same catalog information to customers at home.

Textile companies in South and North Carolina are arming their salesmen with videodisk players so that the salesmen can effectively demonstrate to potential customers the color and style variations of lines of products the companies offer.

Airlines, car rental firms and hotels are teaming up to offer new bonus programs for frequent travelers through automated systems that are able to track bonus points and disburse awards.

What all of these examples have in common is the use by companies of existing information resources or technologies in new and creative ways.

This trend is supported by an equally strong tendency to permit entrepreneurs within companies to acquire resources and organize internal units to experiment with and pilot-test new uses of information resources to market, sell and distribute products and services.

Extending services

Hence, new units are being formed both within and without traditional MIS or data processing departments to do electronic banking, telemarketing, videotex and home retailing, point-of-sale development and information retailing and wholesaling. Their objectives are usually to research and pilot-test new and creative ways of extending the services and products of the company by building on existing information resources about customers, buyers or suppliers and extending through information technologies the services offered in new or existing markets.

For example, the Buick division of General Motors Corp. has organized a Marketing through Technology department to develop a new information system called Epic to aid in the marketing of its automobiles. Epic is being used by Buick in dealer showrooms, in public areas such as hotels and shopping malls and in homes via videotex services.

In dealer showrooms, the Epic system uses PCs in kiosks that allow a salesman to respond to customer questions about the availability of various models, colors, options, prices and financing terms for Buick cars. If a customer is interested in a particular model, the salesman can use Epic to determine the nearest dealership that has the car, and if the customer is comparison-shopping with other makes of cars in mind, the salesman can, through Epic, use another videotex service, Compuserve, Inc.'s Compuserve, to get data on most makes and models of cars to compare with the Buick model under consideration.

Thus, Epic provides better and more accurate information about the Buick product line to salesmen and customers alike as well as integrates the use of a car locator system for inventory control and an external information service for comparison shopping. The long-term mission of the Marketing

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Excerpted from Infotrends: Profiting from Your Information Resources, *by Donald A. Marchand and Forest W. Horton Jr. Copyright © 1986, John Wiley & Sons, Inc. Reprinted by permission of the publisher.*

> ***One method for using information resources strategically is based not on the capability of finding new uses for known information but on using information resources in offering a new product or service. Information resources are embedded in the new service or product in such a way as to appear indistinguishable from the nature of the product or service itself.***

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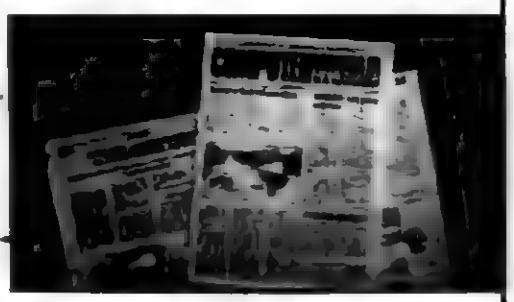
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through Technology department is to determine the profitability of using new technologies to extend the reach of information resources in creative directions to enhance the sales effectiveness, inventory control and productivity of the dealer work force.

One of the most strikingly creative ways of using "old" information with "new" information technology we've encountered is provided by Robert Waggoner. As reported in *Business Week* (March 4, 1985), Wagonner bought one-third of an antiquated newspaper clipping company, Burrelle's Information Services, Inc.:

"It [Burrelle's] was on a slow track to nowhere. Sales were growing at a sluggish pace, profits were modest — and Burrelle's was still cutting and pasting much the way it did when it was founded in 1888. But Waggoner changed all that. The hustling Harvard MBA pushed Burrelle's as a growth company.

"It now [through a computer system] monitors 16,000 newspapers, magazines and trade journals for 40,000 categories, from company and product names to political issues. Customers say they've come to regard fast access to clips as a necessity."

New product or service offerings

One method for using information resources strategically is based not on the capability of finding new uses for known information but on using information resources in offering a new product or service. In this case, information resources are embedded in the new service or product in such a way as to appear indistinguishable from the nature of the product or service itself. In recent years, many examples of companies inventing new products or services in which information resources play the pivotal or key role have begun to appear.

In 1977, Merrill Lynch, Pierce, Fenner and Smith, Inc. first announced its new cash management account, which was an information resource product that permitted the integration of four services to investors:

- Automatic investment of cash and dividends in a Merrill Lynch-managed money market account.
- Credit through a standard margin account.
- Cash withdrawal by check or debit card.
- Investment advice in managing and diversifying the account. Although each of the services standing alone was not innovative, the integration of these services in a single product — the cash management account — provided an unprecedented competitive advantage for Merrill Lynch.

The cash management account was supported by a complex network of data bases, voice/data communications networks and software programs. It was sold through Merrill Lynch's brokers to investors with minimum balances of $20,000.

Although the growth of the cash management account has slowed in recent years, Merrill Lynch was able to amass more than 450,000 accounts and $20 billion in assets before serious competition appeared in 1982 from other investment houses (for example, Dean Witter Reynolds, Inc.), banks and financial services companies.

Moreover, since the invention of the cash management account concept, banks and financial service companies have used their financial information resources and computer and communications technology to manufacture whole new types of financial products "on the fly."

Charles Wiseman and Ian MacMillan, in an article in *The Journal of Business Strategy* (Fall 1984), provide an interesting example of the development of a certificate of deposit (CD) fund by a large investment firm:

"At 6 a.m., leaders at a brokerage house called London to order sheaves of CDs from foreign banks, which often pay higher rates than their U.S. counterparts. By 11 a.m., they had accumulated $50 million of the paper. The next step in the fund creation process depended on an information system that took the prices and rates, juggled them according to the firm's objectives and constraints embodied in its computer program and arrived at management fees and commissions. Thirty-six hours after the start of this production run (job shop style, to be sure), brokers were ready to start selling the fund."

The creation of new financial products on a real-time basis has brought the principles of "flexible manufacturing" to the financial services industry. Portfolio management systems of companies such as Shearson Lehman Brothers, Inc., Citicorp, Bankamerica Corp. and others offer new opportunities to tailor complex combinations of investment services to businesses or consumers with diverse assets and investment outlooks.

Similarly, in the express delivery industry, the merger of transportation (air, land) and communications services (facsimile and imaging machines) has resulted in the creation of new competitive products. During the early 1980s, Federal Express Corp. began planning and developing a new delivery service called Zap Mail, which depended on the availability of improved imaging technology and the mobilization of its fleet of 10,000 delivery vans. In its initial phase, Federal Express offered a two-hour delivery, enabling customers to send high-quality duplicates of documents and diagrams to recipients thousands of miles away in the U.S.

Customers call Federal Express for a Zap Mail pickup. A Federal Express courier picks up the document and takes it to the nearest Federal Express Imager I machine. The machine electronically transmits the document to the Federal Express facility closest to the recipient, where a high-quality duplicate is placed in a Zap Mail envelope and delivered by courier within two hours. The price when the service was initiated was $35.

In May 1986, Federal Express extended this basic service by leasing 3,000 Imager II machines to some of its heaviest users. With the Imager II, customers can transmit and receive documents from Federal Express, eliminating the need for pickup and, in some cases, ending the need for delivery.

The Imager technology and the fleet of Federal Express vans are designed to eliminate problems that have plagued businesses using previously available facsimile transmission services. Those problems included poor quality, slow transmissions

and lack of compatible machines to send and receive documents. By the late 1980s, Federal Express expects at least 30% of its revenue to come from Zap Mail.

Federal Express' approach to Zap Mail, which relies on the delivery of hard copies, is not without criticism in the competitive market by those who argue that long-term growth and profits in this market will be in high-speed data transmission services using computers and word processors such as MCI Communications Corp.'s MCI Mail.

In MCI Mail, for example, a message can be typed into a computer that has access to the MCI system. The message may be sent through MCI to the recipient's computer or printed at a station near the recipient for hand delivery by a local courier. The service is less expensive than Zap Mail; however, it is harder to use and cannot send charts and graphs.

MCI Mail's application is aimed at customers who wish to send one message to hundreds or thousands of recipients.

> ***The creation of financial products on a real-time basis has brought the principles of 'flexible manufacturing' to the financial services industry.***

For example, a manufacturer who wants to send a single message to dealers can type the message into a computer in which a list of dealers' names and addresses has already been stored. With a few keystrokes, the manufacturer can send the message to hundreds of recipients at a cost of only a few dollars for each recipient.

The competition for market share between Zap Mail and MCI Mail represents a clear use of information resources for competitive advantage. Moreover, what is at stake in this competition is not just product differentiation but cost leadership.

In addition, both Federal Express and MCI are using information technologies to tie their customers directly to their product offerings by making on-premise software and hardware available for the customer to interact with the network.

Similarly, financial service companies and banks are moving beyond the design of new products such as cash management accounts and portfolio management systems by offering these services to customers who are directly tied to the seller's data bases and communications links by terminals and personal computers. Innovation in the design of new information-based products and services spills over into their marketing and distribution.

Marketing and distribution

Another strategy for using information resources to competitive advantage involves using these resources to market and help distribute a product or service.

Although electronic marketing will not replace more traditional forms of marketing in the near future, it does provide new types of trade-offs in the expected benefits and costs of direct marketing.

Shopping malls and outlets will continue to be an important part of retailing in the U.S. However, communications and computer technologies will be used increasingly in homes, offices and many public places to permit more widespread shopping for many goods and services.

Direct marketing is another term for selling without stores. The Direct Marketing Association defines direct marketing as "an interactive system of marketing which uses one or more advertising media to effect a measurable response and/or transaction at any location." While direct marketing is often thought of just as direct mail, it also includes the use of radio, TV, telephone, print ads, coupons, store catalogs, package inserts, bill stuffers and even matchbook covers.

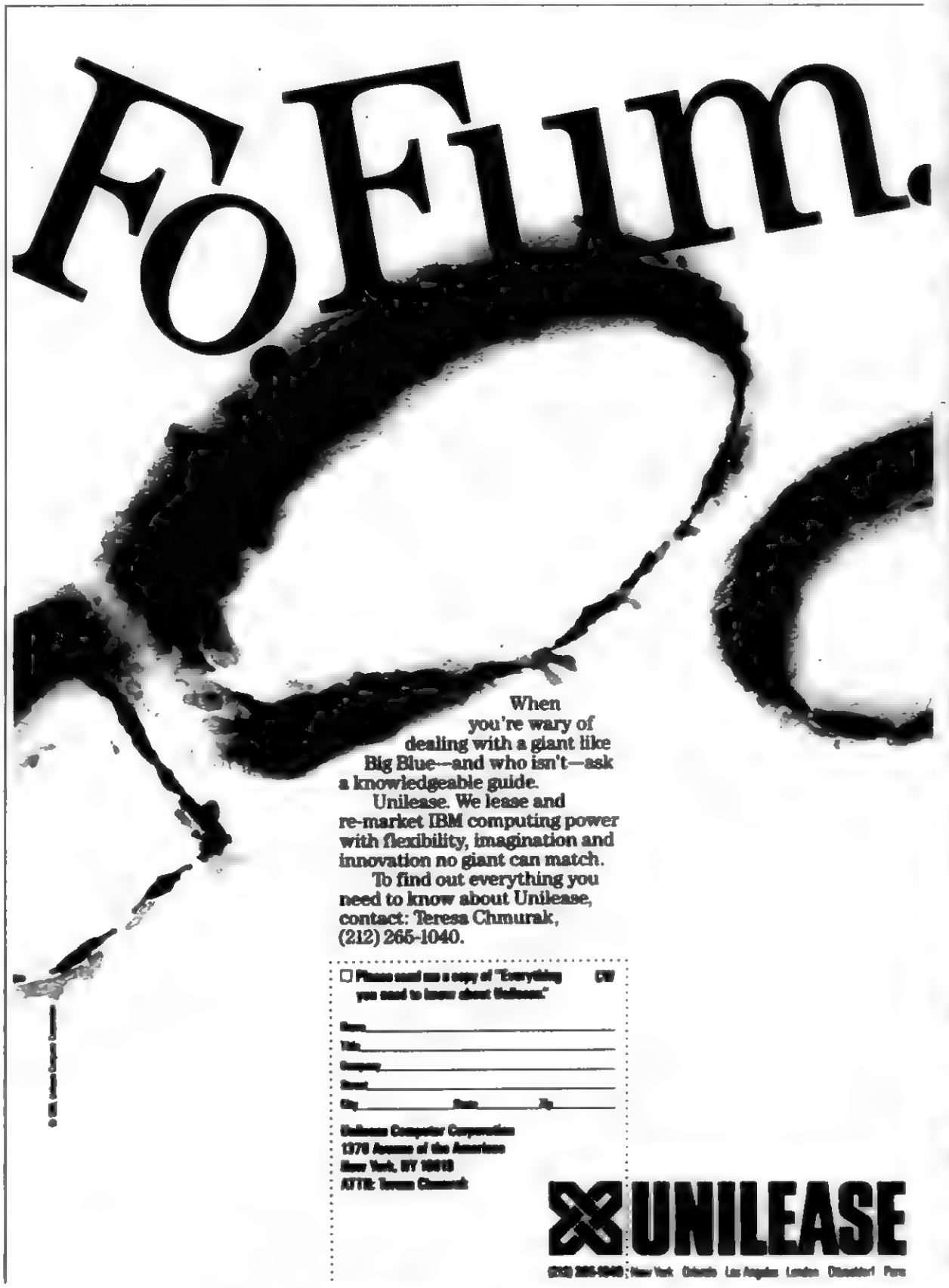
Compared with newspaper, magazine, radio and TV advertising, direct marketing is interactive. Moreover, in its electronic forms, direct marketing can establish direct links with customers 24 hours a day from practically anywhere in the nation. In addition, direct telemarketing compares favorably with other forms of more conventional marketing. While telemarketing does not compete with television for mass-market appeal, in every other feature it either equals or surpasses TV, space ads and direct mail letters when these are used alone.

As the oldest form of electronic marketing, telemarketing has been used to sell virtually all types of products and services. In recent years, firms have combined telemarketing strategies with personal computers and videodisks to provide new forms of direct marketing.

Among the top 30 direct marketing firms in the U.S., it is difficult to identify any that have not begun to develop computers and communications technology based on marketing strategies.

Sears Roebuck and J. C. Penney are pilot-testing, with IBM and AT&T, new home videotex services to offer two-way, home shopping services. Moreover, most major retailers are developing ways of using videodisks and personal computers to automate their catalogs.

Cosmetics firms such as Avon Products, Inc. and Elizabeth Arden, Inc. are offering computer-based makeup analysis to provide customers with more individualized



cosmetic recommendations.

Personal and property-based insurance companies are offering mail customers the option of using a videotex kiosk as a means of finding the most cost-effective insurance policies for their needs. Upscale retailers such as L. L. Bean, Inc. in Freeport, Maine, use computers to combine sophisticated systems for order handling, tracking customers and inventory, sampling mailing lists and performing complex modeling exercises of direct marketing strategies.

Finally, real estate brokers are using videodisks and personal computers not only to automate listing services but also to provide video images of properties and houses that prospective buyers can screen instead of going on time-consuming weekend house-hunting expeditions.

In addition to these forms of electronic direct marketing, most major retailers are linking with banks and credit card companies to develop point-of-sale systems that provide customer convenience as well as increase the company's ability to track inventories on a daily rather than a weekly or monthly basis.

As the lines between the physical store and electronic store continue to blur, it will be difficult in the future to design effective product and service marketing strategies without considering the trade-offs of costs and benefits inherent in all forms of electronic and traditional marketing.

The manufacturing process

Managing the information resources within the manufacturing process more effectively can also be employed in the strategic use of information resources. During the last 15 years, a dramatic change has occurred in both Japan and the U.S concerning the role of manufacturing as a competitive weapon. Throughout the 1970s and early 1980s, manufacturing productivity declined in the U.S., while it rose significantly in countries like Japan and West Germany.

While the exact causes of the changes in productivity have yet to be defined, a change clearly occurred in the significance given to quality control and process manufacturing among Japanese and West German businesses in contrast to U.S. manufacturers. Indeed, a growing debate evolved in the international business community concerning how to adopt quality control and manufacturing improvements used in Japan, West Germany and other advanced economies into American manufacturing.

Throughout this period, two types of quality improvement strategies have been adopted: The first type is very technology intensive and is aimed at improving the design, production and control of products throughout the manufacturing process through the use of computers and communications technology. Manufacturing management is very dependent on the information resource strategies used to control the production, inventory, quality control and cost-control functions. These functions are in turn influenced by three support functions:

- The industrial/engineering function, which influences the design of products.
- The internal job scheduling and production control system.
- The manufacturing intelligence function, which monitors the use of labor and suppliers.

For all of these functions to work effectively, a great deal of information management is required. In recent

> ***As the lines between the physical store and electronic store continue to blur, it will be difficult in the future to design effective product and service marketing strategies without considering the trade-offs of costs and benefits inherent in all forms of electronic and traditional marketing.***

IBM ASCII terminals:

The case in black and white.

Introducing a somewhat more colorful member of the family.

Meet the IBM 3164 ASCII Color Display Station.

It gives you eight foreground and eight background colors. On a 14" screen.

And because of its 8 x 16 character matrix, the 3164 gives you clear, crisp characters in color.

But is color any reason to buy IBM's 3164? It is, according to studies that indicate the use of color increases productivity, decreases errors and promotes user satisfaction.

Color, of course, is far from the sole reason for choosing the 3164. To appreciate the others, you should get to know the rest of our ASCII family.

Emulation. Another side of the family.

Our ASCII terminals are designed to fit into existing systems. Even if the systems aren't ours.

Emulation Capability	
3161	IBM 3101 Model 10 ADDS Viewpoint* Hazeltine 1500* Lear Siegler ADM-3A* Lear Siegler ADM-5* TeleVideo 910*
3163	IBM 3101 Model 20 DEC VT 52* DEC VT 100* TeleVideo 950*
3164	IBM 3101 Model 20

For example, our basic ASCII Display Station, the IBM 3161, emulates up to six terminals. And the advanced-function 3163 emulates a number of higher level ASCII data streams.

Features	3161	3163	3164
Screen size	12"	12"	14"
Lines x characters	25x80	25x80	25x80
Character matrix	8x16	8x16	8x16
Double-sized characters	No	Yes	Yes
Line drawing characters	24	24	24
Vertical scroll	Jump	Jump/ Smooth	Jump/ Smooth
Definable function keys	24	24	24
Windowing	No	Yes	Yes
Partitioning	Horiz.	Vert./ Horiz.	Vert./ Horiz.
Characters in buffer	1920	7680	7680

What's more, every one of our ASCII terminals can operate in its own function-rich native mode.

Our family is flexible.

Our unique plug-in cartridges allow for considerable flexibility in your operation. For example, simply by switching cartridges you can shift a terminal from one data stream to another.

And, in many countries cartridges are also available that go beyond emulation to let you operate your ASCII terminals in several foreign languages. Appropriate foreign language keyboards are also offered.

Enhanced ergonomics. Another family trait.

All our ASCII terminal keyboards have 102 keys. But that's not all they have in common. Every keyboard also has a low profile, gentle contour and typewriter touch.

And our keyboards have programmable function and editing keys so they can be custom-tailored to fit your application needs. The 3163 and 3164 models also have redefinable and recappable keys.

Superior ergonomic design isn't confined to the keyboard, however. All three displays tilt and swivel for maximum user satisfaction. And, of course, by making the display easy to read, we made it easier on the eyes. In addition to the 8 x 16 character matrix, we gave it an advanced non-glare etched screen, cursors, and character and field attributes like blink, reverse video, underscoring and dual intensity.

High standards. Competitive prices.

Quantity discounts are offered, too. And financing is available through the IBM Credit Corporation. Best of all, each terminal comes with the quality, service and support you'd expect from IBM.

Contact your IBM marketing representative, or call 1 800 IBM-2468, Ext. KC/90, for the IBM Authorized Distributor nearest you. And we'll present more evidence in the case for IBM's ASCII terminals.

It may be all you need to color your view.

*ADDS Viewpoint is a trademark of Applied Digital Data Systems, Inc.; Hazeltine 1500 is a trademark of Hazeltine Corp.; Lear Siegler ADM-3A/ADM-5 are trademarks of Lear Siegler, Inc.; TeleVideo 910/950 are trademarks of TeleVideo Systems, Inc.; DEC VT 52/VT 100 are trademarks of Digital Equipment Corporation.

years, this need has resulted in the development of highly automated systems such as manufacturing resource planning and computer-aided design and manufacturing.

The second type of quality improvement strategy, in contrast to the first, is very people intensive. It is aimed at improving the way workers are motivated, the way they work together as teams to solve problems and make operational decisions and the way they interact with and use new technologies.

A variety of techniques and policies assist the worker in becoming a more informed decision maker and participant in the production process. These include quality control circles, job sharing and improved education and training on the job. All of these strategies have, as an integral component, the provision of a closer link between the manufacturing process and the information that workers need to make more effective decisions on the job.

Thus, as manufacturing increasingly has been perceived as a competitive weapon in the 1980s, the objectives of quality improvement and productivity have required improved information resources, human resources and technical strategies.

Info management as a sideline

An organization may find that entering the information management business as a by-product of what it does as its main business can be an outlet for using information resources competitively. Many firms in manufacturing and services have accumulated a wealth of experience and internal skills that can form the basis of a new service. In some cases, capitalizing on this corporate wealth may result in a new consulting service; in other cases, it may result in a new information service.

The case in color.





IBM

In the first case, over the years many large corporations such as Du Pont Co. and General Electric Co. have accumulated considerable experience in specific areas such as health and safety management services or facilities management. These companies, in turn, have marketed these skills outside the company as a value-added service.

In the second case, companies such as Policy Management Systems Corp. (a software service company for the property and casualty insurance market) or Dun & Bradstreet Credit Services (a credit reporting service company), have acquired information resources about their customer bases that they can market as new information services.

William King of the University of Pittsburgh gives the example of Foremost-McKesson, Inc.'s Drug and Health Care Group, which used innovative information systems to gain a competitive edge in a noninformation business. In Foremost-McKesson's case, King found, the company needed to make major changes in the structure of drug wholesaling and to get into new information businesses such as the processing of insurance payments related to drug purchases in order to survive.

Other approaches

Another approach to entering the information management business from this angle is to capitalize on the physical resources a company may have. For many years, companies in manufacturing or in services with underutilized capacity in computer operations have offered external time-sharing and computer services. Today, railroads are using their rights-of-way to establish major fiber-optic communications networks and are marketing these services to other companies.

A third approach to entering the information management business is to enhance the information value of one's products. In this case, manufacturing companies can enter the information business by engaging in system selling as opposed to product selling. Selling solutions to customer problems requires a great deal of enhanced expertise and information management to respond to diverse customer problems. In some cases, companies have organized specific service units to offer specialized expertise and technical help for a price.

For example, fertilizer companies have offered farmers specialized software programs to assist in analyzing crop characteristics and fertilizer needs for more than 15 years. Moreover, some aerospace firms have provided computer services

and industry management consulting and software design on a for-profit basis, while other large corporations have engaged in marketing communications network-management services based on their internally developed expertise in this area.

The routes to the information management business that firms can take are quite diverse. More than anything else, what is required is a realization of the firm's real value in information investments, both in people and in data bases that can be treated as physical assets and capitalized. All that is needed is an entrepreneurial spirit to look beyond the borders of one's traditional business lines for new opportunities.

Collaborative ventures

One basic strategy for using information resources for competitive advantage is to engage in a collaborative information management venture. In the information economy, business has become too demanding and fast paced for a company to mount a significant presence in the marketplace across all its business lines. Increasingly, more emphasis is being placed on leveraging in a cooperative way the resources of two or more firms to provide entry or a presence in selected markets.

In a 1984 study of 38 collaborative ventures, conducted by the consulting firm of Coopers & Lybrand, interviews with participating executives revealed that the sharing of resources and complementary strengths were the two leading reasons for collaborative ventures. Underlying the reasons for collaboration were the convergence of technological innovations that blurred boundaries between markets and industries as well as the pace of international competition, which required companies to form new alliances.

Collaborative ventures have traditionally been used in the manufacturing sector primarily because of larger capital requirements. However, more recent trends indicate the growth of ventures among firms in the information processing industry as well as among traditional service or manufacturing firms that wish to enter this industry.

Moreover, although research and development ventures such as the Austin, Texas-based Microelectronic and Computer Technology Corp. (MCC) — in which 15 major U.S. computer firms are partners — have been among the more visible collaborations, the more common ventures occur among firms seeking an equity investment in another company, undertaking specific lines of business that do not entail creation of a new company or joining together to form a stand-alone company for the purpose of entering a new market.

> ***As more and more traditional and emerging manufacturing and service firms seek business success in the global information economy, the need for continued adaptation and readaptation to changing opportunities in the external business environment will, in turn, result in major modifications in the internal structures and functions of business units.***

Types of collaborative ventures

Type	Purpose	Example
Equity investment	Ensure supplier viability; establish an informal working relationship and exchange of technology	General Motors Corp.'s acquisition of Electronic Data Systems Corp.
Research and development ventures	Share costs and results of basic research and development	Microelectronics & Computer Technology Corp.
Cooperative ventures	Undertake a specific enterprise that does not entail creation of a separate operating company	Communications Satellite Corp. and Holiday Inns, Inc.
Operating ventures	Establish a stand-alone operating company — a "new business"	Satellite Business Systems (IBM and Aetna Insurance Co.)

The chart at left provides some examples of these types of ventures. In type one, a collaborative venture often results in outright ownership or majority shareholding of a company. In many cases, the acquired company is allowed a great deal of latitude in conducting its business, at the discretion of the parent company. IBM's acquisition of Rolm Corp. and the General Motors acquisition of Electronic Data Systems Corp. both fall into these latter cases.

In still other cases, a company may set up its own subsidiary to enter a new business and then acquire a majority interest in an outside company as well. For example, in 1982, Ford Motor Co. created Ford Aerospace Satellite Corp. as a subsidiary to operate satellites and lease space in them to companies for voice and data transmission. Then, in 1984, Ford increased its customer base and expertise in the voice/data communications field by agreeing to purchase 80% of San Diego-based Starnet Corp.

In type two — the research and development venture — two or more companies agree to share the costs and results of basic R&D. In August 1982, MCC was incorporated in response to concerns about the Japanese fifth-generation computer project. MCC's intent is to share R&D personnel and resources from a number of computer companies to evolve strategic initiatives in the knowledge management and expert systems field.

In type three, two companies may share their involvement in a new service without need of forming a third independent business unit. In the fall of 1984, Communications Satellite Corp. (Comsat) and Holiday Inns, Inc. approved a joint venture to offer television programming and teleconferencing by satellite to the hotel chain's 1,500 U.S. facilities.

In a fourth type of venture, two companies agree to form an independent business unit. In the early 1980s, IBM and Aetna Insurance Co. created Satellite Business Systems to enter the market for satellite-based data transmission services for large corporations.

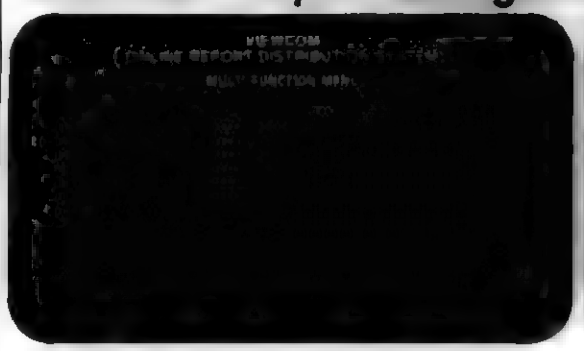
While there are many examples today of the traditional and emerging firms entering into joint ventures, it is important to note that as the information economy and information processing industry continue to evolve, the need for collaborative ventures will continue to accelerate. Moreover, collaborative ventures in the information management business will be used as both offensive and defensive weapons in the marketplace to hold off increased competition or entry on the one hand and to explore and focus on new market niches on the other.

Also, as the information processing industry emerges as the world's leading business, the boundaries for collaborative ventures will extend far beyond national economies. One example is AT&T's recent joint venture with Italy's Ing. C. Olivetti & Co.

Information resources historically have always played a role in shaping the competitive strategies of business. There is and will continue to be a growing role for information resources in the shaping of business strategies in the years ahead because of the evolution of the information economy and the dynamic growth and dominance of the information processing industry in world competition.

Moreover, as more and more traditional and emerging manufacturing and service firms seek business success in the global information economy, the need for continued adaptation and readaptation to changing opportunities in the external business environment will, in turn, result in major modifications in the internal structures and functions of business units. The functional strategies that firms adopt for managing information resources will have to be in tune with, and appropriately support, redefinitions of corporate and strategic business unit strategies. ■

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NEW PRODUCTS

Powerbase performance enhanced

Powerbase Systems, Inc. of Birmingham, Mich., has released a new version of its $349 Powerbase menu-driven, relational data base package, which reportedly is 21% faster and provides more file room than the previous version.

Much of the increase in performance is because of changes in the structure of the .KEY files, which allow the package to accommodate up to 288% more records in a file with multiple indexed fields. Changes to the .KEY files also save disk space when large files are used. A data base with seven files, 1,260 records and six indexed fields requires 105,984 bytes in Version 2.2., compared with 262,656 bytes in the previous version. However, files with few records may require more disk space.

In addition, Powerbase now has the ability to exchange Powerbase data with data from Wordperfect Corp.'s Wordperfect secondary files to perform merges. Powerbase was already able to exchange files with such popular packages as Lotus Development Corp.'s 1-2-3 and Ashton-Tate's Dbase II and Multimate software. Also, Powerbase's in-load and out-load features are now compatible with Lotus 1-2-3, Version 2.

Other enhancements include the ability to take advantage of the Intel Corp. 8087 and 80287 math coprocessors and additional support for random-access memory (RAM)-resident macro software such as Prokey by Rosesoft, Inc. and Superkey by Borland International, Inc.

Users covered by the Powerbase 2.1 maintenance agreements automatically receive a free upgrade. Other users can upgrade for $25. Users of Powerbase versions 1, 1.1, 2, and 2.01 can order a new manual and Version 2.2 disks for $75.

Powerbase runs on the IBM Personal Computer, Personal Computer XT, AT and 3270 Personal Computer as well as compatible computers. The package requires 320K bytes of RAM and Microsoft Corp. MS-DOS or IBM PC-DOS 2 or higher. Site licenses are available from Powerbase.

PC-based microfilm tool out

Kodak system captures, retrieves document images



The Kodak KAR-1500 PC supports up to three levels of microfilm indexing.

The Eastman Kodak Co. of Rochester, N.Y., has announced the Kodak KAR-1500 PC information system, a microcomputer-based system used to capture and retrieve documents on microfilm.

While document images are being captured by the RV-3 camera, the operator keys in descriptive information, creating the index that is later employed for retrieval. Up to three levels of indexing are supported. The simultaneous operation eliminates the need for postprocessing indexing. Faster rotary cameras can also be used with the KAR-1500 PC system, although indexing must be done separately afterwards.

To retrieve a file, the operator keys the known descriptive information into the microcomputer. The software searches the disk and displays a list of the microfilm magazines that contain the information requested. After the proper magazine is inserted into the retrieval terminal, the operator commands the retrieval unit to advance to the requested frame. A printout of the document then can be made.

A basic KAR-1500 PC system costs about $30,000 and includes an IBM Personal Computer AT with a 30M-byte hard disk and computer-aided retrieval (CAR) software ($14,000), a Kodak Starfile RV-3 camera for document capture ($6,000) and a Kodak IMT-50 microimage terminal for retrieving, viewing and printing documents (about $10,000).

The setup also includes the new Kodak Starfile CAR copy board accessory, which links the microfilm camera to the personal computers. The copy board is used to place the sequence numbers and other identifying marks sent from the micro onto the microfilm when it is indexed.

The KAR-1500 PC software is sold separately for about $9,000 and requires about 3M bytes of overhead on the hard disk The CAR software requires a minimum 10M bytes and will run on an IBM Personal Computer XT and compatibles. The other components also are available separately.

Portable word processor debuts

Quadram Corp. of Atlanta has unveiled the Keystyle 80, a portable word processing system that consists of a laptop intelligent keyboard, and the Writestyle, a portable letter-quality printer.

The 3-lb Keystyle 80 is said to feature read-only memory-based word processing software, telecommunications software and calculator, calendar and clock functions. It also features an 8-line by 80-char. pop-up screen.

The Keystyle can also be used as a keyboard for Quadram's Datavue series of portable IBM Personal Computer-compatibles via an infrared link. Optional cables allow the Keystyle to be used as a keyboard for IBM Personal Computers and compatibles. Files can be transferred to a PC or compatible via the RS-232C port.

The 6-lb Writestyle is said to use a direct impact tub-style printwheel with a print speed of 14 char./sec., bidirectional. It can be used with the Keystyle, or as a printer for Datavue and IBM Personal Computers and compatibles via centronics parallel and RS-232C serial interfaces.

The Keystyle and the Writestyle retail for $349 each or $599 together.

INSIDE

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Sony MVR-5500 still video recorder offers floppy disk alternative to slides

Sony Corp. of America, located in New York, has introduced the Promavica Still Video Recorder MVR-5500, a frame storage device designed as an alternative to slides.

The system is said to record still video pictures on a Mavipak disk. The Mavipak is a 2-in. magnetic video floppy disk that is virtually identical in size to a 35mm slide mount. According to Sony, the disk can record 50 fields of pictures or 25 frames with double the vertical resolution and with 360 lines of horizontal resolution. The disk uses an identification code of up to six digits for each image. The MVR-5500 can access from one image to another anywhere on the disk within 2 sec., Sony stated.

The MVR-5500 is said to be compatible with virtually all composite video and analog/digital red-green-blue (RGB) signals from cameras, video tape recorders, videodisks, television tuners and computers. Its composite video and analog RGB outputs allow it to be used with video projectors, monitors and video printers. It also features the ability to synchronize with audio recorders.

The recorder/player has an RS-232C port as well as two six-pin remote control ports for the Program Edit Controller, the RM-E5500.

The Promavica system is priced as follows: MVR-5500 Still Video Recorder, $3,400; RM-E5500 Program Editing Controller, $1,200; RM-52 Remote Control Unit, $150; and 10 MP-50 Video Floppy disks, $100.

Upgraded Tandy micro bows

High-end 3000 gets added storage, RAM

Tandy Corp. of Fort Worth, Texas, has announced a new $4,499 version of its Tandy 3000 IBM Personal Computer AT-compatible computer featuring a 35M-byte hard disk drive.

According to a company spokesman, the Tandy 3000 35 MB HD computer offers 5M bytes more storage, greater memory expansion capability and a standard 640K bytes of random-access memory (RAM) — 128K bytes more RAM — than the newest IBM PC AT.

The Tandy 3000 35 MB HD comes with one 1.2M-byte floppy disk drive and a standard 640K bytes of memory, which can be expanded to 12M bytes under the soon-to-be-available Xenix operating system, Tandy said.

The previous high-end Tandy IBM PC-compatible computer was the Tandy 3000, introduced last November. That machine will continue to be offered with 512K bytes of memory and a 1.2M-byte floppy disk drive for $2,599. A 20M-byte hard disk version will continue to sell for $3,599.

The Tandy 3000 computer uses the Intel Corp. 80286 microprocessor and operates at 8 MHz. The Tandy 3000 Deluxe Graphics Adapter displays the standard IBM Color Graphics Adapter mode as well as additional modes.

Standard features include a real-time clock with battery backup, a serial and parallel adapter, a keyboard and a provision for an optional math coprocessor.

SOFTWARE & SERVICES

Systems software

IPT Corp. has introduced **F68K** and **C68K**, software products said to facilitate multiprogrammer Fortran and C code development on Digital Equipment Corp. VAX and Data General Corp. MV and Eclipse systems.

Each system includes a compiler, assembler, linker and librarian. Also incuded are IPT's source-level debuggers, Fortran-lint and, for C, Lint-Plus. Both debuggers are said to analyse all the modules in a program simultaneously and output operator-selectable levels of comment about the code.

F68K and C68K cost $9,500. Both Fortran-lint and Lint-Plus are available as stand-alone tools for $4,500.

IPT, 1096 E. Meadow Circle, Palo Alto, Calif. 94303.

■

Swanson Analysis Systems, Inc. has ported its finite element analysis program, **Ansys**, to Digital Equipment Corp.'s Vaxstation II/GPX and VMS operating systems.

Ansys is said to integrate preprocessing, solution, postprocessing and color graphics. It is said to be able to generate two- and three-dimensional, hidden-line or section plots and offer options such as multiple windows, zoom and perspective. A solid modeling module facilitates design visualization and optimization.

Ansys on the Vaxstation II/GPX is licensed on a monthly basis ranging from $1,500 to $21,000, depending on the number of users.

Swanson Analysis Systems, P.O. Box 65, Johnson Road, Houston, Pa. 15342.

■

Pansophic Systems, Inc. has announced **Telon 1.4**, an enhanced version of its application development productivity system for IMS-DC and CICS environments.

Telon has three integrated software components: the Telon design facility, the application system generator and the modeling and testing facility. Enhancements include prototyping, modeling without compiles, panel presentation stores and automated user documentation.

A Telon 1.4 perpetual license ranges in cost from $130,000 to $285,000. After the first year, maintenance costs 12% of the purchase price per year.

Pansophic, 709 Enterprise Drive, Oak Brook, Ill. 60521.

■

4D Software Ltd. has announced **Control-M**, a production control software system for IBM mainframe computers.

According to a company spokesman, Control-M features real-time release and contention elimination as well as the ability to dynamically handle the reallocation of resources between multiple CPUs.

Other features include job dependency definition, user notification, job recovery, dynamic print disposition, autoedit setup of IBM's JCL and reporting.

Control-M is priced at $42,000.

4D Software, 4 Browning Lane, Hartsdale, N.Y. 10530.



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Issue: July 9 - Closing: May 30

COMPUTERWORLD FOCUS

We put the hottest issues of the day in focus.

Applications packages

AGS Management Systems, Inc. has announced **Release 5.3** of its **PAC II** project management system.

Release 5.3 reportedly features new user and technical documentation, new entry screens, improved system menus and prompts, increased flexibility and power in tracking and retrieving resource information, increased security and increased flexibility in scheduling and tracking milestones.

The PAC II system runs on large- and medium-scale IBM, Digital Equipement Corp., Honeywell, Inc., Prime Computer, Inc., Burroughs Corp. and Sperry Corp. Univac computers.

PAC II Release 5.3 is priced starting at $44,000.

AGS Management Systems, 880 First Ave., King of Prussia, Pa. 19406.

Utilities

Professional Computer Resources, Inc. has announced **RMS Comparesource**, a software utility designed to simplify installation of the vendor's RMS/38 applications software.

RMS/38 is a resource management system designed to run on the IBM System/38. RMS Comparesource is said to be implemented as a System/38 command. The product is said to provide validation of input parameters with compatible data presentation.

Users can include or exclude all forms of comments, print an exception list or a complete list with exceptions noted, include the change date of each source line and hold or print the output, according to Professional Computer Resources.

RMS Comparesource is priced at $2,750.

Professional Computer Resources, Two Mode America Plaza, Oak Brook Terrace, Ill. 60181.

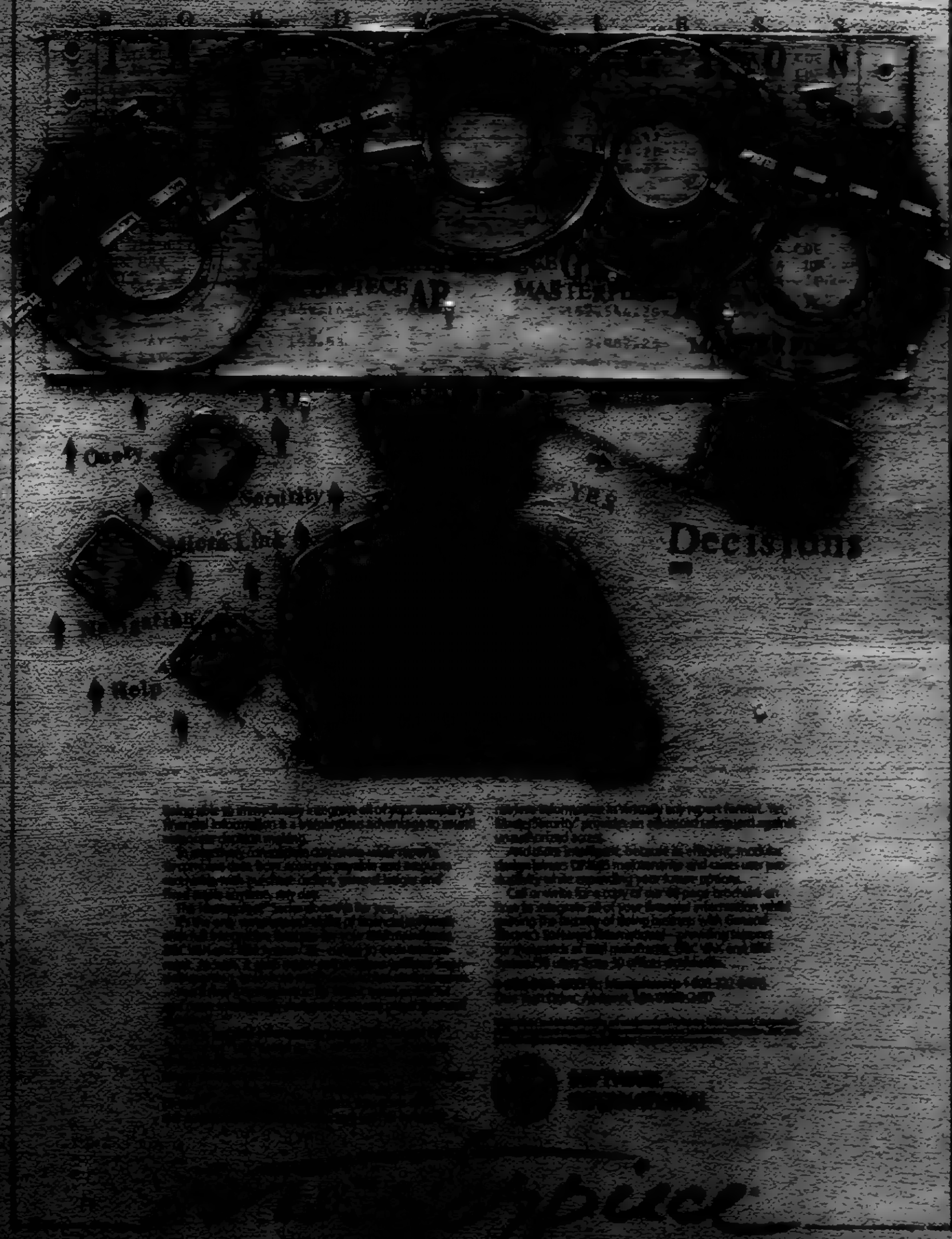
■

Relational Database Systems, Inc. has announced that its **Informix ESQL/Cobol** software is now available for Ryan-McFarland Corp.'s RM/Cobol compilers.

According to the vendor, Informix ESQL/Cobol will enable RM/Cobol application programmers to access the Informix-SQL relational data base via SQL commands embedded in

Continued on page 90

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Together, we can find the answers.

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NEW PRODUCTS/SOFTWARE & SERVICES

Continued from page 86

their programs.

The programs are said to pass through a compiler to convert SQL statements to Cobol, and the compiled Cobol code can interface with the relational data base.

Informix ESQL/Cobol for RM/Cobol compilers is priced from $595 on a personal computer to $36,000 on an IBM mainframe.

Relational Database Systems, 4100 Bohannon Drive, Menlo Park, Calif. 94025.

Fusion Products International, Inc. has added a table creation feature to **Fusion/36**.

Fusion/36 is a report writer and file manager package for the IBM System/36. The table creation feature is a data base tool enabling users to design an inquiry. Tables divide records from up to eight files into categories and then analyze field data in each category. A single table can hold up to 100 categories. A table can present a three-dimensional summary of a data base in one pass.

Fusion/36 with the table creation feature costs $3,600.

Fusion Products International, Suite 300, 4000 Civic Center Drive, San Rafael, Calif. 94903.

■

Global Software, Inc. has announced **Vista**, an information retrieval product for IBM mainframe and minicomputer systems.

Vista is said to be an online, menu-driven system offering query and report writing facilities.

Features include password security, access to information across various applications and customized ad hoc or recurring reports and queries.

Vista is packaged to enable users to access specific applications or multiple application data files, including non-Global products.

Vista is priced from $25,000 to $60,000.

Global Software, 1009 Spring Forest Road, Raleigh, N.C. 27609.

Data base management systems

Unify Corp. has ported its **Unify Relational Data Base Management System** to the IBM RT Personal Computer.

According to the vendor, Unify DBMS was designed for high-volume transaction-oriented applications in commercial environments and for scientific and real-time applications. It features high-performance multiple access methods and the capacity for storage of more than two billion records.

A development license for Unify DBMS on the IBM RT PC costs $1,995. One runtime license costs 50% of the development license price with quantity discounts available.

Unify, 4000 Kruse Way Place, Lake Oswego, Ore. 97034.

Training software

LS/Werner & Associates has announced the **Alvey Expert Systems Starter Pack**, said to be an expert systems educational product.

The pack provides an interactive, self-contained method in which to learn about expert systems. It consists of five modules: versions of four expert system software tools and a user guide.

According to the vendor, the four tools are set in context by presenting such topics as the issues surrounding the development of successful expert systems, expert systems methodology, introduction to and analysis of the four tools and a list of consultants to contact for further guidance.

The Starter Pack costs $1,995.

LS/Werner & Associates, Suite 331, 1433 Santa Monica Blvd., Santa Monica, Calif. 90404.

■

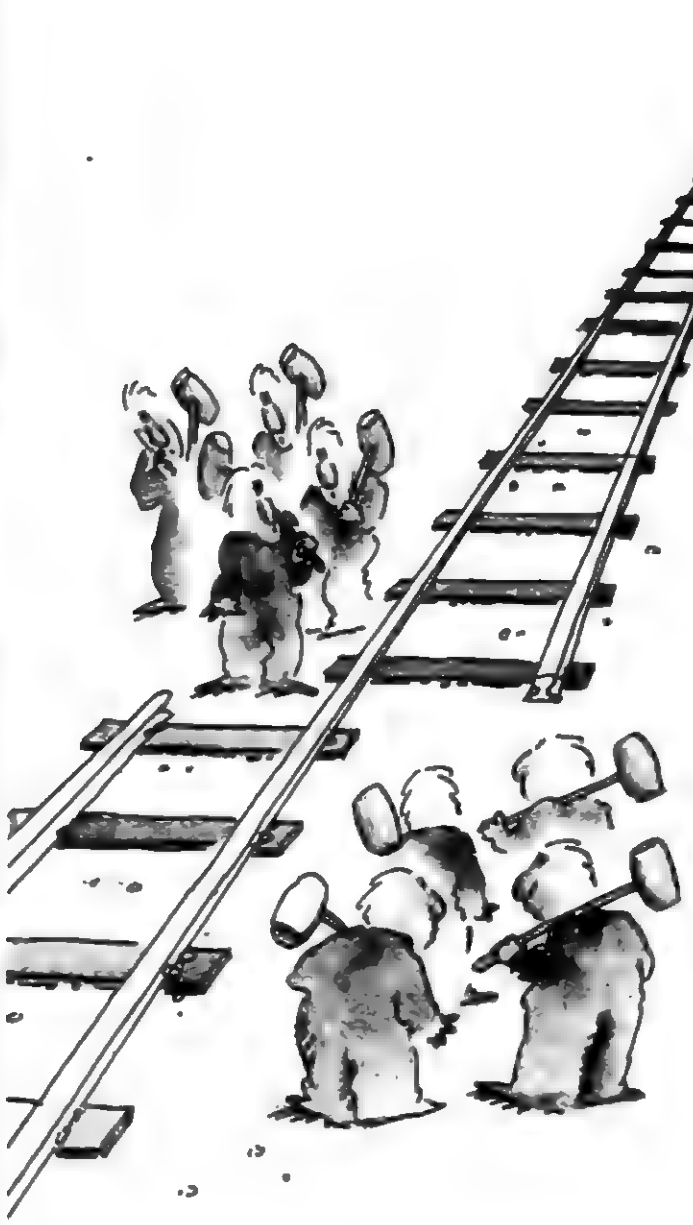
Deltak, Inc. has unveiled its **Training Management System** for the IBM Personal Computer XT or AT.

The menu-driven, on-line interactive system is written in Ashton-Tate's Dbase III and features curriculum planning and comprehensive reporting. It also includes color monitor capabilities.

According to the vendor, the Training Management System was designed to establish training plans for learner-paced instruction and lecture classes, track individual training plans, summarize the results and generate management reports.

The system is reportedly available to Deltak customers through their rental

Continued on page 94



WHEN IT COMES TO BUILDING WIDE-AREA NETWORKS, THERE'S NO SUBSTITUTE FOR EXPERIENCE.

While any number of companies can offer to sell you a private wide-area network, one company can offer you 25 years of computer and communications experience along with it. BBN Communications.

Experience that includes designing and building the world's first packet-switching network for the U.S. government back in 1969. Since then, it has evolved into the world's largest wide-area network, the Defense Data Network, connecting over 30,000 users throughout the world.

But the U.S. Government isn't the only customer with tough networking problems that BBN has helped to solve. Numerous major corporations, among them Wang, Weyerhaeuser, and MasterCard, not to mention European giants like England's National Westminster Bank and Italy's largest corporation, ENI, have also found the answers they were looking for from us. Each came to BBN with a unique networking problem—from integrated voice/data transmission to electronic mail to credit authorization—and each came away with a unique networking solution.

If you're going to make a major commitment to a wide-area network vendor, only three things count. Experience, experience, and experience. In wide-area networking only one company delivers it all.

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Why is MODEL 204 the pacemaker for handling larger databases?

Heartbeat response.

When it comes to fast response to queries and updates, there's no database too large for Computer Corporation of America's MODEL 204.

In fact, against the competition, the bigger the database, the better we look. Here's an example:

A large travel agency with 900-plus on-line terminals uses MODEL 204 to maintain information on accommodations and transportation options around the world. In a benchmark simulating 1,000 users, 1,920 complex transactions were made in one minute on the travel agency's 2-gigabyte database. Response time? An average of 1.1 seconds.

The simple fact is, there is no relational-based DBMS that can store more, or handle it faster than MODEL 204, no matter how complex your queries get.

Like one large direct marketing firm that uses MODEL 204 for on-line real time sales tracking and analysis.

Their 10-gigabyte database contains 4,000 fields, of which 3,000 are keyed. Average response time to extremely complex queries of 3,000 or more transactions per minute? Less than 10 seconds. For less complex queries, response time drops to less than 2 seconds.

Heartbeat response. Another way of saying MODEL 204.

Get the facts. Write John Donnelly, V.P. Marketing, Computer Corporation of America, Four Cambridge Center, Cambridge, MA 02142. Or, call 1-800-258-4100, extension 603.

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Software innovators creating better ways to manage business.

Talk is Cheap.

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Today's system software buying decisions will affect your company for years to come.

Before you select a vendor, talk to people you can trust.

If you're about to invest in system software for your mainframe, here's some free advice that may surprise you:

Go slowly.

The decision you're making will be felt for years to come throughout your entire organization. So don't try to shortcut the selection process.

And in particular, don't make a decision without talking to people with first-hand experience—the users of the products in question.

Naturally, we believe that Software AG products offer the best solutions available to the problems you face. And we'd like to have an opportunity to convince you—not by competitive claims and counterclaims, but by demonstrated performance in real-world customer sites.

In the meantime, we'd like to offer a few thoughts on some factors that contribute to performance.

Needed: integrated, long-term, worldwide solutions.

If you've been involved in data processing for any length of time, you already know more than enough about the dangers of piecemeal "quick fixes". You don't have to be sold on the value of integrated tools that meet a full range of organizational needs through a common syntax and shared procedures.

But while many vendors preach integration, few practice it on the scale of Software AG. From our core products, ADABAS and NATURAL, we have created an entire universe of software products that simultaneously meet the needs of everyone from MIS professionals to end users with no programming experience.

We're also integrated in another way—geographically. As more and more organizations seek to coordinate resources and data on a worldwide basis, they need a caliber of support that is consistent worldwide. Software AG's reach is unique among independent software vendors—with products installed in 52 countries.

Fourth-generation technology: Who needs it? Who's got it?

A lot of vendors have expended a lot of hot air on the subject of fourth-generation languages. And we'd be the last to deny that a well-designed 4GL like NATURAL can be a phenomenal productivity tool—as much as 10 to 20 times more productive than COBOL, for instance.

But the language itself is only part of the story. Because in committing to a fourth generation system, you're really committing to an entire technology for meeting your organization's needs. You'd better be sure that technology includes everything you need—from DBMS, 4GL, and data dictionary to end-user computing tools, office systems, micro/mainframe links, and intersystem communication facilities. If it doesn't, you may be looking at only a partial solution.

In any case, don't evaluate a 4GL by itself. Evaluate it in relation to the other products that are required to satisfy your total information needs. Do they share a common architecture or syntax? Were they designed together, or are they simply marketed together? And most important of all, how do people like working with them?

We *know* how people like working with NATURAL. After all, it's the world's most widely installed, widely experienced fourth-generation language—used by over 75,000 programmers. If you're looking for insights into 4GL technology, you might start by talking with one of them.

Industry surveys repeatedly rate Software AG #1.

It's one thing for a vendor to be proud of its products. It's another for an entire industry to share in that high regard.

Yet that's just what's been happening with Software AG products. For several years, *Datapro* and *Datamation* have both published annual surveys of system software users. And Software AG has repeatedly come out on top by a variety of yardsticks. That's not rhetoric—that's performance.

Software AG: high-performance vendor to over 2000 customers.

Because system software is a long-term investment for most organizations, it inevitably carries with it a long-term relationship with the software vendor.

And for many years, we and our users have recognized the importance of that relationship. In fact, we have worked together to shape it in the interests of delivering the best possible product performance.

But while we're glad our users take the trouble to respond to surveys, we have no control over their comments.

Which makes it all the more gratifying to see the survey results. And all the more imperative that you hear what users have to say—before you buy.

Just give us a call today. Or send in the coupon. We'll be glad to put you in touch with Software AG users in situations comparable to yours, so you can find out for yourself what industry insiders have known all along.

Anyone can talk. But when it comes to performance, Software AG stands alone.

Call us at 1-800-336-3761. (In Virginia and Canada, call 1-703-860-5050.)

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11800 Sunrise Valley Drive, Reston, VA 22091

Continued from page 90

agreements, or it can be purchased for $1,100.

Deltak, East-West Technological Center, 1751 Diehl Road, Naperville, Ill. 60566.

MICROCOMPUTERS

Systems

Vision Research, Inc. has announced its **Desktop Page Composition System** for the IBM Personal Computer, Personal Computer XT, AT and compatibles.

According to the vendor, the system consists of a 300 dot/in. resolution input scanner, a Megabuffer interface board and Megascan image and text editing software.

The Composition System reportedly lets the user store electronic snapshots of printed or computer-generated material and edit them under computer control. The images can be documents, drawings, photos, line art or screen snapshots of other application programs.

The Desktop Page Composition System is priced at $2,495.

Vision Research, Suite B-112, 1590 Old Oakland Road, San Jose, Calif. 95131.

■

Digital Vision, Inc. has introduced a version of its **Computereyes** video acquisition system for IBM Personal Computers and compatibles.

Computereyes is said to allow users to capture real-world images with any standard video source. According to the vendor, two acquisition modes allow the capture of either high-contrast images or 16 gray-level images. On-board switching allows the video source signal to be previewed on the monitor.

The package includes interface adapter, complete software support on disk and manual. It costs $249.95.

A system including a video camera is priced at $529.95.

Digital Vision, Suite 2, 14 Oak St., Needham, Mass. 02192.

■

General Micro Systems has introduced **VK4010**, a hardware and software package said to enable an off-the-shelf personal computer to match the speed and graphics of a dedicated computer-aided design and manufacturing workstation.

Full keyboard and screen emulation of Tektronix, Inc.'s 4010/14 graphics terminals is provided, as well as Digital Equipment Corp.'s VT series emulation.

Hardware includes a graphics controller, monochrome monitor and a character generator. The software features user-programmable soft keys and scripts and a DOS shell.

VK4010 costs $2,295.

General Micro Systems, P.O. Box 5330, 9951 Valley View Road, Minneapolis, Minn. 55343.

■

Panasonic Industrial Co. has unveiled the **Business Partner**, an IBM Personal Computer-compatible desktop system.

The Business Partner is based on an Intel Corp. 16-bit 8086-2 microprocessor. It is user-switchable between 4.77 MHz and 7.16 MHz.

According to the vendor, the Business Partner offers six expansion slots and includes 256K bytes of random-access memory. Other features include Microsoft Corp. MS-DOS 3.1 and GW-Basic, a built-in parallel port and an IBM Personal Computer AT-style keyboard.

The $1,295 model features a 5¼-in. 360K-byte floppy disk drive; the $1,495 model incorporates two disk drives.

Panasonic, One Panasonic Way, Secaucus, N.J. 07094.

Software applications packages

Realia, Inc. has announced **RealCICS**, said to allow development of CICS applications for either an IBM mainframe or Personal Computer.

The system includes the command-level Cobol program preprocessor that converts CICS command-level Cobol programs to a form that can be compiled by Realia Cobol.

The resource definition processor validates and converts CICS system macros to a form suitable for the Personal Computer. The Basic Mapping Support (BMS) macro processor produces the tables and Cobol copy members required for mapped screen use, and a map editor allows the interactive painting and generation of BMS maps.

RealCICS runs on the IBM family of Personal Computers. It costs $995. Additional copies of the operating environment cost $150.

Realia, 10 S. Riverside Plaza, Chicago, Ill. 60606.

■

Samna Corp. has announced **Samna Decision Graphics**, a graphic software package for IBM Personal Computers and compatibles.

According to the vendor, users can create graphs automatically from numerical and statistical data.

The software package is said to convert rows and columns of numbers into graphic forms and present input and calculations on the screen, on a plotter or on a printer. According to the vendor, there are 375 types of graphs available and 30 built-in calculations.

The software accepts data from a central computer, external files, information entered on the keyboard or old files.

Samna Decision Graphics costs $450.

Samna, 2700 N.E. Expwy., Atlanta, Ga. 30345.

EXECUTIVE REPORTS

Special Editorial Features

Every issue of Computerworld presents either a Product Spotlight or Executive Report. For advertisers, it's still not too late to take advantage of the hot topics set for June!

Executive Round Table (June 16) Five top executives discuss such key MIS/DP industry and business issues as: the two most important issues MIS/DP execs face in 1986, does next year's budget include more or less hardware or software purchasing; is management facing mostly technical or administrative issues? Also, expert thoughts on solving telecommunications problems and the proposed Burroughs-Sperry merger. Closing date May 30

Personal Computer Graphics (Product Spotlight, June 23) How to evaluate and select PC graphics software for business presentations. Plus, graphics mainframe-to-micro links and a user survey. Closing date June 6

Integrated Office Automation Systems (Executive Report, June 30) Current strategies of major vendors supplying integrated office systems. Established products, and newer ones that offer unique OA technologies like voice annotation and image technology. Determining user needs, the latest on network security. Closing date June 13

And it doesn't stop there! Important and pertinent Executive Reports and Product Spotlights topics continue through July and August

ISSUE	TOPIC	CLOSING DATE
July 7	Data Security (Executive Report)	June 20
July 14	Expert Systems (Product Spotlight)	June 27
July 21	PBX Networks (Executive Report)	July 3
July 28	Management Training for DP Executives (Executive Report)	July 11
August 4	Applications Generators (Product Spotlight)	July 18
August 11	Information Centers (Executive Report)	July 25
August 18	On End-user Computing (Executive Roundtable)	August 1
August 25	Image Processing (Product Spotlight)	August 8

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PRODUCT SPOTLIGHTS

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Tandem technology sets the new standard for large applications in on-line transaction processing.

More transactions per second at a lower cost per transaction than any system in the world.

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We designed the system in our own laboratory, right down to our own unique VLSI chips. The result is more circuitry in less space. With fewer components than our next largest system, the VLX delivers twice the performance and three times the reliability.



PROCESSORS WITH LARGE APPETITES.

The VLX processors move transactions in 32-bit chunks. They reach into main memory in 64-bit chunks. Because this happens in parallel, more work gets done in less time at a lower cost per transaction.

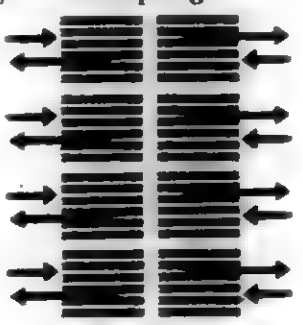
THE SERVICE IS EASY.

All critical components are field replaceable. When service is required, it's faster. You don't even have to stop an operation to add or replace components.



THE DATA EXPRESSWAY.

In a conventional database, I/O requests must be handled sequentially. This creates queues that slow response time. In the VLX system, there are multiple paths to multiple disks. Data enters and leaves the database simultaneously. No time is wasted, and all disk space gets used.

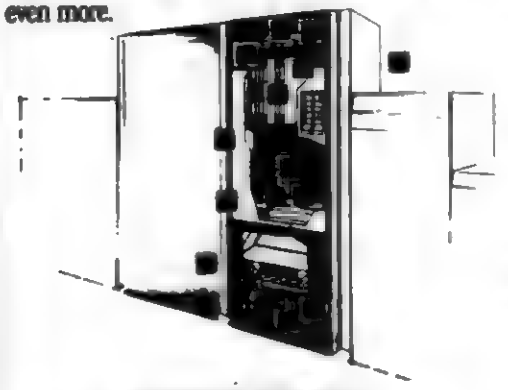


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NO GROWING PAINS.

To add power, just add processors. You can grow from a base four-processor system to 16. From there, you can expand in whatever increments you choose, all the way to 255 systems. You never buy more than you need, and you'll never have to rewrite a line of applications code.



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Tandem systems achieve fault-tolerance with a unique, parallel processing architecture. There are no idle back-up components. Instead, multiple components share the workload. If one goes down, the others pick up the slack, and application processing is uninterrupted.

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The VLX is compatible with any Tandem system and with all major communications standards — SNA, X.25, MAP and O.S.I. And by acting as a gateway to other vendors' systems, the VLX can link them and enhance their value as well.

WE HAVE EXCELLENT REFERENCES.

Tandem systems are already at work for Fortune 500 companies in banking, telecommunications, manufacturing, transportation, retailing and energy, as well as several branches of the U.S. Government.

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TANDEM COMPUTERS



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Take, for instance, its uncommon speed. Unlike most other PCs, the PC 6300 PLUS works as fast as you do, so you never have to wait for it to catch up with you.

AT&T offers another clear-cut reason for selecting the PC 6300 PLUS: Its highly defined, easy-to-read screen resolution. Compared to the IBM PC AT,* the PC 6300 PLUS text and graphics are four times sharper. Whether you're working on sales charts or preparing presentations, getting a better picture helps communicate the big picture.

Our non-glare screen and tilt-and-swivel monitor allow you to work comfortably on the PC 6300 PLUS for hours at a time. Its sleek design enables this unusually powerful PC to fit easily on your desk. Again, next to all the major competitors, AT&T's PC takes up 40% less desk space.

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There's more to AT&T's PC 6300 PLUS than sheer power and comfortable design.

There's a side no one's ever seen before. It's a special feature on the PC 6300 PLUS called Simul-Task which lets you do things on a desktop computer that other PCs only hope to do someday: it works the way you work.

Say, for example, you are working on a spreadsheet and need the latest stock quotes. Simul-Task enables you to call up the new information and return to your original program in a fraction of the time it would normally take. You'll soon be able to activate Simul-Task.

When you are ready to protect your work, the PC 6300 PLUS enables you to eas-



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WITH THE MULTIPLE PERSONALITY.

ily make backup files while you continue on with other things. You can also schedule programs to run while you're away from your machine, so when you return, all the information will be waiting for you. The PC 6300 PLUS even affords you the convenience of sending and receiving electronic mail in the background while you run another program in the foreground.

THE COMPUTERS WITH THE FUTURE BUILT IN

The combination of high performance and unique features makes the AT&T PC 6300 PLUS the personification of PC investment protection. Without abandoning the software you already own, you are bringing some extraordinary new capabilities to your desktop.

That's what you'd expect from AT&T, the one company whose computers are designed for the future.

All the more reason why the PC 6300 PLUS may very well be suited to your personality.

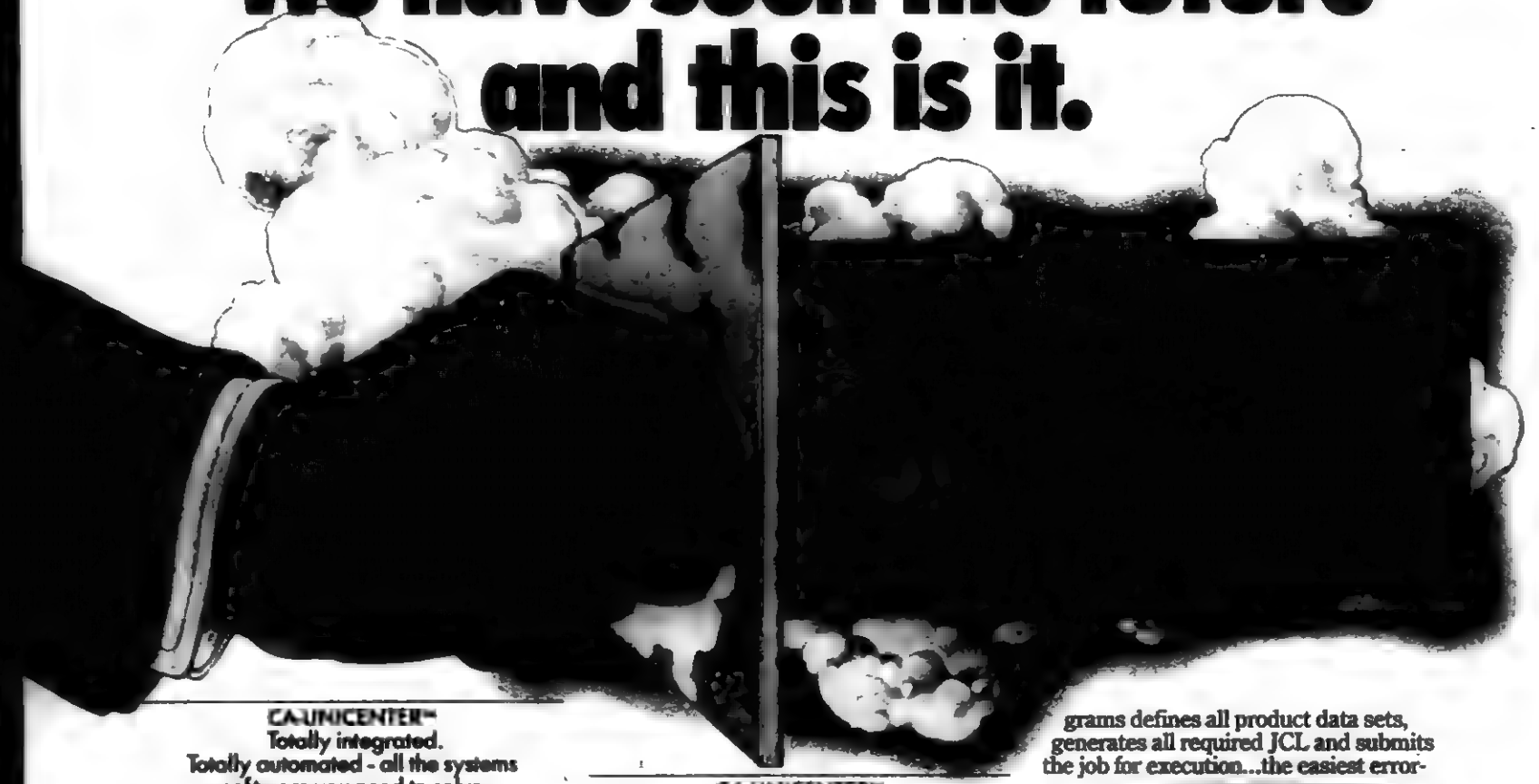
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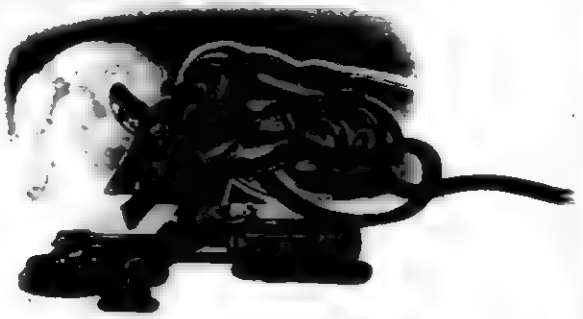
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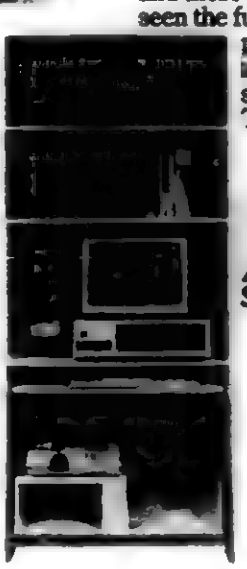
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NEW PRODUCTS/MICROCOMPUTERS

Gessler Educational Software has announced two foreign language word processing programs, **Alexander** and **Gutenberg**.

Alexander has multilingual symbols for French, Spanish, German, Italian, Greek, Hebrew, Russian and English.

It is also equipped with the symbols used in science and math notation, music composition and electronic schematics.

Alexander runs on the IBM Personal Computer, AT&T Personal Computer 6300 and Compaq Computer, Inc. compatibles.

Gutenberg offers formats in 13 different languages. It runs on the Apple Computer, Inc. II+, IIe and IIc, according to the vendor.

Alexander costs $245. Gutenberg costs $99.95.

Gessler Educational Software, 900 Broadway, New York, N.Y. 10003.

■

Gessler Education Software has introduced **Passport**, **Prompt** and **Questionmaster**, three computer software authoring systems for foreign language curriculum use.

Passport was designed for creating courseware for learning French, Spanish, German, Russian, Hebrew, Japanese and 13 other languages.

It runs on the Apple Computer, Inc. II family.

Prompt is for lessons in English as a second language, French, German, Italian and Latin. It runs on the IBM Personal Computer and PCjr.

Questionmaster reportedly allows the teacher to construct interactive teaching and testing programs for learning French, German and English as a second language.

It also runs on the Apple II family.

Prices for Passport, Prompt and Questionmaster are $195, $150 and $69, respectively.

Gessler Educational Software, 900 Broadway, New York, N.Y. 10003.

■

Rainbow Software Systems has introduced **Client Plus**, a program said to help users manage client development and marketing activities.

The program is said to organize client profiles, sort personal contacts, track referral sources, target prospects, provide for follow-up letters, monitor weekly marketing activities, calendar events and create a library of articles and speeches.

Client Plus has two sections: files and reports. It runs on IBM Personal Computers and compatibles with 348K bytes of memory, a single diskette drive and a hard disk drive, according to the vendor.

The program costs $495.

Rainbow Software Systems, 23832 Bluehill Bay, Laguna Niguel, Calif. 92677.

■

Oakland Group, Inc. has announced **C-scape**, a screen generator for C developers designed for use on the IBM Personal Computer.

C-scape reportedly allows users to create input editing screens and menus in the C language.

It has syntax that extends C's Print-F function to include a menu definition language that allows screen addressing, field definition and data action and validation.

C-scape can be used directly with Bricklin's Demo Program, allowing users to create source code without having to re-enter such codes as screen contents and window coordinates, the vendor said.

C-scape costs $149. With the Demo Program, it costs $219.

Oakland Group, 675 Massachusetts Ave., Cambridge, Mass. 02139.

Software utilities

General Micro Systems has added **PC220** to its line of terminal emulation packages.

PC220 provides full keyboard and screen emulation of Digital Equipment Corp. VT220, 200, 102, 101, 100 and 52 terminals. It runs on the IBM Personal Computer, Personal Computer XT, AT and compatibles.

Up to 30 soft keys can be defined. Scripts can be attached to keys or can be executed automatically when PC220 loads, according to the vendor.

An autodial directory is included as well as a shell key.

PC220 costs $169.

General Micro Systems, P.O. Box 5330, 991 Valley View Road, Eden Prairie, Minn. 55343.

■

Colin James III has announced the **Algorithm of Syntactical Mnemonics** (ASM), software intended to reduce the space and time needed for data transmission and storage.

ASM is said to be a one-pass data contraction software product. According to the vendor, it does not use compression, global search, packing, shifting or suppression. It reportedly offers direct throughput without buffering or I/O. It contracts alphanumeric data and processes data at a rate of 106K to 285K bit/sec. on an Intel Corp. 80286 at 8 MHz.

A corporate license costs $1,000; per division site, the cost is $100 a month. There is a $1 royalty per personal computer disk sold.

Colin James III, Box 4, 480 S. Vine St., Denver, Colo. 80209.

■

Panasonic Industrial Co. has announced a **software tool** for its 32-ounce Personal Partner hand-held computer.

The software development tool is said to allow developers to create and test custom applications programs on any Microsoft Corp. MS-DOS computer then download the programs to the Personal Partner.

According to the vendor, programs can be developed in the Forth programming language or in Intel Corp. 8088 assembly language.

Applications can be run and debugged on the MS-DOS computer or directly in the Personal Partner via a random-access memory/read-only memory hardware device.

The software costs $1,995.

Panasonic, One Panasonic Way, Secaucus, N.J. 07094.

■

General Optimization, Inc. has announced the **What's Best Personal Version** for personal computers.

What's Best is a spreadsheet optimization program. The personal version is not copy protected, and it runs on 256K bytes of random-access memory. According to the vendor, it can optimize spreadsheets with up to 800 numeric cells. Up to 250 of these cells can be variable.

What's Best Personal Version is priced at $149. Other versions available include the Commercial Version for $695 and the Professional Version for $995.

General Optimization, 2251 N. Geneva Terr., Chicago, Ill. 60614.

Software data base management systems

Tominy, Inc. has released a version of its **Databasicplus** Basic data base manager, said to interface with the IBM Basic language version 3.2.

Databasicplus reportedly gives a programmer the ability to access a full logical data base system from the Basic programming language. According to a company spokesman, record holding logic, data independence, dynamic space allocation and data access by indexed and sequential keys are standard.

Databasicplus also supplies utilities to create and maintain the data base.

Databasicplus runs on IBM PC-DOS-compatible systems. It costs $99.95.

Tominy, 4221 Malsbary Road, Cincinnati, Ohio 45242.

Software enhancements

Metasoft Corp. has released **The Benchmark Word Processor Version 4.5** for the IBM family of Personal Computers, the NEC Corp.

Continued on page 100

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NEW PRODUCTS/MICROCOMPUTERS

Continued from page 99

APC and APC III, the Victor Technologies, Inc. 9000 and the Digital Equipment Corp. Rainbow.

Added features include the ability to include full-featured graphics in documentation or window-marked text in the Benchmark Graphics and enhanced cursor movement control; printer HEX codes can be imbedded within text. ASCII files from data base management systems can be inserted into a form document, and spreadsheet data can be imported into text.

Prices range from $149 to $695.

Metasoft, Suite 12, 6509 W. Frye Road, Chandler, Ariz. 85226.

■

Everex Systems, Inc. has announced **Version 4.0**, a software package for users of streaming tape systems utilizing the Everex controller.

Version 4.0 performance improvements include the ability to conduct file-by-file operations at close to streaming speed.

Additional performance improvements are such features as performing backup on multiple backup sessions on the same tape and reduced storage requirements, according to the vendor.

Other features include movable nesting windows, on-line Help and a general-purpose notebook program.

Version 4.0 is priced at $150.

Everex Systems, 48431 Milmont Drive, Fremont, Calif. 94539.

■

North Edge Software Corp. has released **Version 2.2** of its **Timeslips** memory-resident time and billing system for the IBM Personal Computer and compatibles.

Timeslips 2.2 includes added flat-fee billing options and the ability to adjust a bill up or down by a flat dollar or percent amount and reports on account billing history by month and year to date.

The system also includes added description of the work performed on the automated time record and a function key that reportedly allows users to duplicate any field on a time slip.

Timeslips 2.2 is priced at $99.95.

North Edge Software, P.O. Box 286, Hamilton, Mass. 01936.

Communications

Torus Systems has announced **Tapestry Starter Packs** consisting of a Tapestry Network Manager Pack and a Workstation Pack.

According to the vendor, Starter Packs provide enough software for a full-functioning two-station network.

Tapestry is network operating software. It features an icon-based user interface that integrates electronic mail, file and printer sharing and communications gateways, the vendor said.

Tapestry Starter Packs are priced at $295 each.

Torus Systems, Suite 105, 495 Seaport Court, Redwood City, Calif. 94063.

■

Intelligent Technologies International Corp. has released **Modem Exchange**, a micro-to-mainframe communications product.

The Modem Exchange board features a 4.8K bit/sec. AT&T 208 A/B compatible modem. It plugs into any IBM Personal Computer or compatible expansion slot.

Using a standard phone line and the Modem Exchange software, the user can access any software application running in the Systems Network Architecture environment, including IMS, CICS and TSO/IPF, according to the vendor.

Modem Exchange features autodial for pulse or tone dialing of up to 36 digits in attended or unattended modes.

Modem Exchange is priced at $1,995.

Intelligent Technologies International, 737 Lincoln Centre Drive, Foster City, Calif. 94404.

■

Galacticomm, Inc. has announced the **Galacticomm Breakthrough**, a 16-channel modem card for the IBM Personal Computer XT, AT and compatibles.

Together with the Software Breakthrough object library, Galacticomm Breakthrough can support up to 64 simultaneous users at a rate of 300 or 1,200 bit/sec., according to the vendor.

The software is IBM PC-DOS compatible, the vendor said.

Galacticomm Breakthrough costs $7,450, including card, adapter, cable and software.

Galacticomm, 11360 Tara Drive, Plantation, Fla. 33325.

Data storage

Priam Corp. has introduced the **External Disk** (ED) and the **External Tape** (ET) series of desktop storage systems for the IBM Personal Computer family of microcomputers and compatibles.

The ED series consists of a 5¼-in. Winchester disk drive available in 43M, 60M or 103M bytes, interface card, installation and utility software and cables, according to the vendor.

The ET series consists of a 60M-byte, ¼-in. streaming tape drive, a removable tape cartridge, controller card, installation software and cables.

The ED series is priced from $1,695 to $2,995.

The ET series can be purchased for a price of $1,895.

Priam, 20 W. Montague Expwy., San Jose, Calif. 95134.

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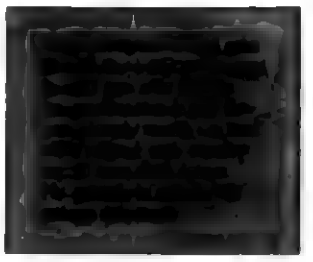


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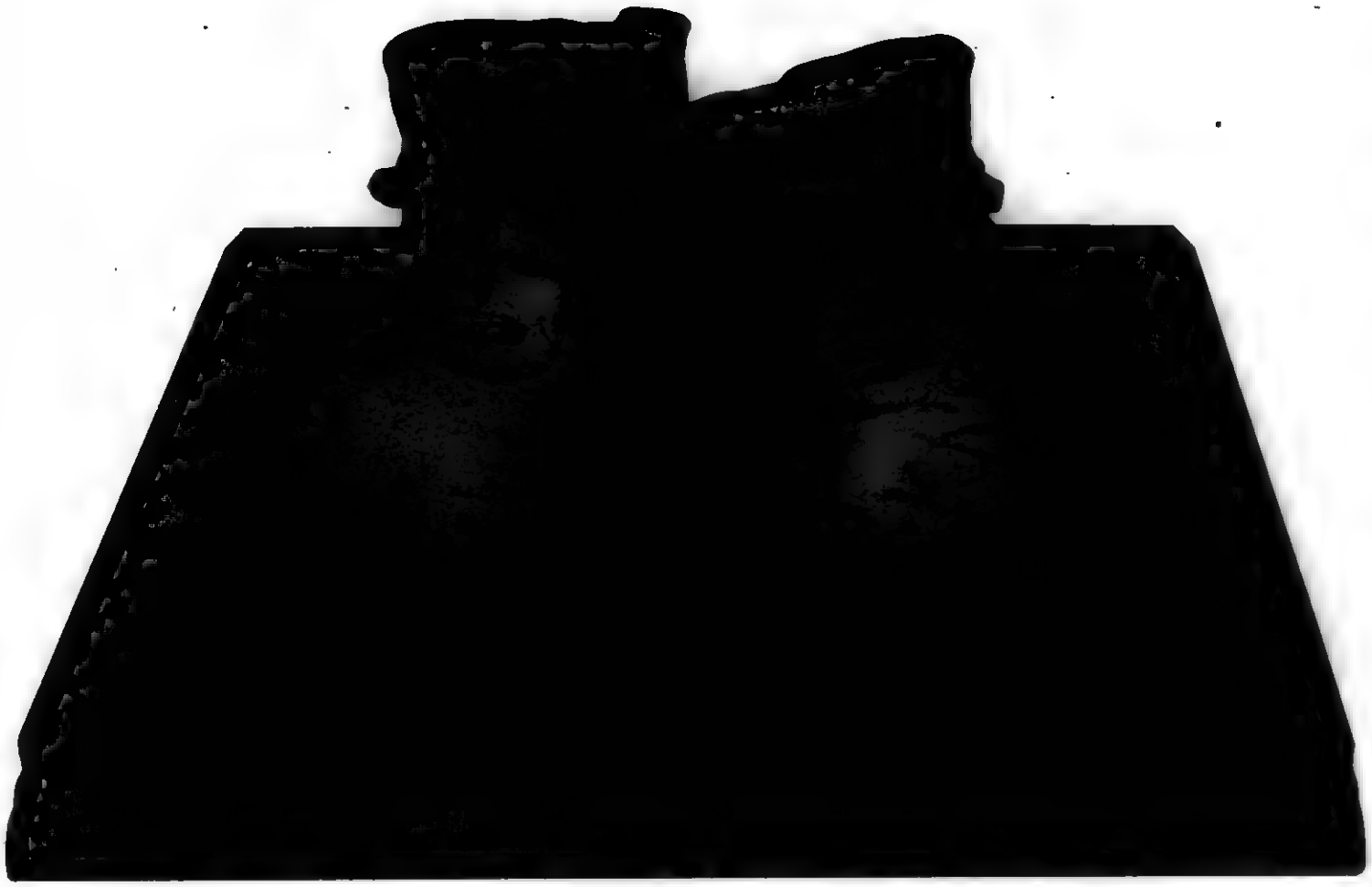
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NEW PRODUCTS/MICROCOMPUTERS

Printers/Plotters/Peripherals

Output Technology Corp. has announced the **OT-700N** near-letter-quality printer.

The OT-700N has a draft speed of 200 line/min. and offers near-letter-quality Helvetica font styling with 10-pitch printing at 25 to 51 char./sec.

Other features are said to include dual-mode dot-addressable graphics, front-panel menu programming, 8K-byte buffer and front and bottom paper feed.

According to the vendor, multipitch printing up to 16.6 char./in., Epson America, Inc. FX and Digital Equipment Corp. LA-120 emulation as well as both serial and parallel interfaces are also featured.

The OT-700N near-letter-quality printer is priced at $2,095.

Output Technology, Bay #33, E. 9922 Montgomery, Spokane, Wash. 99206.

ITT Qume has announced the **Profeeder 2EM** sheet-feeder.

The sheetfeeder was designed for users with large multipage and envelope addressing projects. It automatically snaps into the ITT Qume Sprint 11 Plus series daisywheel printers.

It is a demand-feed system with dual input bins and integral envelope feeder, which allows simultaneous printing of multipage documents and their envelopes.

The Profeeder 2EM is priced at $1,195.

ITT Qume, 2350 Qume Drive, San Jose, Calif. 95131.

■

Applied Data Communications has introduced the **RDH 3.5 L/L Robotic Disk Handler**, said to load automatically, copy and apply wraparound labels to 3½-in. diskettes.

The disk handler can apply labels to as many as 100 diskettes per batch. It features both serial and parallel interfaces, enabling it to copy data from a host computer or from any of the vendor's duplication systems. It accepts a roll of up to 1,000 preprinted labels.

According to the vendor, the device also accommodates the requirements of Apple Computer, Inc.'s Macintosh and other 3½-in.-based systems.

The disk handler costs $12,995.

Applied Data Communications, 14272 Chambers Road, Tustin, Calif. 92680.



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COMMUNICATIONS

Controllers

Black Box Corp. has introduced the **Black Box MNP Error Controller.**

The device is a networking protocol said to allow data communication between personal computers, networks or mainframes. When it detects a transmission error, it automatically returns that data block.

The device operates in three switch-selectable modes. It can communicate only with systems that use the Microcom Networking Protocol (MNP) error-checking protocol and automatically determine if the error-checking standard is active at the receiving end. The system can also operate as though the device were not present.

Priced at $295, it can transmit data rates of 300, 1,200 or 2,400 bit/sec.

Black Box, P.O. Box 12800, Pittsburgh, Pa. 15241.

■

Standard Microsystems Corp. has introduced the **Arcnet-PC300** fiber-optic local-area network controller board.

The board incorporates the Raycom Systems, Inc. Raycom 3101 fiber-optic transceiver driver, the Standard Microsystems' COM9026 local-area network controller and the COM9032 Arcnet local-area network transceiver large-scale integration chip. It features a 2K-byte on-board data packet buffer and an on-board 8K-byte programmable read-only memory socket.

The Arcnet-PC300 is priced at $995.

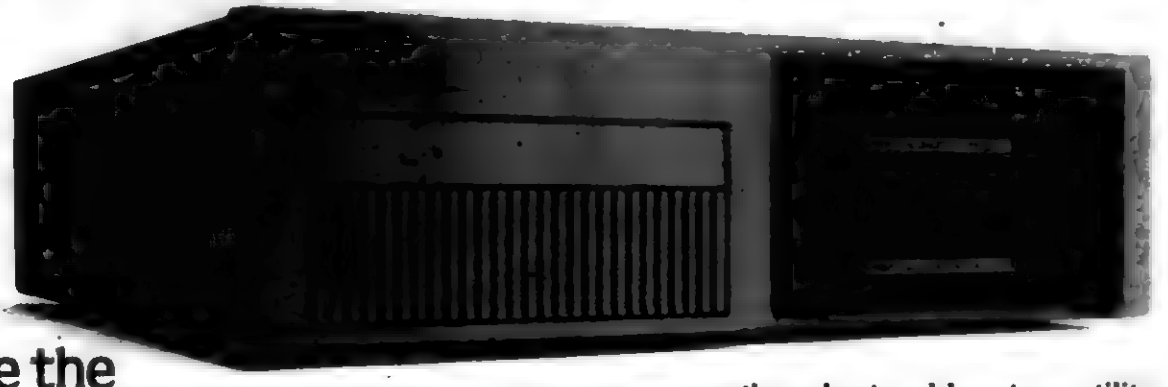
Standard Microsystems, 35 Marcus Blvd., Hauppauge, N.Y. 11788.

Voice/data communications

Infotron Systems Corp. has introduced its **Integrated Data Voice Multiplexer (IDVM)**, a data-over-voice system said to take advan-

Continued on page 104

Announcing the Bernoulli Box Plus.™



It took Bernoulli Technology to take the limits off hard disk.

Introducing the Bernoulli Box Plus: a mass storage subsystem that gives users increased data availability on-line; infinite data expandability; and the versatility to manage everything from sophisticated networks (LAN) to power-user applications.

The Bernoulli Box Plus combines an 80-MB hard disk drive with two 20-MB drives that utilize high performance, removable Bernoulli disk cartridges. The two technologies are housed in a single external subsystem, providing a singular set of performance features and user benefits.

First, is the fact that the Bernoulli Box Plus is not simply an all-disk equivalent to hard disk with tape back-up. Bernoulli drives are high performance devices that run data as fast as your PC will allow. Speeds are identical whether you're using data housed on the hard disk drive or the Bernoulli drives. *More important—the Bernoulli drives represent removable, on-line, random-access storage.* So critical files can be *created* on cartridge; *saved* on cartridge (down to the most recent model or key stroke); *transported* on cartridge; *backed up* on cartridge (from another cartridge or from the hard disk); and *secured* on cartridge (in a desk drawer).

In data-intensive applications—such as computer-aided design and computer-aided engineering—the Bernoulli drives' on-line capabilities mean that operating systems and applications software can reside on the hard disk while other functions are brought on-and off-line via cartridges as needed.

The cartridges—infinitely expandable and strategically manageable by project or department—reduce capacity demands on the hard drive, boosting hard drive throughput and long-term utility.

In addition, the cartridges provide the transportability and security that have helped make Bernoulli technology the new standard in mass storage solutions.

For the network user—the Bernoulli Box Plus represents the most sophisticated storage concept ever introduced. It can be used by many workstations—as a file server—or by any individual workstation. Again, the on-line capability of the Bernoulli drives permits efficient management of the hard disk's limited storage capacity. The Bernoulli Box Plus supports both PC NET and NOVELL networking environments and is compatible with any PC running under the IBM PC Network program.

Mainframe data management in the micro environment. Continuous availability of primary storage; immediate access to secondary files. This strategic structure—perfected in mainframe and mini environments—extends the capacity of hard disk and increases overall subsystem speed, reliability, transportability and versatility.



Hard disk capacity has finally come to a better end—with the beginning of the Bernoulli Box Plus.

For additional information, please call 1-800-255-5550, Extension 458.

IOMEGA
BERNOULLI TECHNOLOGY

IOMEGA Corporation Holly Pond Plaza, 1301 Main Street, Stamford, CT 06902 (203)359-0850

Continued from page 102

tage of unused bandwidth on existing telephone lines to transmit both voice and data simultaneously.

The IDVM consists of a station unit and filters. It works with analog or digital private branch exchanges or Centrex-type telephone switching systems. It features an RS-232 interface.

The IDVM costs $450 per connection.

Infotron, Cherry Hill Industrial Center-9, Cherry Hill, N.J. 08003.

■

Honeywell, Inc. has introduced the **Delta-Plex Series 100** electronic six-wire, key-telephone system.

Based on two processing units, the Delta-Plex 100 family offers three models. The Delta-Plex 101 serves users with up to 16 stations; the Delta-Plex 102 services up to 32 stations; and the Delta-Plex 103 serves up to 64 stations.

Any station or group of stations may be programmed to appear on one instrument or group of instruments.

The series costs $450 to $700 per station line.

Honeywell, Honeywell Plaza, Minneapolis, Minn. 55408.

Protocol converters

Perle Systems, Ltd. and **GSD Systems, Inc.** have announced an **RS-422 capability** for Perle's 350 family of protocol converters.

The family includes the 350/294 unit for the IBM System/34, 36 and 38 and the 350/327 unit in two models that provide IBM 3270 systems network architecture/binary synchronous control and 3770 protocol conversion for mainframe systems.

It allows from four to 40 asynchronous terminals, printers and personal computers to be interfaced to IBM System/34, 36 and 38 or mainframes.

The RS-422 option costs $200 per four ports.

GSD Systems, Suite 507, 600 S. Dearborn St., Chicago, Ill. 60605.

Software

EKD Computer Sales & Supplies Corp. has announced **PCanywhere**, said to allow any terminal or personal computer with a modem to access an IBM Personal Computer, Personal Computer XT, AT or compatible remotely.

The remote user is said to have full keyboard control over all PC functions including access to printers, other peripherals and data on floppy or hard disks. Up to 16 passwords can be specified, and an initial command line can automatically run a program at logon.

PCanywhere is said to support up to 32 different terminal makes. Features include bidirectional file transfer, electronic mail message and access to network functions of Novell, Inc.'s Advanced Netware.

PCanywhere costs $95.

EKD, 764 Middle Country Road, Selden, N.Y. 11784.

■

Codex Corp. has announced the **Codex Communications Test Equipment** (CTE) software for its 2600 series of high-speed modems.

The software is said to allow users to run the circuit quality tests used by Bell technicians on leased lines.

According to the vendor, it integrates the features of a transmission impairment measurement set and remote data scope to analyze line impairments and monitor, collect and analyze data traffic on a circuit.

The user can also evaluate protocols to determine potential errors and mismatches.

The CTE software is priced at $1,500.

Codex, 20 Cabot Blvd., Mansfield, Mass. 02048.

Multiplexers/Modems

Able Computer has introduced the **QHV** and the **QHV Plus** multiplexers for Digital Equipment Corp. Microvax II and other Q-bus-based systems.

The QHV is an eight-line asynchronous multiplexer, said to be fully compatible with DEC's DHV/11. It allows direct memory access or single programmed transfers.

The QHV Plus is a 16-channel multiplexer. It is compatible with the DHV/11 and includes all standard DEC emulation features.

The QHV costs from $1,195 to $1,395. The QHV Plus costs $1,495 or $1,695 with panels.

Able Computer, 3080 Airway Ave., Costa Mesa, Calif. 92626.



SYSTEMS & PERIPHERALS

Terminals

Seiko Instruments USA, Inc. has introduced the **GR-1105** color graphics display terminal.

The display terminal is said to execute 4,500 short vectors per second from display-list memory. It also features a 14-in. 1,024- by 780-pixel resolution screen and a 32,768- by 32,76-point coordinate space.

The GR-1105 terminal is priced starting at $4,995.

Seiko Instruments USA, 1623 Buckeye Drive, Milpitas, Calif. 95035.

■

Intecolor Corp. has announced the **Colortrend 4100 Model 100**, a terminal for data representation and analytical applications.

The terminal provides 249 different fill patterns, a tube dot pitch of 0.31mm, 16 colors and throughput up to 38.4K bit/sec.

The Colortrend 4100 comes with a mouse, detachable keyboard and programmable function keys.

The terminal costs $2,695.

Intecolor, 225 Technology Park, Norcross, Ga. 30092.

■

Monitronix Corp. has announced the **MX-4190** ultra-high-resolution color monitor.

The 19-in. analog red-green-blue monitor features 60Hz noninterlaced refresh rates. It offers 1,600- by 1,280- pixel displayable resolution at 0.25mm pitch. Horizontal scan rates are user-specifiable from 40 kHz to 80 kHz.

The MX-4190 monitor is priced from $5,995.

Monitronix, 2971 Silver Drive, Columbus, Ohio 43224.

Transportation Couldn't Get Out of First Gear.



As you can see from the accompanying illustration, the differential transmission wasn't the brainchild of Detroit.

No, it was more like Italy. And the engineer was none other than Leonardo Da Vinci.

Needless to say, talking differential transmissions over a plate of pasta in the 15th century was not altogether fashionable and, naturally enough, was met with some skepticism.

Today, of course, the American love affair with the car is rather evident. We couldn't live without it.

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Communications Service Assurance is a new concept, to be certain, and, just like Leonardo's differential transmission, will be met with its share of skepticism. That's OK. We're asking that you keep an open mind.

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For further information, please call 800-446-4321. Or you can write directly, PacTel Spectrum Services, 100 Pringle Avenue, Suite 750, Walnut Creek, CA 94596, attention N. Floyd, Marketing Director.

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Printers/Plotters

Olympia USA, Inc. has introduced its **Olympia XL 120** and its **XL 121 with Spell Check**, two portable electronic typewriters.

The XL 121 with Spell Check features an on-board 80,000-word dictionary. A personal dictionary of 300 words can also be created.

Both models feature 40-char. correction memory for automatic lift-off of errors from the page, automatic return for uninterrupted typing, automatic centering, automatic decimal tabulation, special horizontal and vertical spacing capabilities and print enhancements, including bold print and underlining.

The XL120 costs $319, and the XL 121 with Spell Check costs $399.

Olympia U.S.A., Box 22, Somerville, N.J. 08876.

■

Xpoint Corp. has announced the **6224** rugged dot matrix printer for use with IBM's System/34, 36 and 38 computers.

According to the vendor, the 6224 can emulate IBM's 5225 and 5256 printers in local or remote settings, connecting through standard twin-axial cables.

The dot matrix printer is said to support all IBM software except APL. In place of APL, Xpoint features a firmware package called Feature Control.

According to the vendor, Feature Control provides proportional printing and letter-quality modes, 16 foreign character sets, 10 character sizes and a range of bar code options.

Xpoint 6224 is priced at $4,850.

Xpoint, Suite 130, 5600 Oakbrook Pkwy., Norcross, Ga. 30093.

■

Dyna Five Corp. has announced the Digital Equipment Corp. Q-bus-compatible **D5-LP100** line printer controller.

The controller is said to offer a 300,000-char./sec. data transfer rate. Other features are said to include switch-selectable device addresses, switch-selectable interrupt address vectors, parallel interfaces and adjustable data strobe timing.

According to the vendor, the D5-LP100 line printer controller operates in Q16, Q18 and Q22 bit-address backplane and is transparent to DEC software.

It is a dual-height board said to be Centronics Data Computer Corp. and Dataproducts Corp. compatible.

The D5-LP100 is priced at $140.

Dyna Five, 12040 Western Ave., Garden Grove, Calif. 92641.

NEW PRODUCTS/SYSTEMS & PERIPHERALS

Houston Instrument has introduced the **DMP-29**, an intelligent 11-in. by 17-in., eight-pen plotter featuring a maximum pen speed of up to 22 in./sec.

The DMP-29 features Houston Instrument's DM/PL resident plotter language. It will define window limits, scale plots, vary line intensity, produce European character sets and automatically describe circles, ellipses and general curves.

The DMP-29 costs $2,295.

Houston Instrument, 8500 Cameron Road, Austin, Texas 78753.

■

Printek, Inc. has introduced the **Formspro 2000** printer for multipart forms printing.

The printer offers 200 char./sec. print speed and incorporates an 18-pin print head. It accommodates forms up to 13.6-in. wide and from 1-in. to 24-in. long. According to the vendor, print quality from the first through the ninth part is clear and legible.

The Formspro 2000 costs $2,196.

Printek, 1517 Townline Road, Benton Harbor, Mich. 49022.

■

Houston Instrument has introduced the **True Grid** line of seven digitizers featuring standard RS-232C-compatible interfaces.

The 1000 series was designed for cursor control and menu-picking applications. Features include resolution of 0.005 in.; choice of transducers and active areas of 5-in. by 5-in., 11-in. by 11-in. and 11-in. by 17-in.

The 8000 series targets mechanical, electrical, surveying, mapping and architectural applications. Features include resolution of 0.001 in.; choice of transducers; and active areas of 11-in. by 11-in., 11-in. by 17-in., 18-in. by 24-in. and 24-in. by 36-in.

Prices for the 1000 series range from $495 to $975. For the 8000 series, prices range from $1,150 to $4,340.

Houston Instrument, 8500 Cameron Road, Austin, Texas 78753.

■

Facit, Inc. has announced a **bar code option** for its Opus 1 laser printer.

The bar code version was designed to extend the word processing and correspondence printing of the standard Opus 1 in multiuser business environments. It can print on pressure-sensitive, temperature-resistant labels and on letter-size paper.

The printer can print at 12 page/min. and offers a print resolution of 300 by 300 dot/in.

The bar code version of the Facit Opus 1 costs $9,500.

Facit, 9 Executive Drive, Merrimack, N.H. 03054.

■

The 14-pen **DMP-51/52 MP** series plotters from **Houston Instrument** are said to feature a resolution of 0.001 in., a maximum plotting speed of 22 in./sec. and user-selectable acceleration.

The series was developed for architectural, engineering, scientific and other drafting-intensive applications. The plotters are C- and D-size and contain Houston Instrument's built-in DM/PL plotting language.

The DMP-51/52 MP series costs $6,495.

Houston Instrument, 8500 Cameron Road, Austin, Texas 78753.

■

Houston Instrument has added the E-size **DMP-56** to its family of professional drafting plotters.

The DMP-56 plotter is said to accommodate 18 different media sizes, ranging from 8½-in. by 11-in. to 36-in. by 48-in. It is said to produce architectural designs, engineering schematics, mechanical drawings and overhead transparencies.

The DMP-56 features a resolution of 0.001 in. and a maximum plotting speed of 17 in./sec. It can be interfaced with any computer featuring a standard RS-232C-compatible port.

The DMP-56 costs $5,995.

Houston Instrument, 8500 Cameron Road, Austin, Texas 78753.

■

Versatec, Inc. has announced the **Model 810** raster processing machine, a single microprocessor-based rasterizer.

The Model 810 is said to drive Versatec electrostatic color and monochrome plotters.

It is a 32-bit microprocessor with 2M bytes of on-board memory.

According to the vendor, the Model 810 was designed to off-load data ordering and rasterization from the host computer.

The Model 810 raster processing machine is priced at $7,950.

Versatec, 2710 Walsh Ave., Santa Clara, Calif. 95051.

Power Supplies

Sola, a unit of **General Signal**, has announced a series of 5, 7.5, 10 and 15 kVA **uninterruptible power systems**.

The systems are said to feature fourth-generation electronic pulse-width modulation inverters.

The models operate continuously from the inverter, with on-line battery reserve. Each system can handle a 125% overload for 60 min without drawing current from the battery. Battery reserve times at full load are 12 min for the 5 kVA model, 6 min for the 7.5 kVA model and 3 min for the 10 kVA model. The 15 kVA model is dependent on the battery.

Prices range from $12,200 to $24,800.

Sola, 1717 Busse Road, Elk Grove Village, Ill. 60007.



NEW PRODUCTS/SYSTEMS & PERIPHERALS

Computer Power Systems Corp. has announced the **Series 2000** power distribution and regulation system for mini and supermini systems.

The Series 2000 is semiconductor based and is said to cope with power irregularities such as surges, sags, transients and brownouts.

A single-phase model and a three-phase model are available. According to the vendor, both offer monitoring of the user's computer-room temperature and humidity and tap switching.

In addition, all I/O cables can be connected to either the back or front of the unit.

Prices for the Series 2000 power distribution and regulation system range from $5,000 to $10,000.

Computer Power Systems, P.O. Box 6240, 18150 S. Figueroa St., Carson, Calif. 90749.

L/F Technologies has introduced the **L/F-Power II** integrated uninterruptible power supply for the vendor's Ultima terminals.

The L/F Power II resides within the terminal case. It is reportedly preconfigured to provide the exact level of DC power required by the Ultima terminal in the event of a power disturbance. It provides up to one hour of battery backup power.

The L/F Power II is priced at $150.

L/F Technologies, 2800 Lockheed Way, Carson City, Nev. 89701.

■

Sorenson Co. has introduced the **DCR-T** series of three-phase, 10-kW, DC-regulated power supplies for controlled test and burn-in applications.

The DCR-T is said to protect loads from current and voltage caused by open programming lines. It separates remote programming from remote sensing, eliminating the possibility of voltage breakdown across output components.

Standard input is 480V AC at 60Hz. The DCR-T is remote controllable. The units fit into standard 19-in. racks.

The DCR-T units are priced at $3,900.

Sorenson, 676 Island Pond Road, Manchester, N.H. 03103.

Auxiliary equipment

Rediform has introduced **thermal transfer computer paper** for use with thermal transfer printers.

According to the vendor, the paper offers extra-smooth quality that enables wax-based inks to transfer onto the sheet without cracking, flaking or rubbing off.

Rediform's computer paper costs $8.99 for a 250-count pack.

Rediform, W-53 Century Road, Paramus, N.J. 07652.

PRICE REDUCTIONS

Priam Corp. has cut the prices for its 43M- and 60M-byte **Innerspace** internal disk add-in kits for the IBM Personal Computer family.

The kits consist of a 5¼-in. Winchester disk, an optional controller, Priam software and utilities and cables.

The reduced prices are as follows: ID40-AT/XT costs $1,398; ID40-PC costs $1,698; ID60-AT/XT costs $1,798; and ID60-PC costs $1,098.

Priam, 20 W. Montague Expwy., San Jose, Calif. 95134.

■

Interleaf, Inc. has announced a price reduction for its **electronic publishing system** running on Digital Equipment Corp.'s Vaxstation II.

Including laser printer, the system is available now for $29,900. Also included is Interleaf's electronic publishing software, TPS; DEC's Vaxstation II system configuration with 3M bytes of memory, 71M-byte Winchester disk and 95M-byte streaming tape cartridge; and all fonts.

Interleaf, Ten Canal Park, Cambridge, Mass. 02141.

■

General Business Technology, Inc. has announced a price reduction on both the **5220DP** and the **5222DP** dual-purpose matrix printers.

Both printers are said to feature adjustable tractor feed wih tear bars as well as a variety of user-programmable or host-selectable character fonts and styles.

The 200 char./sec. 5222DP is now priced at $2,495, and the 400 char./sec. 5220DP is now priced at $4,450.

General Business Technology, 1891 McGaw Ave., Irvine, Calif. 92714.



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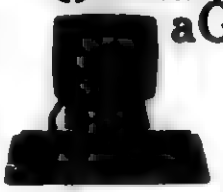
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NEWS

CALENDAR

WEEK OF JUNE 1

JUNE 2-5, DETROIT — **Vision '86 — Applied Machine Vision Conference and Exposition.** Contact: Vision '86 Public Relations, Machine Vision Association of the Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

JUNE 2-5, NASSAU BAY, TEXAS — **International Symposium on Ada Programming Language Applications for Space Station Development.** Contact: University of Houston — Clear Lake, 2700 Bay Area Blvd., Houston, Texas 77058.

JUNE 2-6, NEW YORK — **Communications Week '86.** Contact: Merle Pilkins, Conference Manager, Datapro Research Corp., McGraw-Hill Information Systems Co., 1221 Avenue of the Americas, New York, N.Y. 10020.

JUNE 4, SAN FRANCISCO — **How to Build Your High Tech Career Network.** Contact: Association for Women in Computing, Bay Area Chapter, Suite 44, 55 Sutter St., San Francisco, Calif. 94104.

JUNE 4-6, BOSTON — **Engineering Expert Systems.** Contact: Harmon Associates, 151 Collingwood, San Francisco, Calif. 94114.

JUNE 4-6, SAN DIEGO — **1986 National Educational Computing Conference.** Contact: Susan M. Zgliczynski, National Educational Computing Conference 1986, School of Education, University of San Diego, Alcala Park, San Diego, Calif. 92110.

JUNE 5-6, CLEVELAND — **North Central Region Data Processing Trainer's Conference.** Contact: Gary Livingston, Livingston & Associates, P.O. Box 30619, Cleveland, Ohio 44130.

JUNE 7, BEIJING — **China-Didacta '86: The International Trade Fair for Educational Equipment.** Contact: Swiss Industries Fair, Secretariat China Didacta '86, P.O. Box CH-4021, Basel, Switzerland.

JUNE 7-8, BOSTON — **Massachusetts Health Data Consortium 3rd Annual Computer Expo and Conference.** Contact: Massachusetts Health Data Consortium, Inc. 400-1 Totten Pond Road, Waltham, Mass. 02154.

WEEK OF JUNE 8

JUNE 8-11, NEW ORLEANS — **Ethernet Decision-Makers Group Exchange Conference.** Contact: EDGE International, Inc., Suite 260, 1539 N. China Lake Blvd., Ridgecrest, Calif. 93555.

JUNE 8-11, TORONTO — **World Computing Services Industry Congress V.** Contact: Co-Ordination Plus, Inc., Suite 2102, 65 Queen Street W., Toronto, Ont., Canada M5H 2M8.

JUNE 9-10, TEANECK, N.J. — **Machover on Business Graphics.** Contact: Carol Every, Industry Representative, Frost & Sullivan, Inc., 106 Fulton St., New York, N.Y. 10038.

JUNE 9-11, MYRTLE BEACH, S.C. — **The Association of Small Computer Users in Education 18th Annual Summer Conference.** Contact: Jack Cundiff, Horry-Georgetown Technical College, Conway, S.C. 29526.

JUNE 9-11, NORCROSS, GA. — **Time and Motion Study Fundamentals.** Contact: Institute of Industrial Engineers Registrar, 25 Technology Park/Atlanta, Norcross, Ga. 30092.

JUNE 9-12, BOSTON — **Network Management/Technical Control Conference and Exposition.** Contact: CW/Conference Management Group, 375 Cochituate Road, Framingham, Mass. 01701.

JUNE 9-12, CHICAGO — **Com Lease Spring, The Computer Leasing Conference and Expo.** Contact: Show Management Offices, 3825-I S. George Mason Drive, Falls Church, Va. 22041.

JUNE 9-13, SAN DIEGO — **MUMPS Users' Group 15th Annual Meeting.** Contact: MUMPS Users' Group, Suite 510, 4321 Hartwick Road, College Park, Md. 20740.

JUNE 10-13, ATLANTA — **Summer 1986 Unix Conference and Exhibition.** Contact: The Usenix Association Conference Office, P.O. Box 385, Sunset Beach, Calif. 90742.

JUNE 11, NEW YORK — **The Semiconductor Industry — Its Changing Struc-**

See CALENDAR page 110

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CALENDAR from page 109

ture 1986. Contact: Robert Burton, L. F. Rothschild, Unterberg Towbin, 55 Water St., New York, N.Y. 10041.

JUNE 11-13, MAINZ, WEST GERMANY — **International Tandem Users' Group 1986 Spring Conference.** Contact: ITUG Headquarters, Suite 600, 111 E. Wacker Drive, Chicago, Ill. 60601.

JUNE 11-13, TEANECK, N.J. — **Machover on CAD/CAM.** Contact: Carol Every, Industry Representative, Frost & Sullivan, Inc., 106 Fulton St., New York, N.Y. 10038.

WEEK OF JUNE 15

JUNE 15-20, LONG BEACH, CALIF. — **1986 Government Management Information Sciences Conference.** Contact: Tom Lang, Assistant Chairman, Data Processing Department, 9150 E. Imperial Highway, Downey, Calif. 90242.

JUNE 16-18, UNIVERSAL CITY, CALIF. — **Synergy '86, Conference on Functional Interfacing for Computer-Integrated Manufacturing.** Contact: Cheri Willetts, Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

JUNE 16-19, LAS VEGAS — **The 1986 National Computer Conference.** Contact: National Computer Conference, 1899 Preston White Drive, Reston, Va. 22091.

JUNE 16-20, CAMBRIDGE, MASS. — **Managing Information Technology: New Responsibilities in a Changing Environment.** Contact: Center for Information Systems Research, Sloan School of Management, MIT, E40-193, 77 Massachusetts Ave., Cambridge, Mass. 02139.

JUNE 17-18, PLYMOUTH, MICH. — **Robotic End Effectors: Design and Applications Seminar.** Contact: Mary Dombrowski, Special Programs Division, Robotics International of the Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

JUNE 18-20, TOKYO — **Marketing Opportunities Seminar.** Contact: Agnes M. Pavel, Program Director, U.S. Telecommunications Suppliers Association, Suite 1618, 333 N. Michigan Ave., Chicago, Ill. 60601.

WEEK OF JUNE 22

JUNE 22-27, PHILADELPHIA — **Management Information Systems for Strategic Advantage.** Contact: The Registrar, Office of Executive Education, 200 Vance Hall, The Wharton School of the University of Pennsylvania, Philadelphia, Pa. 19104.

JUNE 23-25, ALBUQUERQUE, N.M. — **Integrated Fiber-Optic Technology Training.** Contact: Linda Castle, Optoelectronic System Consultants, P.O. Box 35525, Albuquerque, N.M. 87176.

JUNE 23-25, MIAMI — **Electronic Data Processing Auditors Association 14th Annual International Conference.** Contact: EDPAA, P.O. Box 88180, Carol Stream, Ill. 60188.

JUNE 23-26, BOSTON — **ATE East '86.** Contact: Morgan-Grampian Expositions Group, 1050 Commonwealth Ave., Boston, Mass. 02215.

JUNE 23-27, AMSTERDAM — **Fourth Annual European Fiber-Optic Communications and Local-Area Networks Exposition.** Contact: Information Gatekeepers, 214 Harvard Ave., Boston, Mass. 02134.

JUNE 23-27, CHICAGO — **A/E/C Systems '86: The Computer and Management Show for the Design and Construction Industry.** Contact: Conference Director, A/E/C Systems '86, P.O. Box 11318, Newington, Conn. 06111.

JUNE 24-26, CHICAGO — **Structured Techniques Association III/Structured Techniques in the Eighties: Practice and Prospects.** Contact: Heller Financial Corp., 105 W. Adams St., Chicago, Ill. 60603.

JUNE 24-27, CHICAGO — **Autocad Expo '86.** Contact: William Ryan, Autocad Expo '86, Autodesk, Inc., 2320 Marinship Way, Sausalito, Calif. 94965.

JUNE 25, CHICAGO — **International Facility Management Association's Computer Applications for Facility Management.** Contact: IFMA, Suite 1410, 11 Greenway Plaza, Houston, Texas 77046.

JUNE 25-26, COATESVILLE, PA. — **Chester County Expo '86: CAD/CAM Conference from Micro to Mini.** Contact: Lee Smith, Central Chester County Vocational Technical School, 1635 E. Lincoln Highway, Coatesville, Pa. 19320.

WEEK OF JUNE 29

JULY 2-3, LAS VEGAS — **Full Meeting of the Design Automation Standards Subcommittee.** Contact: Ron Waxman, Design Automation Standards Subcommitee Co-Chairman, IBM FSD, 9500 Godwin Drive, Manassas, Va. 22110.

WEEK OF JULY 6

JULY 9-11, NEW YORK — **The Fourth Annual PC Expo.** Contact: PC Expo, P.O. Box 1026, Englewood Cliffs, N.J. 07632.

WEEK OF JULY 13

JULY 13-18, CHICAGO — **Guide 65.** Contact: Guide International Corp., 111 E. Wacker Drive, Chicago, Ill. 60601.

WEEK OF JULY 20

JULY 23-25, BOSTON — **Microtrends '86, Education: Redirecting the Revolution.** Contact: Bobbi Hunt, International Communications Industries Association, 3150 Spring St., Fairfax, Va. 22031.

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TruLynx PC software provides fast easy file transfer to IBM host programs through DataLynx Protocol Converters. In one major application company executives update financial planning databases from PC's at home and in the office. In another application source code for large mainframe application programs is transferred to and from PC's for demonstration, test and editing.





Local Data offers two excellent System 34, 36, 38 connectivity products. DataLynx/5251 provides exceptional dialup async access with X.25 and ETU file transfer support.

InterLynx/5251 connects to the host at the twinax port, eliminating the costly communications adapter. Users access the host by way of asynchronous modems or local RS-232C connections.

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Customers of a restaurant supply house in Denver dial an IBM/36 host through a DataLynx/5251, check inventory levels, current pricing and perform their own order entry.

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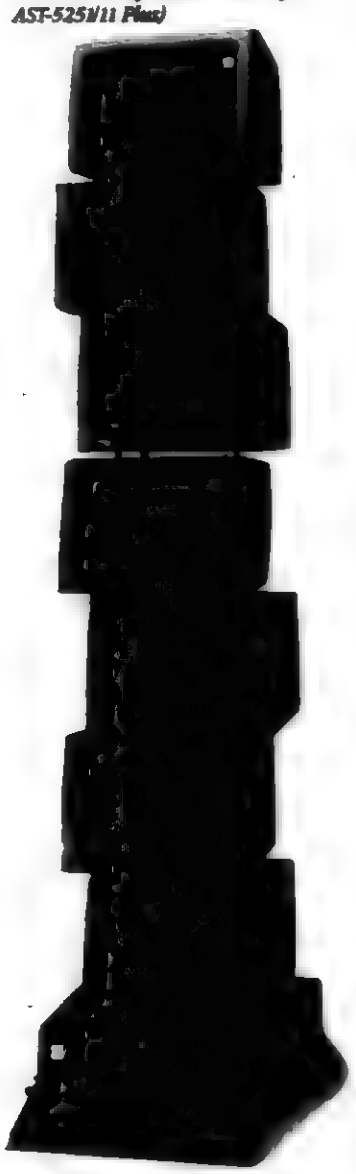
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The TeleCAT-286. Our 20MB version is $2995; 30MB, $3495. For high performance at a low price, don't settle for less.

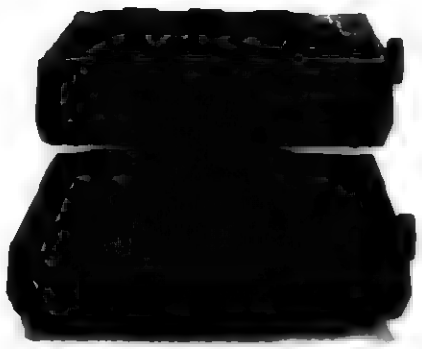
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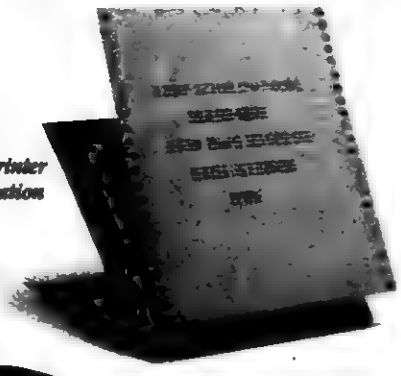
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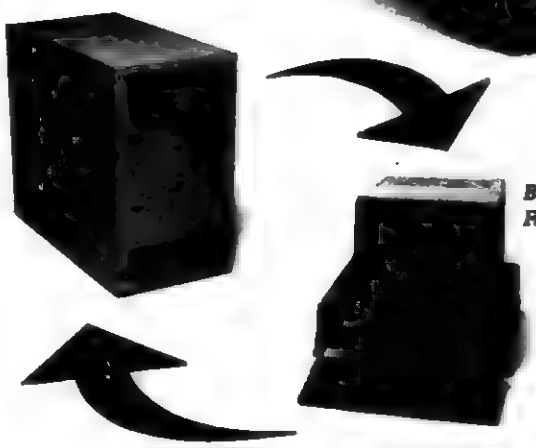
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AST-5251/11—The Direct PC To 34/36/38 Connection. Standard twinax cable, just like IBM's, makes this connection the most convenient for you. Our Hot-Key support provides a toggle between PC DOS and two host sessions. And our new enhanced version, AST-5251/11 Plus, even allows up to seven System 34/36/38 sessions—all concurrently.

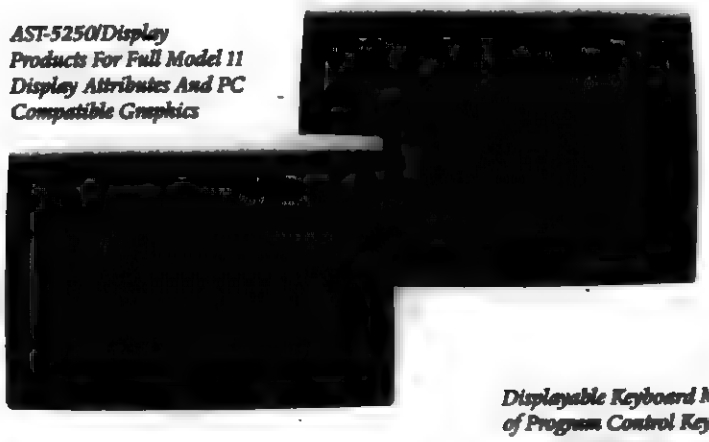
AST's family of smart connections are strategically focused and developed to support and evolve in concert with the IBM Smart Office architecture. Highlighting the minicomputer group here, AST also addresses connectivity in mainframe and personal workstation environments.

Our file transfer system means you can move host data to and from your favorite PC application software files, like Lotus 1-2-3,® WordStar® and dBASE.™ For easy integration of PC and host applications, we've included our Applications Program Interface (API).

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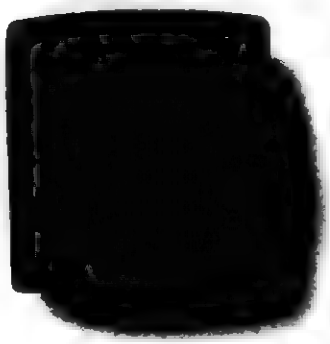
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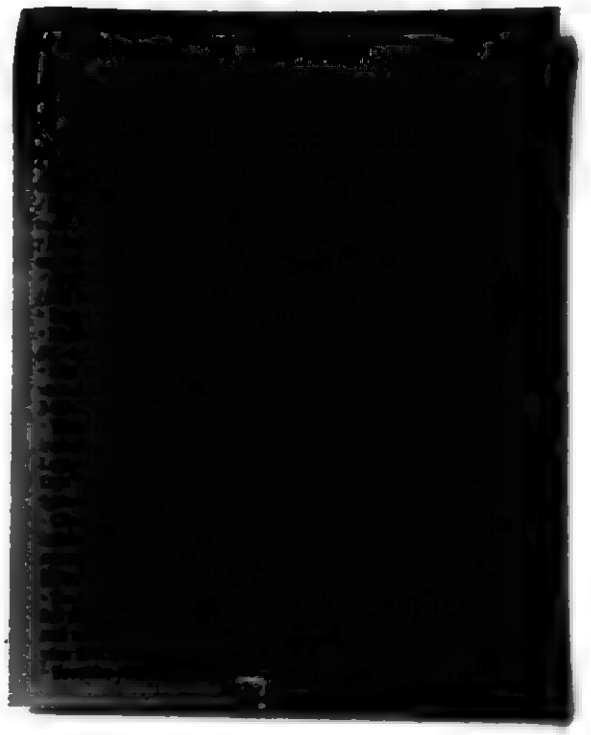


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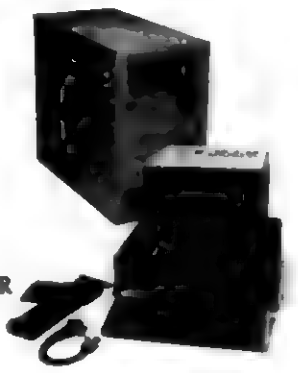
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COMPUTER INDUSTRY

Section begins on page 146

Two business styles grow out of Mohawk Data Sciences

MDS Qantel nemesis becomes firm's defender

By Clinton Wilder

HAYWARD, Calif. — When Asher B. Edelman wanted to shake the bad apples out of Mohawk Data Sciences Corp.'s MDS Qantel computer unit in early 1985, he turned to flamboyant "antivendor" attorney Thomas K. Christo to fill a seat on the MDS board. Two weeks ago, after MDS finally sold the bulk of its U.S. operations for much-needed cash, MDS Qantel raised quite a few eyebrows by naming Christo president and chief operating officer of the minicomputer firm.



Thomas Christo

Christo gained fame in the 1970s and 1980s representing users and distributors in multimillion-dollar lawsuits against several vendors, including IBM, Hewlett-Packard Co. — and Qantel. But after the Edelman takeover and the recent sale of five MDS divisions, the MDS Qantel that Christo now heads bears little resemblance to the one he faced in the courtroom.

"I always felt it would be a heck of a company if you changed the way it did business," Christo said. "In the past, I was always criticizing. Now I have an opportunity to be constructive instead of destructive."

In the past year, MDS Qantel has completely eliminated direct sales to the end user, focusing entirely on the value-added distributor channel. Under Christo and Chairman and Chief Executive Officer Matthew E. Tutino, the firm also gutted several layers of top management.

"We had to tear down before we could build up," Christo said, "and we had to survive. Only one vice-president that was here a year ago is still here. It was a minor miracle that the company survived."

By selling all of its businesses except Qantel (see story at right) in trademark Edelman style, MDS reduced some $140 million in debt to $40 million and removed itself from default on its bank loans. Although it remains to be seen whether MDS Qantel can advance from financial viability to sustained profitability, Christo predicts that the firm will be in the black when its first fiscal quarter ends July 31.

Competing in the mid-range minicomputer area staked out by IBM's System/36 and 38, MDS Qantel will rely on a revamped product line and the sales skills of its value-added dis-

See MDS page 116

Venture capital firms pick up Momentum

By Alan Alper

NEW YORK — It was not long ago that computer industry pundits were taking wagers on the demise of Mohawk Data Sciences Corp. But after a stormy few years resulting in huge debts, Mohawk was recently reincarnated as Momentum Technologies, Inc. under the ownership of two New York venture capital firms.

In the last two years, Parsippany, N.J.-based Mohawk Data Sciences had lost its technological edge and was swaying under the heavy weight of $234.2 million in combined 1984 and 1985 losses. Arbitrageur Asher Edelman, who took control of the company in 1984 vowing a piecemeal divestiture similiar to what he had done at Management Assistance, Inc., was having trouble selling any part of the beleaguered firm. Unlike Management Assistance, the sum of Mohawk's parts did not appear to be greater than the whole.

On the sidelines, seeking a service-oriented computer company, were venture capitalists Donald Ackerman, a general partner at J. H. Whitney & Co., and Bruce Anderson of Welsh, Carson, Anderson & Stowe. Mohawk, despite its losses, seemed ripe for a leveraged buy-out.

Negotiating first with Mohawk's lenders and then its board of directors, the two venture capital firms struck a deal that would enable them to purchase a majority of Mohawk's assets — excluding MDS Qantel, Inc. (see related story) — as well as buy time to breathe life into its moribund operations. Mohawk's banks gave the new owners a three-year respite on the principal payment of the $81 million borrowed to acquire five Mohawk business units: MDS Service, MDS Systems, MDS Credit, MDS Storms and MDS Herkimer [CW, May 12].

"We are taking over a business that is immediately profitable and cash-flow positive," Ackerman said in a recent interview. "The service business was the most profitable part of the business; it was Qantel that experienced declining revenues and was not profitable."

The new owners have restructured the five MDS business units, which last year generated revenues of $160 million, into four Momentum subsidiaries. The only remaining unit owned by Mohawk, MDS Qantel, retains a 10% interest and a seat on the new firm's board. Also, it will receive technical support fees for the maintenance of its installed base.

Momentum will focus mainly on

See VENTURE page 116

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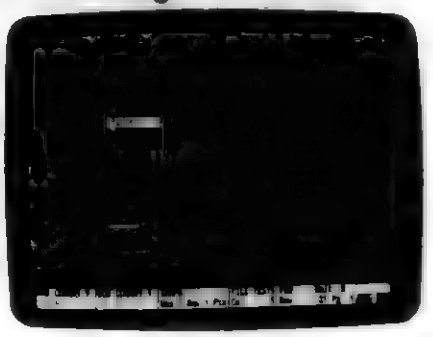
Starting this issue, see page 125.

COMPUTERWORLD

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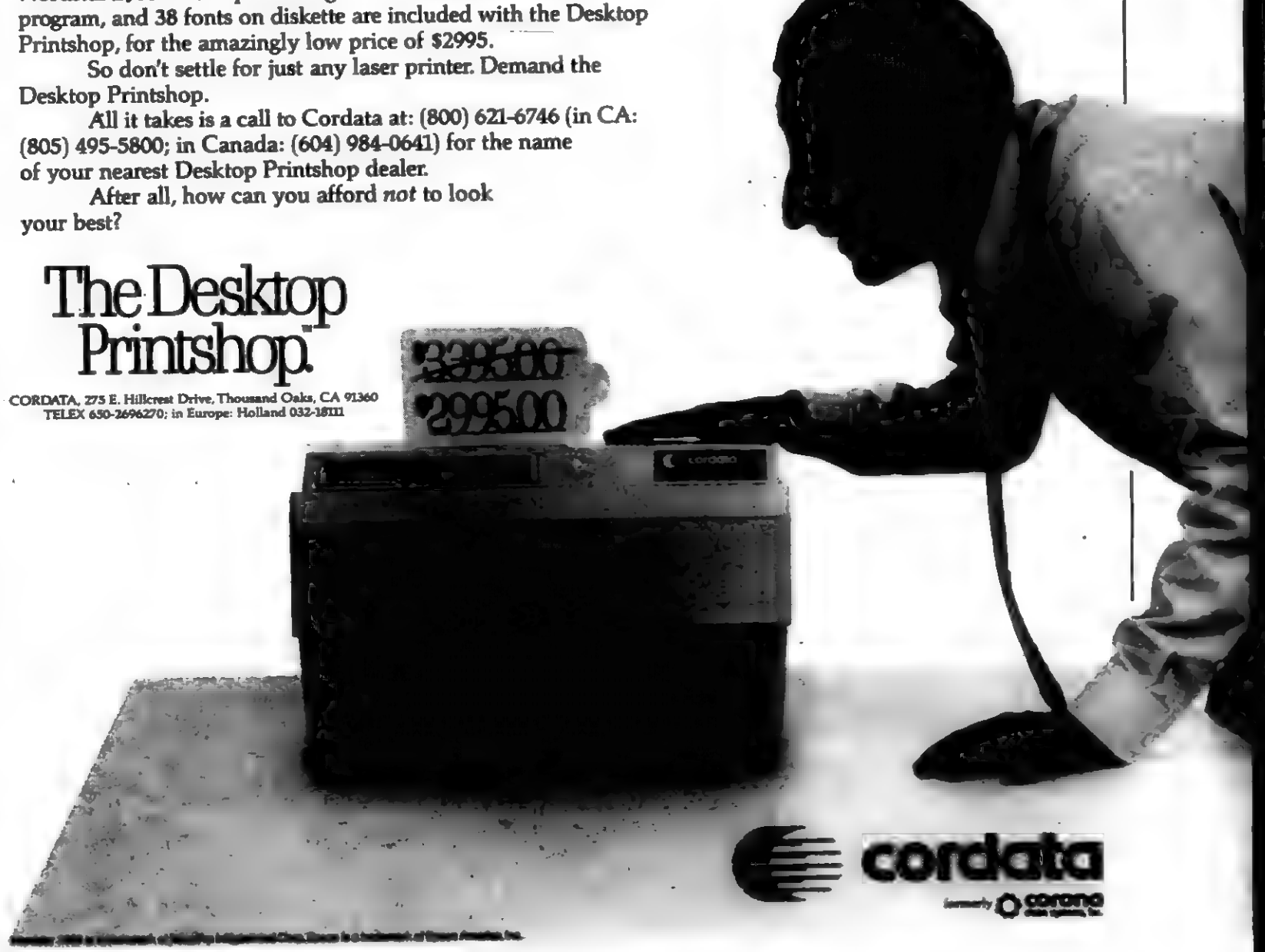
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MDS Qantel nemesis

From page 114

tributor network. MDS Qantel has several vertical software packages, with more on the way, after employing what Christo called "SWAT teams to clean up the software" in the past year.

Although Christo downplayed the irony of serving the company that he once served only with lawsuits, some of MDS Qantel's recent changes strongly reflect his litigation legacy. He successfully represented several distributors against the company and made significant changes in the structure of Qantel's relationship with its resellers.

"We have no quotas anymore," he said. "We have milestones for the value-added distributors to earn a larger discount, but it's not Armageddon if they don't make it. And we have no exclusives, so the onus is on us to come up with the best solution for the value-added distributors to resell. The whole world is open to them."

Perhaps most significantly, Qantel has attempted to minimize the effect of its recent turmoil on its small business user base, particularly in maintenance. Under a 10-year royalty agreement, Qantel users will continue to be serviced by the former MDS Service division, now a unit of Momentum Technologies, Inc.

"Amazingly enough, the changes haven't affected us," said Jeff Croft, DP manager of Bauer Enterprises, Inc., a retail lumber and home hardware business in Stow, Ohio.

Christo admits that the small business minicomputer competition is "scary" but is ready to take on competitors the same way he tried to take on the whole industry. "There are a lot of choices out there for the customer, but you can look at it as exciting, too," said Christo, who still maintains his North Hampton, N.H., law office. "If we guess right, we'll be heroes."

HP announces flat earnings

From page 146

Shipments of the high-end products, code-named Spectrum, are not due until year's end and are not expected to contribute to 1986 revenue.

Earlier this month, however, HP announced it was returning most employees from an unpaid vacation program to full-time work but was implementing a hiring freeze at the company.

Announcing
Computerworld's
MICRO DIRECT SHOPPER
SEE PAGE 125

Venture firms get Momentum

From page 114

systems maintenance, systems integration and reselling, contract manufacturing and lease financing. Hardware design and development, which Ackerman says caused Mohawk's downfall, will be limited to IBM 3270-compatible peripherals.

The key to the firm's success will be its ability to broaden its service business beyond Mohawk's installed base into the third-party arena.

Momentum inherits one of the industry's largest service organizations, with $70 million in annual revenue, 135 locations nationwide and an 800-member work force.

Ackerman said Momentum will focus greater attention on servicing computer networks and mixed vendor environments.

Three of the four subsidiaries are being run by managers who remained during the transition from Mohawk to Momentum, and approximately 40 employees currently have equity holdings in Momentum.

> ***Momentum inherits one of the industry's largest service organizations, with $70 million in annual revenue.***

"It's important that people behave and think like owners of the company and share in the success they create," Ackerman said.

In addition, most of Mohawk's 1,700 employees have stayed on with the new venture. "The people are the most important asset we acquired," Ackerman said. "They understand the operation and have knowledge about the accounts. They kept the company going under the most trying of times."

Business and economic conditions permitting, Ackerman said Momentum can grow at roughly 20% annually. Without offering a timetable for such growth, Ackerman said it "can be achieved through internal growth. It can be achieved more quickly, however, with some judicious acquisitions."

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In-Depth Tutorials — June 9th and 10th

Industry experts will instruct full-day courses on network control, IBM/SNA network management systems, strategic planning and network diagnostics.

Monday June 9 1986

9:00 am - 5:00 pm
Select One

T-1 **Fundamentals of Network Control**
Gabriel Kasperek, President, Kasnet, Inc.
The basics of network control, including problem diagnosis and repair, maintenance and operational issues.

T-2 **Integrated Voice/Data Corporate Networks**
Roshan Lal Sharma, Sr. Scientist/Consultant, Telecommunications Network Science.
Network topologies and their synthesis, cost-effective network planning, future trends in intelligent networks and their impact on network management and control.

T-3 **Cost Efficient Methods for Implementing New Tariffs**
Cheryl A. Cushing, Manager, Reference Services, Connections Telecommunications, Inc.
Post-divestiture tariff rules, including LATAs and POPs with a comparison of major common-carrier tariffs, and evaluation of intra-LATA access alternatives and a review of new regulatory alternatives to traditional network costs.

T-4 **ISDN I**
Samuel Lynch, Senior Consultant, Zatyko Associates.
Definition and concepts, application standards and world-wide status, plus comparison of ISDN against OSI Reference Model as standard.

T-5 **System Network Architecture I**
Thomas Scott, Senior Consultant, Zatyko Associates.
Current status of IBM's communication architecture, new extensions such as LU 6.2/APPC and NETBIOS and IBM LANs as "defacto" standards.

MERGERS AND ACQUISITIONS

Hammer Technologies, Inc. reported that its subsidiary, **Hammer Computer Systems, Inc.**, has acquired all of the issued and outstanding stock of **Certified Software Systems, Inc.**, a Portland, Ore.-based software company. Certified, a developer of single and multiuser horizontal and vertical software, will be operated as a wholly owned subsidiary of Hammer Computer Systems.

■

GSD Systems, Inc. has signed a letter of intent to sell 100% of its outstanding stock to **Perle Systems, Ltd.**, a Toronto-based manufacturer of data communications equipment. GSD Systems is a distributor of protocol convertors, data communications equipment and other products for the IBM System/34, 36 and 38.

■

SHL Systemhouse, Inc. announced it has completed the purchase of all outstanding shares of **Capital Systems, Inc.** of Alexandria, Va., in exchange for 360,000 shares. Capital Systems becomes a unit of **Systemhouse, Inc.** of Arlington, Va., the U.S. subsidiary of SHL Systemhouse, Inc.

■

Micro-Integration, Inc. and **IE Systems, Inc.**, both privately held, have jointly formed **Micro-Integration Corp.** Micro-Integration is one of the industry's first microcomputer communications software companies.

■

Charlton Associates of Irvine, Calif., has announced a merger with **Xidex Corp.** of Santa Clara, Calif.

Charlton will become a wholly owned subsidiary of Xidex. Richard Charlton, chairman and chief executive officer of the current company, will head the newly created subsidiary.

It is planned that the subsidiary will incorporate Charlton Associates' current rigid media operations, Xidex's Dysan small disk division and Xidex's newly acquired trimedia sputtered thin-film operation.

■

Travelers/Diebold Technology Co. announced that it has completed the acquisition of **Execom Systems Corp.**, a decision support systems software company, from **Continental Telecom, Inc.** of Atlanta.

■

Control Your Network

Control Conference and Exposition



T-6 Public/Private Data Network I
Daniel Zatyko, President, Zatyko Associates.
Current status of IBM's communication architecture, including applications and standards, and development of X.25 up to 1988 CCITT adoption.

T-7 MAP/TOP Systems Interconnection I
Donald Harring, Vice President, Zatyko Associates.
Status of seven layer OSI Reference Model as framework for future network compatibility, review of major vendor architecture - IBM, DEC, etc; migration to manufacturing automation and office communication protocols.

Tuesday, June 10, 1986

9:00 am - 5:00 pm
Select One

T-8 Planning the Network Control Center
Gabriel Kasperek, President, Kascom, Inc.
User considerations in the design, equipment selection, software, and instrumentation of a network control center and related vendor issues.

T-9 Problem Resolution and Network Management in SNA Networks
Fred Cook, Senior Consultant Kaptronix.
Techniques useful in analyzing problems in SNA networks. Topics include detailed SNA sequences, VTAM trace, NCCF, NPDA, NLDM and a review of critical parameters in NCP System Generation.

T-10 Network Modeling/Design Workshop
Larry Rhue, Vice President, Connections Telecommunications Inc.
Network design calculations using MNDS PC-based design software and the complimentary Borland SIDEKICK package. Also included, queuing calculations in simple and complex network models, reflecting SDLC, BSC and X.25 protocols, statistical multiplexers and distributed concentrator networks.

T-11 ISDN II
Samuel Lynch, Senior Consultant, Zatyko Associates.
Technology and system/network/switching of ISDN, and certification and network testing, including 1986/87 field trials/user implementation.

T-12 System Network Architecture II
Thomas Rossi, Senior Consultant, Zatyko Associates.
Technology and systems impact of SNA and relation to open architectures and protocols on networks from DEC and other vendors, and higher layer SNA services - DIA/DCA, PU 2.1, etc

T-13 Public/Private Data Network II
Daniel Zatyko, President, Zatyko Associates.
Technology and systems impact of long distance, regional and in-house data networks, including message handling systems and office document interchange formats under different operating systems.

T-14 MAP/TOP Systems Interconnection II
Donald Harring, Vice President, Zatyko Associates.
Session will cover MAP/TOP common protocol connectivity, GM and Boeing programs, other vendor demos, user experiences and the implications of Corporation for Open Systems on MAP/TOP, vendor standards and products.

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DW2

Amdahl, NAS at crossroads

From page 146

the battle, as Storage Technology Corp. found out after becoming the first PCM vendor to reach the billion-dollar level in 1982. The following year, Storage Technology's revenue was down to $887 million, and in October 1984 the company filed for bankruptcy. After trimming itself down to a $673 million level in 1985, the premier peripheral PCM vendor is now operating under the theme "(back) on the road again."

Becoming a $1 billion company, therefore, requires a whole different mind-set, a new level of management skill and maturity. Unlike Storage Technology, a company that expanded too fast in too many directions, Amdahl has a realistic chance of achieving solid revenue growth in the next two years. By the end of 1988, the first PCM vendor may well be twice the size it was in 1985.

Amdahl enters 1986, the year in which it will start shipping the new 5890-300 dual processor, determined not to repeat the mistakes it made when the 580s were first introduced about four years ago. "We'll be a lot more cautious with the 5890 than with the 5860," says Dick Witcomb, Amdahl's director of financial and public relations. The company plans to ship a few machines in the second

Computer Industry section begins on page 146.

quarter, then pause to evaluate its field performance. If all goes well, volume shipments will commence in late 1986.

Overall, 1986 is likely to be a year of modest financial accomplishments for Amdahl, with up to a 16% growth in revenue and a small increase in earnings. 1986 will be, however, a year of great strategic importance to the company. For during the current 12 months, Amdahl must lay the foundation for the rapid growth that it expects in 1987.

NAS President Dave Martin says, "I've never been more bullish" about his outlook for 1986 and beyond. "We'll beat our most optimistic schedule," he says.

Martin is alluding to the first customer shipment date of NAS' top-of-the-line XL mainframes. The company has already met its schedule with regard to its new double-capacity 7380 disks. NAS started shipping them in March, only eight months after the first customer shipment of IBM's 3380-E models.

NAS' long-term CPU plan is also bullish. During calendar year 1986, however, NAS can be expected to ship only about 40 to 50 of the new XL uniprocessors (100 to 110 in the fiscal year 1987).

Considering the performance advantages the XLs offer compared with the IBM 3090 Model 200s and the Amdahl 5890-300s, the above numbers suggest that NAS will be production constrained. Therefore, the effort needed to persuade NAS' Japanese partner Hitachi Ltd. to increase the output of its Kanagawa, Japan, CPU plant will be an internal marketing challenge that NAS will face in 1986.

Ashton-Tate revenue up

TORRANCE, Calif. — Ashton-Tate continued its record growth pattern, reporting a 72% revenue increase for the first quarter ended April 30.

Revenue at the second largest independent microcomputer software company was $41.7 million, up from sales of $23.9 million for the same period last year. The revenue increase includes an estimated $7 million in sales from Multimate International Corp., which was acquired by Ashton-Tate in December.

First-quarter income increased 118% to $5.1 million, or 47 cents per share, compared with $2.3 million, or 25 cents, for the first quarter a year ago.

Ashton-Tate President Edward Esber attributed the rapid revenue growth to high demand for its Dbase III Plus data base management system and increased sales of the Multimate product line.

Ashton-Tate completed the acquisition of Multimate, consolidating operations in sales and product management in its Torrance offices, while maintaining development, technical support and limited Multimate marketing activity in Multimate's East Hartford, Conn., headquarters.

During the quarter, Ashton-Tate raised $47.7 million in a public offering of about 1.49 million shares of stock.

— Maura McEnaney

Creditors dispute value of STC

From page 146

not filed properly.

But the disagreement over the company's worth will not stop STC from meeting its self-imposed deadline for emerging from bankruptcy, according to observers. "STC has every reason in the world to get out of Chapter 11 as quickly as it can," said James Porter, publisher of "Disk/Trend News," a storage industry newsletter. "They need to rebuild the confidence level of their customers. After all, it's tough for a DP manager to buy from a bankrupt company."

It is also in the best interest of the creditors, many of whom have been financially squeezed by frozen assets, to get STC out of Chapter 11 as soon as possible, Porter said.

In one of the largest bankruptcies ever to hit the computer industry, STC filed for protection from its creditors on Oct. 31, 1984. Until that time, the company was a leader in the mainframe disk drive and peripherals market, recording sales of $1.1 billion in 1982. But under the direction of cofounder Jesse Aweida, STC sank millions into assorted development projects just as IBM began to take control of the storage market. By 1984, STC revenue had tumbled to $808.5 million, and losses had climbed to $505 million.

Poppa joined STC in January 1985. A seasoned veteran who has been at the helm of several other troubled companies, including Pertec Computer Corp., BMC Industries, Inc. and Mohawk Data Sciences Corp., Poppa first sold STC's $30 million semiconductor facility to California Devices, Inc. for $6 million. Not long after that, the company abandoned a multiyear $140 million optical disk storage project.

"The problem at STC was pure management," Poppa said. "And it wasn't bad management necessarily, just overambitious management. Had they stayed to the base business, there never would have been any trouble at STC."

Computer industry section begins on page 146.

In the year since he joined STC as chairman, Poppa has pared STC to the bare bones. To build cash reserves, he closed or sold all but STC's core tape drive, disk drive and printer operations. In February, STC reported its first profitable quarter since 1983. It is this back-to-basics attitude, combined with the planned debut of a new cartridge tape drive, that has Poppa sure of STC's worth.

The cartridge tape drive with library capabilities, code-named Cimarron, is expected in October. With decreased inventories and regained customer confidence, STC expects 1986 revenue to hit $725 million and earnings to reach between $30 million and $60 million, Poppa said.

And some analysts are optimistic about STC's viability. "STC could definitely come back and could be competition to IBM in the peripherals area," said Debra Silversmith of Hanifen, Imhoff, Inc. in Denver. "They've done a fairly efficient job of cost cutting, and top management has done a lot to reassure customers," she said.

Although STC has had "dozens" of purchase offers, "no one has been willing to pay what we think the company is worth," Poppa said. "They want to buy distressed merchandise, and we are not distressed."

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Semiconductor group maintains positive business outlook

Forecasts 16% growth in worldwide chip sales

By Maura McEnaney

SAN JOSE, Calif. — The U.S. semiconductor industry's trade group continues to maintain its positive business outlook, although to a somewhat lesser degree, by forecasting a 16% growth in worldwide semiconductor sales in 1986. The forecast is a revision of a September prediction anticipating an 18% increase in worldwide sales.

The mid-year forecast from World Semiconductor Trade Statistics, Inc., (WSTS) projects worldwide shipments to hit $25 billion in 1986, climbing above 1985 sales of $21.5 billion. The 1985 total represented a 17% drop from 1984 levels.

In the U.S., however, semiconductor shipments are expected to increase only 11.5%, from $8.09 billion in 1985 to about $9 billion. The revised U.S predictions fall well below the September forecast of a 25% increase.

Regional sales will vary, the statistics show. In the Western European market, sales of semiconductors will grow 11%, from $4.5 billion to $5 billion, while the Japanese market will climb 25%, from $7.6 billion to $9.5 billion.

The numbers are somewhat skewed since they do not represent the increasing value of the Japanese yen, according to the Semiconductor Industry Association (SIA), publishers of the WSTS figures. "The real Japanese market will grow about 10% to 15%," says the SIA's Ione Ishii.

According to E. F. Hutton & Co. analyst Edward White, the currency differential makes for a much more modest forecast. "Generally the WSTS figures have been somewhat on the optimistic side, sometimes aggressively on the optimistic side," White says.

Only recently has the differential had an impact on the sales within the U.S., White notes. "The currency is going to increase U.S. world market share because Japanese company components are looking more expensive as the yen goes up," he claims.

In December, the market research firm Dataquest, Inc. predicted worldwide semiconductor sales would increase 9.8% over last year's totals, according to Dataquest analyst Sheridan Tatsuno. That forecast was later revised to 10% to 12% to address dumping margins after Japanese firms were hit with steep import duties. But with orders flattening, Dataquest is sticking to its original estimates. "We don't see a real big buildup for the rest of the year," Tatsuno says.

In April, Dataquest predicted a 28% growth in the Japanese market, but because it was listed in U.S. dollars, about 18% of that is owing to currency fluctuation, Tatsuno notes.

The fastest-growing technology in the chip industry this year will be the CMOS category, the SIA indicates. In 1985, sales of CMOS logic chips increased 17% to $2.6 billion. WSTS estimates that shipments of CMOS chips will increase by 34% this year, 44% in 1987 and 42% in 1988.

5¢ 10¢ NICKELS AND DIMES

Compugraphic Corp. reported net income of $1.2 million, or 15 cents per share, on revenue of $86.9 million for the quarter ended March 29. This compares with net income of $5.5 million, or 66 cents per share, on revenue of $107.5 million reported the previous year.

■

LSI Logic Corp. announced revenue for the first quarter ended March 31 of $45.4 million, up 47% from $31 million reported one year ago. Profits were $2.7 million, or 7 cents per share, compared with $1.5 million, or 4 cents per share, in the like period a year ago.

■

Prism Corp. reported revenue for the third quarter ended March 31 of $36.2 million, compared with $29.2 million one year ago. Profits were $2.5 million, or 10 cents per share, compared with a net loss of $4.8 million, or 21 cents per share, in the comparable period a year ago.

■

Quantum Corp. announced revenue for the year ended March 31 of $121.2 million, compared with $120.3 million in the previous year. Profits for the year were $22.2 million, or $2.30 per share, compared with $21 million, or $2.19 per share, in the like period a year ago.

In the fourth quarter ended March 31, revenue was $27.7 million, compared with $33.1 million a year ago. Profits were $6.9 million, or 71 cents per share, compared with $6.1 million, or 63 cents per share, in the comparable period a year ago.

■

Archive Corp. posted revenue for the second quarter ended March 28 of $20.6 million, compared with $13.1 million a year ago. Profits for the quarter were $1.4 million, or 12 cents per share, compared with $58,000, or 1 cent per share, last year.

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Robin Schwartz is Employment and Employee Relations Manager for McCormack & Dodge, a software company based in Natick, Massachusetts. She is responsible for recruiting people for the company's home office as well as its seven regional offices across the country. And earlier this year when Robin was looking for software applications sales and support people, she chose to run an ad in Computerworld.

"*I had numerous openings for positions across the country. From a cost-efficiency standpoint, Computerworld seemed like the logical choice,*" says Robin. "*But before finalizing my decision, I did a little investigating. I talked to our sales managers here at McCormack & Dodge — and they all agreed. The #1 place to recruit qualified computer professionals nationally is Computerworld. To keep in touch with what's going on in the industry, people have to read Computerworld,*" she explains.

McCormack & Dodge is enjoying national visibility as a result of the ad, but, more importantly, Robin is quite pleased with the responses. "*My people were right. We placed the ad in the beginning of the year and received tremendous response via our two-day hot line (800 number). And since we are still getting resumes, Computerworld obviously has a long life cycle through its pass-along circulation,*" she adds.

"*The quality of the responses has made our ad placement more than worthwhile,*" concludes Robin. "*The professionals responding to our ad are experienced, not just job changers. We are getting in touch with just the people we need to reach.*" In fact, according to Robin, "*Quite a few of the positions are already filled. Thanks to Computerworld!*"

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✓PC Mouse with PC Paint+ 139
✓PC Mouse with Ready . 139
✓PC Mouse with Dr. Halo II . 139.
✓PC Mouse with Ready and PC Paint+ 149
NEC
✓Multisync monitor *(EGA compatible)* 549
Orchid Technologies
Conquest Multifunction Board 0k upgradeable to 2Mb, fully supports LOTUS/INTEL expanded memory specification (EMS), includes clock calendar, serial port, and parallel port. 264
PC Turbo 286e w/1 Meg . . . . . 749.
✓Eccell Multifunction Board for the AT 0k upgradeable to 1 Meg, fully supports LOTUS/INTEL expanded memory specification (EMS) and Error Correction Code (ECC), (serial and parallel ports optional) 399.
Paradise Systems
✓Color Card 99
✓Monochrome Card . 109.
✓Color/Mono Card . . . 149
✓Modular Graphics Card . . 275.
Princeton Graphics
✓MAX-12E Amber monochrome monitor 179.
✓HX-12 RGB monitor *(690 x 240)* 449
Quadram
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0k *(upgradeable to 384k)* 189
384k *(fully populated)* 249
Gold Quadboard 0k . . . . . 387.
Silver Quadboard 0k . . . . . 215.
✓Microfazer Printer Buffer *(parallel) w/copy MP 64 (64k) upgradeable to 512k* 159
✓QuadEGA+ 369
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PC-Documate Keyboard Templates available for
DOS/Basic 2.0-2.1 Supercalc 3
✓DOS/Basic 3.0-3.1 Wordstar
✓Lotus 1-2-3 ✓Wordstar 2000
✓Symphony Turbo Pascal
Framework ✓WordPerfect
dBase II ✓dBase III
✓Multimate . . . . . each 12.
Toshiba
All Toshiba printers listed are 24 pin dot matrix.
✓P321 parallel printer *(80 column)* . . . . . 519.
✓P351 parallel printer *(136 column)* . . . . 1089.

DRIVES

All drives are shipped with complete installation instructions.
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✓Bernoulli Box 20 Meg w/PC2 card . . $2299
✓10 Meg cartridge . . . . . 48.
✓Bernoulli Box 40 Meg w/PC2 card 2999
✓20 Meg cartridge 67
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Hard Drive Card 20 Meg . . . . . call
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20 Meg Hard Drive Card . . . . . 489.
Seagate
20 Meg Internal Hard Drive *(w/controller and cables)* 449
Toshiba
PC, XT 360k Drive *(5¼" half-height)* . . 109
✓AT 360k Drive *(5¼" half-height)* 117

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200 nanosecond *(set of 9)* . . . 12
Install memory upgrades & run diagnostics *at time of board purchase only* 10
✓128k Memory Upgrade Set for IBM-AT System Board *(9 chips piggybacked)* . 39
✓256k Memory Upgrade Set for any IBM-AT memory board *(9 chips)* . . . . . 39.

DISKS

DS/DD Disks for the PC & XT (40 TPI).
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✓Maxell MD-2 19
✓Verbatim Datalife . . . . . 17.
DS/High Density Disks for the AT (96 TPI)
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✓Fuji . . 27
✓Maxell . 34.
✓Verbatim 34.

✓Flip Sort *(holds 75 disks)* . . . . . 15.
✓Floppiclene Disk Drive Cleaner (5¼") . . . 18.

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Word-a-holics unite!

Trying to decide which word processor to buy is like trying to decide which college to go to. The decision will change your life forever, but you may never know if it was the best one. Here are five tried and proven professional packages. They all have spell checkers. None are copy-protected. And hard drives are recommended for all. See PC Magazine 1/28.



MultiMate Advantage 3.6 with Graphlink and On-File $299
Originally designed to emulate the WANG word processor, MultiMate is often referred to as the corporate word processor. It offers sophisticated networking capabilities, and, with two free-for-a-limited-time software programs (Graphlink and On-File), also has built in graphics and database.

MicroSoft Word 3.0 with Outline $347
With a mouse and a graphics card, MicroSoft Word lets you move words around without touching the keyboard, and see what you got without squinting. Without a mouse or a graphics card it's still a powerful word-processor, with "Style Sheets" that simplify formatting, and a built-in outline program.

WordPerfect 4.1 ..... $239
We have a friend who writes for computer magazines. At one time or another he has used and reviewed virtually every major word processor. He now swears by WordPerfect and swears at all the others. Use this program for a while and you'll be able to touch type most of your commands with your eyes closed and your right hand tied behind your back.

WordStar 2000 Plus Release 2 ..... $239
WordStar has had some trouble shedding its image as the lumbering dinosaur of the microcomputer age. But hundreds of thousands of people use it. There are a lot of programs out there to back it up. And this new version gives it the same advanced features as any top-quality word processor. Even the control keys are starting to make some sense.

Volkswriter 3.0 ..... $147
Solid performance with a reasonable price continues to be Volkswriter's claim to fame. It's fast, and boasts one of the original what-you-see-is-what-you-get screens. With the new version's spell checker and more sophisticated print formatting, it is now able to compete functionally with the other high-end word processors. (Our new low price is pretty persuasive too).

HARD BARGAINS



A 20 Meg drive on an expansion card, that you can install in under 10 minutes? That features speed mode and a 2K data buffer that makes reading files 300% faster than the XT (read that? For under $500! Go for it. We also have conventional hard drive packages—drive, controller board, cables, and installation instructions. A file and directory management utility will make it much easier to keep all those DOS directories straight. If your existing

20 Meg DriveCard $489
20 Meg Internal Package (PC/XT) $449
20 Meg Internal Package (AT) $569
XTREE File & Directory Management Software.. $37

Chips

Fully tested, factory fresh 9-chip sets from the leading chip manufacturers, such as TI, Samsung, NEC, Hitachi, Oki, etc. All chips and chip sets come with complete instructions.

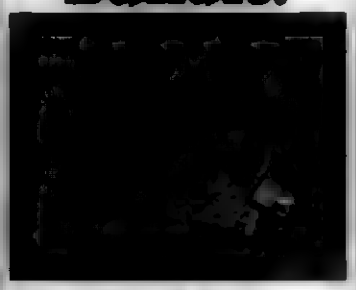
64K (200Ns)	$12 ea. set
64K (150Ns)	$15 ea. set
128k or 256k (150Ns)	$39 ea. set

Bernoulli bombshell!

There are very few products that are bargains at $2999—a fully-equipped car, a fully-furnished condominium in Marlow, NH, and a fully-supported 40 Meg Bernoulli Box. Well we don't sell cars, and there are no condos in our hometown, but we do have Bernoulli Boxes. Both the 20 Meg and 40 Meg versions feature two 1/2 height drives with removable cartridges. We're an authorized Bernoulli service center.

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Bernoulli Box 20 Meg $2299
Additional 10 Meg cartridges $48
Bernoulli Care Kit $79

Mouse Bundle!



A lot of people will sell you a mouse. Some will even sell you a mouse with a software program thrown in. But we'll sell you the Mouse Systems optical mouse with the new PC Paint Plus software, and a copy of *Readyf*, the memory-resident program that organizes and outlines your thoughts. At the cheesy little price of $149.

Mouse Triple Bundle $149

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VP Planner $57

Ability!



Over 600,000 sample copies of Ability were found into the November PC World, so a lot of you have had the chance to check it out. Word Processing, Spreadsheet, Database, Graphics, Telecommunications, and Presentation! It was pretty exciting, but it cost $239. Now a new company, Migent Software, has it, and we can offer the complete integrated package for just $65!

Ability $65

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Tip Sheet



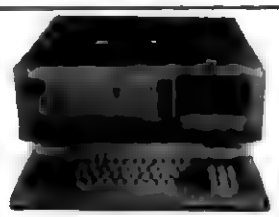
Name: Erik Klem
Title: Sales Consultant
Specialties: Ultimate Frisbee, all night cut-throat cribbage, skiing in June.

"Have you experienced Deep DOS? I don't mean FORMAT, DISKCOPY, and DIR. I'm talking about all those funny sounding utilities that you've ignored for the last several months or years. Like CHKDSK—very helpful in determining what is (or isn't) wrong with your disk. Or EDLIN, a primitive, but occasionally very useful word processor.

"Once you've been using a PC for a while you should go back and thumb through your DOS manual. You may stumble upon a few time-saving hints. Besides, think how impressed your friends will be when you casually comment, 'Oh, EXE2BIN? I use it all the time to convert my .EXE files to .COM compatible form. Saves disk space, you know.' So, CHECKDOS.OUT already."

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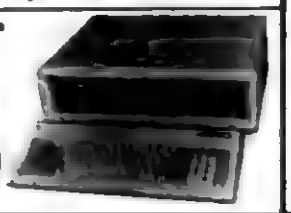
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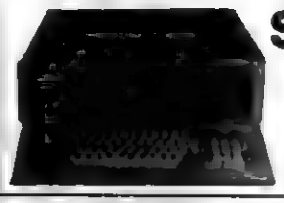
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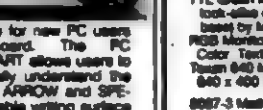
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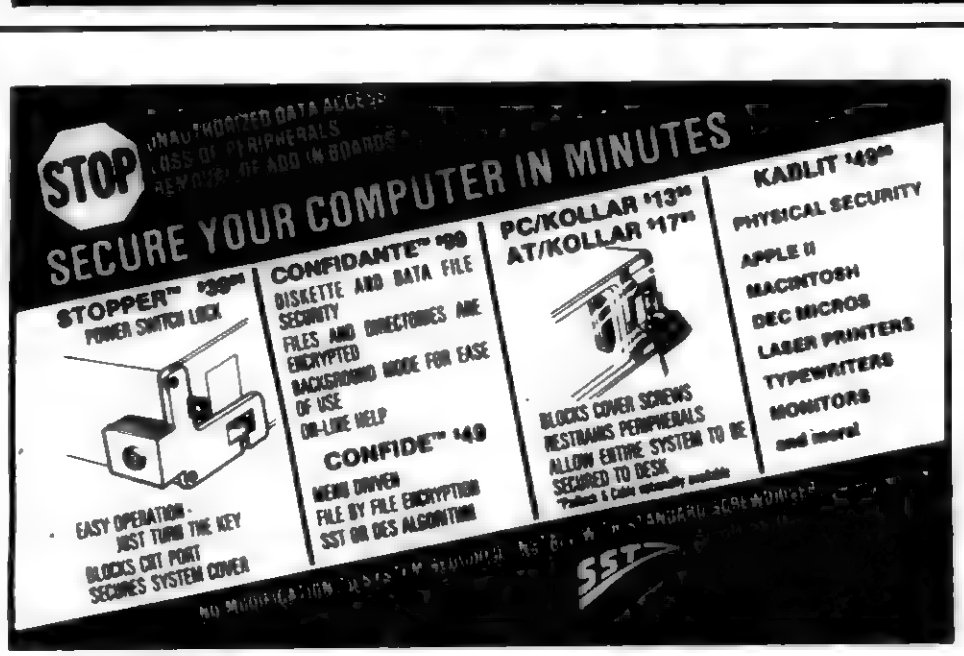
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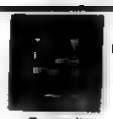
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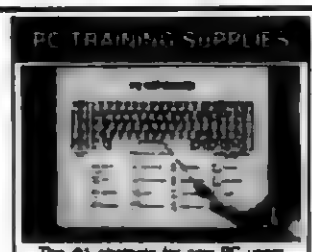
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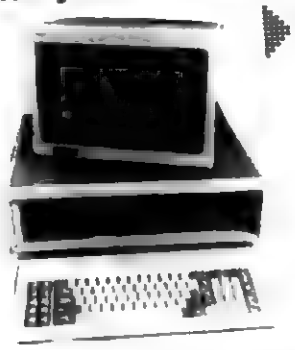
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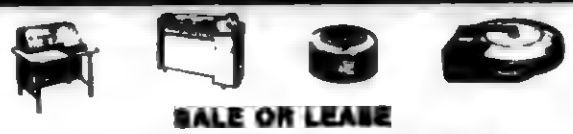
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Request for Proposal No. 1113, due Thursday, June 19, 1986 at 3:30 p.m. for the MISSISSIPPI STATE UNIVERSITY, Department of Electrical Engineering to acquire a multi-tasking 32 bit engineering workstation capable of running Silver-Lisco and Mentor graphics, and requiring compatibility with an existing Ethernet gateway with TCP/IP.

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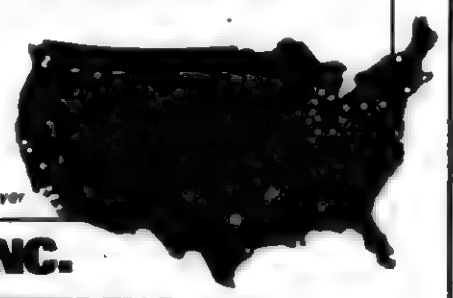
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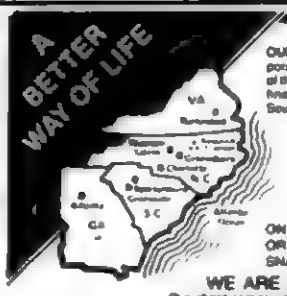
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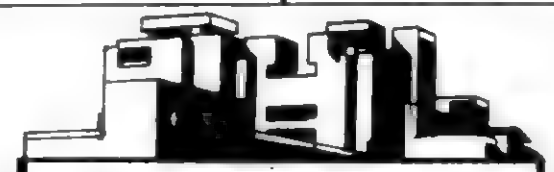
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Honeywell names CEO

Honeywell, Inc. named Vice-Chairman **James J. Renier** to head its day-to-day operations as president and chief operating officer, positions that had been vacant for eight years. Renier, 56, was president of the information systems division from 1982 to 1985. Chairman and Chief Executive Officer Edson Spencer said Renier's appointment "will enable me to focus on Honeywell's long-range opportunities."

■

Tektronix, Inc. will reduce its work force by about 10%, cutting 2,000 jobs through "voluntary means" and layoffs if necessary. The Beaverton, Ore., electronic instruments firm will take a one-time charge associated with the cuts in the current quarter ending May 31 and will complete the reductions by Aug. 23. Corporate officers will take 10% salary cuts.

■

In the first deal of its kind with a foreign vendor, Japan's **Nippon Telegraph and Telephone Corp.** (NTT) signed a $250 million, five-year contract last week to purchase digitized telephone exchanges from Nashville-based Northern Telecom, Inc., beginning in 1989. Northern Telecom won the procurement deal over AT&T in a bidding battle that dates back to the summer of 1985.

■

The former **Digital Equipment Corp.** employee who allegedly passed trade secrets to **Emulex Corp.** was banned by a federal judge in Colorado from using any of DEC's confidential information. Former DEC engineer **Charles Hess** worked as Emulex's director of engineering for only four days in 1985. DEC's suit against Emulex alleging trade secret misappropriation remains pending in New Hampshire.

Wang buys out Intecom

From page 146

Intecom, pummeled by a successful customer lawsuit and weakened by sagging sales, had looked to many observers as if it might not survive without being acquired by a major company. Intecom's high-end switches in its IBX product line compete with those of Northern Telecom, Inc. and AT&T, but Intecom, with sales of $120 million last year, could not project the image of long-term market presence that many customers were looking for.

Before the merger, however, Intecom officials last week expressed optimism about the company's future, despite losses of $7.9 million for the first quarter of 1986 and $6.6 million for fiscal 1985. They said the company would return to profitability in the third quarter of 1986 through a strategy of selling to large companies that have sizable data transmission needs. But full-year losses are still projected.

The company acknowledged that it will pay $12.4 million to American Network, Inc. (Amnet), a long-distance telecommunications firm in Vancouver, Wash., as settlement for the $37.5 million Amnet recently won in a jury verdict against Intecom. The jury confirmed the plaintiff's claim alleging breach of contract, breach of warranty and fraud, all resulting from the sale of a TSX switch, a device that Intecom no longer offers.

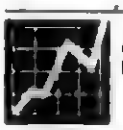
Intecom officials said payment will likely come from Intecom's cash reserves of $39 million.

In addition to legal difficulties, Intecom has been hurt by a slow market and by competitors that, according to Intecom President and CEO Erik T. Ringkjob, have been trying to "buy the market" by underpricing their products. "AT&T is bleeding substantially in this segment of the business," Ringkjob observed.

According to the merger agreement, each of the approximately 26.1 million shares of Intecom common stock not currently owned by Wang is to be converted into shares of Wang Class B common stock. Exxon Corp., which holds 30% of Intecom shares, has agreed to sell all its stock to Wang in exchange for Wang Class B shares.

The boards of directors of both Wang and Intecom have approved the merger.

Altos' 1985 performance brings strong predictions



ACTIVE ISSUES
Kathy Porteus

For a company that pioneered the market for low-end multiuser micros, Altos Computer Systems, Inc. (ALTO — 17¾) has relatively few arrows in its back.

One reason is that Altos dodged most of the bad news in 1985 when the market for multiuser systems grew only 3.5%, according to International Data Corp. "While everyone was bleeding horribly, Altos did relatively well," says George Elling, senior vice-president with Oppenheimer & Co. "Altos could really start gaining momentum as the business environment improves."

Analysts agree that the company's prospects look bright for fiscal 1987. And investors, noting Altos' ability to emerge from a difficult year with new product and distribution strategies in place, are currently supporting a $17 to $18 price level, up significantly from the $9 to $12 range where the stock languished for two years.

Earlier this month, the stock broke through $19, but soon retreated on news that Phillip White, formerly vice-president of marketing, had left Altos to join Wyse Technology, Inc. as president. White's departure does not signal problems for the company, according to analysts.

Altos now emphasizes larger multiuser systems, such as its 32-bit 3068 and its products based on Intel Corp.'s 80286 chip. Such products have been well received, according to analysts. Don Sinsabaugh, managing director with Swergold, Chefitz & Sinsabaugh, Inc., says he expects Altos to announce during 1987 a product based on Intel's 80386 microprocessor.

Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

As a result of offering more powerful systems to its target customer base, Altos will eventually face more direct competition from minicomputer vendors such as Data General Corp. and Digital Equipment Corp.

But expanding the product line upwards, says Rich Edwards, analyst with Robertson, Colman & Stephens, "has very positive implications for gross margins and selling expense, because the average system prices are higher." Also, the company's recent technology transfer agreement with Tandem Computers, Inc. involving Altos' 3086 system provides Altos with extra credibility among OEMs and probable future business from Tandem.

Besides its transition to supplying larger multiuser systems, Altos is changing its distribution mix. "What will propel the company's growth during 1987," Sinsabaugh says, "is the number of small OEM contracts Altos signed over the past six months with companies such as TWA and Jeumont-Schneider." According to Oppenheimer's Elling, more OEM deals are brewing.

Until shipments resulting from such OEM agreements begin, analysts expect Altos' quarterly sales to remain flat. Edwards of Robertson, Colman projects "two further quarters of shipments at roughly $38 million, followed by a marked increase of about $4 million each quarter, reflecting shipments to new OEM customers."

According to Edwards, Altos will earn 77 cents a share on $143 million in sales for fiscal 1986, ending June 30th, and $1 a share on $174 million in fiscal 1987. Edwards admits his estimates are on the conservative side as a result of uncertainty about the U.S. economy and "how well international orders hold up." Foreign business accounted for 34.7% of company revenue during the third quarter.

More enthusiastic is Elling, who currently recommends purchase of Altos because the stock's "leverage is now on the up side." Elling estimates Altos will earn $1.10 to $1.20 a share in fiscal 1987. "If Altos gets OEM orders on-stream," Elling says, "these numbers could be better."

AT&T appoints Olson chairman

From page 146

turing of the corporate behemoth. "I suspect that under Tobias, Information Systems would be phased out as a separate unit. The writing is on the wall," noted Fritz Ringling of the Gartner Group, Inc.

The unified computer and telecommunications businesses could pave the way for a much-needed reduction of the AT&T work force. Such cutbacks could be accomplished either through attrition or layoffs, but Olson adamantly denied that any cuts are planned: "We don't see any major downsizing as a result of this."

Analysts, citing ongoing contract negotiations with the Communication Workers of America union, say they believe Olson had no recourse but to discount the possibility of layoffs last week.

Olson becomes the 13th chief executive in AT&T's 101-year history. Brown, who has held the top post for seven years, will reach the mandatory retirement age of 65 in August.

In other management moves, AT&T elevated Executive Vice-Presidents Charles Marshall and Morris Tanenbaum to vice-chairmen of the board. Marshall will continue to direct external affairs and personnel organizations, while Tanenbaum retains authority over financial planning and strategic planning groups.

Intelligent Systems lays off 17, fires 3

By James A. Martin

NORCROSS, Ga. — Intelligent Systems Corp.'s Quadram and Intecolor divisions laid off 17 assembly workers and middle management employees because of an anticipated summer slowdown in sales and production.

The layoffs were attributed to continuing sluggishness in the personal computer plug-in accessory boards market. Other staff changes are a result of corporate restructuring under the helm of Robert Brown, who was named Quadram president three months ago. In addition, three product managers were fired for "poor performance," while the Datavue portable computer division increased its staff by six.

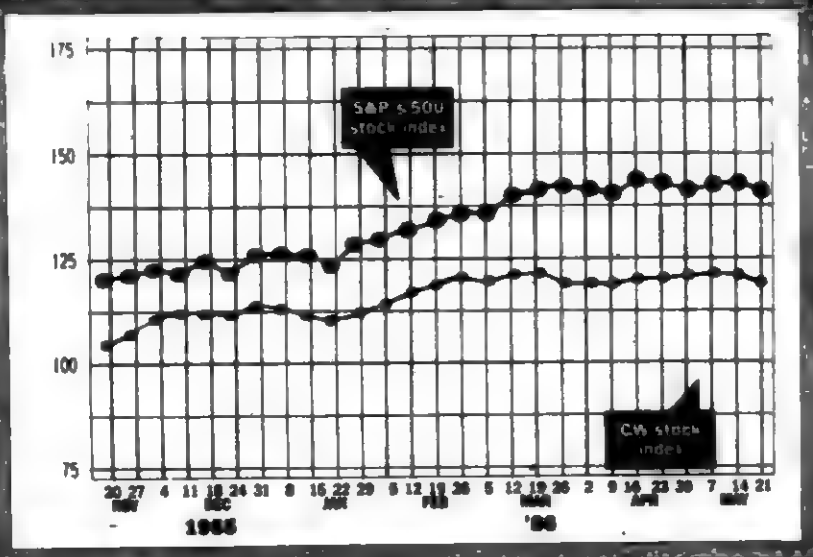
Separately, Intelligent Systems reported net earnings for the fourth quarter ended March 31 of $1.2 million, or 10 cents a share, compared with a loss of $7.2 million, or 64 cents a share, the previous year. Revenue for the quarter increased 9%, to $35.1 million from $32.2 million.

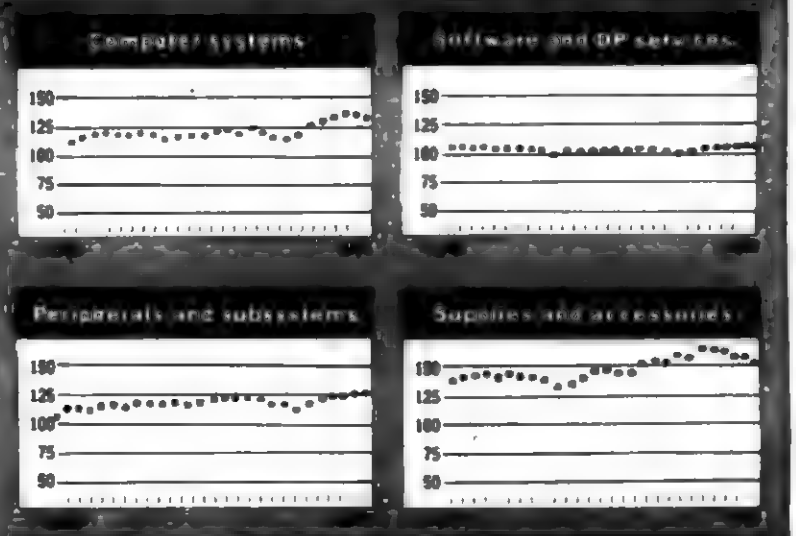
The firm had net income of $33,000 for fiscal 1986, ended March 31, compared with $1.8 million for 1985. Revenue was $125.5 million for 1986, up from $123.9 million.

COMPUTER INDUSTRY

MITCHELL J. HAYES

Computerworld stock trading index





	5/14/86	5/21/86
Computer systems	128.9	127.6
Software and DP services	106.4	106.1
Peripherals and subsystems	125.0	125.0
Supplies and accessories	154.6	155.5
Semiconductors	110.0	106.2
Leasing companies	104.6	104.2
CW stock index	121.5	120.9
Standard and Poor's 500 stock index	142.0	140.5

Computerworld stock trading summary

CLOSING PRICES WEDNESDAY, MAY 21, 1986

COMPUTER SYSTEMS

EXCH		52-WEEK RANGE (1)		PRICE CLOSE MAY 21 1986	WEEK NET CHNGE	WEEK PCT CHNGE
O	ALPHA MICROSYSTEMS	5-	9	6 3/4	-1/2	-6.8
O	ALTOS COMPUTER SYST	9-	19	17 1/2	-5/8	-3.4
A	AMDAHL CORP	10-	18	14 5/8	-7/8	-5.6
O	APOLLO COMPUTER	9-	31	15 1/4	-1/4	-1.6
O	APPLE COMPUTER INC	14-	37	37	+1/8	+0.3
N	AT&T	19-	26	24 1/8	-1/4	-1.0
N	BURROUGHS CORP	52-	71	58 3/4	-1 1/8	-1.8
O	COMPAQ COMPUTER CP	5-	18	17 3/8	-1/2	-2.7
O	COMPUTER AUTOMATION	1-	9	2 1/8	-1/8	-5.5
A	COMPUTER CONSOLES	5-	14	10 5/8	+1/2	+4.9
N	CONTROL DATA CORP	15-	39	23 1/2	0	0.0
O	CONVERGENT TECHNOL	5-	13	9 7/8	+5/8	+6.7
O	CPT CORP	4-	8	4 1/4	-3/8	-8.1
N	CRAY RESEARCH INC	25-	87	85 1/2	+4 3/4	+5.8
O	DAISY SYSTEMS CORP	11-	36	12 1/4	-1/4	-2.0
N	DATA GENERAL CORP	31-	76	40 5/8	+7/8	+2.2
N	DATAPOINT CORP	5-	22	7 3/4	+1/2	+6.8
N	DIGITAL EQUIPMENT	42-	91	87 1/8	-7/8	-0.9
A	EECO INC	13-	17	17 3/8	+3/8	+2.2
N	ELECTRONIC ASSOC.	3-	7	5 3/4	-1/8	-2.1
N	FLOATING POINT SYST	18-	42	37 7/8	-2	-5.0
N	FOXBORO	22-	31	29 1/4	-1/4	-0.8
N	GOULD INC	20-	36	23 1/8	-3 5/8	-13.5
N	HARRIS CORP	22-	35	31 3/8	-1 1/8	-3.4
N	HEWLETT-PACKARD CO	29-	45	43 1/4	-1	-2.2
N	HONEYWELL INC	54-	87	77	+3/8	+0.4
N	IBM	117-	158	144 1/2	-3 5/8	-2.4
O	IPL SYSTEMS INC	1-	4	3	+5/8	+26.3
N	ITT CORP	28-	48	46 1/2	-1	-2.1
N	M/A-COM INC	13-	24	16 1/8	-1/2	-3.0
N	MANAGEMENT ASSIST	2-	28	2 3/8	0	0.0
N	MATSUSHITA ELEC(ADR)	48-	98	87 1/2	-3 5/8	-3.9
O	MENTOR GRAPHICS	13-	30	16 3/4	-5/8	-3.5
N	MODULAR COMPUTER SYS	6-	9	8 7/8	-1/8	-1.3
N	MOHAWK DATA SCI	1-	13	3 3/8	0	0.0
N	NBI INC	11-	20	11	-1	-8.3
N	NCR	25-	54	53 3/4	+7/8	+1.6
N	PERKIN-ELMER	22-	36	29 5/8	-2 3/4	-8.4
N	PRIME COMPUTER INC	18-	27	20 1/2	-3/4	-3.5
N	SPERRY CORP	38-	73	72 1/4	-5/8	-0.8
O	STRATUS COMPUTER INC	9-	25	23 1/2	+1/2	+2.1
O	TANDEM COMPUTERS INC	13-	33	32 1/2	+1 3/4	+5.6
N	TANDY CORP	24-	44	39 3/4	-1 1/8	-2.7
O	TELEVIDEO SYSTEMS	3-	4	3 3/8	-1/8	-3.5
O	TELRON CORP	8-	21	20 7/8	-7/8	-4.0
N	TEXAS INSTRUMENTS	88-	141	138 5/8	+1/8	0.0
A	ULTIMATE CORP	8-	32	30 3/4	+1/4	+0.8
O	VECTOR GRAPHICS INC	1-	1	1/8	0	0.0
A	WANG LABS "B"	16-	29	17 1/4	0	0.0
A	WANG LABS "C"	15-	29	17 1/4	+1/8	+0.7
N	XEROX CORP	37-	72	67 3/4	-1 1/2	-2.8

SUPPLIES & ACCESSORIES

EXCH		52-WEEK RANGE (1)		PRICE CLOSE MAY 21 1986	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMERICAN BUS PRODS	21-	36	32 3/4	-1/2	-1.5
N	BARRY WRIGHT	17-	35	23 1/8	-1/2	-2.1
A	DUPLEX PRODUCTS INC	15-	23	22 1/4	-1/8	-0.5
N	ENNIS BUS. FORMS	14-	28	23 3/4	-3/8	-1.5
N	3M COMPANY	74-	107	98 1/2	-3 3/4	-3.6
N	MOORE CORP LTD	15-	37	23 7/8	-7/8	-3.5
O	STANDARD REGISTER	22-	46	38 3/4	-2 1/4	-5.4
N	WALLACE COMP SERVICE	30-	48	47 3/8	-3/8	-0.7

SOFTWARE & DP SERVICES

EXCH		52-WEEK RANGE (1)		PRICE CLOSE MAY 21 1986	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	2-	6	5 5/8	-1/8	-2.1
N	ADVANCED SYSTEMS INC	9-	20	17	-1/8	-0.7
N	AGS COMPUTERS INC	10-	25	20 3/4	-1/4	-1.1
O	AMERICAN SOFTWARE	9-	15	12	+1/4	+2.1
N	ANACOMP INC	2-	8	5 5/8	+1/8	+2.2
O	ANALYSTS INTL CORP	5-	11	7 1/4	-1/2	-6.4
O	ASHTON TATE	6-	30	28 1/2	-1 1/8	-3.7
O	ASK COMPUTER SYSTEMS	7-	25	12 1/8	+5/8	+5.4
B	ASTRADYNE COMP IND	1-	3	1 5/8	-1/8	-6.8
N	AUTOMATIC DATA PROC	35-	71	70	-1/8	-0.3
O	COMPUTER NETWORK	5-	9	7 7/8	-1/4	-3.0
O	COMPUTER ASSOC INT'L	9-	23	23	+1 1/4	+5.7
O	COMPUTER HORIZONS	5-	11	13 7/8	+1/2	+3.7
N	COMPUTER SCIENCES	13-	36	34 5/8	-1/2	-1.4
O	COMPUTER TASK GROUP	10-	28	24 1/4	-2 1/2	-9.3
O	COMPUTER USAGE	1-	3	3	0	0.0
O	COMPUTONE SYSTEMS	3-	11	4 3/8	-1/2	-10.2
O	COMSERV CORP	1-	6	3 1/4	0	0.0
O	COMSHARE	7-	13	13	+1/8	+0.9
N	CULLINET SOFTWARE	12-	33	15 1/4	+1/8	+0.8
O	CYCARE SYSTEMS INC	13-	27	16 5/8	+2 3/8	+16.8
O	HOGAN SYSTEM INC	4-	12	10 3/4	0	0.0
N	GENERAL ELECTRIC CO	56-	79	76 1/2	-1	-1.2
N	GENL MOTORS E (EDS)	20-	49	48 1/4	-1 1/8	-2.2
N	GTE CORP	38-	54	49 1/2	-1	-1.9
O	INFORMATION SCIENCE	1-	5	3 3/8	+1/8	+3.8
O	INFOTRON SYSTEMS CP	13-	24	16	+1/4	+1.5
O	KEANE ASSOCIATES	10-	20	14	0	0.0
N	LOGICON	25-	43	38 3/8	+7/8	+2.4
O	LOTUS DEVELOPMENT CP	15-	37	34 3/4	-1 3/4	-4.7
O	MCI COMMUNICATIONS	7-	13	10	0	0.0
O	MINGT SCI AMER INC	7-	18	14 3/8	+3/8	+2.8
O	MATHEMATICAL APP GRP	1-	8	1/2	0	0.0
O	MICOM SYSTEMS INC	12-	35	15	-1	-6.2
O	MICROPRO INT'L CP	2-	4	2 1/2	0	0.0
O	NATIONAL DATA CORP	8-	25	22 3/8	-2 1/2	-10.0
O	ON-LINE SOFTWARE INT	4-	16	13 1/2	-1 3/4	-11.4
N	RANSOMNC SYSTEMS	14-	34	33 1/2	-7/8	-2.5
N	PLANNING RESEARCH	11-	23	22	-5/8	-2.7
O	POLICY MGMT SYSTS CP	16-	35	19 3/4	-1 3/4	-8.1
O	PROGRAMMING & SYS	4-	10	8 5/8	-5/8	-6.7
O	REYNOLDS & REYNOLD	30-	66	31	+1/4	+0.8
O	SEI CORP	13-	27	24	-1/2	-2.0
O	SHARED MEDICAL SYST	26-	48	38 5/8	+1/4	+0.6
O	SCIENTIFIC COMPUTERS	4-	8	4 3/4	+1/8	+2.7
O	SOFTWARE AG	12-	22	20 1/4	-1 1/8	-5.2
N	URS CORP	10-	18	15 7/8	+5/8	+4.0
N	UCCEL	11-	21	20 1/4	-1	-4.7
O	VMI SOFTWARE	17-	29	27 3/4	-1	-3.4

SEMICONDUCTORS

EXCH		52-WEEK RANGE (1)		PRICE CLOSE MAY 21 1986	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADVANCED MICRO DEV	22-	36	25 3/8	-7/8	-3.3
O	ADV'D SEMICONDUCTOR	7-	23	11 1/4	-1	-8.1
N	ANALOG DEVICES INC	14-	24	23	-3/4	-3.1
O	ANALOGIC CORP	11-	16	12 1/2	-1 3/8	-9.9
N	APPLIED MAGNETICS CP	9-	19	18 1/2	-3/4	-3.8
O	AVANTEK	18-	28	18 1/4	-5/8	-3.3
O	MADCO CORP	3-	7	5 3/4	-1/8	-2.1
O	INTEL CORP	21-	33	28 1/2	-1 5/8	-5.7
O	MICRO MASK INC	5-	12	9 1/2	-3/8	-6.3
N	MOTOROLA INC	29-	46	46 1/2	-1/4	-0.5
N	NAT'L SEMICONDUCTOR	10-	15	13 7/8	0	0.0
N	TERADYNE	17-	33	28	-1/2	-1.8

PERIPHERALS & SUBSYSTEMS

EXCH		52-WEEK RANGE (1)		PRICE CLOSE MAY 21 1986	WEEK NET CHNGE	WEEK PCT CHNGE
P	AM INTERNATIONAL	3-	8	6 1/8	-1/8	-1.5
A	ANDERSON JACOBSON	2-	5	2 1/4	+1/8	+5.8
O	AST RESEARCH INC	7-	33	17	-2 3/8	-12.2
O	AUTO-TROL TECHNOLOGY	3-	13	9	0	0.0
O	AVANT GARDE COMPUTING	3-	21	4	-3/8	-8.7
O	BANCTEC INC	6-	12	11 1/2	+1/4	+2.2
O	BEEHIVE INT'L	1-	2	1/8	0	0.0
N	BOLT, BERANEK & NEW	20-	44	44 1/4	+1	+2.3
O	CAMBEX CORP	1-	3	1 1/2	0	0.0
N	CENTRONICS DATA COMP	3-	11	8 1/4	0	0.0
A	CETEC CORP	6-	9	7 1/2	-3/8	-4.7
A	COGNITRONICS	4-	7	4 1/8	0	0.0
N	COMPUGRAPHIC CORP	23-	36	23	-5/8	-2.6
O	COMPUTER TRANSCEIVER	0-	1	7/8	0	0.0
N	COMPUTERVISION CORP	9-	44	16 5/8	-1/2	-2.9
N	CONRAC CORP	12-	18	16 3/4	1/4	1.4
A	DATAPRODUCTS CORP	11-	20	17	+5/8	+3.8
A	DH \RAM CORP	4-	17	16 1/2	-1/4	-1.4
O	DATA SWITCH CORP	4-	9	7 1/2	-3/4	-9.0
O	DATUM INC	5-	9	6 3/4	0	0.0
O	DECISION DATA COMPUT	10-	20	12 1/2	+1/2	+4.1
O	ENDATA, INC	2-	8	6 1/8	0	0.0
O	EVANS & SUTHERLAND	12-	27	26	-1	-3.7
O	GANDALF TECHNOLOGIES	5-	13	6 1/2	0	0.0
N	GEN'L DATA COMM IND	8-	21	12 7/8	-1/8	-0.9
N	HAZELTINE CORP	17-	30	16 1/2	1/2	2.9
O	ICOT CORP	3-	12	12	+1/8	+1.0
O	INFORMATION INTL INC	10-	17	14 1/2	-1 1/4	7.9
O	INTECOM INC	3-	11	4 3/8	-1/8	2.7
O	MEGADATA CORP	3-	8	3	-1/8	-4.0
A	MSI DATA CORP	7-	14	13 5/8	-3/8	-2.6
N	NASHUA CORP	24-	52	48	+2 1/4	+4.8
O	NETWORK SYSTEMS CORP	11-	27	13 3/4	-3/4	-5.1
N	NO AMERICAN PHILIPS	32-	47	40 3/4	-5	-10.9
N	NORTHERN TELECOM LTD	26-	41	29 1/8	-7/8	-2.9
O	OMEX	1-	3	1/4	0	0.0
N	PARADYNE CORP	6-	18	10 3/4	+3/4	+7.5
A	PENRIL CORP	7-	14	7 1/2	+1/8	+1.6
N	PLESSEY CO (ADR)	19-	36	34 1/2	0	0.0
O	PRINTRONIX INC	9-	18	13 1/2	+1/8	+0.9
O	QMS INC	6-	16	13 3/4	+1/4	+1.8
O	RAMTEK CORP	2-	7	5 1/2	-3/8	-6.3
N	RECOGNITION EQUIP	9-	17	16 3/8	+2 1/4	+15.9
N	SANDERS ASSOCIATES	28-	44	29 3/8	-1	3.2
O	SCAN TRON CORP	9-	22	19	+1/2	+2.7
N	SCIENTIFIC ATLANTA	10-	15	10 3/8	-5/8	-5.6
O	SEAGATE TECHNOLOGY	5-	13	12 7/8	3/8	2.8
N	STORAGE TECHNOLOGY	1-	6	4 1/4	0	0.0
O	SYNES DATATRONICS	0-	2	3/8	0	0.0
A	T BAR INC	5-	9	5 3/4	-1/4	-4.1
A	TAB PRODUCTS CO	14-	23	21 1/4	+1/2	+2.4
O	TANDON CORP	3-	9	7 1/2	+1/8	+1.6
A	TEC INC	6-	13	5 1/2	0	0.0
N	TEKTRONIX INC	47-	68	58 3/4	-3/4	1.2
N	TELEX	34-	88	83 1/8	-5/8	-0.9
O	TESDATA SYSTEMS CP	0-	3	5/8	0	0.0
N	TIMEPLEX INC	15-	23	18 1/4	+3/8	+2.0
N	TITAN CORP	4-	11	9 3/4	1/8	1.2
O	VISUAL TECHNOLOGY	1-	3	5/8	0	0.0

LEASING COMPANIES

EXCH		52-WEEK RANGE (1)		PRICE CLOSE MAY 21 1986	WEEK NET CHNGE	WEEK PCT CHNGE
N	COMDISCO INC	7	24	20 3/4	-3/4	-3.4
N	CONTINENTAL INFO SYS	5-	21	19 3/8	0	0.0
O	FINALCO GROUP INC	3-	5	3 1/4	-5/8	17.1
O	PHOENIX AMERICAN INC	2-	6	4 5/8	+1/4	+5.7
O	SELECTRIM INC	6-	12	7 1/4	+1/4	+3.5
N	U.S. LEASING	32-	46	40	3/4	1.8

EXCH: N—NEW YORK; A—AMERICAN; P—PACIFIC; B—BOSTON; L—NATIONAL; M—MIDWEST; O—OVER-THE-COUNTER; S—SPLIT

O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Source: Trade Quotes, Inc.

COMPUTER INDUSTRY

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Mohawk Data Sciences seeks rebirth in the hands of venture capitalists and a former courtroom nemesis/114

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The U.S. semiconductor industry predicts 16% growth this year after its 17% sales drop in 1985/118

Honeywell names Vice-Chairman James J. Renier president/144

INSTANT ANALYSIS

"Authors of business plans are like would-be novelists. Almost no one will read their work, and the few who do will probably reject it."

— Richard A. Shaffer, editor and publisher, "Technologic Partners Computer Letter"

Wang buys out Intecom

Pays $156 million for remaining 80% of switch maker

By Stanley Gibson

ALLEN, Texas — After two years of seeking an acquirer, Intecom, Inc. has found the large partner it desired. Last week, Intecom's 20% owner, Wang Laboratories, Inc., announced it will make the vendor of digital private branch exchange equipment a wholly owned subsidiary of Wang in a transaction valued at $156 million.

In merging, Intecom gives up its independence in exchange for the credibility that comes from being a part of a major international company. Wang, in turn, gains a company with sophisticated switching products that it believes are strategically important. The pattern mirrors the relationship of Rolm Corp. and IBM, whose original 15% equity partnership led to Rolm's complete acquisition by IBM in 1984.

"The migration to twisted-pair wire in computing networks means that computer companies will have to get telecommunications capability. And all information will flow through a switch like ours," said C. Michael Bowen, chairman, chief executive officer and a founder of Intecom. Bowen said he had merger talks with nearly every major computer company as well as with such companies as General Motors Corp.

"Together with the smaller switch technology of Telenova, Inc., in which Wang has a 42% interest and the option to acquire control, Wang now possesses a very broad foundation for the integration of voice and data, which is essential to our industry," An Wang, chairman and CEO of Wang, said in a prepared statement.

See WANG page 144

Creditors dispute STC value

Poppa downplays import of $300 million discrepancy

By Maura McEnaney

LOUISVILLE, Colo. — A $300 million disagreement with creditors over the value of Storage Technology Corp. (STC) is standing in the way of an approved reorganization plan for the company to emerge from Chapter 11 of the U.S. Bankruptcy Code, STC's chairman said recently.



STC's Poppa

Chairman Ryal R. Poppa told analysts at a recent Hambrecht & Quist investment conference in San Francisco that the next few weeks should bring a consensus with the credit committee on how much STC will be worth as of Jan. 1, 1987, when it is expected to come out of bankruptcy.

"We believe the company is valued between $500 and $600 million, but the creditors are saying the company is only worth about $250 million," he said.

Sources familiar with bankruptcy proceedings say valuation discrepancies like this one are the result of both sides attempting to get the most out of their dollar as well as a somewhat arbitrary means of determining a company's worth. When debt is being paid off in stock, creditors seeking the best deal want a company to be valued low in order to receive more shares. Conversely, when a company is valued at a higher price, fewer shares need to be issued to meet the debt.

STC claims it owes creditors approximately $700 million. The company's credit committee is now considering a plan that will give creditors $100 million in cash, $300 million in eight- to 12-year notes and the balance in equity.

STC recently asked the Federal Bankruptcy Court to invalidate some $400 million of creditors' claims, including a claim from the European Computer Manufacturers Association. STC alleged that some claims were duplicates and others were

See CREDITORS page 118

INDUSTRY INSIGHT

Bob Djurdjevic

Amdahl, NAS at crossroads

At a time when industry headlines echo the woes of some vendors caught in an alleged slump, it is important not to generalize about the extent or the depth of the problem. IBM's single-digit growth may indeed qualify as a slump relative to the company's earlier optimistic forecasts. But Digital Equipment Corp.'s 86% earnings growth in the first quarter of 1986 and positive reports from other large vendors are reminders that the term "slump" may be an unjustified exaggeration of the industry's problems.

The business outlook for the two primary plug-compatible mainframe (PCM) vendors, for example, finds another market niche poised for rapid revenue growth. Both Amdahl Corp. and National Advanced Systems Corp. (NAS) have good reasons to be optimistic about their futures. Because of competitive pricing pressure, however, the two vendors' earnings will fall short of their revenue increases.

Amdahl, the original PCM vendor, has come a long way since June 1975, the date of the first customer shipment of the world's first IBM-compatible mainframe, the 470 V/6. As its 10th year ended Dec. 31, the company reported revenue of $862 million. When the curtain drops at the end of this year, Amdahl may become only the second PCM vendor ever to reach the $1 billion plateau.

Getting there, however, is only half

See AMDAHL page 117

Djurdjevic is a computer industry analyst and president of Annex Research, a Phoenix-based computer research and consulting firm.

HP announces flat earnings

RISC-based Spectrum could provide infusion

By Maura McEnaney

PALO ALTO, Calif. — Hewlett-Packard Co. produced further evidence of its need for the much-touted Spectrum program last week, announcing flat earnings and revenue for the quarter ended April 30.

Second-quarter revenue was $1.78 billion, up only slightly from $1.68 billion a year ago. Earnings declined 2% to $127 million, or 49 cents per share, compared with $129 million, or 51 cents per share, during the same period last year.

The revenue increase is due in part to a 12% increase in international orders, the company said. Incoming orders climbed 6% to $1.7 billion.

Year-to-date revenue at HP was $3.4 billion, up 5% over 1985 figures.

Earnings, however, are down 4% to $236 million, or 92 cents per share.

The financial figures come as no surprise to HP observers, who have been watching the company's order rate slip for about two years.

In a prepared statement, John A. Young, HP president and chief executive officer, said, "The fact is our U.S. business has been essentially flat for nearly two years. It continues to be a difficult business environment."

In February, HP unveiled its new product line based on reduced instruction set computing architecture.

See HP page 116

AT&T appoints Olson chairman, groups businesses under Tobias

By Alan Alper

NEW YORK — AT&T announced several major organizational changes last week, including the expected promotion of President and Chief Operating Officer James E. Olson to chairman and the grouping of its computer and long-distance businesses under the same executive.

Randall L. Tobias, chairman of AT&T Communications, will also become chairman of AT&T Information Systems effective Sept. 1. He replaces Robert E. Allen, who succeeds Olson as president and chief operating officer and joins the board of directors upon Chairman Charles L. Brown's retirement.

With Tobias presiding over Information Systems and Communications, analysts said AT&T will be able to present a more coherent front to end users, many of whom have professed confusion over the firm's strategy.

Olson said AT&T would move to combine certain aspects of Information Systems and Communications so the firm could have one group representing its total array of products. He declined to say how the two groups would be combined, adding that "further steps will be announced as they unfold in the weeks and months ahead."

Some analysts believe Olson's statements presage a total restruc-

See AT&T page 144



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Third-party maintenance firm Sorbus, Inc. begins to reap the benefits of the deep pockets of Bell Atlantic, which acquired it 18 months ago. **Page 150.**

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Hewlett-Packard rolls out its latest Spectrum machine, a processor that will unify its manufacturing and technical workstation lines. **Page 6.**

■

Fujitsu's U.S. subsidiary lands the first contract to supply end-user equipment for McDonald's ISDN trial. **Page 2.**

■

AT&T today is scheduled to unveil enhancements to its Systems 75 and 85 PBX products. **Page 2.**

■

Control requirements at the University of Michigan Hospital shape a new network management system. **Page 19.**

■

Pick-based systems help a company scoop up market share in a trailing-edge industry. **Page 45.**

■

Microsoft promises significant extensions to its Windows operating environment this week, including a major new communications facility and new support for dynamic exchange of real-time data between applications. A New York session (at the Windows on the World restaurant) also will highlight in-house Windows development efforts at some large corporations.

■

Wang Laboratories, Inc. will introduce, probably in the fall, an IBM-compatible laptop micro that features a built-in thermal printer, according to a major Wang user. "Wang is giving us a Cadillac. If it's priced aggressively, they will have a real success," the user predicted, adding that the unit will be offered to beta test sites in June. The laptop's 25-line LCD screen features an amber display with black letters. It is powered by the 80C86 CMOS chip, which makes it, like the Wang PC, twice as fast as the IBM PC. The system comes with 512K bytes RAM standard,

See **NEWS** page 5

Wang Office talks to IBM

Communication links to Disoss, Profs, 3270 forged

By Stanley Gibson

LOWELL, Mass. — Wang Laboratories, Inc. last week announced several links to IBM's office communications systems in a move to convince current and prospective customers that it has the superior departmental environment for IBM mainframe-based networks.

Among the communications links announced last week were the following:

• An upgrade of Wang's Office/Disoss Gateway from Version 1.0, introducing software Releases 1.5 and 2.0, both of which will include LU6.2 and Information

See **WANG** page 5

AT&T divisions back together

By Elisabeth Horwitt

NEW YORK — AT&T last week announced major organizational changes that signal its intent to return to a prevestiture unity as quickly as Federal Communications Commission regulations allow. The plans disclosed by AT&T Vice-Chairman Elect Randall Tobias would place AT&T Information Systems and Communications divisions under a single managerial structure, headed by Tobias.

The changes represent AT&T's first step toward coordinating sales, marketing and product development efforts for the two divisions. At the time of the AT&T divestiture, the FCC had originally mandat-

See **AT&T** page 6

Sperry users doubt value of Burroughs tie

By Alan Alper

NEW YORK — Sperry Corp. customers are demanding assurances that their investments in Sperry systems will be protected and enhanced in the years to come in the wake of Sperry's agreement last week to a takeover by Burroughs Corp.

Sperry's action occurred following two weeks of tense negotiations and after Burroughs agreed to a sweetened acquisition offer totaling $4.8 million in cash and securities.



Blumenthal

The proposed acquisition would create a corporation with $10 billion in revenue — second only to $50 billion IBM in the computer industry — and restructure the famed BUNCH lineup that for the past decade has watched IBM solidify an overwhelming lead in the mainframe market. The last major shakeups among large systems vendors came in 1970, 1971 and 1976: RCA Corp. sold its mainframe division to Sperry, General Electric Co. sold its computer division to Honeywell, Inc., and Xerox Corp. sold its mainframe division to Honeywell, respectively.

Sperry insiders contacted last week said there is a good deal of uncertainty within the organization concerning the merger's impact. "We've not gotten any word from management as to what's going on," said one middle manager, who requested anonymity. "No one knows where they stand."

Sperry users, meanwhile, continued to lament their mainframe supplier's potential loss of independence, taking little comfort from Blumenthal's statements that

See **SPERRY** page 4

CW EXCLUSIVE

Head crashes: MIS seeks aid for sensitive disk drive problems

By Donna Raimondi

MIS managers and disk drive vendors have discovered that the thin-film head technology used in new disk storage systems requires much stricter computer room purity than earlier disk types.

Thin-film technology uses heads that fly 12 to 13 microinches above the disk, as opposed to the 20 to 25 microinches of its ferrite-head ancestor. Not only is there less space between head and disk, but the material thin-film heads are made of is not as durable as the older ferrite materials, says C. E. Shannon, director of Customer Engineering Headquarters Operations at Memorex Corp., the storage products subsidiary of Burroughs Corp. "When a contaminant comes in contact with the new head, it won't bounce off like it did on ferrite. Instead, it crashes," Shannon says.



"In November, we were getting ready to install some Burroughs thin-film disk packs, and Burroughs had some concerns about our environment," says Jim Donovan, chief of computer operations at the University of Chicago Medical Center. Although the university's computer room was adequate for the two Burroughs B7900 computers and various Burroughs disk drives that inhabited it, the vendor was concerned that the more sensitive thin-film drives would not perform well there, Donovan says.

Burroughs had good reason to consider the air quality when it sold the new systems to the university. While many computers and peripherals are hardy and are not affected by slightly insufficient environmental purity, thin-film disks are very sensitive.

"Our air conditioner sucked air right off the freeway and blew it into our environment," says Chris Scharff, manager of information systems at Yamaha International Corp. in Buena Vista, Calif. The dirty air caused disk prob-

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NEWSPAPER

Fujitsu nets ISDN contract for Illinois Bell/McDonald's trial

For headquarters, training center net

By Peggy Watt

McDonald's Corp. and Illinois Bell Telephone Co. last week announced that the first equipment contract for their planned Integrated Services Digital Network (ISDN) was awarded to the U.S. communications products subsidiary of Japanese mainframe vendor Fujitsu Ltd.

Fujitsu America, Inc. of San Jose, Calif., will provide digital telephones, voice and data terminals, workstations and network adapters for the trial run, which is scheduled to begin later this year [CW, May 5].

Patrick Krause, telecommunications director for McDonald's, told *Computerworld* that Fujitsu was selected because it met contract specifications and could provide satisfactory technology, the required level of expertise and appropriate support.

Fujitsu, according to Krause, will be one of several customer premises equipment suppliers for the trial test. Other contracts are being negotiated, he said.

The parties involved refused to attach any dollar figure to the contract awarded last week and said only that Fujitsu would supply "a significant number" of the workstations to be used. More than 100 vendors were said to have inquired about various contracts for the project; about 20 submitted bids.

An Illinois Bell spokesman said the company is still negotiating to select an estimated five to 10 suppliers that will participate in the trial run, scheduled for December. He said the other contracts will be awarded fairly soon, in time for an organizational meeting of all participants in mid-June.

Under Illinois Bell's coordination, an ISDN of more than 400 lines will be built to serve the fast-food company at its corporate offices and training facility, Hamburger University, in Oak Brook, Ill.

The completed system will handle voice communications over internal, outside and long-distance network services, high-speed data transfer, image transmission, electronic mail and other information handling, all over the same lines from the same workstations. The trial run is expected to last 18 months to two years.

Krause said the initiation of the trial has been delayed because of AT&T's delay of software development for its Number 5 Electronic Switching System digital switch, which will provide the interface between McDonald's on-premises equipment and outside communications services. Testing will begin in November or December rather than in September or October, he said.

Fujitsu will supply multifunction digital telephones, intelligent voice and data terminals, intelligent workstations and adapters for gateways, said Lou Sena, Fujitsu manager of product line planning. None of the products to be used in the McDonald's trial testing are yet on the commercial market, but Fujitsu installed similar prototype versions in ISDN trials in Japan and Singapore, he said.

"I think McDonald's has a very clear and focused idea of what ISDN can do," he said. "This is a complex architecture, but the possibilities for applications are tremendous."

Fujitsu will use such standard hardware interfaces as RS-232 computer connections, RJ-11C for telephony and V.35 for high-capacity data transfer such as facsimile transmission. Other connection guidelines will come from the switch supplier, AT&T, with a 5ESS. The trial will adhere to the CCITT interface.

However, Fujitsu will still do some new development for the McDonald's trial test, Sena said. "We're taking the current models and building on their foundation, basically adapting a couple fundamental designs in image processing and the user interface," he said.

However, he said, Fujitsu does not expect to have to develop any major hardware from scratch for the Illinois trial. "We are already developing a product line," he added. "I think one of the reasons we got selected is not just our equipment but the experience we bring."

AT&T System 75 enhanced

By Elisabeth Horwitt

ATLANTA — A series of enhancements to AT&T's System 75 and 85 digital private branch exchanges (PBX) is scheduled to be unveiled today at the International Communications Association 39th Annual Conference and Exhibition.

The products represent another step in AT&T's strategy to use its digital PBXs as the basis for future Integrated Services Digital Network applications and services, said Senior Vice-President of Sales Richard C. Holbrook.

Highlights of the announcement include the following:

- Automatic Call Distribution, offered only on the System 75 digital PBX, enables a supervisor to reconfigure call control, send calls to the least busy unit and reroute calls to other groups during peak periods.
- The Inbound Call Director and Outbound Call Director, automate PBX-based functions such as call screening and call placement.
- A new family of Call Management Systems was designed to meet the call handling needs of telemarketers and other specialized users.
- Unified Messaging Manager and Unified Messaging Link integrate a wide range of AT&T voice and electronic mail products.
- Audio Information Exchange-Medium and Speak-To-Me enable users to create, send and retrieve voice and text through a Touch-Tone telephone, terminal or workstation.

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ILLUSTRATIONS ON PAGES ONE AND 17 BY ALAN WITSCHONKE

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Two-step buy for Sperry

By Alan Alper

NEW YORK — Burroughs Corp.'s proposed acquisition of Sperry Corp. for $76.50 a share would be accomplished in two steps — the first in cash, the second in preferred stock and debt securities — according to documents filed with the Securities and Exchange Commission.

Burroughs has offered to purchase some 31 million Sperry shares at $76.50 in cash, which would give the Detroit-based firm majority ownership. After the offer expires June 10, a subsidiary of Burroughs, called SP Acquiring Corp. will be merged with Sperry.

At that point, the remaining Sperry shares will be converted into Burroughs 9¾% subordinated debentures, due in 1996, and Burroughs Series A cumulative convertible preferred stock.

Although Sperry's financial advisor, First Boston Corp., considered Burroughs' previous offers of $70 and $75 a share inadequate from a financial point of view, the $76.50 a share proposal was deemed "fair."

"If you look at the $76.50 price, it's much closer to Sperry's price of $80 a share than Burroughs initial price of $70," noted Harvey Poppel, a partner at merger and acquisition specialist Broadview Associates.

To aid the transition, Burroughs is attempting to enlist the aid of Sperry's top management.

According to the SEC filing, Burroughs is offering five-year management contracts to 26 Sperry employees, including Joseph J. Campanella, corporate vice-president and president of the Aerospace and Marine Group; Edwin Decker, corporate vice-president and president of the Defense Products Group; Edwin Gilbert, senior vice-president, controller and management information systems; Kurt Merl, vice-president and president of the Systems Management Group; and James Aldrich, senior vice-president of corporate planning.

Sperry users doubt value of tie

From page 1

the new corporation would support both firms' current computer architectures as well as accelerate development of enhancements.

Most users interviewed by *Computerworld* maintained the view held since Burroughs' renewed entreaties began early last month: A merger between the rival mainframe suppliers would offer few advantages to users and in fact could further erode confidence in both companies.

"I still don't see any benefits for the users," noted Martin Litzky, president of national Sperry users group Use, Inc. "If this is being done to reduce costs by $150 million, which is peanuts for a $10 billion company, it doesn't make sense. There are other ways to do that without merging two competing companies."

Burroughs officials said the proposed acquisition should be completed within the next two months.

The companies would operate somewhat autonomously under a yet-to-be chosen corporate name, with Burroughs Chairman W. Michael Blumenthal at the helm, Sperry Chairman Gerald Probst as vice-chairman and Sperry President Joseph Kroger as president of the Sperry unit.

Although Blumenthal emphasized last week that no attempt would be made to convert one set of customers to the other's products, some Sperry users questioned the long-term plausibility of that policy given the current incompatiblity of the two firms' architectures.

Sperry users fear loss

In the event Blumenthal abandoned that approach, Sperry users fear that it would be the Sperry architecture that would be jettisoned.

"If they tried to force me into a Burroughs environment, I most likely wouldn't move to Burroughs but to IBM," noted Robert Gatlin, director of Management Information Services at Ceco Corp.'s Metal Building Systems subsidiary. "From what I hear, a lot of people are reconsidering whether it makes sense to be non-IBM anymore."

Eventually, however, industry observers contend that if Blumenthal is to make the merger work, the new company is going to have to develop some sort of framework to tie the two disparate architectures together.

"That has to be a strategic goal over the next five to seven years," noted Harvey Poppel, a partner of Broadview Associates, a consulting firm specializing in mergers and acquisitions.

"They need to have some sort of unifying structure. That doesn't mean they have to combine the two lines into one, but building a bridge, like what Sperry did with RCA, so they could communicate back and forth," Poppel said.

Citing the accelerating pace of technological change, Use's Litzky said it would be hard to project what the combined company's product line might look like in the months or years after the acquisition is completed.

> ***"If they tried to force me into a Burroughs environment, I most likely wouldn't move to Burroughs but to IBM."***
>
> — Robert Gatlin, Ceco Corp.

"It's hard to say what will happen in 30 days, not to mention what will happen in five years," he said. "If you told me 30 days ago Sperry would be acquired by Burroughs, I would not have believed it, and now it looks like it will happen."

Sperry users are concerned because, as of press time, they had not been contacted by the supplier to apprise them of the situation.

That, observers said, is most likely to change in the near term.

"I expect that certain customers are going to be receiving a letter signed by Blumenthal and Probst within the next couple of days," Litzky said.

Some users, such as a group in New England (CW, May 25), have taken it upon themselves to contact Burroughs in an effort to voice their concerns on the implications of the proposed merger.

"I wrote Blumenthal the day after it was announced," noted John DiPalermo, director of the New York State Social Services Department's Office of Information Technology Management. "The thing I wanted to make sure of is that not only is the 1100 line supported but that the new company continues to sink R&D into follow-on products."

Most observers agree that initially Blumenthal will not make any moves that might disrupt either firm's operations.

Sometime later, however, expectations are that heavy staff reductions will be needed to reach the roughly $150 million in cost reductions that Blumenthal envisions in the first year of the combined companies' operation.

Blumenthal has dismissed such projections as "premature and totally inappropriate."

To take advantage of the so-called critical mass created by the merger, Blumenthal is likely to combine functions such as purchasing, R&D and administrative support. Analysts also expect him to close redundant facilities.

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Wang Office talks to IBM

From page 1

Distribution Services (IDS) as the VS-to-IBM mainframe transport options. Version 1.0 includes IDS only, which provides VS-to-VS communication over an IBM Systems Network Architecture (SNA) network. Version 2.0 includes a capacity to send Disoss documents that is not included in Version 1.5.

- Version 2.0 of the Wang/Profs Gateway, which will allow Wang Office users to exchange messages between Wang Office and Profs.
- Version 2.0 of Wang Office, which includes improved document scanning features.
- An IBM 3270 logon capability that will allow users of IBM 3270 terminals to log on to a Wang VS by way of an IBM mainframe.

The new products will be available in July, except the Disoss gateway Version 2.0, which will be available in the fourth quarter of this year.

Direct connection

Pointing to future developments, Wang said it will provide its VS computers with a direct connection to the IBM Token-Ring PC local-area network and will implement IBM's SNA Distribution Service on its Wang Office/Disoss Gateway.

Neil O'Brien, director of operations at Mony Financial Services in Syracuse, N.Y., said he is very interested in the Wang developments, particularly the LU6.2 implementation, and the 3270 Logon.

O'Brien estimated his department's investment in Wang equipment at $15 million, including what will be a total of 100 VS computers by the end of the summer. He said he is in the process of installing IDS and will likely add some of the announced products to his system.

"All the vendors have to be IBM compatible now in order to be in the running for requests for proposals. If you don't have Disoss, you're out of the contract," said Vincent Flanders, associate editor of *Access 86*, a magazine for Wang users.

Gerry Paul, Wang vice-president of communications software development, said the new products give Wang a lead over both IBM and Digital Equipment Corp. in connecting minicomputers to IBM mainframes.

"There's less headache than putting in IBM," he said. Paul said IBM has no Profs gateway on the System/36 and no support for the Disoss library interface. DEC sells Disoss connectivity products that include LU6.2 but does not offer a Profs interface.

"The real devil in Wang's eye is Digital," said George Colony, president of Forrester Research, Inc. in Cambridge, Mass., describing inroads that DEC's All-In-1 office automation product has made in Wang's share of the market.

Colony added, however, that Wang's announcements gave him a positive impression of the overall health of the company. The Wang 3270 VS Logon allows IBM 3278 terminal users to access Wang VS applications through an IBM mainframe, such as Wang Office and Pace as well as such peripherals as disks and printers. However, Wang officials said it is not yet known how many terminals the system can handle, and Wang is currently testing to determine its limits.

Version 2.0 of the Disoss gateway, which will be available in December, will enable a Wang VS user to send a Disoss document. Currently, a user can file and retrieve documents from a Disoss library but cannot send a Disoss file. In addition, Version 2.0 will allow a Wang Office user to add Disoss and Profs users to a Wang Office electronic mail directory as if they were Wang Office users.

Wang Office Version 2.0 improvements include a new document indexing and searching function that allows users to locate a document by author, title, date created and words in the text.

The Profs gateway consists of software on the VS, priced at $2,000, and software on the IBM mainframe, priced at $20,000; software for the 3270 VS Logon is priced at $2,000. Pricing for the Wang Office/Disoss Gateway depends on whether LU6.2 or IDS is used. LU6.2 and IDS software for the VS is priced at $4,000; Document Content Architecture to Wang word processing translators on the VS are priced at $2,000; LU6.2 software on the VS is priced at $3,000.

Wang also announced new Wang Office license fees ranging from $495 to $18,000.

TOP OF THE NEWS

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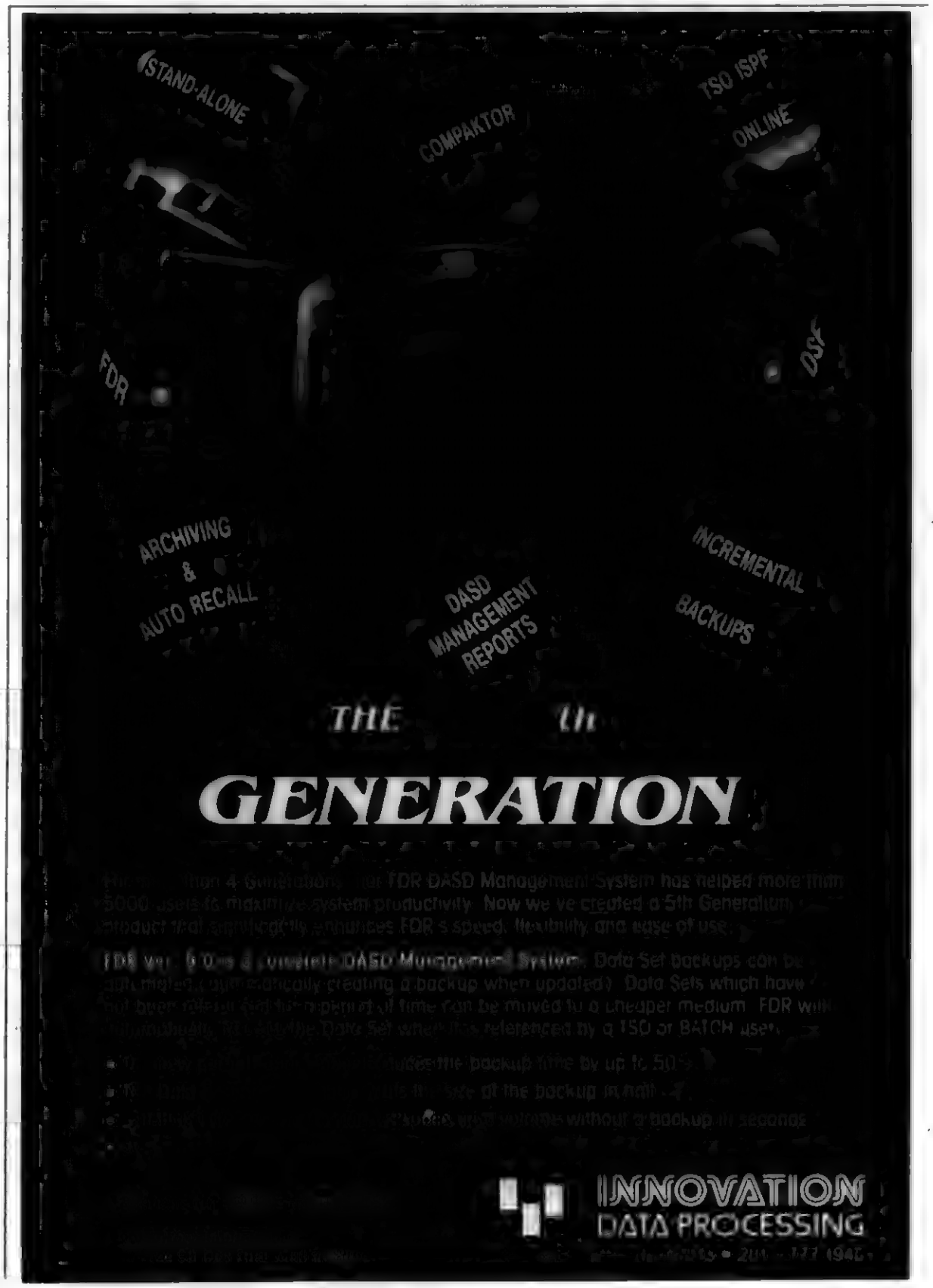
with an option to grow to 1M byte. The laptop features one 10M-byte, 3½-in. hard disk with an option to add another 3½-in. disk or a 5¼-in. floppy drive.

■

Electronic Data Systems is apparently the site of beta testing of a new 80386-based network, which was announced recently by Corvus Systems, Inc. of San Jose, Calif. Corvus spokesmen refused to say publicly where the tests were occurring, but sources said Electronic Data Systems has been working with Corvus on the processor for some time.

■

IBM has added its 1M-bit memory chip to a second product, the 3880 disk storage cache controller, which is now shipping from the company's General Products Division plant in Tucson, Ariz. Last month, IBM began installing the chips.



Spectrum ties HP's CAD, manufacturing product lines

HP's 1000, 9000 series converge at high ends

By Jeffry Beeler

PALO ALTO, Calif. — Uniting its two principal computer lines, Hewlett-Packard Co. last week introduced a Unix-based processor that is the first engineering-oriented offshoot of the company's Spectrum development project. The action represents the high-end convergence of the company's HP 1000 series manufacturing system and HP 9000 series engineering workstations.

HP spokesmen also contend that the 16- to 64-user processor, officially called the HP 9000 Series 800 Model 840, provides three times better price/performance than the Digital Equipment Corp. VAX 8600.

The 9000 series supports the same AT&T Unix System V-based HP-UX operating system as the Model 840, allowing users to recompile existing code when migrating over. But the HP 1000 series operates the Real-Time Executive operating system, and porting applications will require an extensive software conversion using a set of migration tools called Port/HP-UX.

> ***"For the first time, HP is addressing both the manufacturing and engineering arenas through one product line, the 840."***
>
> — Carl Morganstern
> HP Performance Technology Center

The base configuration of the 840, with 8M bytes of main memory, expandable to 24M bytes of main memory, is priced at $113,500, which includes the operating system and a C compiler. According to HP, the unit is scheduled to begin shipping at the end of this year.

The Model 840 employs the reduced instruction set computing (RISC) architecture that was announced in February with the long-awaited HP Series 3000 Models 930 and 950 superminicomputers.

The 840 drew qualified praise from analysts. It provides HP with "a compute-server and data-resource sharer that was previously the missing link in their technical systems product line," said Dave Burdick, director of computer-aided design and manufacturing industry services at Dataquest, Inc., a San Jose, Calif.-based market research firm.

But the company's comparison of the 840 to the VAX 8600 was downplayed by analysts. "There couldn't be a worse comparison," said Charles Foundyller, president of Duratech, Inc., a Cambridge, Mass.-based research firm. "The 8600 is not a RISC machine, so they shouldn't be compared on a million instructions per second basis. It's probably 2½ times faster than the IBM RT Personal Computer; that would be a fair comparison."

Both Foundyller and Burdick found the 840 presently lacks the breadth of software available for the 8600.

For the first time, HP is addressing both the manufacturing and engineering arenas "simultaneously through one product line, the 840, according to Carl Morganstern, a technical staff member with the company's Performance Technology Center.

The resulting union of the 9000 and 1000 families allows factory automation and computer-aided design or engineering systems "to speak the same language and share data between the two environments," Morganstern said.

HP President John A. Young said the Model 840 verifies the price/performance benefits the company projected for its RISC-based HP Precision Architecture. The Model 840 also "reaffirms HP's commitment to employ this new architectural foundation across all our major computer systems for years to come," Young said.

By eliminating infrequently used instructions and adopting other design tricks that further enhance throughput, High Precision architecture reportedly enables the 840 to equal the performance of a VAX 8600 for one-third the price. HP's performance claims were based on benchmark tests in which a 24M-byte 840, rated at 4.5 million instructions per second (MIPS), and a 32M-byte 8600 ran identical "computation kernals" that involved no I/O, according to an HP spokesman.

Like the latest additions to the 3000 family, the 840 supports HP's recently introduced Allbase data base management system, which is said to provide both relational and network interfaces to the same information.

The 840 also supports Advanced Research Projects Agency and the University of California at Berkeley Unix Version 4.2 interconnection capabilities as well as the firm's existing Network Services and LAN/800 link products, which together allow the workstation to connect to other HP systems.

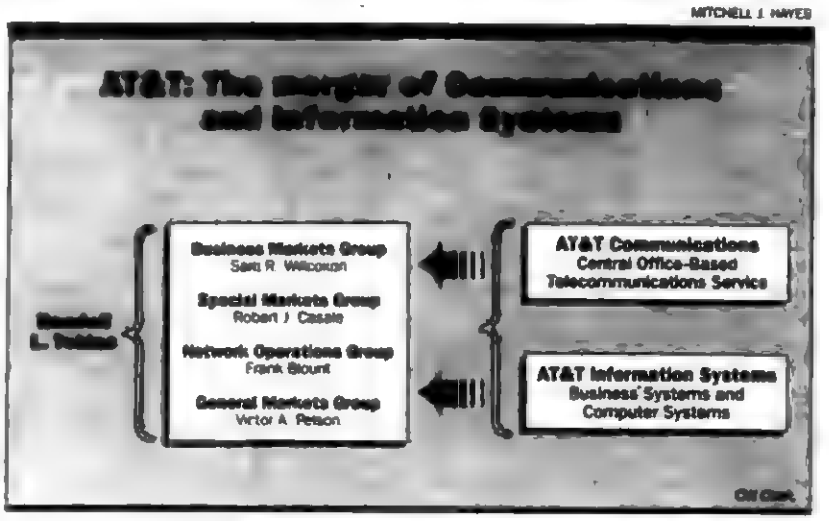
In a related development, HP last week offered five additional bundled versions of its HP 9000 Series 300 technical workstation family. Each of the packaged Model 320 systems is intended to compete directly with designated workstations from IBM, DEC, Sun Microsystems, Inc. and Apollo Computer, Inc., according to Ted Chen, HP's Series 300 and 500 product manager.

According to HP, the five additional Model 320 bundled systems range in price from $13,000 to $34,900, compared with $44,950 for the Model 560.

HP also announced the Model 560, formed by adding another two processors to its existing HP 9000 Series 500 Model 550 workstation and increasing its main memory. Unlike the 550, which incorporates just one CPU and starts with 2M bytes, the 560 uses three processors and holds up to 8M bytes, Chen said.

Senior writer Rosemary Hamilton contributed to this report.

MITCHELL J. HAYES



AT&T reunites two major units

From page 1

ed a division between AT&T's central office-based telecommunications services and its customer premise equipment and computer services, a mandate dropped in the FCC's recent Computer Inquiry III decision [CW, May 19].

"Now that the FCC no longer forces us to keep our networking and computer businesses apart, we can substantially improve our ability to focus our assets and abilities on specific vertical markets," Tobias said last week.

The major impact on AT&T customers will be AT&T's ability to integrate the offerings of the two divisions at both the sales and product level.

"Before, if you were a large business, you would get calls from two sets of AT&T salespeople who often were competing with each other," said AT&T spokesman Michael Tarpey.

By FCC regulation, sales representatives from the two divisions could not even talk to each other before making their presentations, he added. "Now, we'll have one team head, with up to a dozen support people specializing in data/voice networking, PCs or whatever."

Responding to questions about recent losses in AT&T Information Systems' computer division, Tobias said that the computer business will be "increasingly important to AT&T. A lot of people have interpreted our strategy as being in the computer business, period. Instead, we will be leveraging our communications and networking offerings in the computer business, focusing on the three things together."

AT&T is currently examining how to coordinate joint development of products that would mesh AT&T Commmunications' central-office-based services and AT&T Information Systems' customer premise private branch exchange and switching equipment, he added.

Despite Tobias' assurances, Joaquin Gonzalez, a senior analyst at Stamford, Conn., consulting company the Gartner Group, Inc. interprets the recent organizational reshuffling as meaning: "The AT&T Communications way of viewing the world has triumphed over AT&T Information Systems." Gonzalez predicted that "AT&T will be de-emphasizing its computers" and emphasizing "its basic strength, which is its telecommunications network," over customer premise equipment.

In order to conform to FCC regulations, AT&T must continue to maintain separate accounting for the two divisions, Tobias said. "We've failed to find any 'noncompetitive' market where the cross-subsidizing regulations don't apply," Tobias said.

When asked if AT&T Information Systems and AT&T Communications will ever truly be one company, Tobias replied, "Never say never."

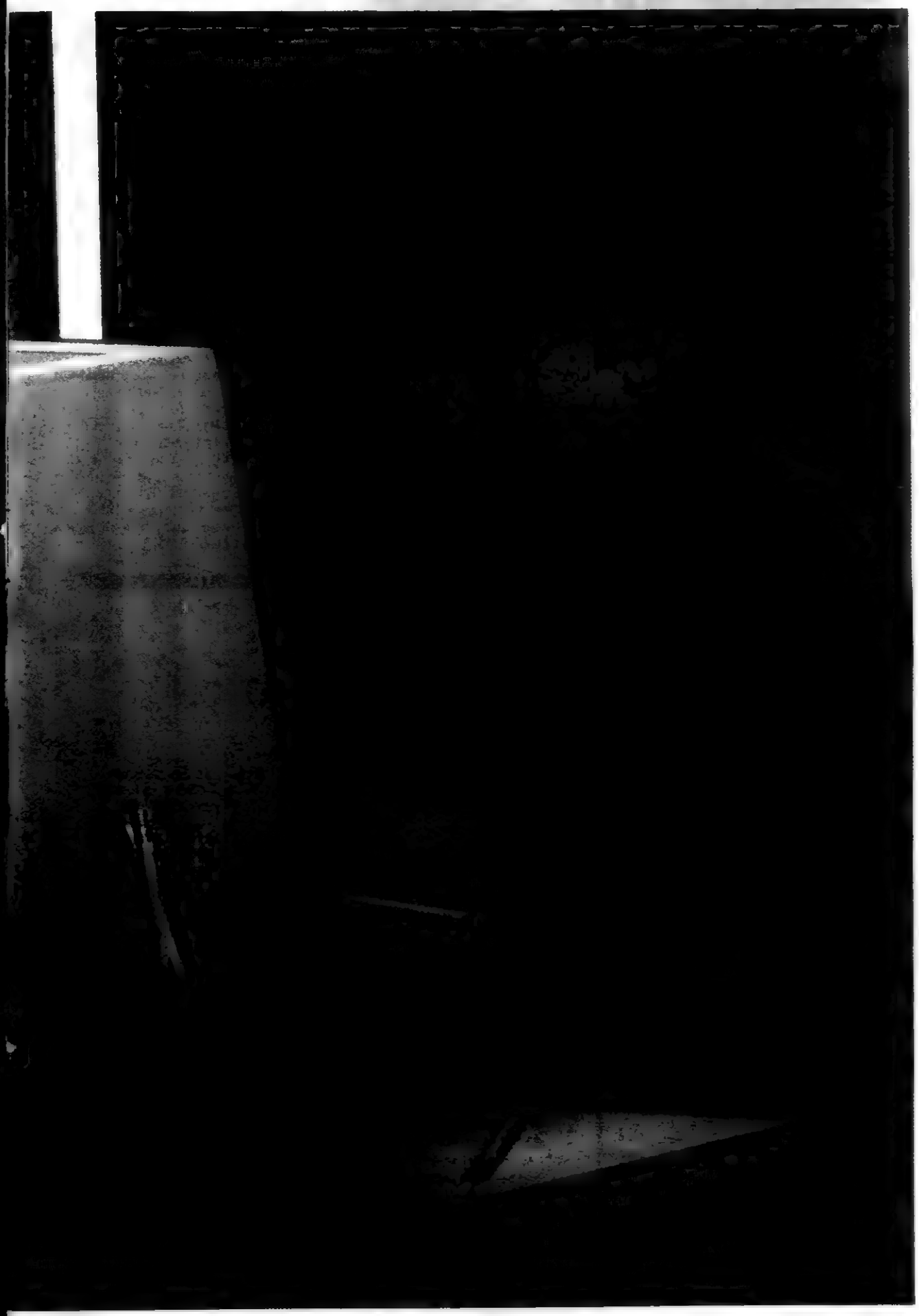
AT&T "does not expect any major layoffs to result from the organizational merger," Tobias said. "There will be some efficiencies as a result of the merger; with 210,000 employees, you can expect a lot of attrition, ups and downs."

"What AT&T announced is not the total organizational change," said Greg Carlsted, senior industry analyst at San Jose, Calif.-based consulting company Dataquest, Inc. "You can expect more announcements in the fall." He added that AT&T's new organizational structure is "significant in that they are positioning themselves to utilize their resources more effectively than they have done in the past. Now that they are free of the Computer Inquiry II ruling, we'll see some major changes in the way AT&T looks at its customer premise products and networking services."

Under the new regime, 92,000 AT&T Information Systems employees and 118,000 AT&T Communicaitons employees will be allocated among four groups, headed by presidents who will all report to Tobias (see chart). The four new organizations are the following:

- Business Markets Group, headed by Sam R.Willcoxon, oversees marketing and sales for all AT&T Communications products; AT&T Information Systems' large business systems including PBXs of 80 lines or more; and computer systems.
- General Markets Group, headed by Victor A. Pelson, oversees consumer products, sales and service, as well as general business systems (PBXs under 80 lines) from AT&T Information Systems; consumer markets and services from AT&T Communications.
- Special Markets Group, headed by Robert J. Casale, is responsible for managing selected joint ventures and partnerships with other companies.
- Network Operations Group, headed by Frank Blount, designs and manages AT&T's nationwide network. The organization's information management and movement resources will be available to the other three groups.

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Rolm to unveil low-end PBX

Digital system bucks feature-rich trend

By Elisabeth Horwitt

Rolm Corp. today is set to announce Redwood, an entry-level digital telephone system that can be configured as either a key system or a digital private branch exchange (PBX). The announcement precedes an AT&T low-end digital PBX introduction by approximately a week, according to analysts.

The new product "spans all the needs of the small- to medium-size business," according to Rolm President Dennis D. Paboojian. While CBX, Rolm's existing digital PBX line, starts at 32 lines, an entry-level Redwood system starts at eight lines, noted Judith Ross, product marketing manager for Rolm's Advanced Products Division. The system can be upgraded to up to 144 lines as a business grows, she added.

Redwood Model 1, a manual key system, is available now. Model 2, the key/digital PBX version, will ship in September. Customers can upgrade the Model 2 key system version to a digital PBX by changing the software, Ross said.

"Rolm has taken a risk, flying in the face of industry wisdom that says users want feature-rich digital PBXs," commented Greg Carlsted, senior industry analyst at San Jose, Calif., consulting company Dataquest, Inc. Rolm is banking on demand for an easy-to-install offering somewhere between a key system and a PBX in terms of functionality and price, he added.

Standard Redwood features include call conferencing, call forwarding and speed dialing. The PBX version also features least-cost routing.

"There *was* a demand for hybrid key-PBX systems, which was largely met by AT&T's Horizon and other vendors' hybrids," commented Michael Bobrowicz, a research analyst at Stamford, Conn., consulting firm, the Gartner Group, Inc. "We see current market growth as fairly flat."

The Redwood currently offers no direct link with Rolm's Phonemail, although users can forward or pick up calls on the voice messaging system, Ross said.

"The low-end market has small need for data," Ross said. "CBX serves our customers' data communications needs."

Carlsted criticized Rolm for not offering data on its initial Redwood offering but gave Rolm points for Redwood's support of Rolmlink, "a digital connection that is a step away from Integrated Services Digital Network and IBM connectivity."

Redwood pricing ranges from $600 to $800 per line, including telephone sets. The system's pricing per interface is 10% to 35% lower than that of the CBX, Ross said.

Tandem, Arthur Young joint CIM pact breaks new ground

By Rosemary Hamilton

CUPERTINO, Calif. — In an unusual alliance, Tandem Computers, Inc. announced last week that it signed an agreement with Arthur Young, a Big Eight accounting and consulting firm, to jointly provide products and services to manufacturing customers.

Although many vendors have forged partnerships to jointly develop manufacturing automation products, the Tandem alliance is apparently the first formal agreement between a computer vendor and a Big Eight consulting concern in the computer-integrated manufacturing (CIM) market.

Some observers question whether such an arrangement detracts from the consultant's role as objective advisor, but both Tandem and Arthur Young said the agreement is nonexclusive. Most of the Big Eight firms have informal working relationships with CIM vendors.

"We remain interested in other vendors because there are as many solutions to CIM as there are vendors," said Woodrow Chamberlain, a partner in Arthur Young's manufacturing consulting group. "We don't go out and recommend anything. But we are expressing an opinion that says you should consider Tandem seriously when considering CIM."

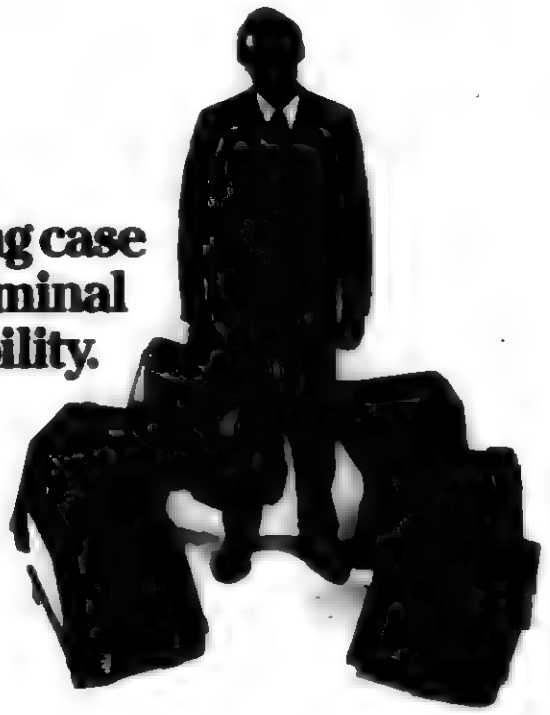
According to the agreement, Tandem and Arthur Young will provide a hardware and services package to customers "embarking on a major new strategy in CIM," said Gerald Peterson, vice-president of marketing at Tandem. Arthur Young will work with customers in the areas of software, training, support and overall strategy. Tandem will provide its line of Nonstop fault-tolerant computers and associated networking products.

Some of the other Big Eight firms said they have chosen not to make formal agreements because they have not found the appropriate partner or because they believe it would compromise objectivity.

Larry Roches, senior manager in the manufacturing consulting practice of Peat, Marwick, Mitchell & Co., said a formal partnership with a vendor would be "outside of our independence and objectivity policy."

John Arnold, a manager in the manufacturing consulting practice of Coopers & Lybrand, said that so far his firm has opted to work as a "preferred consultant" with vendors, such as Hewlett-Packard Co.

But at Arthur Andersen & Co., partner Roger Willis said the idea of a formal agreement has not been ruled out. "We've thought about it and haven't come up with a situation that seemed right," Willis said.



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Percent of Installed User Base – 1984		Percent of Installed User Base – 1985		Percent Considering Vendor for 1986	
Manufacturing Resource Planning					
IBM	34.5	IBM	35.6	Cullinet	42.1
Sperry	8.6	Comserv	9.6	IBM	19.2
Comserv	6.9	Cullinet	9.6	Comserv	10.5
Arthur Anderson	5.2	Cincom	8.2	MSA	7.9
Burroughs	5.2	Martin Marietta	5.5	Cincom	5.3
Inventory Control					
IBM	36.4	IBM	25.6	Cullinet	21.4
Comserv	6.8	American Software	13.4	Undecided	14.3
Walker	6.8	Cullinet	8.6	American Software	11.9
MSA	5.5	MSA	9.8	Cincom	9.5
Sperry	5.5	Comserv	4.9	Arthur Anderson	7.1
Bill of Material Processing					
IBM	43.6	IBM	35.8	Cullinet	45.2
Comserv	9.1	Cullinet	10.4	Comserv	17.1
Sperry	7.3	Comserv	9.0	MSA	8.5
MSA	5.5	Martin Marietta	6.0	IBM	6.8
Arthur Anderson	3.6	MSA	5.0	Undecided	6.8
Master Production Scheduling					
IBM	34.0	IBM	25.5	Cullinet	37.5
Comserv	11.4	Cullinet	8.5	Comserv	18.8
MSA	6.4	MSA	8.5	IBM	6.8
NCR	6.4	Comserv	6.4	MSA	6.3
Software Intl.	4.3	Honeywell	6.4	Cincom	6.3
Integrated Financial (A/P, A/R, G/L)					
IBM	18.0	MSA	17.0	Cullinet	21.4
McCormock & Dodge	18.0	McCormock & Dodge	21.6	MSA	17.9
MSA	12.0	IBM	10.3	McCormack & Dodge	14.3
Software Intl.	10.0	American Mgmt. Systems	5.1	IBM	7.1
Information Associates	6.0	Cullinet	3.4	Lawson Assoc.	3.6

*The Software News/1986 Survey reports – "Cullinet's standings in manufacturing and financial software this year are clearly the most striking among all the mainframe software vendors. Cullinet, the leading independent supplier of mainframe database management software, began offering applications packages just three years ago."

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Trackside system logs official results of Indianapolis 500

By Eddy Goldberg

INDIANAPOLIS — This year's rain-delayed Indianapolis 500 was not the first time the racing event caused problems for the people running the computerized operation that logs each racer's laps, pit stops and official finishing times.

In 1964, when Jerry Challis wrote the first program to automate the official results, he was asked a week before the race what would happen if the race was stopped before the finish. Since the Indy 500 had never been stopped before, he had not planned on that eventuality.

But, sure enough, the race was halted on the first lap due to a serious accident. A car lost control exiting the fourth turn, hit the inside wall, bounced against the outside wall and exploded, Challis recalled. "Another car T-boned it, and both drivers were burned," he said.

Challis had to rush back to the IBM 7094 used that year and modify the program to subtract the time the race was stopped. The program was more fully modified before the next year's race in case it happened again. A. J. Foyt won that year with a speed of 147.35 mph.

In 1968, Challis rewrote the program in assembler language for the IBM 360. That program, later converted to run under IBM's MVS operating system, is still used today. However, the results were recorded manually and entered into an off-site computer until 1978 when computers made their first appearance at the course itself.

The first trackside computer was called an Ascore, Challis said. Each of the 33 U.S. Auto Club timers pressed a stopwatch button attached to the Ascore every time their car completed a lap.

In 1981, a Dataspeed RT500 computer (the RT stands for race track) was brought in and used as a backup to the Ascore. That was the year Bobby Unser won after a court battle that took the title away from Mario Andretti.

Today, the Dataspeed RT500 is still used, backed up by an IBM Personal Computer XT. Two more XTs attached to the Dataspeed log the recorded data on a disk. The Dataspeed also has a feed to ABC, allowing the television network to broadcast the standings on a moment-to-moment basis.

After the race, the information on the PCs is transferred off diskettes onto an IBM 3033 mainframe, where Challis's 20-year-old programs compute the official results. The computer time is donated by the Indianapolis firm, Pallm, Inc., where Challis works. Pallm supplies software to the insurance industry.

The whole timing operation employs about 100 to 125 people, Challis said, and no two years are alike. Two years ago, when Rick Mears won in a record 163.62 mph, the Dataspeed went down 67 laps into the race, was restored and then went down again. The race information, which is ultimately backed up by people writing lap information on clipboards, had to be entered into the mainframe after the race. "We had to reconstruct the whole race afterwards," Challis said.

This year, although the rain delay did not cause any computer problems, it did inconvenience the roughly 400,000 fans who showed up. When asked what he did on the rained-out weekend, Challis replied, "We got wet."

Decision Data enters two systems in multiuser mart

Desksides compatible with System/36

By Alan Alper

NEW YORK — Decision Data Computer Corp., a supplier of IBM System/34, 36 and 38 peripherals, last week expanded into the multiuser computer market, unveiling two systems that are software compatible with the IBM System/36 as well as the IBM Personal Computer.

Although Decision36 is not plug compatible with the System/36, it is source-code compatible with the IBM system, which the company said enables it, after recompiling, to run business and professional application software written in RPG-II under IBM's System Support Program. It is also object-code compatible with Microsoft Corp.'s MS-DOS, so it can run application packages written for the IBM Personal Computer.

> ***'If we used the technology used in 1971 to design the System/36, we'd be cheating the customer.'***
>
> — Larry Gerhard
> Decision Data Computer Corp.

Larry Gerhard, Decision Data president, said the firm opted against plug-compatibility with the System/36 because it wanted to improve on IBM's decade-and-a-half-old design. "If we used the technology used in 1971 to design the System/36, we'd be cheating the customer," Gerhard said.

Instead, he said, working with outside vendors, Decision Data designed a system using the Personal Computer AT bus architecture that could run third-party-developed applications for the System/36 while providing distinct price and performances advantages.

Decision36, initially available in a deskside or desktop configuration, is aimed at small to medium-size corporations, branches or divisions of corporations and, to a lesser extent, departments within large companies, noted Ed Marino, marketing director of Decision Development Corp., the Decison Data unit responsible for the marketing the system.

First-time users as well as current System/36 users are being targeted by the firm's direct sales force, distributors and value-added resellers, who will be marketing the system, he added. Current IBM resellers, in particular, are being approached to market the system.

One value-added reseller has already been signed, Executive Technology Data Systems, which sells into the certified public accounting market.

The primary deskside configuration supports between eight and 16 users and includes 512K bytes of main memory, 512K bytes of user memory on Intel Corp. 8088-based boards, up to 800M bytes of hard disk storage and an optional ¼-in. streaming tape drive for backup.

Supports ASCII, twinaxial devices

Both ASCII and twinaxial devices are supported. Prices range from $14,000 to $55,000 for a 16-user system with 800M bytes of hard disk storage, Marino said.

An entry-level desktop configuration, supporting between two and eight users, offers the same features as the deskside unit, but it can only be used with ASCII devices, Marino said. Prices range from $8,200 to $25,000, he noted.

Production quantities of the Decision36 will be available in September although select value-added resellers will be able to receive shipments beginning next month.

Advertisement

SAS Institute Sets New Standards for Mainframe C Compilers

SAS Institute Inc. announces a mainframe version of the Lattice® C compiler, allowing development of C programs on IBM 370 machines and easy interface with non-C programs and software packages.

"C has emerged as the language of choice for developing applications that are portable across operating environments," says Institute Marketing Vice President Ione Cockrell, who views the compiler as a tool for protecting a company's programming investment.

"Virtually every new computer supports C," she explains, "and portable programs created with the mainframe compiler under OS or CMS run on any other machine with a C compiler."

The compiler uses standard IBM linkage conventions, allowing assembler language programs, MAIN routines in other high-level languages, and packages such as IBM's ISPF and GDDM to be invoked directly from C.

"A C function can be called directly from a high-level language, or a MAIN function in a high-level language can be called directly from C," adds Institute Language Systems Manager Oliver Bradley. "Mainframe programmers can now use C in place of assembler for developing small, fast subroutines called from other languages."

The extensive function library includes nearly all functions from Kernighan and Ritchie, the Lattice C compiler for personal computers, and the draft ANSI C standard. Information is provided on individual function portability.

Bradley says the Institute built ease of use into the compiler and library. "We've designed the listing and cross-reference to make a program easy to follow and errors easy to find," he says. "The compiler and runtime library produce explicit numbered error messages, and a trace-back of active function calls is displayed when a C program is abnormally terminated by the operating system."

Other mainframe products available from the Institute include a Lattice C cross-compiler, which generates PC object code ready to download to a personal computer; and Phoenix Software Associates' Plink86™ for linking compiled programs and Plib86™ for structuring object file libraries on a mainframe.

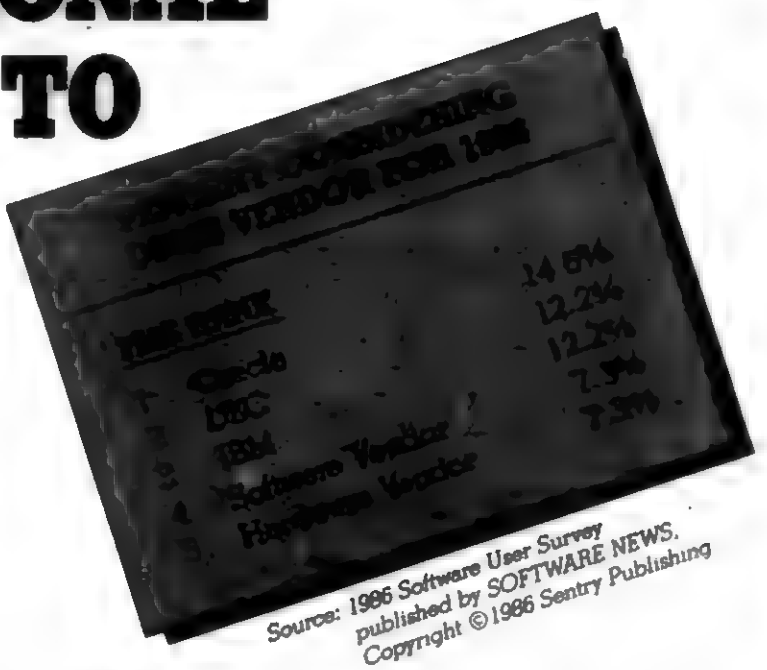
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ORACLE RELATIONAL DBMS ROCKETS TO #1 IN THE 1986 SOFTWARE USER SURVEY. WHY?



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	San Diego	Jun 17, Aug 7
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	Sunnyvale	Jun 10, Jul 8, Aug 7
CO	Denver	Jun 17, Jul 17
CT	Hartford	Jul 16
	New Haven	Aug 20
FL	Jacksonville	Aug 5
	Tampa	Aug 6
GA	Atlanta	Jul 15
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ID	Boise	Jul 31
IL	Chicago	Jun 12, Jul 8, Aug 14
IN	Indianapolis	Jun 17, Aug 19
KY	Louisville	Aug 7
LA	New Orleans	Jul 11
MA	Boston	Jun 19, Jul 16
	Burlington	Aug 12
MD	Bethesda	Jun 12, Jul 9, 23, Aug 7
ME	Bangor	Jul 3
MI	Detroit	Jun 10, Jul 15, Aug 19
	Grand Rapids	Jun 13
MN	Minneapolis	Jun 26, Jul 22
MO	St.Louis	Jun 11, Jul 30
NE	Omaha	Jul 9
NJ	Cvt. Station	Jun 5, Aug 7, 28
	Iselin	Jul 8, 22
NY	Albany	Jul 23
	New York City	Jun 12, 25, Jul 24, Aug 12, 26
	Rochester	Jun 19, Jul 10, Aug 13
NY	Syracuse	Aug 19
OH	Akron	Jul 23
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MIS seeks aid for drives

From page 1

lems that led to downtime. The company was experiencing problems with its disks, tapes and CPUs, he says, but primarily with the Memorex thin-film head disks.

Considerations that did not matter in the past have become vitally important. "Old specifications are not quite adequate if you are at the outside limits of the temperature and humidity ranges," Shannon says.

The environmental factors in computer rooms that Shannon investigated were within guidelines, as far as Shannon's staff could determine. They did find that humidity and temperature levels varied from one part of the room to another, in some cases. To get a better fix on the problem sites, Shannon called in Winton Laboratories, Inc., a worldwide environmental management firm with offices in the Los Angeles area.

Winton Labs, a closely held company that derives $9 million in revenue from computer-related engineering and consulting, specializes in finding the kinds of computer room problems that can wreak havoc on thin-film disks. "There should be an absence of carbon, rust and concrete dust. The temperature and humidity should be balanced. Those are the things to look out for," says Storm Larkins, president of Winton Labs. "Generally, if you are all right in those categories, you are not going to have problems," he adds.



Crumbling subfloors release dust into the air, wreaking havoc on thin-film disks. Winton Laboratories, Inc., an environmental management firm, decontaminates the subfloor surface.

At a large communications carrier that requested anonymity, walls were knocked down during a project to expand the computer room. During construction, dust settled under the floors and was sucked into the room through the air-conditioning system.

"In the last three- to four-month go-round before we discovered why we were having these problems, we had from seven to 10 head disk interferences a month," says the communications carrier's consultant of regional hardware plans.

All three of the above managers solved their once-mysterious problems by calling in Winton Labs to search for the source of pollution and eliminate it. In Scharff's case, he heard about the firm and contacted it himself. At the telecom company, one of the three IBM plug-compatible manufacturers (PCM) represented in the computer room called in Winton; Burroughs suggested to the University of Chicago that it call Winton. Memorex's Shannon says all of the companies he has found that perform the specialized work that Winton does are Winton subsidiaries.

In all cases, Winton Labs turned up the disk-crashing culprits, the managers say.

Yamaha's problems started in 1980, Scharff said. At that time, the company was unloading older IBM equipment and replacing it with a Burroughs B6800 computer and some new disk drives. Within 2½ years, the firm had gone to a second B6800 and had added more drives. "We began to experience problems that caused downtime," he says.

Winton discovered that Yamaha's 1970 air-conditioning system blew black hydrocarbon contaminants from the freeway right through the computer room. In fact, Larkins says, a map in Winton's offices that identifies problem locations is dotted with flags for a half-mile on either side of the Los Angeles freeway. Yamaha's site is alternately blown by the dry, dusty Santa Ana winds and soaked by nighttime fogs.

Another culprit at Yamaha was a crumbling concrete subfloor under the floor tiles that released dust into the room. Winton recommended replacing the air-conditioning system to solve the hydrocarbon problem and installing different ceiling tiles to help solve the humidity factor. The subflooring was coated with a blue-paint-like encapsulant that prevents further crumbling.

Scharff instituted other recommendations during a four-year period. "We are in the fourth year of improvements now, and it's all straightened out."

Scharff says he feels confident that his problems are gone, although he has contracted Winton to inspect the room quarterly and perform an annual cleanup. He has installed a Burroughs B7900 and new thin-film disks and has experienced no problems with either of them. "Our main production data base is on those thin-film disks, and they are hit with both reads





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and writes several million times a day. They are doing fine," he says.

Yamaha did environmental monitoring on its own prior to calling in Winton, according to Scharff. They ran tests on the electricity to monitor drops and spikes and ran temperature and humidity graph units. "We saw the bad fluctuations but wondered where they came from," he says.

The same was true for the other computer rooms. "I could tell if the floor was dirty, and I kept track of humidity and temperature, but it takes some sophistication to detect the tiny particles that can cause problems with thin-film disks," Donovan says.

The considerable cost of making a computer room pure is insignificant in view of the value obtained for the money, all of the users agree.

"The cost is reasonable compared to what the downtime costs," says the consultant for the communications carrier, a company that needs to maintain at least 99% reliability. "We have not seen a head disk interference that can be attributable to dirt in more than three months now. That seems like an eternity to us."

The communications company serves up to 20,000 end users in three large computer centers that include two IBM 3090 Model 200s, three IBM 3084 Model Q64s and five 3081 Model K32s attached to 900G bytes of direct-access storage devices (DASD). The principal types of DASDs are IBM and PCM versions of IBM's 3380 thin-film device. "We were seeing numerous head crashes on the 3380-type DASD, and we were looking for reasons," the consultant says. "We prefer not to say which vendors' equipment we had the most trouble with, but we had the least problems with IBM's."

In the process of knocking down walls, the company never noted that the air-conditioning was pulling up dust from under the floor into the computer room. "We never got under the raised floor to look," he says. Winton recommended cleaning and sealing the floors and in addition checked for temperature, humidity, clean air conditions and proper filtering systems. "We were lacking to some degree in almost all of those areas. We changed our air-conditioning cycling so we do not pull in outside air without refiltering constantly. We sealed the floors, one of which was next to a loading dock, and we had our building maintenance people put in precautions to check humidity problems."

Donovan was impressed with the minuteness of the environmental inspections conducted at his site. "We installed three Burroughs 9630 laser printers, and Winton even inspected the best way to contain the carbon toner that these printers throw off," he says. "They suggested that we either create an I/O room outside the main computer room or that we relocate the printers inside the operations room but surround them by air grilles to keep the carbon toner directed away from the disk drives."



An encapsulant prevents further crumbling of the subfloor.

Shift seen for IBM CPUs

By James Connolly and Eric Bender

Speculation of a major shift in IBM's mid-range processor strategy grew last week with observers in the user, vendor and analyst communities predicting that IBM will soon announce some degree of unification of the System/36 and System/38 product lines.

The announcement could occur in mid- to late June, according to one user who asked not to be identified. He said that vendor sources in Europe told him that IBM plans to add RPG-III capabilities to a new version of the System/36 operating system SSP and that IBM plans a single replacement machine for the System/36 and System/38.

Speaking at a conference last week, consultants Amy Wohl and Dale Kutnick said they expect multifacted announcements from IBM.

Wohl, president of Wohl Associates in Bala-Cynwyd, Pa., reported that IBM officials recently spoke about "some kind of fusion of the 36 and 38 design."

Kutnick, executive vice-president of the Gartner Group, Inc. in Stamford, Conn., predicted that a small 4300, based on IBM's Micro370 processor running IBM VM Entry, could be announced by the end of 1986. However, he also said the System/36 and 38 could converge in four possible ways. The first way would be a large System/38 running SSP. The second means would be use of what he conceded would be expensive coprocessors. The third way would be to bring SSP and the System/38's CPF operating system together. The fourth approach would be to develop common hardware for the systems.



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NEWS

WORLD DIGEST
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PARIS — The French government announced last month plans to ease its regulatory grip on telecommunications services.

In a move that was expected since elections put a conservative coalition into power last March, the government's proposed legislation would open up competition for value-added services and free the Postal Telephone and Telegraph (PTT) of its industrial policy-making role.

Gerard Longuet, the secretary of state for posts and telecommunications, said the legislation will be voted on by the French Parliament before mid-July.

Since 1837, the PTT authority has maintained a monopoly over all telecommunications-related activities in France.

MUNICH, West Germany — Aggressive foreign competition — and a passive government response — forced West Germany's fifth-largest computer maker, Periphere Computer Systeme GmbH, to sell 65% of its stock to the steel and engineering company Mannesmann AG, according to Periphere Computer founder and Chief Executive Eberhard Faerber in a recent interview.

The company was swept off the market by such U.S. computer firms as Apollo Computer, Inc. and Sun Microsystems, Inc., he said.

BERGEN, Norway — Microsoft Corp.'s Norwegian distributor for IBM Personal Computer software, Logos A/S, has discontinued its contract with the U.S. software firm.

"The reason is lack of support, delays in deliveries and an ignorant attitude from the vendor," said Bjornar Langeland, Logos A/S president.

Langeland also claimed that Microsoft does not appreciate the need to translate its software into Norwegian, a key to success for other software distributors in Norway.

LONDON — The UK is now the first country in Europe to offer phone users a choice of telephone networks. With the inauguration of the Mercury Communications system last month, the monopoly of privatized British Telecom has come to an end.

Although Mercury has been in competition with British Telecom since 1984, customers have so far only been able to lease lines from the fledgling carrier. But with the addition of three Northern Telecom, Inc. DMS-250 switches to its cable and microwave network, Mercury has launched itself into the voice switching business.

BRUSSELS — The clone wars between IBM and its price-cutting competitors took a new turn last month when London-based vendor Qubie Ltd. laid a formal complaint before the European Community Commission against the American computer giant.

Qubie is protesting that IBM's use of UK copyright and design protection laws to clamp down on clone vendors distorts competition in the European Community.

TOKYO — Hitachi Ltd. has announced plans to boost its purchasing of South Korean electronic parts by up to 55% this year, to $119.8 million.

These purchases will account for about half of all Hitachi procurements from Asian-based companies.

Because of the runaway appreciation of the Japanese yen against Korean currency, Japanese electronics vendors can now obtain Korean components for about 15% to 50% less than their Japanese equivalents.

Hitachi will buy largely from the three leading Korean electronics vendors — Goldstar Co., Samsung Electronics Co. and Daewoo Electronics Co.

VIENNA — Siemens Austria, a subsidiary of the West German computer and telecommunications giant, plans to merge its computer and data communications units.

Effective October 1, Siemens Data GmbH, the division selling terminals, personal computers and other OEM products, will be completely restructured, according to company officials.

The new unit is expected to employ about 1,000 people. Peter Amlinger, chairman of the board, said the firm is seeking to respond to customers' growing demand for systems that transmit and process voice, text, pictures and data.

TOKYO — Surveys may indicate that growth has leveled off in Japan's office automation market, but vendors at the annual Tokyo Business Show last month were out in force with networked and multitasking products expressly for the office environment.

During the show, attendees had the opportunity to hear one Japanese executive urge vendors to "take radical steps to create a new office environment."

That executive, Takao Nagata, chairman of the show's sponsor, the Nippon Administrative Management Association, delivered the keynote address.

Nagata's view was echoed by Masahiro Akita, a computer salesman with Sanyo Electric Tokki Co., who said in an interview that "networking, multitasking and distributed processing are the three most important buzzwords in the market today."

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Shell as a Command Language*	Jan 20-21 Mar 17-18 Jun 9-10 Aug 4-5 Sep 29-30	Apr 3-4 Jul 17-18 Sep 25-26	Mar 20-21 Jul 31-Aug 1	Feb 6-7 May 8-9 Oct 30-31	Mar 20-21 Jul 31-Aug 1	Feb 13-14 Apr 24-25 Sep 11-12	Feb 6-7 May 8-9 Oct 30-31	Jan 23-24 Mar 20-21 Jun 5-6 Jul 31-Aug 1 Oct 9-10 Dec 4-5	$490	
"C" Language Programming*	Feb 24-28 May 12-16 Jul 14-18 Sep 8-12 Nov 3-7	Apr 7-11 Jul 21-25 Sep 29-Oct 3	Mar 31-Apr 4 Aug 4-8	Feb 10-14 May 12-16 Nov 3-7	Mar 31-Apr 4 Aug 4-8	Feb 17-21 Apr 28-May 2 Sep 15-19	Feb 10-14 Apr 12-16 Nov 3-7	Jan 27-31 Mar 31-Apr 4 Jun 9-13 Aug 4-8 Oct 13-17 Dec 8-12	$1225	
Shell Programming*	Jan 22-23 Mar 19-20 Jun 11-12 Aug 6-7 Oct 1-2	Apr 14-15 Jul 28-29 Sep 6-7	Apr 7-8 Aug 11-12	Feb 17-18 May 19-20 Nov 10-11	Apr 7-8 Aug 11-12	Feb 24-25 May 5-6 Sep 22-23	Feb 17-18 May 19-20 Nov 10-11	Feb 3-4 Apr 7-8 Jun 16-17 Aug 11-12 Oct 20-21 Dec 15-16	$490	$1125
Using Advanced UNIX Commands*	Jan 29-31 Apr 9-11 Jun 18-20 Aug 13-15 Oct 8-10 Dec 3-5	Apr 16-18 Jul 30-Aug 1 Sep 8-10	Apr 9-11 Aug 13-15	Feb 19-21 May 21-23 Nov 12-14	Apr 9-11 Aug 13-15	Feb 26-28 May 7-9 Sep 24-26	Feb 19-21 May 21-23	Feb 5-7 Apr 9-11 Jun 18-20 Aug 13-15 Oct 22-24 Dec 17-19	$735	
UNIX Internals	Feb 17-20 Apr 28-May 1 Jul 7-10 Sep 1-4 Oct 27-30	Apr 21-24 Aug 4-7 Oct 13-16	Apr 14-17 Aug 18-21	Feb 24-27 Jun 2-5 Nov 17-20	Apr 14-17 Aug 18-21	Mar 3-6 May 12-15 Sep 29-Oct 2	Feb 24-27 Jun 2-5 Nov 17-20	Feb 10-13 Apr 14-17 Jun 23-26 Aug 18-21 Oct 27-30	$1375	
UNIX Administration*	Feb 12-14 Apr 23-25 Jun 30-Jul 2 Aug 27-29 Oct 23-25 Dec 17-19	Apr 29-May 1 Aug 12-14 Oct 21-23	Apr 22-24 Aug 26-28	Mar 4-6 Jun 9-11 Dec 2-4	Apr 22-24 Aug 26-28	Mar 11-13 May 20-22 Oct 8-10	Mar 4-6 Jun 9-11 Dec 2-4	Feb 18-20 Apr 22-24 Jul 8-10 Aug 26-28 Nov 4-6	$735	
Advanced "C" Programming Workshop*	Mar 3-4 May 19-20 Jul 21-22 Sep 15-16 Nov 10-11	May 5-6 Aug 18-19 Oct 27-28	Apr 28-29 Sep 8-9	Mar 10-11 Jun 16-17 Dec 8-9	Apr 28-29 Sep 8-9	Mar 17-18 Jun 2-3 Oct 13-14	Mar 10-11 Jun 16-17 Dec 8-9	Feb 24-25 Apr 28-29 Jul 14-15 Sep 8-9 Nov 10-11	$490	$1125
Advanced "C" Programming Under UNIX*	Mar 5-7 May 21-23 Jul 23-25 Sep 17-19 Nov 12-14	May 7-9 Aug 20-22 Oct 29-30	Apr 30-May 2 Sep 10-12	Mar 12-14 Jun 18-20 Dec 10-12	Apr 30-May 2 Sep 10-12	Mar 19-21 Jun 4-6 Oct 15-17	Mar 12-14 Jun 18-20 Dec 10-12	Apr 30-May 2 Jul 16-18 Sep 10-12 Nov 12-14	$735	
Berkeley Fundamentals and "csh" Shell*	Feb 3-7 Apr 14-18 Jun 23-27 Aug 18-22 Oct 13-17 Dec 8-12	May 12-16 Aug 25-29 Nov 3-7	May 5-9 Sep 15-19	Jun 23-27 Dec 15-19	Feb 3-7 May 5-9 Sep 15-19	Mar 31-Apr 4 Jun 9-13 Dec 15-19	Jun 23-27 Dec 15-19	Mar 3-7 May 5-9 Sep 15-19	$1225	

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Former NCR users await legal action on systems claims

Allege extensive bugs and inadequate service

By Clinton Wilder

Hoping to capitalize on the precedent of the landmark Glovartorium, Inc. decision more than five years ago, four former users of NCR Corp. systems have legal action pending against the vendor for supplying allegedly defective minicomputer hardware and software.

Only one of the four unrelated cases involves a system still marketed by NCR. That system, a V-8555-II, is cited in a civil court case filed against NCR by Ryan-Walsh Stevedoring Co., a Mobile, Ala.-based cargo handling firm.

Other computers cited in the four cases are the 8200, 8230, 8250, 8400 and V-8455. All four plaintiffs claim their systems suffered from extensive bugs, resulting in so-called "silent death" crashes, data loss and significant down-time and that NCR was unable to adequately service the problems.

In the precedent-setting Glovartorium case, NCR paid $2.6 million in damages to an Oakland, Calif., dry cleaning firm that won a lawsuit over its troubles with an NCR 8200 [CW, Nov. 1, 1982].

> ***All four plaintiffs claim their systems suffered from extensive bugs, data loss and significant downtime.***

According to court documents, Ryan-Walsh is seeking $1.5 million in compensatory damages and $10 million in punitive damages resulting from alleged system failures of a V-8455 and later a V-8555-II it leased in the early 1980s.

Ryan-Walsh is charging that both NCR and one of its salesmen misrepresented both systems as reliable and working.

Ryan-Walsh is seeking a jury trial for the case, while NCR has argued that the issue should be resolved through arbitration. Ryan-Walsh and its attorneys declined comment on the case.

Greeters of Hawaii, Inc., a tourist services firm in Honolulu, is seeking to recover $100,000 in payments to NCR, $450,000 in lost profits allegedly due to computer failure, "several million dollars" in lost potential revenue and unspecified punitive damages.

The revenue claim, according to a source close to the case, came from the firm's Aloha Reservations division, a subsidiary that set up an on-line reservation system on the firm's NCR 8250. Greeters of Hawaii claims it eventually had to sell the division after lost reservations and incorrect billing invoices, allegedly due to computer bugs, resulted in a significant loss of business.

Greeters of Hawaii has officially charged NCR with breach of contract, breach of warranty, misrepresentation and fraud. The plaintiff alleges that the Dayton, Ohio-based vendor "knew that the system had hardware and software deficiencies that resulted in lost data and shutdowns."

NCR attorney Pat Steiner could not be reached for comment on the case.

The Greeters of Hawaii case is scheduled for an arbitration hearing next month. Its leasing contract with NCR included an arbitration clause developed by NCR in the mid-1970s that specifies that any disputes over system problems must be resolved by an arbitrator rather than by a civil court judge or jury.

Nitram, Inc., a Tampa, Fla., chemicals manufacturer, originally filed its suit against NCR in district court in 1983, but the case has been stayed pending an arbitration hearing. Nitram alleges that its leased NCR V-8455 was plagued by disk crashes, slow response time and other problems.

Nitram eventually converted its billing system to an IBM Personal Computer. The user was forced to run its production control system manually, according to sources familiar with the case.

Nitram ceased its lease payments after the system proved unusable, and faces counterlitigation in state court from NCR Credit Corp., the vendor's leasing unit. Nitram is seeking to recover the lease payments it did make plus unspecified damages from business problems allegedly resulting from computer faults.

NCR attorney Robert Clark called Nitram's allegations "baseless" but declined further comment.

In another Florida case, Medical Billing Services of Orlando, Fla., is seeking more than $1 million in damages due to its alleged problems with an NCR 8200 and an 8250 in the mid-1970s, according to the plaintiff's attorney, John Mahaffey. Medical Billing Services claims it had similar file corruption and system crash problems with both the 8200 it purchased in 1976 and the 8250 it bought the following year.

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VIEWPOINT

EDITORIAL

The yen for revenge

Computer and semiconductor industry people can be forgiven the urge to gloat a bit at the turmoil that the strong yen has created within Japan's business and political circles. U.S. products that used to be priced far above comparable Japanese goods due to the stronger dollar are suddenly cost competitive in Japan.

Partially as a consequence, Hitachi Ltd. and Fujitsu Ltd., Japan's largest computer manufacturers, reported a profit drop for 1985, and the Japanese electorate may deny Prime Minister Yakusuhiro Nakasone a third term due to his seeming inability to counteract the trend. Still, however savory the irony, temptations to gloat must be resisted as being both premature and ill-founded.

For one thing, the strengthened yen, on the rise since last September, has yet to have a discernible impact on U.S. computer sales abroad. Hitachi, Fujitsu and other leading Japanese computer manufacturers will squeeze their profit margins before letting the higher yen affect price. The Japanese have long held market share to be more important than profit levels.

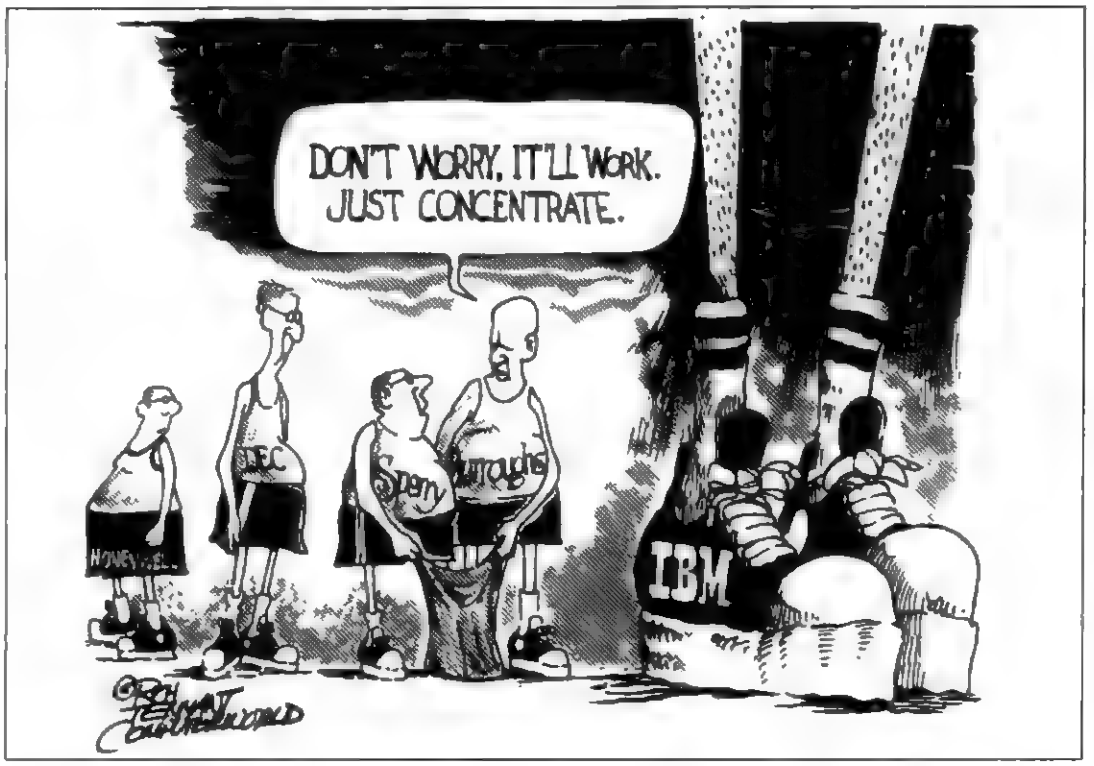
At the low end of the computer and peripherals markets, prices have not been dramatically affected, if at all, and here the Japanese are expected to expand manufacturing automation efforts to maintain a competitive advantage.

Rather than gloating — or worse, advocating reactionary protectionist measures like the massive trade reform bill approved last month by the House of Representatives — U.S. computer makers should take advantage of this unique opportunity to push further into Japanese markets. Prices are down, and the Reagan administration is hinting strongly that it would help curb the yen's rise if Japan helped create even more domestic demand for imported goods. This combination of government inducement and lower prices affords U.S. manufacturers an excellent opportunity to expand their Japanese market.

The payoffs are already starting to come for U.S. companies who have pushed to expand their Japanese market. Cray Research, Inc., for example, recently sold two of its supercomputers to Japan's Nissan Motor Co., despite the latter's close ties to Hitachi, and Isuzu Motors Ltd. has made a commitment to Burroughs Corp. equipment. Nippon Telephone and Telegraph just signed its largest non-Japanese supply contract ever, with Northern Telecom, Inc.

True, the trade frictions between the U.S. and Japan have miles to go before they are put to sleep. As we have noted in this space before, there are fundamental differences between the two societies that still must be bridged. But protectionist measures can only damage the ties between the two leading information systems providers in the world, damage that would have a profound impact on corporate information systems managers around the world.

Now is plainly not the time for the U.S. computer and semiconductor communities to gloat over the Japanese economic predicament or to seek U.S. government trade intervention. Now is the time for them to show their development, manufacturing and marketing mettle, competing vigorously for Japanese sales and allowing the free market system to carry the day.



LETTERS TO THE EDITOR

Data sharing threatens privacy

In your editorial, "Computers aren't the issue" [CW, April 14], and in Daniel J. Lasser's letter, "Misapplying the principle of privacy" about the editorial [CW, May 5], you both imply that "the privacy advocates" don't know what they are talking about simply because they are critical of the way computer technology is threatening individual rights.

Lasser even tells us how we should be more credible and sincere. One way, he says, is to distinguish just which sort of computer matching is tolerable and which is not. We have done just that in congressional testimony in December 1982.

Receiving welfare, paying taxes, working for the government, registering for the draft, using food stamps — these are not criminal; they are activities we encourage, and people who end up on lists because they do these things ought not be subjected to computer matches simply because the technology is available.

The reasons for this are both legal and moral: Those who formed our Bill of Rights warned against general searches of everybody's house in the neighborhood, for instance. The federal Privacy Act prohibits data sharing of this sort. And the reasons are also practical: Data collected for one purpose — whether a middle initial, Social Security number or address — is not checked for accuracy when entered if it is not crucial to the transaction, yet it takes on life-and-death significance when it becomes the basis for a "hit" that can deprive one of public assistance, a livelihood, freedom from prosecution or simply the right to be let alone.

Lasser also implies that we "privacy advocates" should quit worrying about disclosure of IRS information because a notice on our tax returns warns us that some tax information will be shared. Does he realize that the American Civil Libertes Union and other privacy advocates struggled hard — against the Daniel J. Lassers of the 1970s — to impose that requirement of prior notice?

In the 1980s we are simply saying that federal agencies ought to comply with the nondisclosure requirements of the Privacy Act of 1974 and the Tax Reform Act of 1976.

Both *Computerworld*'s editorial and Lasser's response repeat that old line that computers are not the problem. In fact, the massive data gathering of the 1980s could not possibly be conducted without automation. I worry less about personal information about me in a dusty folder at the bottom of a file cabinet than I do about the same information recorded for posterity in an automated system, which permits long-distance and simultaneous retrieval, which eliminates the old deterrents of cost and space, which rarely distinguishes between contemporary and outdated information and which permits merging, linking, rearranging and analysis.

Robert Ellis Smith
Publisher, *Privacy Journal*
Washington, D.C.

Personal data belongs to individuals

There are much deeper issues of law and morality underlying the recent editorial and letter about computer matching of files than those referred to by Daniel Lasser in "Misapplying the principle of privacy" [CW, May 5]. The one that is deeply embedded in Anglo-Saxon law is that everybody, even speeders and software pirates and welfare cheats, is presumed innocent until proved guilty. In continental Europe the Napoleonic Code led in a different direction, but in the U.S. the dragnet idea is not acceptable, in law or in good police practice.

Computer technology makes dragnetting cheaper and faster, and the current political atmosphere makes it otherwise tempting, but the Magna Carta and the Constitution will prevail.

It has been recognized in Britain and Sweden where oversight government agencies have been set up; it does not yet have the explicit support of federal law in the U.S. It is that personal data belongs to the individual, not to the organization that collects it, whether governmental or commercial, and can be used only for the purpose for which the individual gave prior consent.

Elements of this are found in official practice: IRS forms have a nonbinding reference, and on a homier level the Association for Computing Machinery controls its sale of mailing lists on that basis.

The abuse of credit agency information, driver and automobile registrations and even of such simple things as telephone cross-directories (which Ma Bell was always careful about) annoys every one of us. I hope that the file-matching discussion, and civil liberties concerns in general, will help eliminate those abuses.

Herbert R. J. Grosch
Mies, Switzerland

VIEWPOINT

Help wanted: Seasoned telecom execs with management savvy

Technical, business skills a must for fast-paced job

Just a few years ago, market researchers were reporting that the demand, cost and growing variety of data communications systems were placing tremendous pressure on telecommunications managers to control costs and choose wisely among available options. It was an understatement then. Today, it's at best a gross oversimplification.

The technology is so fast moving, the issues so complex and the number of products and services so great that it is difficult for even the most experienced telecom specialists to keep up.

In fact, there are few people qualified to manage a corporate telecommunications system of any size. Yes, there are plenty of good voice-oriented "telecom managers" around. But very few qualified *corporate*-level people. And by all accounts very few, if any, voice people are able to make the transition.

Few have implemented systems

"We have a situation where it's very difficult to find people who have been successful in implementing systems to recommend to a client," says Vincent S. Morgan, managing associate of Korn/Ferry International, the largest executive search firm (headhunter) in the world. "As a result, we often see consultants on the case, and they're usually on top of other consultants."

This inability to find qualified people is forcing some large companies to take a backdoor approach. According to Morgan, companies are asking Korn/Ferry to survey other companies to determine how they are managing their total information resource, with a particularly hard look at telecommunications. With that information, these companies hope to better plan and integrate their MIS, office automation and telecommunications systems — at which point they can be more specific with Korn/Ferry about what kind of people they need.



By RON SCHNEIDERMAN

Will they be able to find the right people? Robert A. James, national director of telecommunications for Arthur Young, a leading accounting and consulting firm, doesn't think so. He says the right people must be experienced and understand all of the technologies — voice, data, image, text, videoconferencing and graphics.

Equally important, he adds, they must understand their companies' business. This last point is a big one backed up by experience and research. A survey by the Omni Group, a consulting firm, indicates that corporate information services managers often don't understand what business their companies are in.

Voice-oriented people won't make it as chief information officers or even corporate telcommunications managers, says James, because they don't understand software. In addition, virtually every requirement in a telecommunications environment is unique and not amenable to a standardized turnkey solution. Systems are composed of a wide variety of transmission media and network technologies as well as a mix of terminals and other communications equipment and services.

Telecommunications already ranks as the second-largest expense at many large corporations, after salaries. Some knowledgeable projections call for data costs in large companies to pass voice costs within the next three to five years. One more heady fact: There are about 75 DP people for every 1,000 employees in large companies compared with one telecommunications specialist for every 1,000. "That has to change," says James.

Where are all of these managers going to come from? The breakup of AT&T all but did away with the biggest source of trained telecom people, forcing many companies to grow their own.

Undoubtedly, many of the new telecom managers will come out of the MIS area. At least they have a head start; they may be middle managers with computer science or engineering backgrounds who know a little about their company's business. A few companies have developed training programs, picking managers with a demonstrated knowledge of the business and its marketing strategy and some technical background.

Training for telecom hard to find

There are schools, although very few, that offer specialized curricula. The Universities of Hawaii and North Carolina and New York University have telecommunications programs. Other schools allow their computer science and electrical engineering majors to load up on telecommunications courses, just as a business administration major might concentrate on marketing.

Last year, the State University of New York formed a multimillion-dollar Telecommunications Institute, a cooperative venture by the state and the Nynex Business Information Systems Co. One reason the program was started, according to a college official, was that "the industry tells us there is a need for 100,000 people with training nationwide, and very few colleges offer this program."

New demands for strategic applications, higher productivity and computer-integrated manufacturing and design activities will put increasing pressure on corporate and MIS management.

Recognition of the importance of the telecom activity will grow with the realization that rising telecommunications costs will more than offset lower hardware costs, even if rates drop. The question may not be — as it often is — what's the cost, or even who's in charge, but does he know what he's doing?

Schneiderman has been covering the computer and electronics industries as a reporter and editor for more than 20 years.

SDI demands trillions of instructions, 99.9999999% reliability

Success depends upon near-perfect accuracy in untested situations

READER'S PLATFORM

By DAVID BENDEL HERTZ

It has been said that the Strategic Defense Initiative (SDI or Star Wars) provides the U.S. with a rare opportunity to enhance national security and provide a basis for the next generation of industrial technology in one fell swoop. The military, academic and political communities are divided into two camps: "It will work" and "It won't work." But the real question is, How can we find out whether it will work if and when we need it?

The general idea of Star Wars is that a large number of American satellites will keep watch over the earth's surface and instantly spot the takeoffs of enemy missiles, which, of course, must be distinguished from other similar but harmless activities on the earth's surface such as oil field burn offs. Then the satellites will communicate with supercomputers on earth to track and destroy the detected missiles with defensive weapons such as X-ray laser beams or antimissile missiles. The entire process of sighting, identifying and destroying must take place in a few minutes.

It has been estimated that the number of coordinate instructions for the computers will number in the trillions and that there will be hundreds of thousands of performance-critical functions, some of which must be executed with a reliability of 99.9999999 or better.

To indicate the magnitude of this task, an AT&T report last year stated that there were an average of 300 "serious errors" in every 1,000 lines of computer code at some 200 major corporate installations. It is well known that no large-scale program works right the first time: It is very likely that some parts of the SDI programs will be using combinations of various instruction sets for the first time because some combination of circumstances involved in an attack situation will give rise to unexpected input data.

Some help in increasing reliability and getting around these problems may come from artificial intelligence programs that are intended to build error-free programs for complex systems using high-level languages and self-validation and verification.

But if there are errors in such self-verified programs, they will be much more difficult to detect in advance or to find later. Past experience in developing and implementing complex, large-scale-computer-executed real-time systems, in which extremely fast reaction in the face of changing and unanticipated inputs is required, does not provide much comfort.

There may be bugs hidden in the underlying models that the codes are intended to implement. It is very difficult, almost impossible, to validate models of situations and events that have never occurred, except in a genuine confrontation — and that may turn out to be a bit late. And even if the models are correct, it is always possible that some parts of the code might cause the computers and their backups to crash.

Realism most serious factor

The realism of the models is perhaps the most serious factor in assessing risks that the program won't work. The models must make some simplifying assumptions about the real world, perhaps distorting it sufficiently so that what had worked in testing the model doesn't when applied to an actual situation. But this cannot be known for sure in advance.

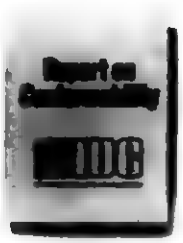
How do we test for what may have been overlooked, omitted, misjudged? Could reliance on Star Wars as a "peace shield" lead to a worldwide *Challenger* disaster? How can we know until we try it? Are the technological risks, to say nothing of the political and economic considerations, worth it?

Open debate over these questions is essential to prevent the nation from being locked into a defense posture it will ultimately regret.

Hertz is Distinguished Professor and Director of the Intelligent Computer Systems Research Institute at the University of Miami in Florida.

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COMMUNICATIONS

WIRE TAP
Daniel J. Rosenbaum

Look twice at ISDN rates

Most data communications managers worth their salaries are thinking about how an Integrated Digital Services Network (ISDN) is going to change their jobs. The really smart ones are wondering how they're going to pay for it.

There are three basic benefits to an ISDN: easier access to mid- and high-speed data transmission; simplified, call-by-call access to a full range of voice and data communications services; and access to network control information that previously had been the sole province of the telephone company.

An ISDN network includes at least two kinds of lines. The first is a 64K bit/sec. circuit-switched line designed to carry user-provided data. That 64K bit/sec. line is called the B ("bearer") channel. The second line is the D ("data") channel, carrying packet-switched access and call set-up information for a cluster of B channels. The D channel will operate at either 16K bit/sec. or 64K bit/sec. — depending on how many B channels are in the cluster.

ISDN allows you to pick your service on a session-by-session basis and lets you use and monitor setup data. If you have a sudden but infrequent need for a bandwidth-monopolizing service such as videoconferencing, ISDN will, in theory, allow you to literally dial it up.

The idea behind ISDN — and it remains to be seen if this will be the reality — is that users will have to pay only for what they use. That sounds

See LOOK page 23

Rosenbaum is the editor of "Wiretap," an information industry newsletter published in Morristown, N.J.

Hospital's needs set goals for Applitek net manager

By Elisabeth Horwitt

WAKEFIELD, Mass. — Applitek Corp. announced last week the commercial availability of Network Management System (NMS), minicomputer-based software that performs monitoring and diagnostics, accounting and security functions for the company's Unilan local-area network product line. Many of NMS's features were developed to meet the networking needs of the University of Michigan Hospital, an Applitek customer.

Applitek had already developed a basic diagnostic system that runs on Applitek's network interfaces, which link computers to the Unilan broadband networks. But the centralized management, accounting and security features were implemented at the hospital's request and according to its specifications, said Applitek spokesman Gerald McDonald. "The system would have been very different without the hospital's input," he said. "They helped us define the needs of large, multiuser sites."

The NMS collects statistics from each Unilan network interface and displays information on a color monitor. Traffic and error-frequency statistics are monitored and logged on disks for later analysis. Records are maintained of interface updates, such as changes in the number of terminals or transmission rates. The NMS also monitors and compiles data on user transmissions and sessions for security and accounting purposes.

The new management features were a prerequisite for Applitek's landing the contract for the Ann Arbor, Mich., hospital's major network installation, according to Robert Dieterle, manager of the hospital's pathology data systems. "We could never have run a network this size without some kind of network management system," he commented.

The hospital plans to use the network to support approximately 1,030 asynchronous terminals that will be used by students, clinicians, technicians and administrators to access Digital Equipment Corp.

See HOSPITAL'S page 22

System unites net management

By Stanley Gibson

CHERRY HILL, N.J. — A centralized network management system recently introduced by Infotron Systems Corp. is a "significant improvement over the often patched-together networks currently in use in many customers' locations," a company spokesman said.

The Integrated Network Manager (INM) consists of Infotron's proprietary software and an Apollo Computer, Inc. workstation that features color graphics and multitasking windows. The system was designed to offer control of networks that include Infotron's 990NP network processors and its Infostream 1500 T1 multiplexers.

"INM offers customers gains in network availability and boosts network manager productivity, since a single operator can invoke network testing and diagnostics remotely instead of having to dispatch people to the site," said Infotron spokesman Robert Bower.

Previously, each network processor had its own network diagnostic system. The new system, however, allows an operator to monitor and diagnose the status of all the network processors and lines from one terminal, Bower noted.

The INM will save users money both by speeding up troubleshooting and by reducing downtime because of malfunctioning lines, he added.

The INM lets users concurrently monitor the network in one window, perform diagnostic testing in another and alter operating parameters in yet another window, according to Infotron. As many as 13 windows can be viewed at once, and information in the windows is updated in real time.

See SYSTEM page 23

NEW THIS WEEK

- Grid Systems offers a Distributed Secure Network for laptop microcomputers

For more on this and other new products, see pp. 85-113.

INSTANT ANALYSIS

"The International Standards Organization's recommendations for defining field formats in financial transactions is another one of those standards where you give up a little efficiency in order to be able to add and change things more quickly and easily."

— Scott Lefteneess, Visanet vice-president of access planning and implementation, Visa U.S.A., Inc.

Token-ring patent holder Soderblom squares off with 3Com

Polaroid precedent may be factor in suit

By Stanley Gibson

MOUNTAIN VIEW, Calif. — The Olof Soderblom patent controversy is rearing its head again as 3Com Corp. confronts the issue of paying the token-ring patent holder a fee for the use of the networking system.

"Soderblom is creating a significant problem for us and everyone else," said Robert Metcalf, chairman and senior vice-president of 3Com.

"We're arguing with Olof now," he added, indicating that the Swedish network designer has paid a personal visit to Metcalfe's Mountain View, Calif.-based company in order to discuss the question.

Founded company to sell patent rights

After developing and patenting a token-passing network system in Sweden in the 1960s, Soderblom filed for a patent in the U.S. that was granted Oct. 6, 1981, and is good for 17 years.

Following the granting of the Swedish patent, Soderblom assigned the rights on it to the bank for whom he developed the system. Later, the bank assigned the rights back to him, and he founded a company called Willemijn Holding Co. in Rotterdam, the Netherlands, to sell his patent rights. Soderblom has retained the Washington, D.C., law firm of Pollock, Vande Sande & Priddy to defend his patent rights in the U.S.

IBM reportedly paid Soderblom $5 million in 1980 for the nonexclusive rights to his token-passing configuration, and Ungermann-Bass, Inc. recently said that it would pay Soderblom for a license to market the system.

However, companies such as Natick, Mass.-based Proteon, Inc. have not agreed to pay Soderblom. Proteon has been selling a token-ring network for several years, insisting that its system does not infringe on Soderblom's patent.

Polaroid decision may set precedent

Metcalfe said the recent instant photography patent decision rendered in favor of Polaroid Corp. has made many network professionals nervous.

The decision in that suit, in which Polaroid claimed that Eastman Kodak Co. copied its instant photography process, resulted in Kodak's having to abandon its line of instant photography products, which it had been selling for 10 years.

Some fear wasting net investments

Metcalfe said some networking professionals fear that a future court decision on Soderblom's token-ring patent might result in the waste of huge net investments, even to the point of having to tear cabling out of the walls of buildings.

Metcalfe explained that Soderblom is asking for a royalty of 1% to 3% of 3Com's systems' selling prices.

The royalty would include a per-

See PATENT page 22

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Hospital's needs set Applitek goals

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VAXs and PDP/11s as well as Control Data Corp. Cybers and turnkey laboratory systems.

The hospital needed a centralized management system that would collect network performance statistics from about 43 Applitek NI10/T network interfaces distributed over approximately five miles of corridors, McDonald said. Also required was a way to store port configurations so that they could be downloaded to the network interfaces in case of update or network failure.

The hospital has stringent security requirements, Dieterle said. "Some of our patient and accounting records reside on computers with no internal security. And we have graduate students working part-time in our laboratories, who often get the urge to hack," he noted.

> ***'Some of our patient and accounting records reside on computers with no internal security. And we have graduate students working part-time in our laboratories who often get the urge to hack.'***
>
> — Robert Dieterle
> University of Michigan Hospital

Multilevel security

It was the hospital's idea to install multilevel security, McDonald said. On the network interface level, each port is assigned a "mask" containing up to 95 names, each of which provides the user with access to a different network resource. Still under development is a password security system that would enable users to petition the NMS for permission to access a particular network resource.

This second level of security is important for organizations such as the hospital, which have terminal pools shared by a changing group of people, McDonald noted. "Port-based security is probably sufficient when managers are assigned terminals on a fairly permanent basis," he added. Users can also access resources through the NMS when they are temporarily using a different port, Dieterle noted. "Users should be able to access the same resources from anywhere on the system."

Report generation is another NMS feature still under development, McDonald said. The existing system can be programmed to poll each network interface in turn at regular intervals and compile statistics on how many times a device had to retransmit within a given time period, "so you can diagnose trouble before it becomes serious," he explained.

Network resource use

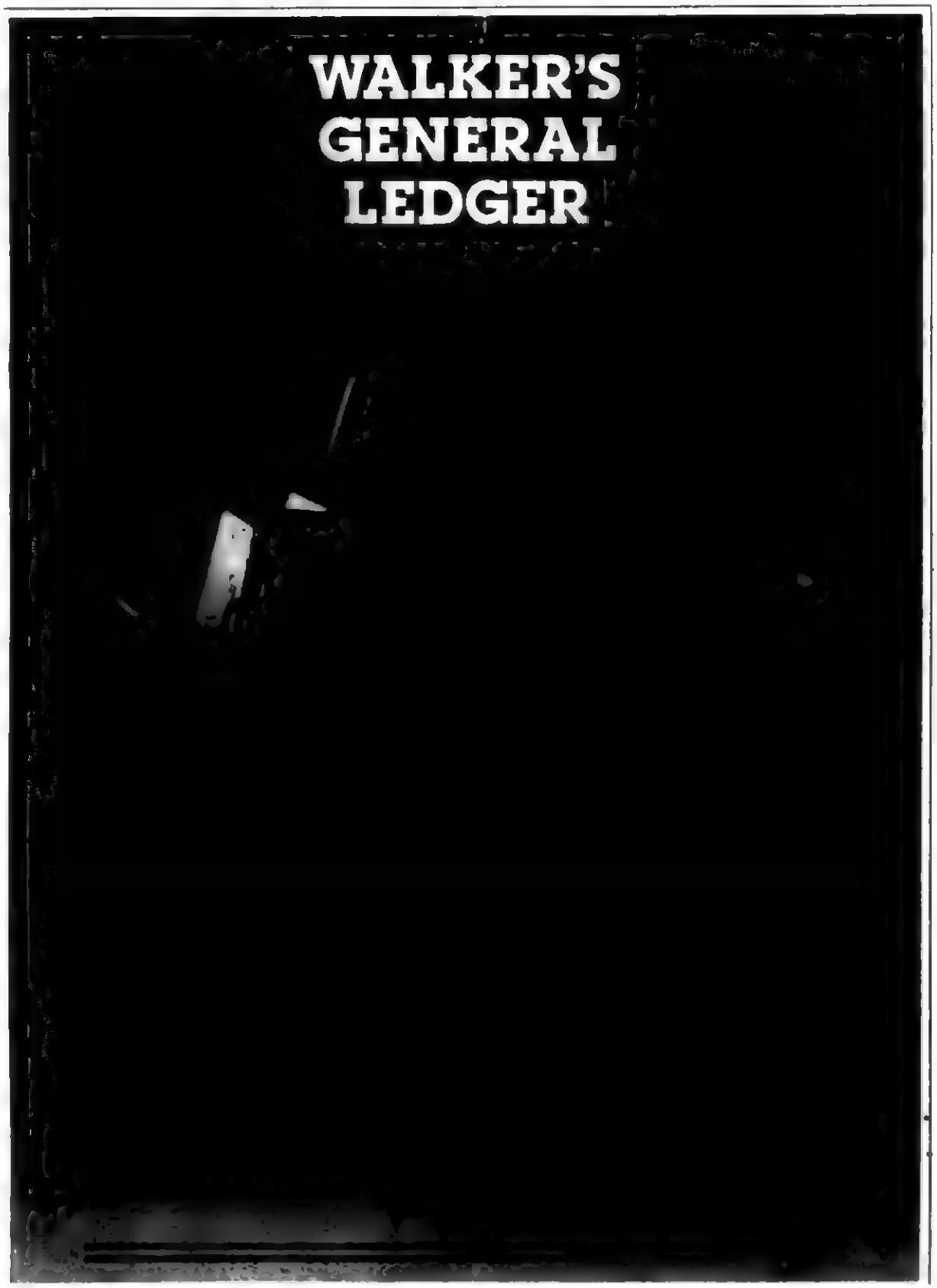
The NMS also keeps track of the use of network resources for accounting and billing purposes. But Applitek currently offers no package that analyzes network statistics and generates reports on overall network traffic patterns, error frequency and resource usage, McDonald noted.

Instead, customers can create their own customized reports using the DEC Record Management Service or other RSX-11 or VMS-based report generators. Applitek has indicated to the hospital that it will be offering a reporting package by the end of this year, Dieterle said.

Current gaps in the NMS product "don't inhibit us now but could be annoying in the future," Dieterle commented. "We are thinking of implementing the network campuswide, but not until Applitek's hardware, software and network management is all in place."

Applitek announced the NMS a week after a similar introduction by Infotron Systems Corp., a wide-area network equipment vendor currently working out the details of a friendly acquisition of Applitek. "It was a complete coincidence," McDonald said. He added that a priority of the merger will be integrating the two companies' network management systems.

The NMS runs on a multitasking DEC PDP 11/73 or MicroVax II, under RSX-11 or VMS. Available now, its pricing starts at $20,000.



Patent holder squares off

From page 19

centage of the value of the devices attached to the system, including mainframes.

Texas Instruments, Inc., which sells 3Com the chip sets used in its system, said it believes it is not liable to pay any patent license fees, but that systems sellers would have to pay any fees necessary.

Metcalfe pointed out that although the Institute of Electrical and Electronics Engineers, Inc. (IEEE) had held off making Ethernet a standard until it had settled patent questions with Xerox Corp., IEEE made IBM's Token-Ring specifications an industry standard even though Soderblom's patent claim was still pending.

Metcalfe is known as the father of Ethernet, which he developed while employed by Xerox.

Look twice at ISDN rates

From page 19

great, but take a closer look at what it is you're using.

Some of the tariff structures used for today's networks probably still work with ISDN, but there are some wrinkles that alert data communications managers should think about today, even though they may not get the chance to use ISDN for the next five years or so.

Pre-ISDN switched networks insulate users from the setup and service selection processes. Service selection was always built into network access; you could not make a voice call over a line conditioned for data, for instance.

Also, the cost of call setup was built into the price of a phone call. That's why the first minute of a call is more expensive than subsequent minutes — it costs more to provide that first minute.

Besides the data you send during a communications session (which in ISDN would be on the B channel), you are exchanging setup and call status information with both the network and the called station (on what would be an ISDN D channel). Because of the flexible nature of ISDN, you are likely to have to pay for everything you transmit, no matter which channel it moved on, just as you now pay for every second a session is active.

Valuable information

There is some justice to this, since D-channel information can be spectacularly valuable — perhaps even more valuable than the session it controls.

If you have full access to your network's control information, you will be able to get an exact measurement of who is using the network for what at which hours.

You'll be able to precisely charge back on a department, project or station basis. Call-accounting costs will drop dramatically, as will the man-hours required to create the appropriate call-accounting data bases.

What's more, because setup information includes the originating phone number, you will be able to tell who is calling you before you answer your phone. For that matter, you'll be able to program your phone to reject calls from certain numbers or sets of numbers. Self-configured WATS is more than a vague possibility.

All of this has a significant downside, though. Setup information is transmitted *even if the call isn't completed*. If you pay for everything transmitted in ISDN, you will be paying for no-answers and busy signals as well as completed calls.

No one will tell you that. When you ask AT&T about how ISDN will break down costs, they say they're still thinking about pricing issues — just before they tell you that setup takes so few bits that any charge would be "negligible." On a station-by-station basis, that may be true. But how many calls are placed every day in your network, and how many of those are uncompleted?

On the other hand, the information ISDN gives about uncompleted calls can tell you useful things, such as whether your network resources are deployed where they are really needed.

The bad news, then, is that ISDN may well mean you'll have to pay for uncompleted calls. The good news is you may find strategic uses for the data those calls generate.

ISDN is, at minimum, five years off. If you're smart, you'll be thinking about ways to take advantage of it before it takes advantage of you.

System unites net control

From page 19

The manager can view the entire network on the display screen, depicted as a color-coded map, with deteriorating lines drawn in yellow and line failures in red.

A warning system that includes an audible alarm can be programmed by the network manager to alert him to deteriorating network conditions. For example, he can be informed when the frequency of errors rises above a predesignated threshold. A log records the date and time of all network alarms.

The system also offers a statistical summary of traffic utilization, average and peak loading. These reports can be stored on disk, archived on tape and reviewed later on the workstation.

ANM not made obsolete

The introduction of the INM does not make obsolete Infotron's other network product, the Advanced Network Manager (ANM), the company said.

Based on an IBM Personal Computer XT or AT, the ANM is sufficient for small networks that include either Infotron's 990NP network processors or the Infostream 1500, according to Infotron.

However, when the number of T1 lines in a 990NP network increases or the net's size increases to more than 32 990NP nodes, INM is needed, Bower said. The INM can handle up to 64 990NP nodes and 14 T1 lines.

An INM designed to manage a network based on either Infotron's Infostream 1500 or the 990 Network Processor costs $80,000; an INM designed to manage a network that uses both types of system is priced at $100,000. The first product shipments are expected in September, according to Infotron.

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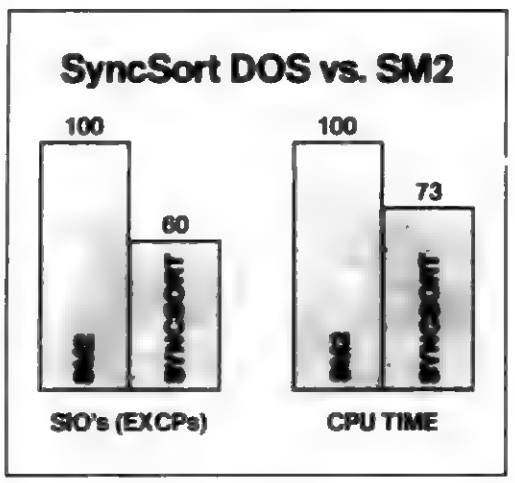
- **Multiple Output** — From a single sorted file, you can create multiple files and reports. Each can include the same or different data as determined by INCLUDE, OMIT, OUTFIL or OUTREC parameters.

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SOFTWARE & SERVICES

SOFTALK
Frank Sweet

The high cost of sales hype

Do you remember the commercial that brought the Ronco company into the annals of American folklore? It sold a device comprising a slanted plastic platform with a slightly raised horizontal blade at the lower end. It was called a "Veg-O-Matic." It had no moving parts. You worked it by pressing a vegetable onto the platform and sliding it over the blade. "It slices! It dices!," the man on TV smiled as he deftly reduced a raw potato to a heap of thin slivers.

After ordering one and finding myself unable to duplicate the performance, I studied the ad more closely. Only then did I notice that the friendly demonstrator had forearms like a blacksmith. He was awe inspiring. In a brawl, the fellow could have pounded me into the ground like a tent peg.

Tool salesmen stress their products' features and downplay the training they take to operate. They must, of course. They want to encourage sales, not frighten people away. And more often than not, no harm is done. One does not normally shop for a tool unless one has some training or experience in working it. Craftsmen seldom confuse artist and instrument. No musician asks the violin salesman if his product will play a great sonata. Writers do not ask if a typewriter will compose a novel.

There is one field, though, in which tool buyers and tool users are different populations, with often catastrophic consequences — data processing. This is probably because our profession is too new for our talents to have percolated into public lore.

Whatever the reason, hardware and software are often selected by those

See HIGH page 28

Sweet is a free-lance data base consultant in Jacksonville, Fla. He publishes "Boxes and Arrows," a monthly newsletter for Cullinet Software, Inc. IDMS users.

Cobol utility passes first test

Networking extension 'lived up to its promise'

By Jeffry Beeler

PALO ALTO, Calif. — An enhanced version of a systems utility that reportedly allows Cobol object code to be ported among dissimilar network nodes has received the first independent confirmation of its developer's performance claims.

In tests that International Data Corp. (IDC) conducted recently at its Technology Laboratories in Palo Alto, Austec International Ltd.'s just-announced Distributed Data Access (DDA) product "lived up to its promise," according to an IDC report.

The report's conclusion marks a turnabout from the market research firm's initial skepticism toward DDA and its reputed capabilities, which seemed "too good to be true," the five-page document said.

IDC is thus far the only known organization outside of Austec itself to have tested the DDA product under conditions that approximate a realistic work environment. The product was announced last month in New York.

Austec, a 9-year-old Australian supplier of Cobol compilers and application generators, describes DDA as a networking extension to its existing Acebridge utility, which reportedly enables heterogeneous systems to operate together as one virtual machine.

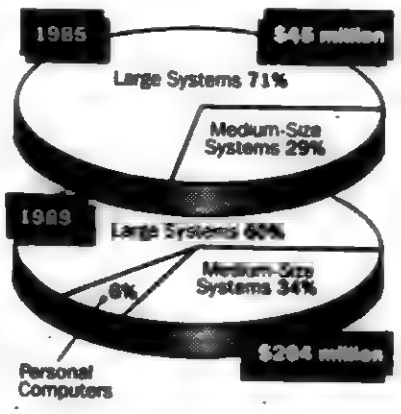
Since Acebridge's introduction in 1984, Austec has signed license agreements that make the product available with a raft of processors running Unix, Microsoft Corp. MS-DOS and IBM MVS. A few examples of CPUs that already support the utility include IBM's IX/370-based mainframes, NCR Corp.'s Tower, AT&T's 3B line and Digital Equipment Corp.'s VAXs.

To date, Austec has been unsuccessful in its efforts to negotiate a licensing arrangement with IBM that would give users access to Acebridge in the MVS and VM realms.

Both Acebridge and Austec's Ace Cobol, a compiler that is reportedly compatible at the source-code level with most other Cobol compilers, are prerequisites for using DDA.

See COBOL page 27

Data dictionaries: Growing, independent marketplace



Information provided by International Data Corp.

MITCHELL T. HAYES

DEC system targets utilities

By Charles Babcock

MARLBORO, Mass. — Electric and gas utilities and petroleum exploration firms are among the target customers for a data base management system introduced by Digital Equipment Corp.

The $9,090 DBMS, Spatial/II, is designed to manage information by geographical reference using the DEC VAX line of computers. It will be available in August.

Spatial/II is intended to permit definition of data by points, chains, polygons, triangles and variable grids. These data structures allow a description of locally defined data in a three-dimensional context, according to Linda Moore, manager of DEC's Marlboro, Mass.-based Earth Resource Engineering Group (EREG).

DEC spokesman Ed Canty said the VAX line is frequently used in oil exploration and that the need for a DBMS to handle geographic information "has been evident since the group was formed" three years

See DEC page 29

NEW THIS WEEK

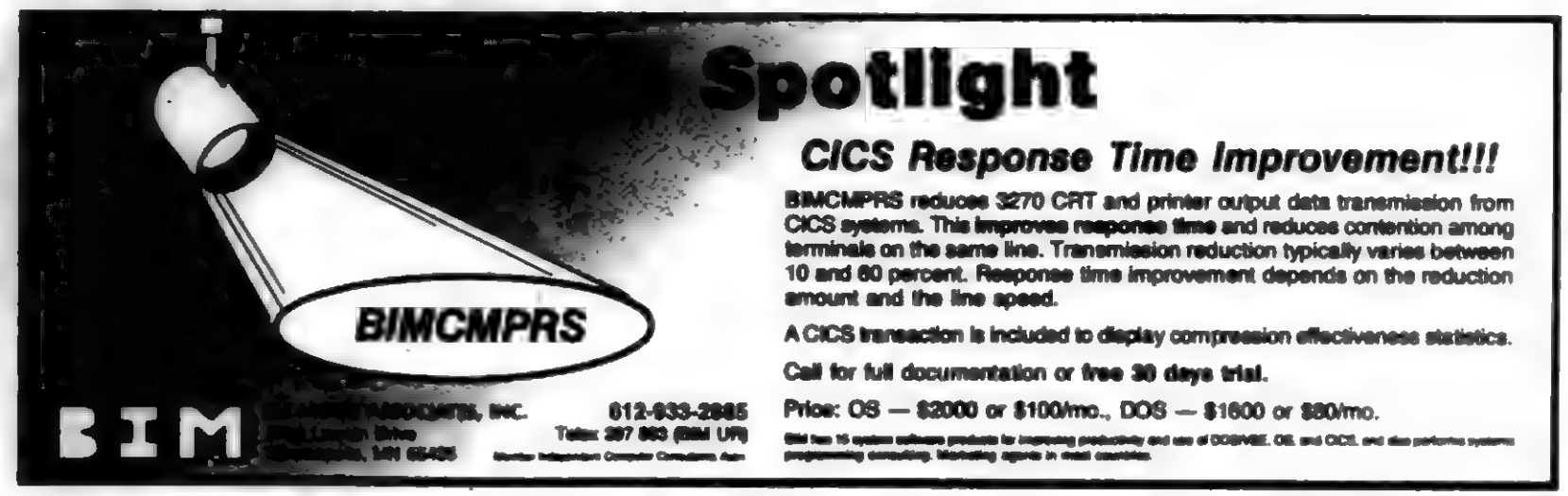
- Hewlett-Packard offers an Ada compiler
- Honeywell ports its CP-6 operating system to its DPS 90 information processing system

For more on these and other new products, see pp. 85-113.

INSTANT ANALYSIS

"The cable between the 382 and the 6300 system was unplugged to verify that the program was really executing locally."

— IDC Technology Laboratories report on the new Austec Distributed Data Access product





Cobol utility passes first test

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To take advantage of DDA's purported capabilities, a user first must provide each node in its target network with Acebridge, which typically sits atop a processor's operating system. The user also must run its existing Cobol applications through Ace Cobol to ensure that all systems in the network are compatible with each other at the object-code level.

Once all the software preparations are complete, DDA permits application code to be shipped from any Acebridge-supported processor to any other system, regardless of make, in the same network, according to Austec President Leslie McNeill.

For users, such portability of Cobol application code yields a number of benefits, McNeill claims. Included is the ability to do the following:

- Balance processing burdens by downloading applications from an overtaxed central system like a VAX-11/780 running Unix to an IBM PC-DOS-based IBM Personal Computer AT, many of which are often underused.
- Write an application on one network node, and execute it on another.
- Allow systems to obtain needed applications by using software that already resides on dissimilar nodes rather than by forcing users to develop redundant programs from scratch.

To check McNeill's product claims, IDC devised a series of tests in which DDA was required to perform several everyday operations on an Austec-supplied mailing list application.

In the first test, the application's source code was customized through modifications. After compiling and executing it on an AT&T 3B2/400 running Unix System V, IDC downloaded the resulting object code through RS-232 serial connections to an AT&T Personal Computer 6300 using MS-DOS and to an NCR Tower XP. The code was again executed.

"The cable between the 3B2 and the 6300 systems was 'even unplugged to verify that the program was really executing locally out of memory on the 6300," the report stated. "This verified the portability and downline load capabilities."

In the second test, the same application was required to retrieve and update files on the 3B2 and the Tower XP while being executed on the 6300. A subsequent check of each file confirmed the successful completion of the modifications, the report said.

In the final test, the application ran simultaneously on the 6300 and Tower XP, while both machines also updated a file on the 3B2. "Record, not file, locking worked as specified, and the integrity of the data was preserved during simultaneous access," the report said. A similar test involving a PC AT and Personal Computer XT connected through PC-Net reportedly produced the same results.

"The application program's knowledge of the environment and the location of object and data files is made available to Acebridge and DDA through the use of environment variables, which specify a path where Acebridge will search for the named data or object file," IDC said.

DDA will be priced from $500 to $1,000 per node. Austec is negotiating distribution and support agreements with hardware vendors.

> ***Since Acebridge's introduction in 1984, Austec International Ltd. has signed license agreements that make the product available with a raft of processors running Unix, Microsoft Corp. MS-DOS and IBM MVS.***

CA-JARS/CICS Release 5.0 gets CICS 1.7 support

By Eddy Goldberg

GARDEN CITY, N.Y. — Computer Associates International, Inc. recently enhanced Release 5.0 of its CA-JARS/CICS product to provide support for Version 1, Release 7 of IBM's CICS teleprocessing monitor running under MVS. The CA-JARS products provide an automated means of measuring software productivity and system performance.

CA-JARS/CICS Release 5.0 came out in January and contains major functionality and feature improvements over the prior release that supported CICS Release 1.61. The recent enhancement to CA-JARS/CICS supports CICS 1.7, which was introduced by IBM last August.

The number of extensions that IBM made in CICS 1.7 required significant extensions to the monitoring product, explained David Tory, senior vice-president at Computer Associates International.

CA-JARS/CICS is available for both the MVS and DOS/VSE environments.

The perpetual license price is $19,000 for the MVS version. The DOS/VSE version currently supports CICS 1.61 and is priced at $11,500.

Chances are you don't currently audit your operating system—even though it's ultimately in control of information used to manage your organization. And for good reason.

For the most part, you don't audit the system because the software is just too complex. Then too, certain hard data on system controls is usually unavailable. And a manual review would take weeks to perform, require outside experts, and cost too much.

Those are some of the main problems AEX2-Examine/MVS software is designed to solve. This new software package now makes it possible for you to get the information you need to effectively analyze your MVS environment. So when top management asks how you know your data center business controls are working, you'll have the answer.

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AEX2-Examine/MVS software also helps your DP staff become more productive by improving their knowledge of the system, its controls, and its level of operating efficiency. In effect, it puts MVS under a cost-conscious microscope.

Tighter business controls, more accurate information and improved data center productivity are all key management objectives for the coming decade. AEX2-Examine/MVS software provides a tool to help you achieve these strategic objectives *today*. And positions you to meet your increasingly stringent demand for due care in the future.

For more information, contact Shawn McLaren today, at 1333 Lawrence Expressway, Santa Clara, CA 95051-3595; (415) 941-6558; Telex 357437. AEX2-Examine/MVS is developed and maintained by SKK, Inc., Rosemont, Illinois. [redacted] Examine/MVS and AEX2-Examine/MVS are trademarks of SKK, Inc.

The Cambridge Systems Group

Over a decade of strategic software solutions.

AEX2-Examine/MVS™ auditing software. Your bridge to the future.



The high cost of sales hype

From page 25

without the wherewithal to do so competently. The least damaging results are cases in which we spend thousands of hours doing the best we can with tools that are defective or incomplete.

The saddest are those in which the unfortunate buyer sincerely believes the tool can do the job without a craftsman. Consider three tools with which we build on-line data base applications for mainframes: teleprocessing monitors, conversation controllers and data base management systems.

On-line data processing works like a polite conversation — the participants take turns. After pressing a function key, the CRT operator waits, keyboard locked, until the computer responds. Then the computer waits until the person answers and so forth.

Since computers work faster than people, we expect tools for building on-line applications to free the machine automatically for other things while awaiting human response.

Since programs run amok now and then (runaway index, say) we expect the teleprocessing monitor to protect programs from one another. Since transmission costs bandwidth, we expect the conversation controller to transmit and receive only what's changed on the screen since the prior iteration.

Finally, since programs abend or power fails in midflight, we expect the data base management system to notice when something goes wrong and put everything back the way it was, automatically, on its own, without intervention.

Tortuous programming

Yet most teleprocessing monitors provide no automatic conversation control. They require tortuous and developer-costly programming to avoid putting the partition to sleep after each mainframe-to-CRT transmission. The most widely sold such product vulnerably exposes on-line tasks to each other — one runaway program can overlay and destroy all on-line activity.

Most on-line development packages provide no application-view screen buffer. They inflict the program with raw incoming transmission fields (low values if no transmission, data if there was).

Even Cullinet Software, Inc.'s ADS/Online (the very top of the line, in my opinion) transmits all data fields to the CRT when you ask for a display, regardless of how many fields were altered by the program.

For years, one of the largest selling data base management system packages on the market compelled retrofit. It forced data processors to track down and recompile every program ever written that used a record when that record was expanded with new data.

The instruction manual of another popular DBMS that boasts of automatic recovery warns that it can handle only "planned failures." In other words, its highly touted automatic recovery works only if you carefully shut the system down before power fails or software crashes.

The point is not that tools are imperfect and are continually improved. It is not even that some features are essential to the very reason for a tool's existence. A knife that does everything but cut is worthless.

Data independence, intertask storage protection, transmission buffering and automatic recovery are as essential to their respective tools as cutting is to a knife. But we all hope to get smarter with years, and tool builders are no exception.

No, the point is that, in each case, competing tools are available that contain these essential features; yet those lacking them sometimes sell more successfully. The reason is that, in contrast to typewriters, violins, radio telescopes or shovels, the people doing the buying are often not the ones who must use them.

A salesman wearing dark-blue suit and white oxford-weave button-down shirt with black tie once explained why. He confided, "Executives don't buy on the basis of features. They buy based on trust." He reminds me of Kaa, Mowgli's cobra acquaintance in Rudyard Kipling's *The Jungle Book*: "Trusssssst me."

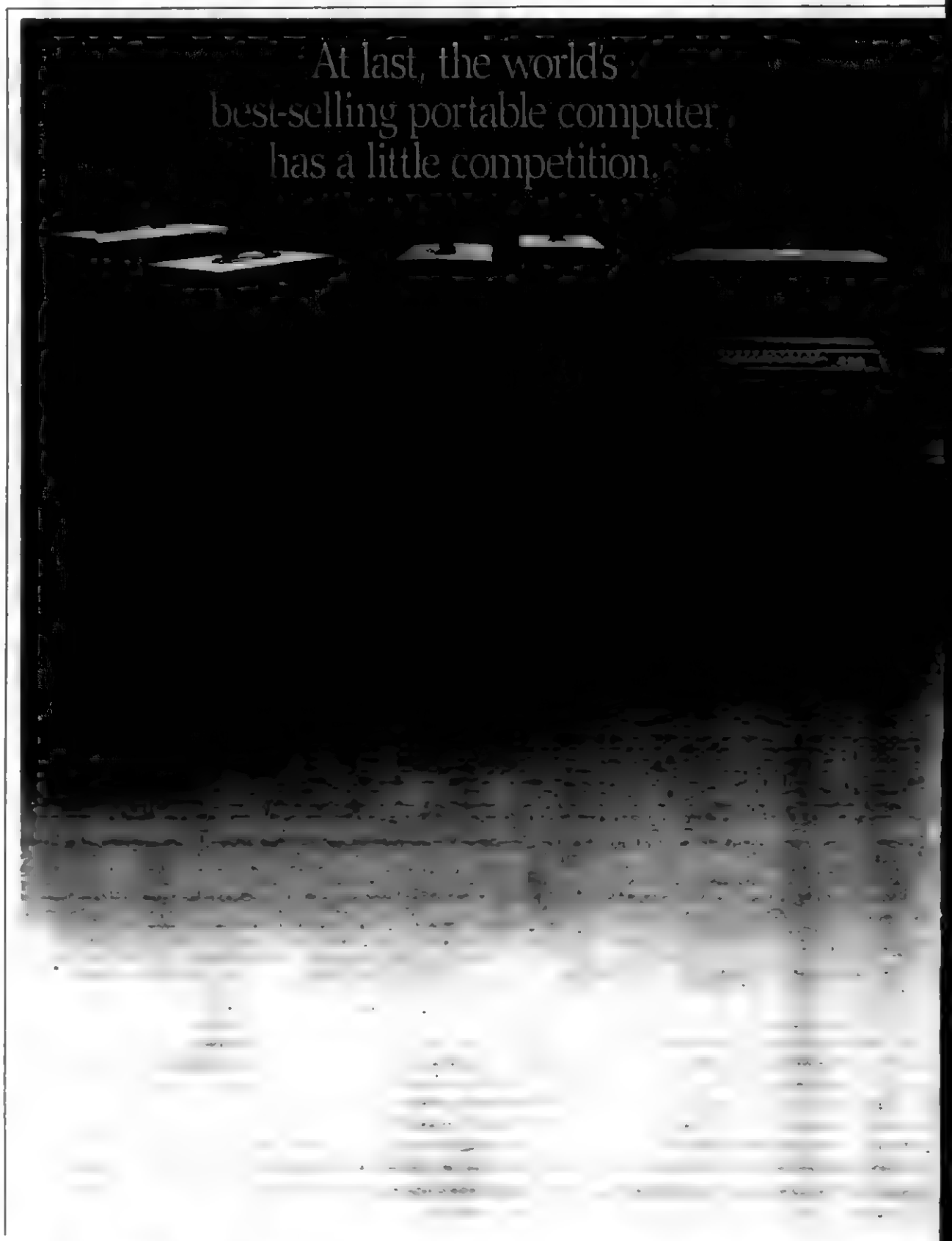
You know, when you think about it, the terms "user-friendly," "relational," "nonprocedural" and "distributed" have something in common. It is this: Any DP professional who uses one of these buzzwords should be summarily dragged out back and shot. The words meant something when first coined. They have since been debased into meaningless noise by vendor puffery. "My data base is more relational!" they scream. "My spreadsheet is more user-friendly! My cigarettes are milder and more flavorful!"

Aaarrrggghh.

The cost of misguided tool selection, in inadequate applications, bloated DP staffs or inflated hardware configurations, must be staggering. But it pales in comparison to the cost of tools without craftsmen.

When microcomputers first began to proliferate in firms with mainframes, many data processors feared becoming casualties of the micro revolution. Control and security were what we complained about, but the real issue was power. The chill deep in our hearts was that our captive customers would get away. We thought that users' cost issues were their smoke screens to escape.

We were right, of course. The more aggressive users enthusiastically pursuing micros did so precisely in the hope of fleeing the shackles of their glacial DP department. Why



should they wait six months for a report when, with their own equipment, they could have it now?

Today the dust has settled. The videogame fad has gone the cyclical way of hula hoops and miniskirts.

Microcomputers in large organizations have fallen into three roles, none of which seriously affects mainframe data processing.

Some are desktop tools for truly stand-alone purposes (word processors). Others download mainframe data and transform it into spreadsheets or graphs — more effective presentations than columnar fanfold reports. (Downloading is cheaper, too — the traditional way of conveying data from mainframe to executive involves grinding up forests.) The rest make splendid doorstops.

The "free at last" phenomenon is not new. It has been with us since our profession's beginnings. An IBM manual on DP organization, published in 1962, spends a chapter explaining that it's less costly to have one big DP department than for each user to have his own computer, complete with programmers. Birds of a feather train each other.

The distributed processing fad of 1978-1979 was touted as the breakthrough enabling each user to have his own machine. Today, a "departmental machine" wave is building strength — the latest reincarnation of the same flawed reasoning.

Hospital trauma

A hospital was trapped in a snarled portfolio of obsolete and unmaintainable applications on an IBM 370. (How they got into the mess is irrelevant to the story.) They understood the vendor to say that if they bought a System/38, their problems would be solved because it needed no programmers to run it. (The vendor probably said it requires less support because it does less.)

The notion of a self-programming computer matched their dreams, and they bought it. Now they have a 370, a System/38 and even more programmers supporting both. They are still entangled in the same obsolete application portfolio.

A prospect once told a Cullinet executive he was hesitant to buy IDMS. A competing DBMS salesman had assured him that his product would cost less in salaries. It required no data base administrator. The Cullinet executive suggested that the buyer request a list of the competitor's satisfied customers. "Call one of them. Ask for the data base administrator. I guarantee that someone will answer the phone."

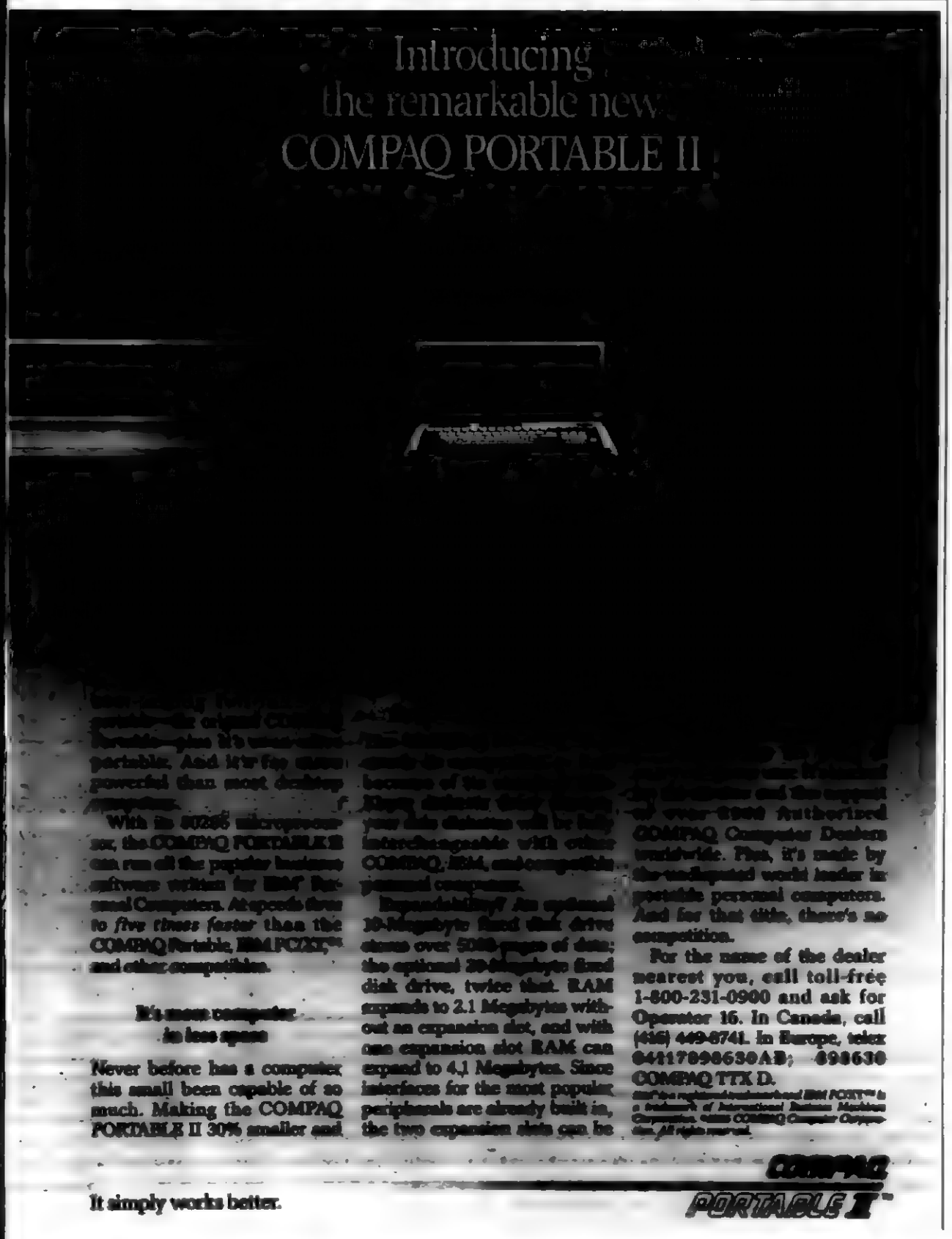
In 1971, South American revolutionaries took over a profitable service bureau and fired the "capitalist technocrats" who ran it. The abandoned machines were rusting within a year.

In each case, the reasoning seems to be that if one buys the right brand of canvas, it will paint a masterpiece on its own. The reasoning is flawed because what limits success is and always has been talent, not tools. There is a knack to building applications, a learned skill. Talented people, plus their instruments, produce useful results.

Buyers who swallow the notion that a piece of software or hardware can do the job without talented people condemn themselves to Sisyphean disappointment. (Sisyphus, in mythology, was doomed forever in Hades to roll uphill a boulder that always rolled back down.) Sellers who claim their DP product slices and dices without need of talent prey on ignorance, intentionally or not.

Those of us who make a living selling are sometimes tempted to join the crowd and propose such fantasies, especially when the prospect seems ready to fall for a competitor's even-wilder promises. It would be a mistake, though.

Our industry is maturing. Long-term customer satisfaction, not an immediate sale, is what counts. And over the long pull, it is the tool user, not the tool buyer, who must be satisfied — today's programmer is tomorrow's vice-president of MIS. Software vendors might take a lesson from the dinosaurs. Extinction, you see, is nature's gentle way of suggesting you made a slight mistake.



DEC system targets utilities

From page 25

ago. The DBMS was developed by the EREG.

The data base was designed to integrate a variety of applications, including gridding and contouring, computer-aided mapping, remote sensing, seismic interpretation and modeling, well-log analysis and reservoir simulation, Moore said.

It is supplied with an interface that provides a menu-driven access to the system. End users may access files by recognition instead of recall. Experienced users may define commands without following a menu sequence, while programmers may use the interface's menu command builder, menu structure editing and prototyping, Moore said.

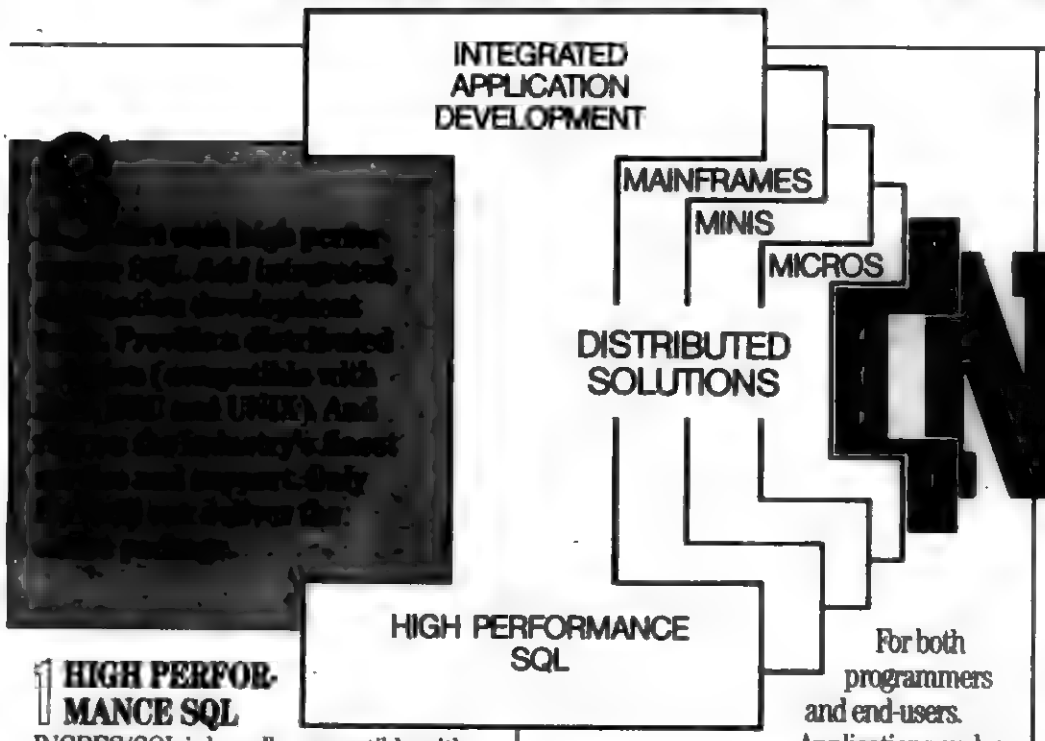
An assortment of file and graphics utilities aids in making use of the information stored in the DBMS.

A domain manager controls user access. An interactive editor permits the creation and modification of graphics or text data.

A data scanner checks for errors, calculates fields and verifies records. A topology builder generates complex data structures from simple data elements. A graphics module allows the construction of 3-D graphics.

In addition to utilities and petroleum exploration firms, Spatial/II is targeted at government agencies and the telecommunications industry, Moore said.

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MICROCOMPUTERS

SMALL TALK
Eric Bender

Radical change in PC software

This is a clean-slate approach to exploiting personal computer hardware, that may turbocharge today's applications and radically change the way users deal with today's machines. It's coming in the not-too-distant future from Lotus Development Corp. and — surprise — it's not a secret.

In fact, Lotus' principal technologist, Jerry Kaplan, outlined the scheme several times, the first being at the Lotus Developers Conference earlier this spring. The reasoning goes like this:

"The design of the present generation of PC programs reflects the constraint of the mainframe environment and the discipline of structured programming," he said. "Neither of these are particularly well suited for PCs. . . . PCs are not miniature mainframes; they are used by different people and for different purposes."

With microcomputers, "we have an individual user working through a known interface with a predictable load and known resources," Kaplan pointed out. "This stability explains why micro software is more effective in general than mainframe software — PC applications have fewer design constraints."

In mainframes, he continued, the operating system really can't make intelligent decisions about what to do with its resources. Usually it knows only that there is a need for the CPU or for some device or file or data. Applications thus are designed to minimize computation

See RADICAL page 42

Bender is Computerworld's senior editor, microcomputers.

Package plugs real-time data directly into 1-2-3

By Douglas Barney

WILMINGTON, Mass. — Laboratory Technologies Corp. late last month announced Labtech Real Time Access, a $195 software package that allows popular Microsoft Corp. MS-DOS applications to display, access and analyze real-time data from industrial and laboratory processes.

Real Time Access allows technicians, scientists and engineers to work with real-time data without having to develop special routines for data transfer, control timing loops or instrumentation drivers, the supplier said.

The software is the first data acquisition/analysis package that directly plugs real-time data into Lotus Development Corp.'s 1-2-3, according to Frederick Putnam, president of Laboratory Technologies.

Competitive products generally require custom applications for data analysis, he said. "Real Time Access brings this kind of real-time monitoring into that Lotus standard for the first time."

Option to Labtech Notebook

Real Time Access works as an option to the $895 Labtech Notebook, which the firm claims is the most popular personal computer-based data acquisition package.

"Previously, Labtech Notebook could collect the data, but to move it into another package required putting the data on disk and then bringing it into the other package," Putnam noted. "Real Time Access eliminates the disk and moves data in the other package directly through memory. It turns out to be 10,000 times faster to transfer data to a Lotus spreadsheet."

The ability of Labtech Notebook and

See PACKAGE page 44

High-end graphics tools debut

Supports IBM's EGA, 2,000-image data base

By David Bright

CAMBRIDGE, Mass. — Visual Communications Network, Inc. (VCN) last month introduced a high-end business graphics software package that supports IBM's Enhanced Graphics Adapter (EGA). The VCN Concorde, a $695 package, operates on the IBM Personal Computer XT and AT on a stand-alone basis or with spreadsheets exporting Data Interchange Format files such as Lotus Development Corp.'s 1-2-3.

"This is the year of graphics," VCN Chairman Hoo-min D. Toong declared. Toong said that corporate users and consultants require better graphics than those provided by programs such as Lotus' 1-2-3 and Symphony. "Graphics needs have grown from simple bar graphs," he said.

Toong stated the success of VCN Execuvision, the company's first graphics package, bears out this trend. He estimated about 30,000 copies of VCN Execuvision have been sold since the product's introduction two years ago.

The new package's features include animation, freehand screen painting, text manipulation and self-running presentation capabilities. The painting capability provides multiple-level zoom, a choice of 64 colors and complete scaling.

Fifteen high-resolution and 15 medium-resolution text fonts that can be scaled, tilted, shadowed, colored or underlined are available. These features can be integrated with charts and other traditional business graphics created by VCN Concorde.

The package comes with a data base of over 2,000 icons, symbols and images. Users can also create their own logos and images and add them to the data base. Output media include 35mm slides, overhead transparencies and printer hard copy. The software is currently available.

INSIDE

Alloy accelerator board supports dual tasking/32

Ideassociates software permits four IBM PCs to share a 5251 emulation card/40

NEW THIS WEEK

- University of California at Berkeley offers Turbo Pascal graphics tools

For more on this and other new products, see pp. 85-113.

INSTANT ANALYSIS

"The Intel 80386 allows us to create virtual software machines. . . . There's not going to be a single operating system of choice. Things like LISP operating systems may find themselves coresident in this kind of architecture with Unix and MS-DOS."

— Neil Colvin, [illegible], Phoenix Technology, Ltd.

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The second Database Derby will be held in San Francisco during the month of August, 1986. We look forward to seeing Cullinet, ADR and the rest of the database thoroughbreds in this year's run for the roses.



If you'd like to know more about the Database Derby, and how ORACLE wound up in the winner's circle, join us for a free half-day seminar at a city near you. Call 1-800-345-DBMS, or write Oracle Corporation, 20 Davis Drive, Belmont, CA 94002.

And check our full-page ad earlier in this issue for further details about ORACLE.

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Accelerator board reportedly allows IBM PC to run two tasks at once

FRAMINGHAM, Mass. — Targeting the "most demanding" personal computer users, Alloy Computer Products, Inc. late last month introduced an accelerator board that reportedly allows IBM Personal Computers to run two tasks simultaneously. More than 20% of the installed base of IBM Personal Computers, Personal Computer XTs and ATs would have a need for such a product, Alloy product manager Dave Friesen claimed.

The $995 Bi-Turbo board also provides disk caching and a private RS-232 port for second task use.

According to Friesen, Bi-Turbo is compatible with all IBM PC software and should appeal to users who would otherwise use multitasking programs such as Microsoft Corp.'s Windows or IBM's Topview.

Bi-Turbo allows users to run lengthy tasks such as invoicing along with a spreadsheet or other application, Friesen said. For single applications, users can choose between the IBM PC's processor or Bi-Turbo's 8-MHz NEC Corp. V20 processor by means of a hot key.

Instead of replacing the main system's processor or having it function as an I/O processor, the board assigns one processor to each task.

Hyperdrive 2000 release postponed until late summer

Bug found in internal hard drive for Mac Plus

By Peggy Watt

CAMBRIDGE, Mass. — Buyers of Apple Computer, Inc.'s Macintosh Plus are installing hard disks in greater numbers than purchasers of earlier Macintosh versions, according to John Ison, director of product planning at General Computer Corp.

But they are not yet able to buy General Computer's Hyperdrive 2000 internal hard disk drive and coprocessor board, announced at the Macintosh Plus introduction in January, because release of the product has been pushed back until late summer.

"Synchronizing the coprocessor turned out to be harder than we expected," Ison said. He claimed the product was well into beta-testing when a bug was discovered, and the release date was revised to allow a complete design review and a new test schedule.

The new Hyperdrive 2000 will cost $3,195. It will replace the Macintosh CPU with a 12-MHz Motorola, Inc. 68000 microprocessor and include a 20M-byte internal hard disk drive, another 1.5M bytes of random-access memory on the board and a floating-point 68881 coprocessor for mathematical calculations.

Upgrade kits

Upgrade kits to move from General Computer's 10M- to 20M-byte Hyperdrive models, in both the original and Macintosh Plus-compatible versions, to the Hyperdrive 2000 will be available for $1,899, according to Ison.

General Computer already offers an upgrade kit for current owners of Hyperdrive hard disks who are upgrading their 128K-byte or 512K-byte Macintosh to a Macintosh Plus.

To ensure the Hyperdrive's compatibility with the new 800K-byte disk drive, General Computer sells an $89 upgrade with new system software, Hyperdrive read-only memory, drive bracket, cable and manual.

Macintosh owners who used third-party upgrades and replaced their system's logic board need a $299 General Computer upgrade that also includes a new Hyperdrive controller board.

Hyperdrive family prices cut

With shipment of the Hyperdrive upgrades, General Computer also dropped prices on its Hyperdrive family, originally introduced in November 1984.

The 10M-byte Hyperdrive now sells for $1,399, down from $1,699; the 20M-byte disk costs $1,699, reduced from $2,199.

Scheduled for release in June is General Computer's Hypernet, $295 file server software that allows as many as 32 Macintosh computers to share files, storage and programs on an Appletalk network. It is said to support the Corvus Systems, Inc. Omninet semaphore protocol for compatibility with multiuser application programs.

As a feature unique to General Computer, Hyperdrive internal hard disks do not void the Macintosh warranty when installed by a dealer.

Apple's recent shuffling and pruning of its dealers hit a few Hyperdrive dealers, who were cut by Apple but left carrying General Computer's accessories, Ison said. The hard disk company then beefed up its financing, support and marketing programs for its 1,500 dealers.

General Computer will retain dealers that wish to carry Hyperdrive, despite a lack of Macintosh microcomputers.

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A STUDY COMPARING DEC, PYRAMID, SUN, AND SEQUENT LED TO THE FOLLOWING CONCLUSIONS...

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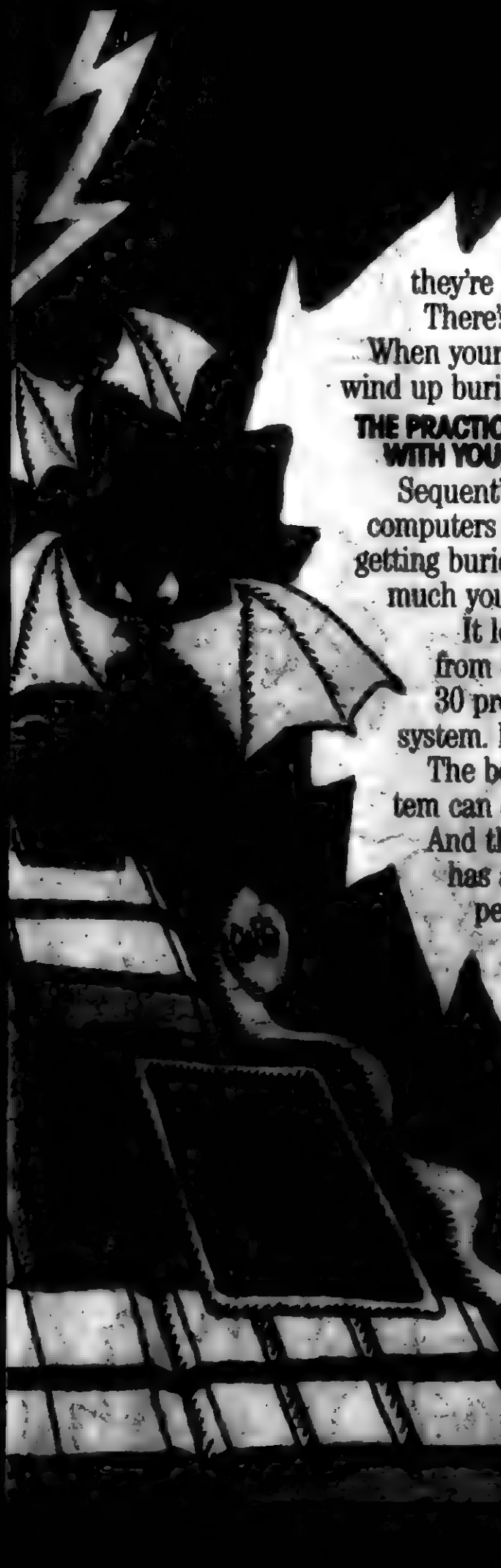
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Tool said to give four IBM PCs emulation capabilities via single board

By David Bright

BILLERICA, Mass. — Responding to increased demand for links between IBM Personal Computers and System/34, 36 and 38 minicomputers, Ideassociates, Inc. has developed software enabling four IBM PCs to share an IBM 5251 emulation board.

The $495 Ideacomm 5251/Share resource-sharing package sharply reduces the cost of 5251 terminal emulation, according to Leslie Lord, product manager. Lord said the package is targeted for users who may only connect to the host minicomputer about 15 minutes per day.

Ideassociates also added IBM 3180 terminal emulation to the board as well as the ability to display up to four concurrent host applications in windows.

In a multiple IBM PC configuration, one micro functions as a server, and as many as three others can be connected via RS-232 ports or asynchronous modems. The server PC can also operate as a stand-alone workstation, and the connected PCs can access either the server's printer or the mini's printer.

Since the 5251/Share software always runs in the background, the server's session is not interrupted when one of the connected IBM PCs accesses the host.

While data travels between the server and the host at 1M bit/sec., the IBM PCs connected to the server are limited to a 19.2K bit/sec. transmission rate.

Available this month, the improved Ideacomm 5251 card retains its original price of $895. A complete package with Idea 5251, Ideacomm 5251/Share, an Ideamini card with two serial ports and cable costs $1,495.



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PC local-area net resellers form group

By Stanley Gibson

Pooling their resources to gain national stature, several personal computer local-area network resellers recently formed an organization called the LAN Group.

"The best way of thinking about it is as a national distributor with offices in different cities," offered Jay Leifheit, president of Tel-Matic Systems, Inc. of Toledo, Ohio, one of the member companies. The group will enable its members to sell to large end users that have networking needs in widely separated locations, Leifheit explained.

The LAN Group is now forming a Delaware corporation to be owned equally by group members, although it is unclear where the corporate headquarters will eventually be located.

Each member company is about equal in size and expertise, with company sales of roughly $10 million annually, according to several group members.

There are no plans at this point for a merger of the member companies.

Companies forming the LAN Group are: Tel-Matic Systems; Costa Distributing, Inc., San Francisco; Cache Data Products, Inc., St. Louis; Comtec, Inc., Roanoke, Va.; Microserv Technologies Corp., Needham, Mass.; and CPU Corp., Houston.

Most of the companies sell Novell, Inc. network products and ITT personal computers.

Over time, the member companies expect to look more and more like one nationwide distributor. Leifheit said the group has been working together for the past six months establishing member guidelines.

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Radical change in PC software

From page 31

between input and resource and to relinquish the CPU while they're waiting for input.

But with PCs, Kaplan said, "allocating of resources is the responsibility of the application, and it can perform this task a lot more intelligently."

Kaplan proposed a program architecture "based on the principle that the machine's resources should be fully occupied at all times."

This "strategic programming" would replace the standard mainframe read/process/output scenario with a read/prioritize and queue/execute setup.

"This architecture separates the order of requests from the order of execution," Kaplan explained. "Requests can be processed in any order, as long as the world is 'consistent' after each operation. It allows the application to allocate resources intelligently, using knowledge of the specific problem and environment."

Going one step further, requests are broken into as many pieces as possible, so the scheme becomes read/decompose/prioritize and queue/execute incrementally.

This is crucial to the scheme — not just doing background tasks per se, but breaking all tasks into minimal units.

Okay, here's the payoff: "If the units are small enough, the time required to execute a given unit may not be noticeable to the user. Under these conditions, the user is never locked out from the application."

Among potential benefits, the system now can update the screen before completing an operation, precompute potential Next screens, anticipate costly future commands, perform internal housekeeping in background or accept new requests while performing old ones.

But more strikingly, the micro also can charge into tasks that previously were infeasible: identifying data base inconsistencies, checking grammar, creating user profiles, performing inferences and making suggestions to the user.

In a film shown at its annual meeting, Lotus jokingly acknowledged the uneasy feelings that aggressive micros might raise. In one slide, a Macintosh displayed a "Mac Critic" window asking, "You're not going to wear those shoes, are you?"

"In what we're calling mixed initiative systems, the program as well as the user can initiate action," Kaplan remarked. And yes, that does seem a little different.

A related design goal is to let users give vaguely defined orders, as in Lotus' upcoming HAL add-on for 1-2-3. However, another issue comes up as the computer begins humming away happily at these tasks — in Kaplan's words, "the notion of damage within a program." You want the system to say, "Are you sure about that?" if you tell it to reformat a hard disk, for example.

This all would produce fundamental changes in the way people deal with computers — getting used to computers initiating action and getting used to relinquishing a certain level of direct authority. These concepts haven't bothered those who have seen them so far, but those are programmers rather than regular folks, Kaplan admitted.

And, of course, this all presupposes a single-user, single-tasking environment. "When you need outside resources, that assumption is blown," Kaplan said. "You really need a way to tell the operating system how important tasks are."

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Borland releases enhancement tool for Reflex use

SCOTTS VALLEY, Calif. — Borland International, Inc. has announced Reflex Workshop, a $69.95 enhancement tool with built-in vertical applications for use with its relational data base manager Reflex, The Analyst.

The package consists of a 250-page workbook and diskette with 26 working examples of common-data base applications, including personnel file maintenance, accounting, order entry and scheduling. Some are drawn from actual in-house applications, and others handle tasks reflected by frequent calls to Borland's technical support, said Joanne Sakai, technical support assistant manager.

"A lot of people have been asking for ways to get started," she said. "Many of our calls are application-oriented and less technical problems."

Reflex Workshop runs with Reflex on the IBM Personal Computer and compatible systems and requires at least 384K bytes of random-access memory and a graphics board.

Reflex Workshop is scheduled to be available this month. Borland will bundle it with Reflex for $199.95 during an introductory period.

The Workshop's data base models are divided into four main categories: finance and accounting; administration; sales and marketing; and production and operations. Specific uses are included in each category, with examples of how to employ the data within Reflex and how to customize data bases for individual use.

Reflex offers five ways to view data, including forms, lists, graphs, reports and cross-tabulation charts. It also accepts data from several popular spreadsheet programs and other data base management systems.



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Package plugs in real-time data

From page 31

Real Time Access to run on inexpensive personal computers should broaden the market for data acquisition products, Putnam predicted.

"It used to take a $70,000 computer to do real-time analysis. Now all you need is 512K bytes and Lotus," he said.

With Real Time Access, information from data gathering devices can automatically update spreadsheets, giving scientists and quality controllers the ability to continuously monitor assembly lines and experiments.

"This package cuts across all types of research activities, industrial quality control and industrial manufacturing process activities," Putnam said. Key markets for Labtech are the petrochemical, chemical, pharmaceuticals and automobile industries. Sales are also expected to medical schools and universities.

Key applications

Key applications include statistical process control, custom process monitoring, security systems, physiological monitoring, electronic testing and energy management systems.

One example of the use of Real Time Access, Putnam suggested, is in monitoring engine pistons coming off an assembly line.

"If the piston goes outside of the limits which are derived from statistics that are calculated on-line by a spreadsheet, you get an alarm. Then a worker goes over and adjusts the equipment so the pistons are produced within spec," Putnam said. "What we are bringing with Real Time Access is the capability to do all of that on-line and to do the whole thing in a Lotus spreadsheet."

Laboratory Technologies may eventually butt heads with Lotus, which plans to introduce products for engineering and scientific data acquisition and analysis.

"We have kind of a funny relationship with them, because rumor has it that they are working on a product to do similar things to what our product does," Putnam said.

In fact, Lotus recently released a catalog of scientific products that are compatible with Lotus software, which included Labtech Notebook.

Real Time Access will ship in July. It is scheduled to rise in price to $295 in October. The menu-driven program runs on IBM Personal Computers and compatibles with at least 512K bytes of random-access memory.

In addition to 1-2-3, Real Time Access is compatible with many popular applications such as Lotus' Symphony, Ashton-Tate's Dbase III and Mathsoft, Inc.'s Mathcad.

The package also is compatible with a wide range of vertical and custom-written applications, according to the vendor.

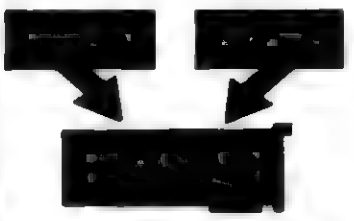
Both Real Time Access and Notebook are available through IBM's direct sales force under the Labtech logo. Approximately 2,500 copies of Labtech Notebook have been shipped so far, Putnam said.

Major corporations such as Polaroid Corp., Ford Motor Co. and Standard Oil Co. are currently using Labtech Notebook.



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QUADRAM



Cygnet delivers electronic mail retrieval program

By Peggy Watt

SUNNYVALE, Calif. — Microcomputer and MIS managers are at the top of the list to receive complimentary evaluation copies of a new memory-resident communications program, Get, which began shipping last month from Cygnet Technologies, Inc.

As part of a telemarketing promotion, Cygnet has already sent out about 100 copies of the $89.95 package to MIS managers at Fortune 1,000 companies, according to Ken Dickens, marketing director.

According to Dickens, early tests showed that the use of Get doubled or tripled the use of electronic mail in the office.

The 64K-byte package runs on IBM Personal Computer and compatible systems, in background, checking designated electronic mail services at times specified by the user.

If messages are waiting, Get flashes a message in one corner of the screen without disturbing other applications running at the time. The user can then retrieve the message.

Get includes a text editor and autodial and file transfer capabilities. Access can also be protected by password.

The program comes with interfaces for MCI Communications Corp.'s MCI Mail, Western Union Co.'s Easylink, ITT's Dialcom, Readers Digest Association, Inc.'s The Source, Compuserve, Inc.'s Compuserve, General Electric Information Systems Co.'s Quickcom and Genie, GTE Corp.'s Telemail, Tymnet Inc.'s Ontyme, AT&T's Mail and other commercial services.

The product can also be programmed to search for and retrieve messages from such other on-line services as bulletin board systems or corporate in-house electronic mailboxes.

Get is a spin-off of the Cygnet Cosystem, a computer with built-in utilities and telecommunications capabilities. The Cosystem has moved slowly in the marketplace, and Cygnet has split off several of its pop-up utility programs and sold them separately.

SYSTEMS & PERIPHERALS

HARD TALK
James Connolly

Don't count out mainframe

Could this be the start of something big? Or, to be more precise and to twist the words of the old song a little more, could this be the start of something small?

There are people on both the user and vendor sides of the computer industry who gleefully point at the less-than-spectacular annual and quarterly financial results of mainframe vendors as proof that the mainframe is dead. Those are the people who swear that the personal computer and its associates — the local-area network and departmental processor — have knocked the mainframe into its grave.

But those people are wrong or, at best, premature. They are just as wrong as the mainframe folks were five years ago with their flat declarations that the PC was a toy with no place in the American corporation.

The statistics most frequently cited as proof of the mainframe market hardships are IBM's comparatively weak revenue and earnings numbers for recent quarters. And, of IBM's numbers, perhaps the most critical are the seemingly disappointing order rates for the 3090 series of mainframes. According to International Data Corp. market research figures, worldwide large-scale unit shipments dropped by 13.6% in 1985, despite the start of 3090 shipments.

Some of the blame for the lack of interest in the 3090 may rest with IBM, which has been criticized by users and analysts for not distinguishing the

See DON'T page 46

Connolly is Computerworld's senior editor, systems & peripherals.

Minis aid firm's expansion

Keeping system abreast of 30%-per-year growth

By Donna Raimondi

LA FOX, Ill. — Richardson Electronics Ltd. scoops up market share in a trailing-edge technology as it produces and sells electron tubes and power semiconductors.

While Richardson's earnings have grown at an average of 30% per year for the past five years, the company's information systems have kept pace and enabled expansion using Pick Systems' Pick-based McDonnell Douglas Computer Systems Co. minicomputers.

A combination of slow but steady growth in the tube market — about 5% a year now — and a dwindling number of companies that produce tubes has helped fuel Richardson's growth. Four years ago, Richardson was a $25 million company running with 25 employees.

The entrepreneurial Edward Richardson, son of Arthur Richardson who founded the company in 1947, took over the reins in 1961, says Eric Powell, vice-president of information systems. Today, $70 million in sales and approximately 430 employees attest to the success Ed Richardson achieved through his policy of growth by acquisition. This started in the early 1960s, when he became concerned about having sources of supply for the tubes that he sells.

As the company grew, the information systems department had to continually grow and change to support it. "Before, we had a Singer System 10 batch computer, and we had Ed Richardson. Ed did the planning, and the computer did the keeping track of everything," Powell says.

Now, a recently installed hierarchy of executives relies upon the McDonnell Douglas (formerly Microdata Corp.) M9208 and M9250 systems that run under the McDonnell Douglas' Reality operating system. Seven locations in the U.S. and sites in Canada, the UK and France are connected to the systems via leased lines. In the U.S. and Canada, the company uses an all-digital network connected through Teltone Corp. switching multiplexers. "In the UK and France, we are using conventional analog lines," Powell says.

The communications scheme has helped

See MINIS page 50

Inmos unveils 16-bit Transputer for low-end parallel processors

By James Connolly

BOSTON — Inmos Corp., the company that produced the 32-bit Transputer used in Floating Point Systems, Inc.'s FPS T series of supercomputers, recently announced a series of evaluation products based on a 16-bit Transputer designed to be the key processing component in lower-cost parallel processing systems.

Inmos said its IMS T212, announced in Boston, executes up to 10 million instructions per second (MIPS). Inmos' earlier Transputer, the IMS T414, was introduced in October 1985 and is the key processor in Floating Point's massively parallel T series systems.

Like the IMS T414, the IMS T212 reportedly features 2K bytes of 50-nsec, on-chip, static random-access memory, an external memory interface and four inter-Transputer links that allow multiple transputer connections. Scheduled for shipment in June, the IMS T212 costs $400.

Other products announced by Inmos included the 10-MIPS IMS M212 disk processor, for $300, and the IMS C011 and IMS C012 link adapters, which cost $35 and $50, respectively, and are designed to connect Transputers to other manufacturers' peripherals and processors.

Inmos, which is based in Bristol, England, and has a research facility in Colorado Springs, also introduced its Inmos

See INMOS page 49

INSIDE

Alcyon announces single-board, Unix-based computers for the OEM mart/46

Britton-Lee to use IBM disk drives in its data base systems/49

NCR introduces an aperture card plotter for CAD/CAM applications/49

NEW THIS WEEK

- Lee Data offers a plug-compatible replacement for IBM's 3178 interactive terminal

For more on this and other new products, see pp. 85-113.

INSTANT ANALYSIS

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TOWER SYSTEMS INTERNATIONAL

Alcyon ships line of VMEbus-based multiuser systems

Real-time supermicros run Unix V.2 software

By Eddy Goldberg

SAN DIEGO — Alcyon Corp. recently began shipping a new line of VMEbus-based, real-time, multiuser Unix systems. The 10 supermicros consist of five models, each available in single- or multiprocessor configurations.

The systems can be adapted by OEMs for technical, real-time applications in markets such as factory automation, data communication and medical instrumentation.

The systems support from one to 16 users, with disk capacity from 20M bytes to 450M bytes and a number of I/O options. Alcyon's A68VME single-board computers are based on the VMEbus standard and the Motorola, Inc. 68010 processor. The A68VME reportedly runs at 10 MHz with no wait states.

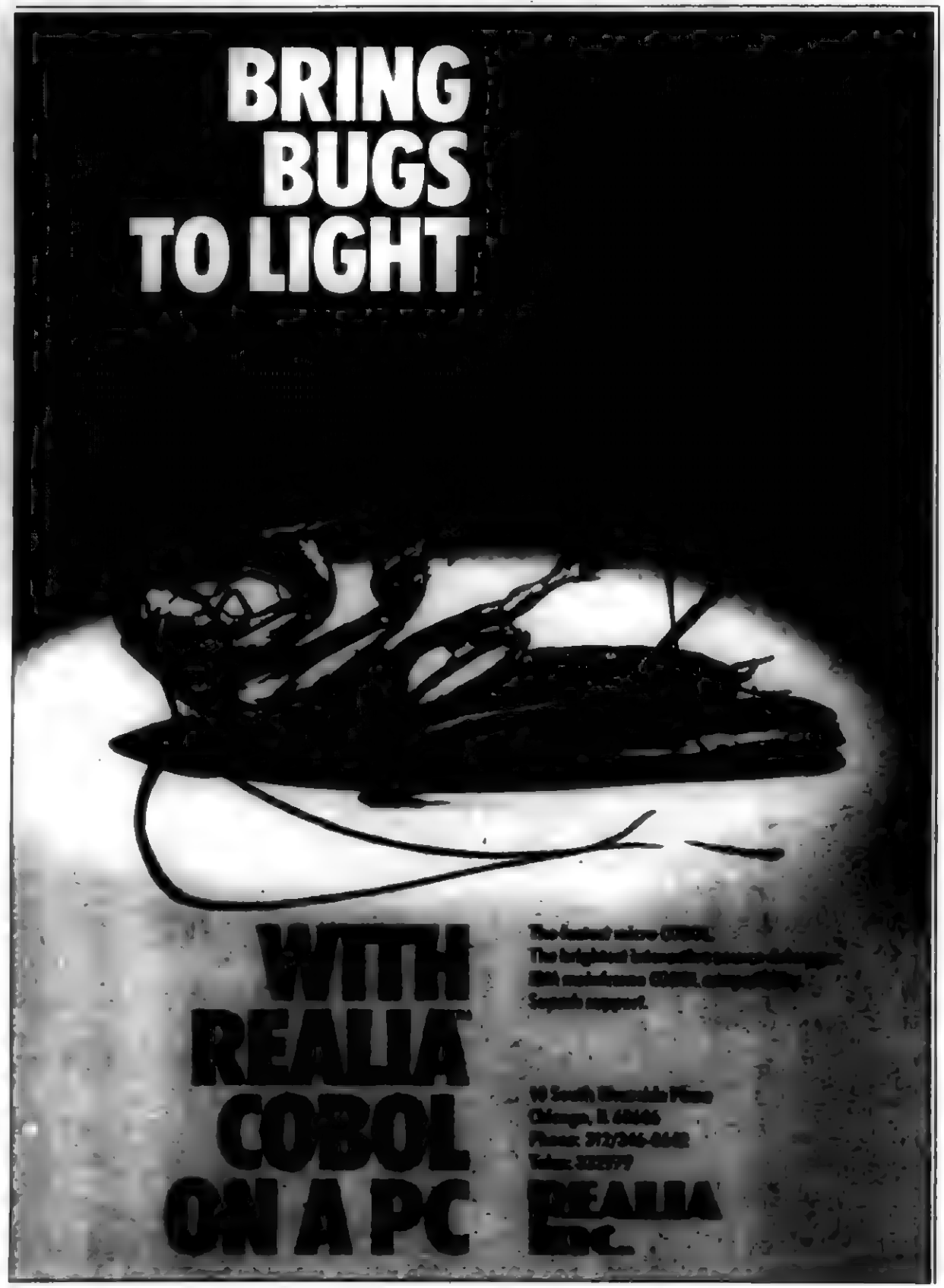
Alcyon also provides its Regulus operating system, which is AT&T Unix System V.2-compatible and is built around a real-time, multitasking kernel. For applications requiring faster real-time response than is offered by the Regulus system, Alcyon offers a faster real-time kernel on a second board.

The VMEbus multiprocessing system allows developers "to distribute tasks across nodes and add application software without having to make system software decisions," said William Hughes, vice-president of sales and marketing for Alcyon. He added that in the multiprocessor configurations, one processor can be dedicated to a single task, guaranteeing reponse in a real-time, nonrepeating situation.

Alcyon also sells other software tools including C language compilers and its Distributed File System. DFS is a software package consisting of upwardly-compatible extensions to Regulus to support the interconnection of computer systems via a local-area network.

Alcyon also provides optional software such as Fortran 77 and Pascal-2 optimizing compilers, a C language debugger, AT&T Unix System V utilities and a number of application packages.

Prices start at $7,490 for the single-processor Model 20 and $11,990 for the multiprocessor Model 20-MP, which support one to two users. At the high end, the Model 450, which supports 12 to 16 users, is priced at $45,490, while the multiprocessor Model 450-MP sells for $49,990.



Don't count out the mainframes

From page 45

3090 from its predecessors with features that make customers jump at the chance to own one.

With the talk that departmental systems and PCs are going to replace the mainframe, it may appear that the supplantation has begun. But there remains the question of whether there is a market for departmental systems. Also, there is the question of whether the true role of the PC is to take over the processing from the mainframe. It would be interesting to see how many of the PCs sold each year are replacing mainframe-type terminals while retaining access to the mainframe. Is the PC anything more than a very smart terminal?

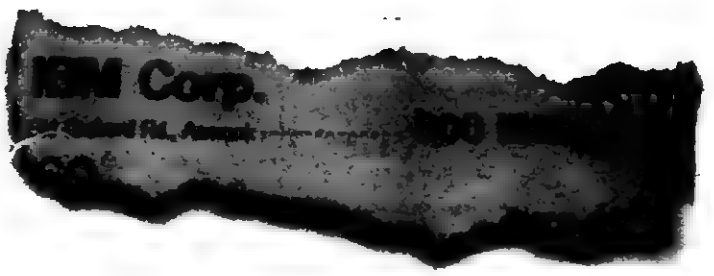
Also, it may be that the primary use of departmental processors will remain for special applications such as computer-aided design. Lately, analysts have begun to say that the key element of departmental processing — office automation — should be a function of a divisional processor. It may be to that market, targeted by superminicomputer manufacturers, that the mainframe will lose the corporate customer.

There probably always will be a need for the large batch or data base system, particularly if PCs create the demand for mainframe support that some observers claim.

But if there is need for a distributed data base and for keeping the price of one million instructions per second (MIPS) of power under $100,000, then maybe users and vendors are justified in looking closely at the supermini. A 6-MIPS machine may be right to run an integrated office package and applications to support one division of a Fortune 500 company. However, even with that local processing, there still will be the need to access a host's data base for the exceptional request.

It is ironic that what the supermini is offering for power is comparable to what the mainframe offered a couple of generations ago. In the late 1970s — with IBM's 3033 — a high-end system sat in the 6- to 9-MIPS range, rather than the 28-MIPS range they occupy today.

So the dip in the mainframe market may be the result of a sluggish economy, or it may be because the 3090s haven't wowed people. Or, it may just be the start of something big — not what the low-end advocates think it should be, but a reliance on the same scale of system that was a star a few years ago.





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Now call the people on the left, and you can emulate some terminals, a limited number of system printers, and not all of the 5250 display attributes. Of course you'll be able to work with IBM file transfers, but once the goods are delivered, can you work with virtually no support of PC based products?

So before you call the number on the left by force of habit, consider who's really giving you the best solutions in 3X communications. And ask yourself this.

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SYSTEMS & PERIPHERALS

Computer service market to grow; vendors' share to increase

Almost 90% of the $13 billion computer maintenance and support market is owned by the hardware manufacturers themselves, and it looks like those vendors will grab even more market share. Those were the findings of an **Input** study of the service market.

Input, a Mountain View, Calif., market research firm, says that the service market will continue to grow and that the hardware vendors' market share will grow even larger.

In addition, the report notes that some smaller vendors have begun offering innovative services, ranging from a heavy reliance on user involvement in service to reliance on redundant circuits.

HARDWARE NOTES

■

The U.S. Department of Commerce's **National Bureau of Standards** has published a guide entitled *Care and Handling of Computer Magnetic Storage Media*. The 130-page book outlines how to maintain proper environmental conditions as well as how to handle tapes and disks.

It looks at how extreme environmental conditions and magnetic fields affect storage media, examines the chemical factors involved in storage and lists some of the precautions to take for long-term archival storage.

The publication is available from the U.S. Government Printing Office in Washington, D.C., at a cost of $5.50.

■

Memorex Corp. has announced a program that offers increased capacity and peformance to customers who lease or purchase the company's 3680 or 6240 High Density Package disk drives.

The program allows 3680 or 6240 customers to upgrade to future products — a double-capacity disk drive and the 3888-23 disk cache controller, respectively — or to obtain an equivalent configuration of their existing system at any time at a predetermined price.

■

Zero One Systems, Inc. has completed installation of a **Cray Research, Inc.** X-MP/48 supercomputer at the National Aeronautics and Space Administration's Ames Research Center in Mountain View, Calif. The system, valued at $21 million, will be used for large-scale fluid dynamics, aerodynamic design and analysis, atmospheric modeling and satellite image processing. It currently serves up to 500 users running 1,500 jobs per day.

The X-MP/48 is the third upgrade, following the installation of a Cray 1S in 1981 and a Cray X-MP/22 in 1983.

■

Another **Cray Research, Inc.** X-MP/48 is being delivered to the **Pittsburgh Supercomputing Center**, a consortium composed of Carnegie-Mellon University, the University of Pittsburgh and Westinghouse Electric Corp., according to Cray Chairman John Rollwagen. The X-MP/48 at the Monroeville, Penn., site should be operational this month.

■

Honeywell, Inc. and data base computer manufacturer **Teradata Corp.** have signed an OEM contract under which Honeywell will integrate Teradata's DBC/1012 with Honeywell's large-scale computers. The contract is a four-year, nonexclusive marketing and distribution agreement. No delivery date has been announced.

■



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SYSTEMS & PERIPHERALS

NCR introduces plotter aimed at CAD systems

Follows 3M with 4300 CAD/COM

By James Connolly

MOUNTAIN VIEW, Calif. — NCR Corp.'s Micrographics Systems Division has introduced an aperture card plotter designed to handle computer-aided design (CAD) plotting on computer-output micrographics (COM).

NCR's announcement of its 4300 CAD/COM is the second such debut in recent months, following 3M Corp.'s March introduction of a laser film plotter.

The 4300 CAD/COM was designed to be a higher speed alternative to standard paper plotter outputs. It records a digitized image directly from a CAD workstation onto an aperture card, eliminating the need for a paper plot prior to microfilming.

According to NCR, the 4300 CAD/COM plots with an accuracy equivalent to a high-quality 200 dot/in. paper plot. The company also said that images are processed and indexed in less than three minutes. The system includes a printer designed to produce eye-readable titles across the top of the card for filing and sorting.

The 4300 CAD/COM was designed to interface with nearly all CAD systems via a Versatec, Inc. or compatible processor and can be adapted for use in a personal computer environment. It uses a dry silver film that is intended to eliminate the need for chemicals.

The system is 13-in. high by 37½-in. wide and 18-in. deep. It will be sold through third-party channels at prices ranging from $38,000 to $45,000, depending on the configuration. Deliveries are scheduled for late this year.

Firm claims 'breakthrough' in thin-film manufacturing

By David Bright

SANTA CLARA, Calif. — Information Memories Corp. recently announced what it terms a "significant breakthrough" in the manufacture of thin-film-plated media for hard disk drives.

The new K-2-S process should result in lower 3½-in., 5¼-in. and 8-in. disk drive prices and greater disk drive accuracy, according to marketing manager Mary Eckert.

Information Memories, a subsidiary of Xebec Corp. of San Jose, Calif., supplies hard-disk platters to drive manufacturers such as Syquest Technology and Maxtor Corp. So far, the platters have been coated with a sputtered carbon layer. Sputtering is a dry, vacuum method of coating the platters, while the K-2-S process applies a wet coat.

K-2-S is less costly than the traditional sputtering method and creates a thinner coating at least as durable and corrosive resistant, Eckert said. This month, Information Memories should be sampling products created with K-2-S, she added.

While Eckert is hopeful that drive manufacturers will take advantage of the process, K-2-S has yet to attract much attention. Officials at two potential client companies declined comment until they evaluate the product. Analyst Bob Katzive, who follows the disk drive market for Disk/Trend, Inc., said he did not know about the company's activities. He said Information Memories' field is crowded with more than 20 players worldwide.

Britton-Lee to use IBM drives

By James Connolly

LOS GATOS, Calif. — Relational data base management system manufacturer Britton-Lee, Inc. plans to use IBM disk drives in its series of data base machines scheduled to be announced during this month's 1986 National Computer Conference.

Britton-Lee officials said that under a recent letter of intent, IBM's newest Winchester disk drives will be incorporated into Britton-Lee's Relational Server series. The RS300 series consists of data base machines designed for office automation environments and includes the RS350, which is scheduled for an NCC introduction.

"Since our products are now being heavily deployed in on-line transaction processing and corporate decision support applications, it is only natural for Britton-Lee to have the most reliable disk repository integrated into our data base machines," according to Peter Story, Britton Lee's vice-president for marketing.

Inmos unveils Transputer

From page 45

Transputer Evaluation Module 400 (ITEM 400). The ITEM 400 costs $50,000 and reportedly allows evaluation of a 400-MIPS, 40-transputer system. It includes a power supply and card cage module, 10 IMS B003 boards incorporating four IMS T414s per board and the IMS D701 Transputer Development System, which operates on an IBM Personal Computer XT or AT and includes Inmos' Occam 2 compiler.

In addition, Inmos introduced the IMS B006 Evaluation Board, priced from $1,750, which allows evaluation of the IMS T212, and announced the IMS B007 Graphics Evaluation Board, which costs $4,200 and allows evaluation of the T414's graphics capabilities.



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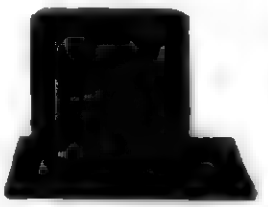
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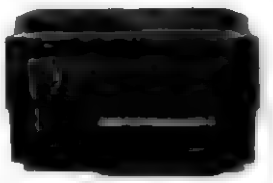
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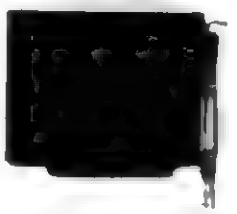
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Minis aid in firm's expansion

From page 45

drive the growth of information systems services, Powell says. But the Reality systems themselves have been critical in allowing the information systems to grow or change in response to the booming business. For example, in March, Richardson Electronics inked a pact with Varian Associates, Inc., a leading manufacturer of electron tubes, to distribute Varian's products.

Richardson agreed to provide all accounting for the joint venture. The company had to implement new kinds of general ledger generation and reporting. It also had to write a program to allow Varian customers to buy equipment with whatever currencies they wanted, since Varian already allowed its customers to do. Both of these complex systems, which are exception systems in that the non-Varian parts of the business do not use them, were put in place in about two months, according to Powell.

"We exist in an almost utopian data base," Powell says. "One piece of data will exist in one place only." Users can reference that piece of data even though it is in another file because the data base is relational.

In the past two years, the information systems department has grown from two to nine employees. The original two kept a highly structured accounting of everything that was done, and the company insists on that kind of work from the newer programmers and analysts. "We say to the staff, 'You must follow all of our conventions, otherwise you redo it,'" Powell says. "That has made it a lot easier for us to make massive changes."

Almost all programming is done in-house. The programmers work in an enhanced version of Basic called Data-Basic and use the built-in inquiry language English. "The Reality operating system forces you to be in and to operate in a relational data base, so everthing we have is data base oriented. We make major changes almost every week," Powell says. Reports generated with English generally take fewer than 15 minutes to design, he adds.

The company rapidly outgrew its first 32-user Reality system, which had been bought from one of the first companies acquired four years ago, Powell says. "We quickly found out the potential for revenue generation on the system," he adds.

The company operated as two divisions when the first Reality system came on board. The two parts were inadvertently in competition with each other. They operated under different names and at different locations, but had identical products, availability and cost. Customers would get a price from Richardson's Chicago division then call the New York division and sometimes get a lower price.

"We were losing potential profits by not having information available to both divisions. So we put terminals in the other division and developed a system for inputting quotes and a ready-access system, which is really the heart of our system now," Powell says.

The ready-access system, written in-house and called Master Inquiry, gives fast access to customer, sales, quote, vendor, cost, inventory, stock, status and accounting information. The immediate result of its implementation was that the two divisions were able to set standard pricing and not out-bid each other for their customers' business.

As more acquisitions and bigger distribution agreements with other suppliers expanded Richardson, the company quickly went from the initial 128K-byte system to a newer model with 1M byte of main memory and 56 ports. That system was upgraded again to an M9208 with 6M bytes of memory, 1G byte of disk and 208 ports.

Another system, an M9250 with potential for more than 200 users, is working now as a backup developmental system. It will soon become an inquiry-only system as the company breaks up into two kinds of end users: updaters and inquiry-only.

Updaters are order entry, purchasing and inventory control people. Inquiry-only personnel look up customer history information, such as how much a customer was charged for a particular product the last time he ordered it. This dual system is a temporary solution to a need for a bigger computer.

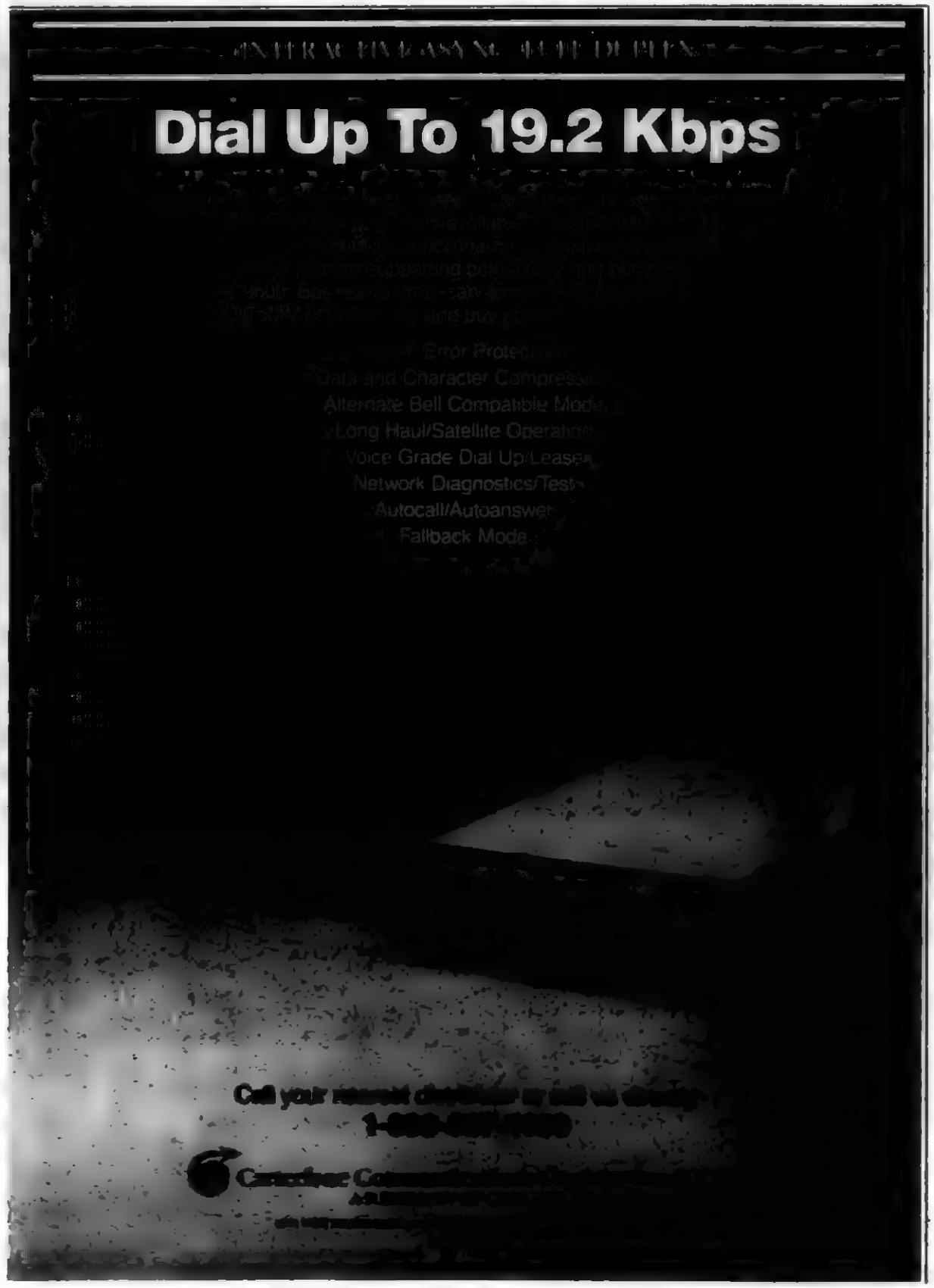
Promised first model of 400-user system

McDonnell Douglas has promised Richardson the first model of a new 400-user system by June 1, 1987, Powell says. When that happens, the two existing systems will be traded in and all work will be performed on the new one.

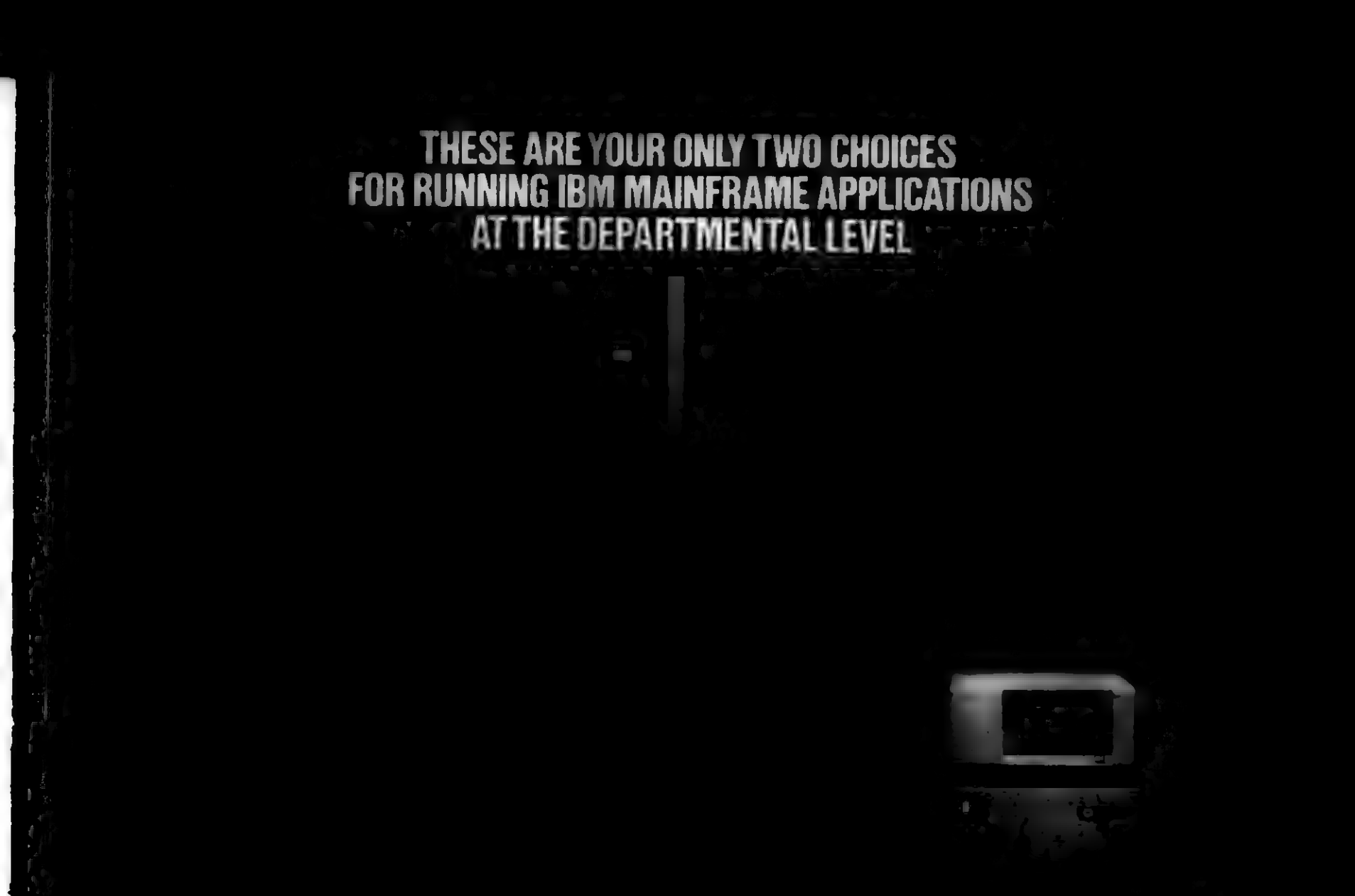
"As we have grown from about $25 million a year four years ago to probably $70 million this year, we are getting orders out in roughly the same length of time. We ship 98% of the orders — about 550 a day — the same day that we get them," Powell says.

One of the information system's main projects is to provide reporting, planning and budgeting information to the newly organized business structure. In the old days, everybody reported to Ed Richardson, who remains as chief executive officer. Now, a new president presides over seven vice-presidents, each of whom controls several operating groups.

"All of the VPs take an active role in their departments, and they take an active role in operating the computer to the extent that they need to in order to function in their jobs," Powell says. "So they all have terminals on their desks."



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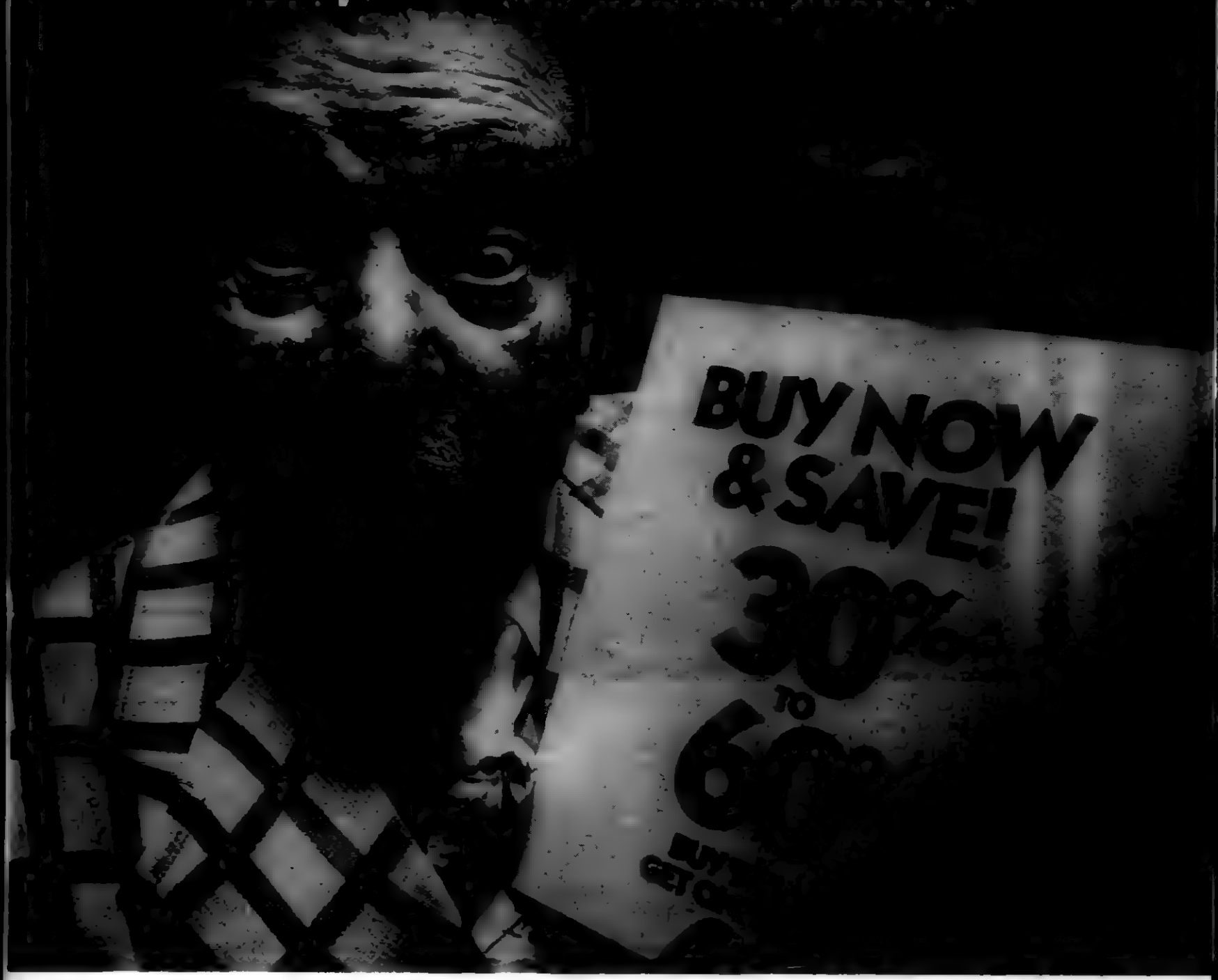
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Product Spotlight

Edited by Barbara Wierzbicki



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INSIDE

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Word processing

PCs taking over from dedicated systems

By SHAWN BRYAN

There really is some very good news for people looking for word processing software. With few exceptions, there are personal computer packages available ranging from economical programs that perform basic tasks to full-featured offerings that can run circles around the best dedicated word processing systems for half the price. You could say it is an embarrassment of riches.

The "no-frills" word processors — a misnomer because many no-frills packages have grown into very capable products — earn their keep by being relatively easy to use. "No frills" does not necessarily mean you have to give up functionality, just that the number of functions is more limited. A $200-or-less word processor should include standard functions such as an 80-col. display, word wrap, centering, right and left justified margins, insert and delete, search and replace, moving blocks of text and automatic reformatting. Many popular no-frills packages — such as Software Publishing Corp.'s PFS:Write, IBM's Writing Assistant and Lifetree Software, Inc.'s Volkswriter — provide users with all the features needed to perform basic word processing. If ease of use and a reasonable price tag are priorities, then the lost capability may well not be worth either the cost or the learning time involved in using a full-featured program.

At the other end of the spectrum are the full-functioned word processors. These programs, generally ranging from $300 to $700, offer just about every conceivable option (indexing, footnotes, end notes, math capabilities, table of contents generation, multiple columns and so on). Such full-featured contenders are replacing dedicated word processing systems at a fast clip. These products include Multimate from Multimate International Corp. (recently acquired by Ashton-Tate), Wordperfect from Wordperfect Corp., Wordstar 2000 from Micropro International Corp. and Microsoft Word from Microsoft Corp.

The relative flexibility and plummeting prices of PCs make them a natural choice when installing new word processing stations. Manufacturers of dedicated systems like the IBM Displaywriter — now discontinued — find demand for their sys-

Most good software can swap files with other good software. It may be better to offer a choice than to make a decision that satisfies no one.

Bryan is chief financial officer of Cabot Cooperative, a dairy manufacturing company in Cabot, Vt. He is also president of Datatek, a consulting firm specializing in small computer systems design and implementation.

PCs overtaking dedicated word processing systems

Continued from previous page

tems vanishing as better and better software elevates PC word processing capabilities.

The strongest argument to be made for traditional systems is that they are dedicated to the sole task of word processing. To that end, their keyboards are customized for their single-purpose application. Keys are labeled, and often a single keystroke accomplishes what requires multiple keystroking in a micro-based package. Personal computers, on the other hand, can perform a number of tasks, in addition to word processing, that are not possible on dedicated systems. PC users can now achieve equivalent word processing capability plus run thousands of other software applications programs including spreadsheet, data base management and business graphics. You don't get dedicated keys, but you don't get single-purpose hardware and software either.

There is, of course, a price to be paid for these feature-laden micro packages. Squeezing the capabilities of a dedicated system into a PC program means compressing all the functions into a keyboard that is, of necessity, generic. Manufacturers circumvent this problem — albeit sometimes in a cumbersome way — through the use of menus or multiple keystroke combinations. The IBM keyboard, for example, has 10 or 12 function keys that, coupled with the Alt, Shift and Ctrl keys, give you up to 48 possible keystrokes for calling up special features.

Dedicated word processing may still have its place, but it cannot be cost-effective in most situations. The $12,000 price tag attached to a dedicated word processing system is dizzying in comparison with that of a personal computer — fully equipped with printer, memory, high-resolution color monitor and so on — for about $6,000.

> ***"The price tag attached to a dedicated word processing system is dizzying in comparison with that of a personal computer."***

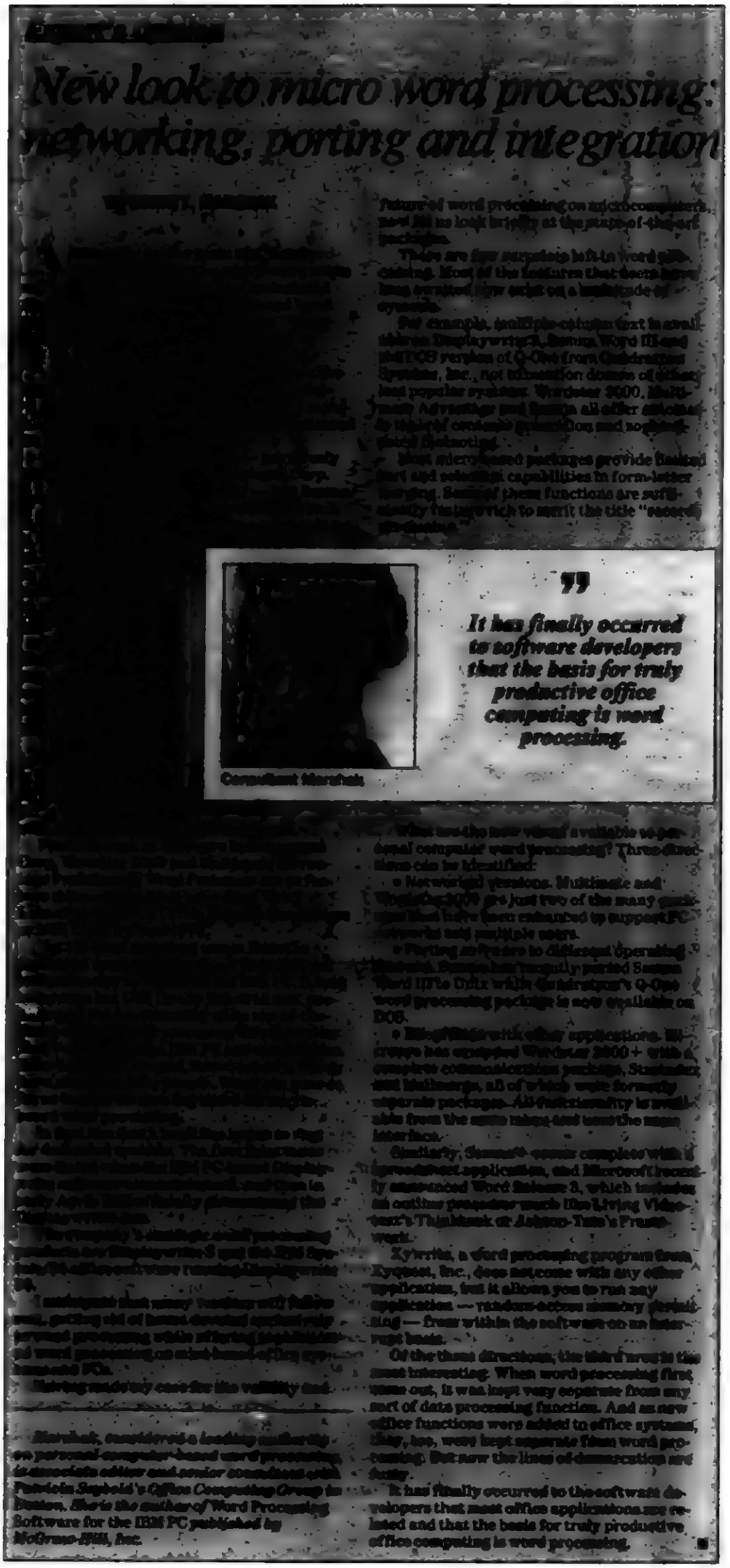
Every quest for a good word processing package begins with a shopping list of required features and capabilities. The following universal questions should be answered before making any word processing purchase. These standard queries will trigger additional questions specific to your particular environment:

• Program support. Does the manual have a good tutorial with real examples? Does the tutorial take you through the program in stages, or do you have to try to learn everything at once? Are the program examples realistic, and do they help you learn to use the program or do they teach you things you will never use? Does the manual have a good index and a good table of contents? Can you find specific information in a hurry, and is the information explained in an understandable way?

Is there an on-line Help system? Does the on-line Help system offer specific help or vague generalizations? When all else fails, is there a program support facility at the manufacturer's company staffed by knowledgeable people? What are the program support options? Is there a toll-free telephone line? Is there free support or is the help by subscription? Do you get swift, accurate responses to your questions?

• Performance. How many keystrokes are required to accomplish common tasks like block moves and copies, search and replace and deletions? How many keystrokes does it take to scroll from one end of the document to the other? From the top to the bottom of the page? And from one end of a line to the other? Are cursor movement and screen scrolling swift or sluggish? Can you move from word to word, paragraph to paragraph and page to page with only one keystroke? How does the program mark text that is to be acted upon? Does the program support monochrome and graphic displays of text? Do you get a good representation on the screen of what your document will look like when it is printed? How many lines are available on the screen for editing text and how many are used by the program for information display?

Continued on next page



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How many documents can you work on at once? Can you split the screen vertically? Horizontally? Both? How many keystrokes does it take to move from one document to another? How many keystrokes does it take to save a document? To recall one? How long does it take to save a document? How much memory does the program need? How much can it use? Can you customize your installation to take advantage of your hardware? Is there an unerase feature? Can you lose text accidentally? How many chances do you have to change your mind before text is gone forever? Are you warned when an action is irretrievable?

• Printing. How many printers are supported? How easy is it to install printers? Is there a customization program that allows you to install printers not now supported? How many printers can be installed at once? How are special printing characteristics shown? How are they entered? Can you print parts of the document instead of the whole thing? Can you print in the foreground and background — print one document while working on another? Can you print superscripts, subscripts, headers, footers, tables of contents, indexes? Will the program print columns of text? How long a page can you print? How wide?

• Import/export capability. What kinds of files can you import and export? How difficult is importing and exporting? Can it be done from within the word processor or do you have to run a special program?

• Special features. Is there a dictionary or spelling checker built in? Does it work on-line as well as in batch mode? Is there a style checker or thesaurus? Is there automatic hyphenation — can you turn it off? Is there an automatic file save or back-up procedure? Is there a math capability? Can you merge several files? Is there a mail-merge feature? Is there a macro feature? Can you use boiler plate easily? Can you easily reformat documents? Can you import graphs into your text? Is there a line drawing feature?

• Trade-offs. Every program is a compromise. How do trade-offs between speed and ease of use, for example, affect your ability to get the work done? How well will the program hold up in the long haul? Will the menus get in the way? Will the lack of menus put people off? Will a program's lack of speed or difficulty of use become a problem? Will copy protection cause problems with a hard-disk system?

The manager trying to decide how to install word processing in his office faces a bewildering array of software choices. Perhaps the best known name in PC word processing is still Micropro's Wordstar. While Wordstar has seen better days, there are still countless users of this venerable product. Wordstar 2000 is a menu-driven, more friendly version but other products beat the program to the punch, most notably in the areas of speed and flexibility.

The first product to displace Wordstar was Ashton-Tate's Multimate. Multimate emulates the popular Wang Laboratories, Inc. dedicated word processing systems. In fact, it emulates Wang so well that Wang finally decided the lost market share was worth fighting for. They have released Wang Word Processing for the IBM PC, but it suffers when compared with the richer and better documented Multimate system, a product cloned from the same source. The Wang solution, however, offers connectivity with the vendor's VS and Alliance systems plus communications devices that work with other manufacturers' PCs. Thus Wang Word Processing for the IBM PC can work as part of a Wang integrated office solution while Multimate is more of a stand-alone selection.

> ***The release of some spectacularly good integrated software threatens to make serious inroads into the stand-alone word processing software market.***

The Wang and Multimate systems both come with special keyboards. They move functions to single keys, eliminating the Alt and Ctrl key sequences used on standard PC keyboards. The Wang keyboard is mandatory, the Multimate keyboard is optional. The software-keyboard combination is effective for dedicated word processing, but some software takes control of the keyboard and assigns tasks to special key sequences. Such software may not work as well on these fancy keyboards.

The keyboards also offer a completely different touch. Touch is a matter of taste, but if the computer is to be used mostly for word processing, it is foolish to ignore the comments of the staff using the machine. Make sure you can live with them after the purchase. A lousy keyboard can make life miserable for the typist and the boss.

Both Multimate and Wang are page-oriented systems. This means they save each page as a separate file on the disk. The benefit of this method is that your word processing documents are backed up on disk page by page. If the power suddenly

Continued on next page



Continued from previous page

goes off, only the current page being edited is apt to be lost. The disadvantage is that there can be both page and document length limits that could prove restrictive if you tend to write novels instead of memos to your staff. The other drawback often cited for page-oriented word processors is that they are slow. That was true with floppy disks, but most computer systems today have sprouted hard disks and thus have eliminated the speed problem.

Memory-based systems such as Wordperfect keep the entire document — or as much of it as possible — in memory. The advantage is that the entire document is in random-access memory (RAM), the fastest part of your computer. The disadvantage is that RAM is temporary. If the power goes off and you haven't recently saved your work, you may find everything has evaporated. Most high-performance memory-based word processing programs offer an automatic backup option that will occasionally call a halt to operations, while it puts your work into a temporary file on disk. If the power goes off, the latest backup is available in that temporary file.

If you are purchasing a word processing program for a marketing department, you will undoubtedly find that graphics capabilities are important. There are several ways to approach this problem, depending upon your company organization. Large companies may have offset presses that can take information directly from a PC, provided it is properly formatted with the typesetting codes.

But even big firms can benefit from a single Apple Computer, Inc. Macintosh and laser printer. While still struggling to gain a solid reputation for number crunching with the gray-pinstripe-suit set, this machine rivals any other system for doing your own graphic arts work. Painting, graphs, charts and so on take on new meaning with a Macintosh and a laser printer. A significant problem with the Mac, however, is that connectivity with your host system may not be available. While Apple has promised connectivity improvement, the Mac is still not as well supported as other systems in this respect.

The IBM and compatible crowd is catching on, and Microsoft Word now offers some of the same graphics capability found on the Mac. Other products are also available that work with word processors to add a graphics touch, like Ashton-Tate's Graphlink, available with Multimate.

Another breed of software — the integrated program — further complicates word processing selection. The release of some spectacularly good integrated software threatens to make serious inroads into the stand-alone word processing software market. Integrated software — a term once synonymous with Lotus Development Corp.'s 1-2-3 — now means everything from spreadsheet-based programs to fully independent software modules running under a common umbrella.

Enable from the Software Group and The Smart System from Innovative Software, Inc. are two that come immediately to mind. Each of these programs has a full-blown, built-in word processor. Enable uses an integrated software approach but manages to keep stand-alone power alive. The Smart System uses the separate program in a shell approach. Both products have 99% of the functionality of the dedicated systems, including spell checking, indexing, outlining and so on. The beauty of such software is that it is gracefully linked with other software applications — spreadsheet, data base management, graphics and communications — that all work harmoniously together.

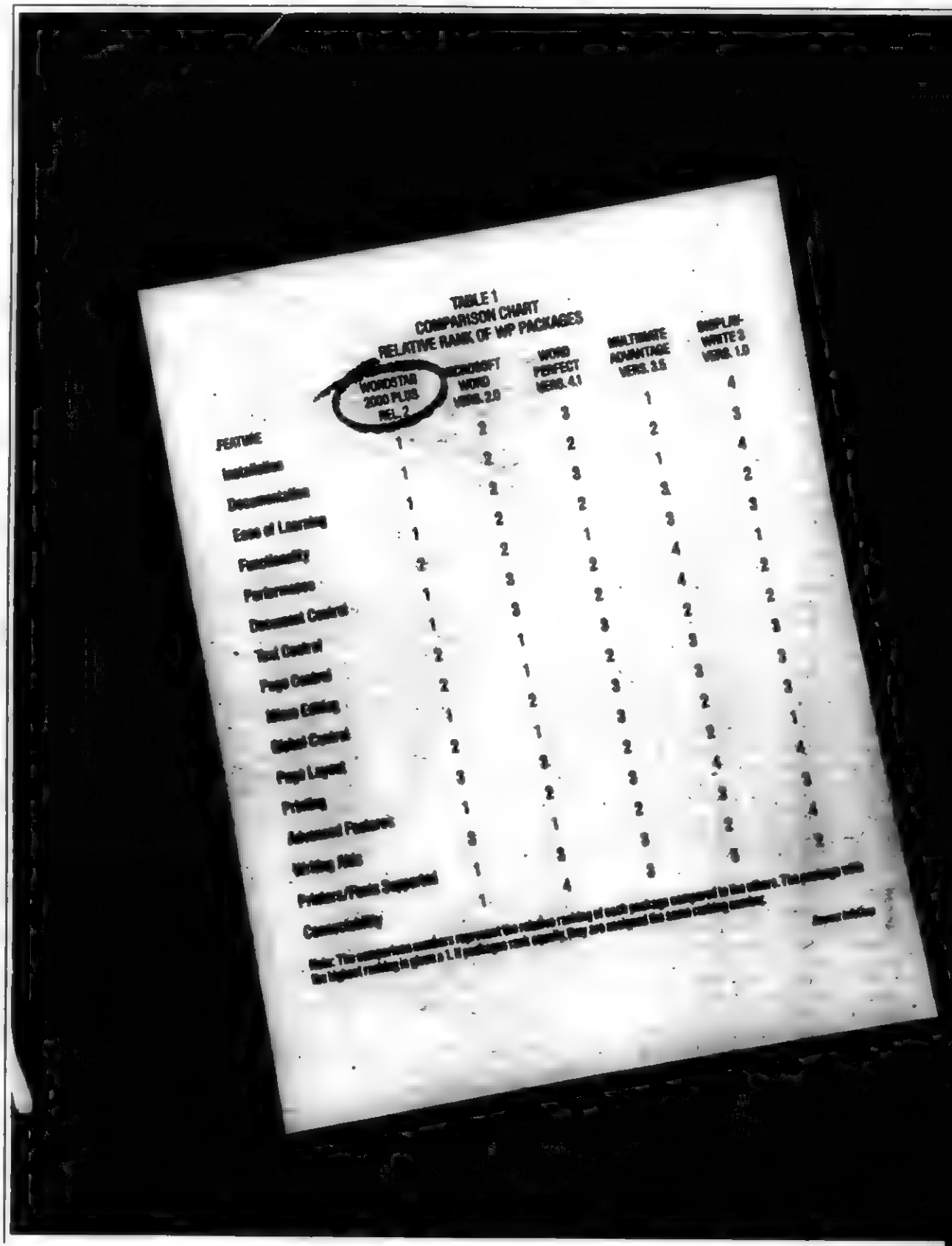
> ***"The beauty of integrated software is that it is gracefully linked with other software applications — spreadsheet, data base management, graphics and communications — that all work harmoniously together."***

Both Enable and The Smart System allow you to move from section to section like a skater on ice, flowing effortlessly from spreadsheet to data base to word processing, for example, to complete a mail-merge letter. Graphs can also be moved into your text and printed as part of your written message.

Another heavyweight that merits consideration in this group is Framework II, a much-improved version of the Framework program introduced by Ashton-Tate. Word processing in Framework II isn't quite as fancy as in the above programs, but the product includes some valuable features like automatic conversion of text fractions to decimal numbers when they are transferred to a spreadsheet.

If word processing is just one of many required capabilities on your PC systems, you may find reasonable alternatives in the new breed of integrated programs now available.

Last, if you have multiple personal computers in a network being used


TABLE 1
COMPARISON CHART
RELATIVE RANK OF WP PACKAGES

FEATURE	WORDSTAR 2000 PLUS REL. 2	MICROSOFT WORD VERS. 2.0	WORD PERFECT VERS. 4.1	MULTIMATE ADVANTAGE VERS. 3.5	DISPLAY-WRITE 3 VERS. 1.0
Installation	1	2	3	1	4
Documentation	1	2	2	2	3
Ease of Learning	1	2	3	1	4
Functionality	1	2	1	4	2
Performance	2	3	2	4	2
Document Control	1	3	2	2	3
Text Control	1	1	3	3	3
Page Control	2	1	2	3	3
Menu Editing	2	2	3	2	3
Global Control	1	1	3	2	1
Page Layout	2	3	2	4	4
Printing	3	2	3	3	3
Advanced Features	1	1	2	3	4
Writing Aids	3	3	3	3	2
Printers/Fonts Supported	1	4	3	2	2
Consolidating	1				

Note: The comparison numbers represent the relative ranking of each package compared to the others. The package with the highest ranking is given a 1. If packages rank equally, they are assigned the same ranking number.

for a number of different chores, these products all sport — or claim to have in the works — versions that will run on networks. The only one I have actually seen working is The Smart System, LAN Version from Innovative Software.

Third-party selections dominate the market with the big manufacturers taking distant second and third places. The choice is further complicated by various host hardware installations that may not be conducive to shared resources with PCs. Because word processing often dictates sharing of information, not only with people but with other software and hardware, it is important to consider all the options when trying to make the best decision.

The first consideration, existing hardware, may be a moot point in some instances. In a Wang-powered office, for example, it may well make sense to stick with Wang-compatible word processing if you are moving to PCs. New communications releases from Wang make it possible to tie microcomputers from many manufacturers to a Wang host, and the company's recently released word processing program, Wang Word Processing for the IBM PC works as part of its total office system.

The Wang hardware devices include the Wang Local Office Connection and the Wang Remote Office Connection. The Local Office Connection allows an IBM Personal Computer or compatible to function as a workstation on a Wang VS host computer system. This hardware attachment allows connections to be made within about 2,000 feet of the host. It retails for $1,895 and includes the communications hardware and software, the Wang replacement keyboard and Wang Word Processing for the IBM PC.

The Remote Office Connection allows connection to a VS host system over point-to-point or multipoint synchronous links at up to 9.6K bit/sec. This hardware-software system extends the distances over which you can connect to the host and allows for file transfer between the host and a PC. The PC will also be able to use some of the facilities available on the host, like Wang Office Information System. This option includes a Wang replacement keyboard, word processing software, telecommunications card, diagnostic software, Wang Networking Software and an RS-232 cable for $1,200.

The same holds true in an IBM-powered office, where most likely Displaywrite on a host system holds a commanding lead over other options. Even if Displaywrite is not the best micro word processing program, familiarity with its style may make the transition to PC word processing simpler. If you stick with a known entity, people will be less threatened than if they are faced with learning to use an entirely new program.

Even within Wang and IBM environments, there exist many personal computer options because most of the better third-party word processing programs now offer conversion capability. If you are using word processing on your mini or mainframe, your consideration is usually fairly simple: Find a PC software product that includes file conversion utilities for the brand of large computer system and software you are using.

> ***Get copies of the software you want to consider and set up some demo rooms. Let the people who will have to live with the purchase use the product.***

Multimate, Wordperfect and others include file transfer capabilities for many of the common formats now in use such as IBM's Document Content Architecture and Document Composition Facility. Some even offer custom transfer utilities for a fee.

A more mundane hardware consideration is the display monitor used on PC-based word processing systems. There are essentially three options. You can purchase a graphics display card and graphics monitor in either high or low resolution. High-resolution cards are fairly new to the marketplace, so make sure the software you are considering supports the display device. Lower resolution devices are almost universally supported but can be troublesome, because the resolution is not particularly good.

You will not find many programs that display text on the screen as it will actually appear on paper when using the lower resolution graphics adapters. Various tricks, like reverse video and different colors on a color display, are used to denote what the text will look like when printed.

Another option is to purchase a higher resolution monochrome display device that presents most text as it will appear. Unfortunately, these devices do not display graphs on the monitor, so you may be stuck if you use your machine to create graphic displays.

The third option is to purchase a monochrome display and a monochrome graphics card. These cards allow display of both graphs and high-resolution text. You can also purchase a combination of the above in a single board. Some hardware offers this capacity built in. If yours does not, these devices, such as the

Continued on next page

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Continued from previous page

Hercules Graphics Card from Hercules Computer Technology, Inc. are available from third-party manufacturers.

My recommendation for all serious word processing is monochrome, either amber or green. The higher resolution makes long hours at the screen bearable. If graphics are a real concern, the Hercules standard is almost universal, and excellent results can be achieved by combining a monochrome monitor and a Hercules card. It costs a little more and means a third-party board for your systems, but the money is well spent. In terms of software, you might look at either the Apple Macintosh or an IBM Personal Computer or compatible running the Windows and Word programs from Microsoft.

> ***Be realistic and remember that every software purchase is a compromise. The goal is to hit as close to the bull's-eye as possible.***

After establishing the desired micro configuration, you have to think about how the PC will work as part of the larger whole. In offices where a host computer does the heavy work, you will want to be sure you can tie the PC to the host system.

Getting information to your PC from the host for processing can be accomplished through asynchronous file transfer with a modem and dial-up port — the cheapest and slowest method — or by direct connection to your mini or mainframe. Many devices are now on the market that allow file transfer through terminal emulation. For example, AST Research, Inc. makes an IBM 3270 emulation board and software that permits connection from a PC to an IBM mainframe. Using this software and hardware makes the PC look like a 3270 dumb terminal to the host while retaining all the PC functionality on the other end.

In this instance, the PC appears to be a device the host system recognizes as a legal terminal. In many cases, the software supplied with such direct-connect hardware reconfigures the PC keyboard to take advantage of the many specialized keys available on more sophisticated terminal display stations. If you have such a machine, file transfer to your word processor is simple. Of course, you can still use the PC as a terminal on the host system to do word processing.

Let's say your office regularly uses an IBM 3081 as its host system — a fairly large computer requiring 3270 emulation. The office does a lot of production typing of a routine nature, drawing upon the name and address files in the mainframe for mass mailings to customers. The first problem is simple. Connectivity with the host is simplified by any one of several 3270 emulation products. You now have a PC that can talk to the host and get data from it. Since the typing is production work with a lot of repetition, you will want a word processing package that is strong on handling boilerplate as well as mail-merge activity. You will also want a program with sound conversion capabilities in order to be able to bring the names and addresses from the mainframe into the word processor. Multimate and Wordperfect are strong in both areas.

Once the information is on your PC, you can use the conversion utility to turn it into files understood by your PC word processor. The advantage of using these protocols is that spacing, tabs and other formatting information is not lost in the transfer process as it is in a straight ASCII download.

The toughest part of any evaluation process is devis-

Continued on page 68



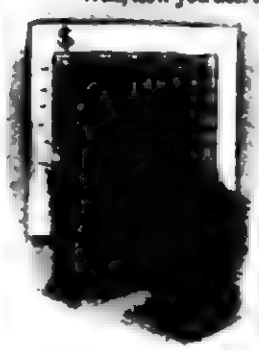
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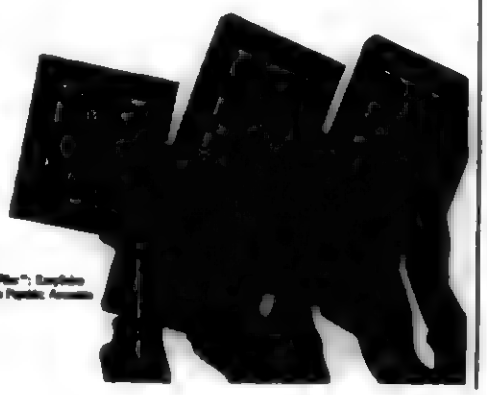
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University converts to micros

[redacted]

[redacted] to IBM, the University of New Mexico (UNM) is the largest of the state's five publicly funded universities, with [redacted] on five campuses and [redacted] faculty and support staff.

From the day IBM's Magnetic Tape/Selectric Typewriter was first announced in the mid-1960s, the university has used a wide variety of word processing equipment. Today, UNM has more than 150 dedicated word processing systems from a variety of vendors including IBM, Wang Laboratories, Inc. and Xerox Corp.

Campus equipment, tight budgets and an investment in data and programs on existing systems [redacted] that integration approaches must involve the use of equipment already in place. The effort to connect and share data between a wide variety of equipment has been ongoing at the University of New Mexico's main campus in Albuquerque for the past several years.

In the late '70s, UNM decided to connect its several thousand computer terminals, microcomputers and dedicated word processors to its Digital Equipment Corp. VAXs and an IBM 3081 Model D with a single network. The goal was to link administrative and academic terminals to all major university computers; to permit document interchange, messaging and calendaring; and to allow easy data file interchange.

To that end, dedicated systems are being gradually phased out at UNM and replaced by microcomputers. Connection is being shifted by IBM's Document Content Architecture, which allows [redacted] to be served from dedicated systems to microcomputer with formatting commands intact. This saves UNM dedicated systems to "open" mainframe computer systems, which a recent International Data Corp. report on text processing, word processing and electronic typewriters, which stated, "The ability of multifunctionality continues to be the most important emphasis in the word processing market place."

To lay the groundwork, UNM chose Ethernet. Installation of this broadband network is nearly complete across the 600-acre main campus, allowing terminal-to-any access to the DEC systems, which are used for academic computing, and to the IBM mainframe, which serves administrative needs. Microcomputers use Polygon Associates, Inc.'s PolyTERM software for emulation of the DEC VT100 when accessing the network.

To deal with its long-term objectives, UNM developed a purchase and support policy to provide a guarantee to user departments that equipment purchased would fit into the long-term plans of the university. The policy provides some [redacted] limiting purchases to a number of products that have been pretested by the Microcomputer Support Group for compatibility.

The Microcomputer Support Group provides a variety of services, including configuring and pricing systems, a user hot line, [redacted] support and application development tips and user training.

For UNM, the rest of this decade will be one of consolidation and conversion to microcomputers with open architectures. Such a move will help prevent [redacted] locked into a specific integration concept and thus lengthen the useful lifetime of the university's integrated computer systems investment. ■

Swearingen is an office automation consultant based in Albuquerque, N.M.

Continued from page 54

ing a method of judging what your needs are and then selecting the product best suited to addressing those needs.

A survey of existing chores is a logical first step. What is it people are doing, and how can that be automated? A simple and inexpensive word processing program may suffice for many routine typing chores. The larger programs have more power and flexibility but require more hand-holding. Overkill can be as dangerous as underkill, especially to a new user. Be certain you have accurately assessed the needs of the actual users of the system.

Also list any hardware constraints. This allows weeding out of programs that cannot pass muster with your host system or with your existing personal computers.

Now comes the time-consuming part. Get copies of the software you want to consider and set up some demo rooms. Let the people who will have to live with the purchase use the product. Get their feedback. It is an old sales technique, but if the user thinks he has a part in making the decision, he'll be happier with the purchase.

Be realistic and remember that every software purchase is a compromise. The goal is to hit as close to the bull's-eye as possible. Don't be afraid to standardize on more than one system. Most good software can swap files with other good software. It may be better to offer a choice than to make a decision that satisfies no one.

While the users are evaluating the software, you should be evaluating the vendor. You can buy software a number of ways — from the manufacturer, from a local dealer, from a mail-order house. Evaluate prices and support from your chosen method and compare with other vendors.

Once the decision is made and the software purchased, follow up with support if possible. Help install and start tutorial sessions. Some of the greatest productivity gains can be made in such repetitive tasks as word processing, where the same document is used over and over. Those gains may be lost forever if the introduction to the new machine and software is a painful one.

Also explore the workstation vs. the dedicated PC. Some personal computers are better shared, while others may be better left dedicated to a single, high-volume user. If the word processor is at someone's desk but part of a shared installation, that person will have to be displaced every time someone wants to use the machine. Soon the word processor will be gathering dust from a lack of use. Weigh the cost of two machines vs. the cost of shared resources.

Finally, and most important, continue to listen to the people using the programs. Stay current and pay attention to upgrades. Most reputable software firms will notify you of upgrades, and they will have a reasonable fee for the service. ■

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PC WORD PROCESSING SOFTWARE

Vendor/Product	Minimum memory (in bytes)	Mouse driven	Spelling checker	On-line thesaurus	Automatic hyphenation	Line-drawing capability	Outline mode	Split-screen capability	Multiple-file capability	Context-sensitive help	Price
Alma Corp. **Suite G5** **10200 S.W. Nimbus Ave.** **Portland, Ore. 97223** *AI: Typist*	256K	Yes	Yes	No	No	No	No	Yes	Yes	Yes	$99.95
Analytical Software, Inc. **10939 McCree Road** **Dallas, Texas 75238** *Executive Assistant*	128K	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	$150
Ann Arbor Software 407 N. Main St. Ann Arbor, Mich. 48104 *Textra 3.1A*	256K	Yes	No	No	No	No	No	No	No	Yes	$29.95
Arraya, Inc. 6711 Vajoen Ave. Van Nuys, Calif. 91406 *Windward*	256K	Yes	No	No	No	No	Yes	No	Yes	Yes	$149.95
Beaman Porter, Inc. 417 Halstead Ave. Harrison, N.Y. 10528 *Powertext 2.1*	128K	Yes	Optional	Yes	Optional	Yes	Yes	Yes	Yes	Yes	$399
Businessoft Corp. **Suite M-4** **703 Giddings Ave.** **Annapolis, Md. 21401** *Mind Reader Version 2.0*	256K	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes	$189
Chang Laboratories, Inc. 5300 Stevens Creek Blvd. San Jose, Calif. 95129 *Memoplan*	128K	No	No	No	No	No	No	No	No	Yes	$295
CMI Software 1396 Main St. Waltham, Mass. 02154 *Techwriter*	256K	Yes	Optional	No	Yes	Yes	Yes	No	Yes	Yes	$395
Command Software Corp. **Suite 1** 1360 N. Main St. Walnut Creek, Calif. 94596 *Commandwriter II*	256K	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	$150
Computer Associates International, Inc. 2195 Fortune Drive San Jose, Calif. 95131 *Easywriter I*	128K	Yes	Yes	Yes	No	No	No	No	Yes	Yes	$195
Computer Associates *Easywriter II System*	192K	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	$395
CYMA/McGraw-Hill 2160 E. Brown Road Mesa, Ariz. 85203 *Final Draft*	256K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	$199
Data Software, Inc. **Suite 1108** **4801 Spring Valley Road** **Dallas, Texas 75244** *DAC-Easy Word*	256K	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	$49.95
Emerging Technology Consultants, Inc. 4760 Walnut St. Boulder, Colo. 80301 *The Professional Writer's Package*	256K	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	$490
Friendly Software, Inc. 3630 W. Pioneer Pkwy. Arlington, Texas 76013 *Friendly Writer*	128K	Yes	Yes	No	No	No	No	No	No	No	$89.95

The companies included in the chart responded to a recent telephone survey conducted by Computerworld. Further product information is available from the vendors.

CW chart compiled by Christie Sears.

Product Spotlight/PC Word Processing Software

Vendor/Product	Minimum Memory Required (in bytes)	More Drives	Spelling Checker	On-Line Dictionary	Automatic Indexing	User-Definable Macros	Outline Mode	Columns Capability	Mail-Merge Capability	Graphics Capability	Price
Custom Productions, Inc. Suite 102 817 10th St. Santa Monica, Calif. 90403 *Multilingual Scribe*	320K	No	No	No	No	No	No	No	No	No	$184
Handic Software, Inc. 400 Patterson Plank Road Carlstadt, N.J. 07072 *Word Result*	128K	Yes	No	No	No	Yes	No	No	Yes	Yes	$129
Handic Technologies, Inc. Suite 900 7800 San Felipe Houston, Texas 77063 *Handic Write/Spell*	512K	Yes	Yes	No	No	No	Yes	No	Yes	Yes	$395
Hewlett-Packard Co. Contact local HP sales office *Advancewrite I*	640K	Yes	No	No	No	No	Yes	Yes	No	Yes	$295
Hewlett-Packard *Advancewrite II*	640K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	$550
Hewlett-Packard *Advancewrite III*	640K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	$695
IBM Software, Inc. Old Danbury Road Danbury, N.H. 06230 *Professional Qwerty*	128K	No	No	No	No	No	No	No	Yes	Yes	$149
IBM Contact local marketing representative *Writing Assistant*	128K	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	$165
IBM *Displaywrite 3 Version 1.1*	256K	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	$450
Image Processing Systems 4414 Regent St. Madison, Wis. 53705 *Freeformer 2.32*	256K	No	Yes	No	No	Yes	Yes	No	Yes	Yes	$250-$475
Infonetics, Inc. 13 Woodland Ave. Verona, N.J. 07044 *Galen's Scribe*	128K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	$495
Innovative Software, Inc. Suite 380 9300 W. 110th St. Overland Park, Kan. 66210 *Smart Word Processor*	256K	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	$395
Leading Edge Products, Inc. 225 Turnpike St. Canton, Mass. 02021 *Leading Edge Word Processing*	256K	Yes	Yes	No	No	Yes	No	No	Yes	Yes	$100-$195
Lexitronics, Inc. Suite 14 101 E. Holly Ave. Sterling, Va. 22170 *Lexitype*	256K	No	Yes	Yes	No,	No	Yes	Yes	Yes	Yes	$595
Lifetree Software, Inc. Suite 315 411 Pacific St. Monterey, Calif. 93940 *Volkswriter Deluxe 3*	256K	Yes	Yes	No	No	Yes	Yes	No	Yes	Yes	$295
LJK Enterprises, Inc. 7852 Big Bend Blvd. St. Louis, Mo. 63119 *Simply Perfect*	128K	Yes	Yes	Yes	No	No	No	No	Yes	Yes	$169.95
Lisi Software P.O. Box 93 Belmont, Calif. 94002 *Mscapec*	128K	Yes	No	No	No	Yes	No	Yes	No	Yes	$199.95

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Meeting user needs.

But WordPerfect's climb to the top was no overnight success story. For the past three years, user feedback has been applied to each new version of WordPerfect, pushing it closer and closer to perfection.

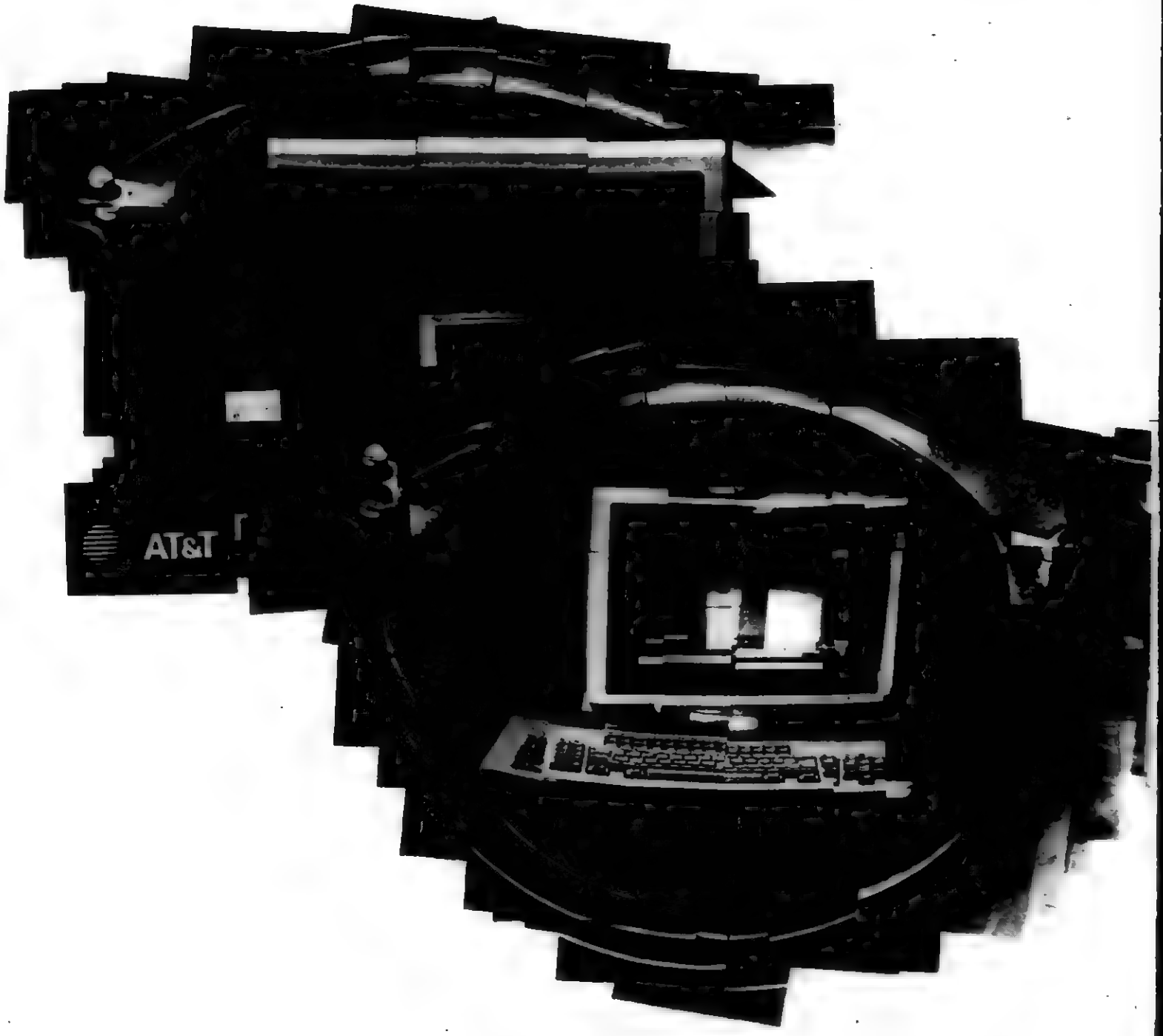
The result is WordPerfect 4.1, a word processor with unsurpassed business features for the IBM PC and compatibles. Features like an elegant thesaurus, a 115,000-word spelling dictionary, math capabilities, columns displayed side-by-side on screen, windows, line drawing, paragraph numbering, and extensive printer support.

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The AT&T 6500 will tie together data and applications from up to three synchronous and 16 asynchronous hosts. Not to mention allowing PCs to work as terminals.

What's more, you can switch back and forth between synchronous and asynchronous hosts with the touch of a single keystroke.

WINDOWS WORTH LOOKING INTO.

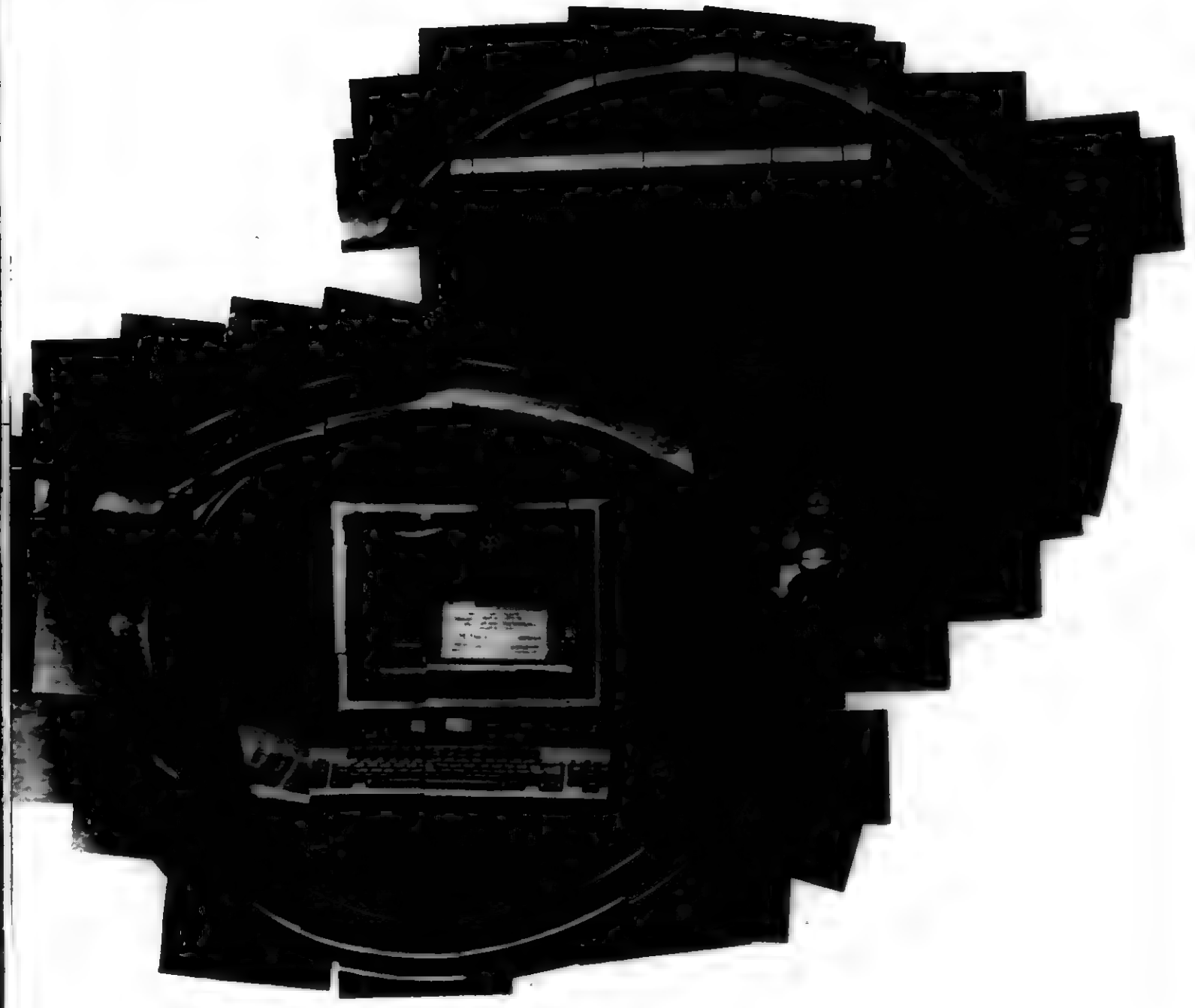
The 6500 lets you create up to four windows at the same time—into both synchronous and asynchronous hosts—and freely pass information among various databases.

For example, an inside salesperson taking an order could access: the customer's credit status in one host; relevant inventory information from another host at a completely different location; and the order form to fulfill the request from yet another host at another location.

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Product Spotlight/PC Word Processing Software

Vendor/Product	Minimum Memory Required (in bytes)	Hard Drive	Spelling Checker	Thesaurus	Mail Merge	Outline Processor	Help	Footnoting	Multiple Windows	Math Capability	Price
Mace Software, Inc. 260 Sheridan Ave. Palo Alto, Calif. 94306 *Wordmarc Author*	256K	Yes	Yes	Yes	No	No	Yes	No	No	Yes	$195
Mace Software *Wordmarc Composer*	512K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	$495
Mark of the Unicorn 222 Third St. Cambridge, Mass. 02142 *The Final Word*	192K	Yes	Yes	Yes	Yes	Yes	No	No	Optional	Yes	$395
Martin Marietta Data Systems P.O. Box 2392 Princeton, N.J. 08540 *Write*	256K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	$500
Mathematik Corp. Suite 12 6609 W. Paja Road Chandler, Ariz. 85226 *Mathematik Word Processor*	256K	Yes	Yes	No	No	Yes	Yes	No	Yes	Yes	$195
Micro Architect, Inc. 6 Great Pines Ave. Burlington, Mass. 01803 *Word-X*	128K	Yes	No	No	No	No	No	No	Yes	No	$30
Micro Business Products, Inc. P.O. Box 539 Wayne, N.J. 07470 *Wordstar 2*	256K	Yes	No	No	No	Yes	Yes	No	No	Yes	$199
Microgro International Corp. 33 San Pablo Ave. San Rafael, Calif. 94903 *Wordstar Professional 3.3*	192K	Yes	Yes	Yes	No	No	Yes	No	Yes	Yes	$495
Microgro International *Wordstar 2000, Release 2*	256K	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	$495
Microsoft Corp. P.O. Box 97017 16011 Northeast 36 Way Redmond, Wash. 98073 *Microsoft Word 3.0*	256K	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	$395
Multimate International Corp., an Ashton-Tate company 52 Oakland Ave. N. East Hartford, Conn. 06108 *Just Write*	128K	Yes	Yes	Yes	No	No	No	No	No	No	$145
Multimate International *Multimate Professional 33 Series Word Processor*	256K	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes	$495
Multimate International *Multimate Advantage 360*	320K	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	$595
Multimate International *Multimate Executive Word Processor*	320K	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes	$495
Office Solutions, Inc. 2802 Coho St. Madison, Wis. 53713 *Office Writer 4.0*	256K	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	$445
Owl Software Corp. Suite 210 15643 Sherman Way Van Nuys, Calif. 91406 *A-B-C*	192K	Yes	No	No	No	No	Yes	No	Yes	Yes	$240
Paladin Software Corp. Suite 7E 3285 Scott Blvd. Santa Clara, Calif. 95054 *Inkwell Plus*	192K	Yes	Yes	Yes	No	No	Yes	No	No	Yes	$149

Product Spotlight/PC Word Processing Software

Vendor/Product	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Price
Palantir Software Suite 100 12777 Jones Road Houston, Texas 77070 *The Palantir Word Processor 3.0*	192K	Yes	Yes	Yes	No	No	Yes	No	Yes	Yes	$395
Paperback Software International, Inc. 2830 9th St. Berkeley, Calif. 94710 *Executive Writer*	128K	Yes	No	No	Yes	Yes	No	No	Yes	Yes	$60.95
Peachtree Software, Inc. 4355 International Blvd. Norcross, Ga. 30093 *Peachtext 5000*	128K	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	$295
Practicorp International, Inc. 44 Oak St. Newton Upper Falls, Mass. 02164 *Practiword*	256K	Yes	No	No	No	Yes	No	No	Yes	Yes	$99.95
Professional Software, Inc. 51 Freemont St. Needham, Mass. 02194 *Write'n Spell*	256K	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	$149
Quadralens Systems, Inc. Suite 1800 15260 Ventura Blvd. Sherman Oaks, Calif. 91403 *Q-One*	640K	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	$495
Quark, Inc. 2525 W. Evans Ave. Denver, Colo. 80219 *Word Juggler*	128K	No	Yes	Yes	No	No	No	No	Yes	Yes	$99
R Systems, Inc. 10310 Markinson Road Dallas, Texas 75238 *R Word*	256K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	$295-$895
R Systems *R Office*	256K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	$495-$1,295
Readware Systems, Inc. P.O. Box 515 Portage, Mich. 49081 *Readwriter*	256K	No	No	No	Yes	Yes	No	Yes	Yes	Yes	$395
Samna Corp. 2700 Northeast Expwy. Atlanta, Ga. 30345 *Samna Word I*	320K	No	No	No	No	No	Yes	No	No	Yes	$295
Samna *Samna Word III*	320K	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	$550
Samna *Samna+*	512K	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	$695
Schmidt Software Systems, Inc. P.O. Box 13778 San Rafael, Calif. 94913 *Inkword*	128K	Yes	No	No	No	No	No	No	Yes	Yes	$195
Self / Sys, Inc. 4306 Upton Ave. Minneapolis, Minn. 55410 *The Executive Secretary*	128K	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	$189.95
Softext, Inc. 555 Goffle Road Ridgewood, N.J. 07450 *Lex Word Processing*	256K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	$500-$2,500
Software Publishing Corp. P.O. Box 7210 1901 Landings Drive Mountain View, Calif. 94039 *PFS:Write*	256K	Yes	Yes	Yes	No	No	No	No	Yes	Yes	$140

Product Spotlight/PC Word Processing Software

Vendor/Product	Minimum Memory Required (in bytes)	Menu Driven	Spelling Checker	On-Line Dictionary	Automatic Hyphenation	Line-Oriented Editing	Column Mode	Outline Capability	Mail-Merge Capability	Graphics Capability	Price
Samna Technologies, Inc. 78885 S.W. Cirrus Beaverton, Ore. 97005 *Freestyle*	256K	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	$295
Yes Software Research, Inc. 1190-B Foster Road Las Cruces, N.M. 88001 *7th Scientific Word Processing System*	512K	Yes	No	No	No	Yes	No	Yes	No	Yes	$595
TCS Software, Inc. Suite 600 6100 Hillcroft Ave. Houston, Texas 77081 *Q Word*	256K	Yes	No	No	No	No	No	No	Yes	Yes	$149
Texasoft, Inc. P.O. Box 1169 Cedar Hill, Texas 75104 *Textplus Word Processing*	128K	Yes	No	No	No	Yes	Yes	No	Yes	Yes	$99
Thore EMI Computer Software, Inc. 3187-C Airway Ave. Costa Mesa, Calif. 92626 *Perfect Writer*	128K	Yes	Yes	No	Yes	No	No	Yes	Yes	Yes	$199
TMT Software, Inc. 34069 Heinsville Road Round Lake, Ill. 60073 *My Word*	128K	Yes	Optional	No	No	Yes	No	No	Yes	Yes	$35
United Software Industries, Inc. Suite 200 8399 Topanga Canyon Blvd. Canoga Park, Calif. 91304 *Einstein Writer*	128K	Yes	Yes	No	Yes	No	Yes	Yes	No	Yes	$149.95
Wang Laboratories, Inc. One Industrial Ave. Lowell, Mass. 01851 *Wang Word Processing for the IBM PC*	256K	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	$250
Wordperfect Corp. 329 N. State St. Orem, Utah 84057 *Wordperfect 4.1*	256K	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not available
Xyquest, Inc. 3 Loomis St. Bedford, Mass. 01730 *Xywrite II Plus*	192K	No	No	No	Yes	Yes	Yes	No	Yes	Yes	$295
Xyquest *Xywrite III*	256K	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	$395

In Depth

Source code under lock and key

Placing software source code into escrow offers a form of protection for vulnerable users and vendors alike. A new wave of escrow firms is drawing up agreements that may withstand even the rigors of bankruptcy law.

By REGINALD WELLER and SHELLEY WALL

Consider the following scenario: You, an oscilloscope manufacturer, license an operating system from a start-up software firm and embed it in a controller in your product. A few months later, you discover that erratic output from an operating system call causes the oscilloscope to give inaccurate readings.

Since, according to the licensing agreement, the system's vendor is obligated to fix any bugs found, you quickly call the vendor's office — only to find it has gone out of business. If you cannot access the vendor's source code, your oscilloscope will be rendered unmarketable until replacement software is found and customized.

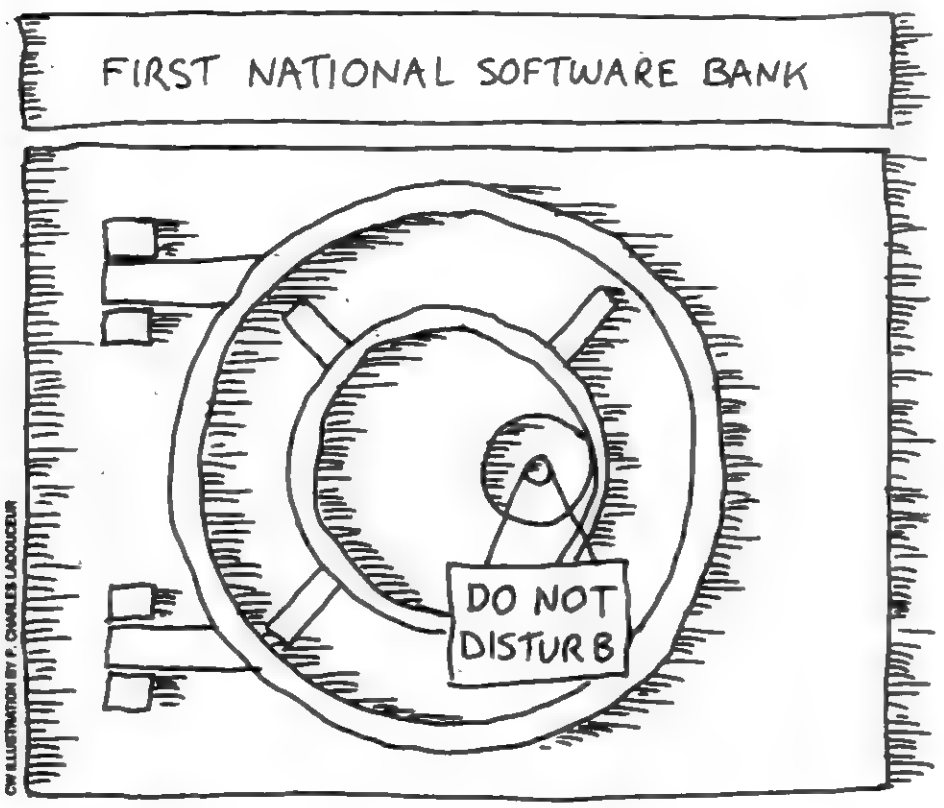
The above story, although fiction, is based in reality. When Art Benjamin Associates Ltd. went out of business in March 1982 [CW, April, 12, 1982], it left approximately 80 users of its Act/1 CICS programming aid without support or maintenance.

One solution that has emerged in response to users' fears that such a situation could happen to them is the escrowing of code with a neutral third party as escrow agent.

Software developers, in licensing a product to users, need to protect the proprietary source code they have written. While they wish to guard against unauthorized use, piracy and illegal copying, they also want to avoid legal disputes.

In contrast, users, as licensees, need to protect their software investments from discontinuance of product support and maintenance. Although a large, stable licensor is not likely to go out of business, a licensee could still suffer significant financial loss if the product line in question is discontinued as the result of a strategic business decision by the licensor. The prospect of time-consuming legal remedies exacerbates the licensee's vulnerability.

Weller is the president of National Safe Depository of San Jose, Calif. Wall is an associate at the law firm of Fenwick, Davis & West in Palo Alto, Calif.



Protecting interests

Commonly, software licensing agreements give the licensee the right to use only the licensor's machine-readable object code. The licensor retains the human-readable source code in order to prevent misappropriation of proprietary materials.

The object code is, in effect, an encrypted version of the source code that needs regular updating and modification whenever the source code is revised. Since software programs are often released before they are fully debugged, licensees may need continued access after initial purchase. The escrow procedure provides the parties to a software licensing agreement with an opportunity to protect their respective interests safely and economically.

Setting up the procedure whereby source code is deposited into escrow can be simple and flexible. The escrow agreement should be separate from the underlying licensing agreement that controls the relationship between licensor and licensee.

Once the licensor and licensee agree that a software escrow is necessary

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Although a large, stable licensor is not likely to go out of business, a licensee could still suffer significant financial loss if the product line in question is discontinued as the result of a strategic business decision by the licensor.

and appropriate, they must negotiate the critical elements of the escrow agreement. Again, the interests of the licensor and licensee are likely to conflict. The licensor will want to release as little of the source code as possible and only under extreme circumstances, such as bankruptcy. The licensee, on the other hand, needs to ensure that all revisions and updates are included in the source code deposit and that access to the escrow materials is possible under all adverse circumstances: discontinuance of product support, acquisition of the licensor by another vendor, discontinuance of product line and other situations less extreme than bankruptcy.

Basic types. The most common type of escrow agreement is a three-party arrangement among the licensor, licensee and escrow agent. Also prevalent is the two-agreement arrangement: one between the licensor and the escrow agent for deposit of the materials and the other between the licensee and the escrow agent for release.

Another type is a two-party agreement between the licensor and escrow agent for the benefit of multiple users, or licensees of record. This format avoids the expense and burden of establishing repeated escrows that are identical in nature. Additions or deletions to the list of the licensees are submitted by the licensor. Written confirmation from the escrow agent provides an accurate record of potential recipients of the escrowed materials.

Trust agreements are a new development in escrows. Such agreements are designed to help shield the escrow from a trustee in bankruptcy by removing title to the source code from the licensor's estate. The escrow agent, as trustee, holds title in trust for the benefit of the licensee, who holds beneficial or equitable title.

Escrow materials. The materials deposited into escrow must be sufficient to enable the licensee to maintain and enhance the program independently. Besides source code, support documentation should include such items as type of hardware used, the programming language, printouts, flow charts, schematics and even machine-readable object code. Any escrow agreement must carefully specify all material to be deposited to ensure that the purpose of the escrow is not undermined.

Updates. A common characteristic of most software is the ongoing need to debug, update, enhance or modify. These periodic revisions must be added to the escrow and then acknowledged in writing to all parties by the escrow agent to create a written record during the life of the software. As with the original deposit, the update process must be clearly drafted into the escrow agreement.

Verification. Licensees commonly ask how they can be certain that the licensor has indeed deposited into escrow the authentic and complete material required by the agreement. One effective method is to have a third-party verifier. However, such a procedure can be expensive and cumbersome, since to do anything more than spot-check a complicated and lengthy source code often proves time-consuming. With frequent updates, the difficulty increases.

One less problematic alternative has the licensee run the deposited source code (or other escrow materials) with the applications it is intended for, with proper witnesses, before approving the deposit of the materials into escrow.

Another method for achieving compliance is to draft language into the agreement whereby the licensor warrants that all materials deposited or to be deposited conform with the agreement. Since normal contract remedies may be insufficient, compliance by the licensor may be further encouraged by use of liquidated damages.

Finally, the escrow agent, in addition to the written acknowledgement procedures, can play an active role — carefully prescribed in the agreement — of inspecting materials received for deposit.

Access. Control of access to the escrow documentation is another important provision of the escrow agreement. Ideally, storage will be in a safe deposit box in a climate-controlled vault, whereby all access can be positively identified and recorded. Each escrow should be stored in its own individual box. Licensees usually will be required to give written advance notice for access so that the licensor, at its option, may be present.

Release procedures and conditions

Time is truly of the essence when a licensee finds his investment in a software program jeopardized by the licensor's failure to maintain the program, whatever the cause. Extended delays must be avoided.

Normally, the licensee will serve written notice to the escrow agent, with a copy to licensor, that a default condition has occurred sufficient to trigger a release of the escrowed software under the agreement. The escrow agent must then, in turn, notify the licensor within the time period specified in the agreement. If the licensor does not respond within a specified number of days, the escrow agent may release the source code, or a copy thereof, to the licensee.

Precise and detailed contractual provisions for the release of source code and documentation to the licensee are critical to an effective escrow. The provisions mainly concern the economic viability of the licensor, especially the likelihood of bankruptcy, and the licensor's maintenance obligations as defined in the licensing and escrow agreements.

The escrow agreement should be structured to provide for release of the escrow materials in the event a

licensor's failing economic condition jeopardizes its performance under the license agreement. Such circumstances commonly include ceasing to do routine business, discontinuing the software product at issue and bankruptcy.

Lack of maintenance by the licensor has many possible causes. A program can be discontinued for business reasons or as a result of a merger or buy-out. Key technical personnel can leave the company. Documentation can be lost, with no backup available. Financial problems, often minor at first and more pervasive later, can result in cutbacks that jeopardize the ongoing maintenance and enhancement process. Any or all of these circumstances would trigger the licensee's urgent need to have access to the source code in order to support the licensed program independently.

When the licensor disputes a licensee's claim of default, the dispute resolution provisions of the escrow agreement are activated. Improperly drafted dispute procedures can defeat the very purpose of the escrow. Some possible solutions to expedite release of escrowed source code in the event of a dispute include the following:

Injunction. If the licensor unjustifiably refuses to allow release of the escrow materials, licensees may obtain a temporary restraining order to prevent the licensor from acting to prevent release.

To increase their chances for success in having the court grant a preliminary injunction, licensees should see that appropriate language is drafted in the escrow agreement.

Arbitration. An arbitration clause is frequently used in software escrows. This provision specifies that the parties have to present their respective cases before a predetermined arbitrator within a few days and confine the arbitration to the very narrow issue of whether a default has, in fact, occurred. The arbitrator would be required to render his opinion within a similarly short time frame.

Liquidated damages. This technique, common to real estate transactions, serves primarily to discourage the licensor from improperly objecting to release of the code.

The cost of a software escrow is a negotiable matter. Either party may pay, or the fees may be shared. Multiple-user escrow expenses are borne by the licensor, often as a value-added marketing benefit for the licensees. Costs for the release of materials are typically paid by the licensee requesting the release.

Legal issues

Although the scope of the legal issues raised by the escrow procedure is considerable and cannot be treated fully here, it is important to acknowledge the potential impact of bankruptcy law in particular on the effectiveness of the escrow release provisions.

Whether or not an escrow will succeed in its essential purpose if the licensor bankrupts depends on all parties resolving the following issues:

- Is the software escrow an executory contract that can be rejected by the

SCIENCE/SCOPE®

Twenty years ago on June 1, Surveyor 1 made the first soft landing on the moon, giving scientists their first close-up look of the lunar surface and blazing a trail for the manned Apollo missions three years later. The three-legged spacecraft, built by Hughes Aircraft Company, landed one second ahead of the originally predicted time and just nine miles from the predicted target point after traveling 240,000 miles. In the following eight months, Surveyor televised 11,150 pictures, photographed the solar corona of the setting sun, made a color composite photo of the lunar surface, and measured the hardness of the lunar surface. By January 1968, four other Surveyors had made soft landings on the moon. They provided detailed scientific information about the physical and chemical character of lunar materials and added immeasurably to the understanding of the physical processes that shape the moon's surface.

Electronics engineers and doctors have created an implant to improve the hearing of profoundly deaf people. The device uses a microphone and pocket-sized signal processor to convert sound waves to electrical impulses. A transmitter behind the ear sends these electrical signals through the skin to a nickel-sized receiver/stimulator implanted in the mastoid cavity. From there, signals travel along an electrode array threaded to the snail-like cochlea of the inner ear. Auditory nerve fibers receive these electronic signals and transmit them to the brain—tricking it into thinking the ear can hear normally. The electrode of the electronic ear is protected by a plastic coating material, which must provide electrical reliability and long life. Since most polymer insulations tend to lose adhesion in body fluids after a period of time, the National Institutes of Health has asked Hughes to subject three coating materials to intensive testing. One plastic was created by Hughes, originally for high-temperature electronic and structural uses; the others were developed by Union Carbide and Dupont.

Confusing enemy weapons so they plunge harmlessly into the ocean is the job of an electronic warfare system now being installed on U.S. Navy aircraft carriers. The SLQ-17A shipset can deceive an enemy missile's guidance system by transmitting a ghost image of a Navy carrier. The hostile weapon locks onto this false image and veers away from the real ship. Hughes delivered the most recent system for installation aboard the USS Independence (CV-62) and is continuing to provide this essential warfare system to Navy aircraft carriers.

A new launcher for Amraam and Sidewinder missiles will add commonality to U.S. Air Force and Navy fighters, thus helping to reduce procurement and maintenance costs. The rail launcher uses common modules to allow an interchange of parts between launchers on different aircraft. Hughes is building more than 600 launchers for Air Force F-15 and F-16 aircraft. Eventually the launchers will be installed on the Navy's F-14 and F/A-18 aircraft. In addition, preliminary work is under way to adapt the launchers to Britain's Tornados and Sea Harriers.

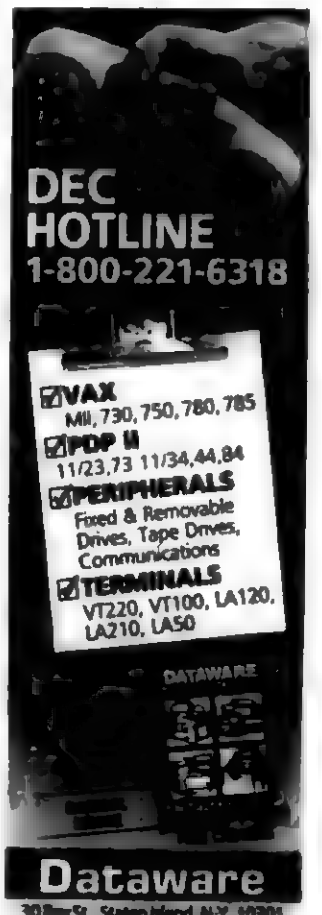
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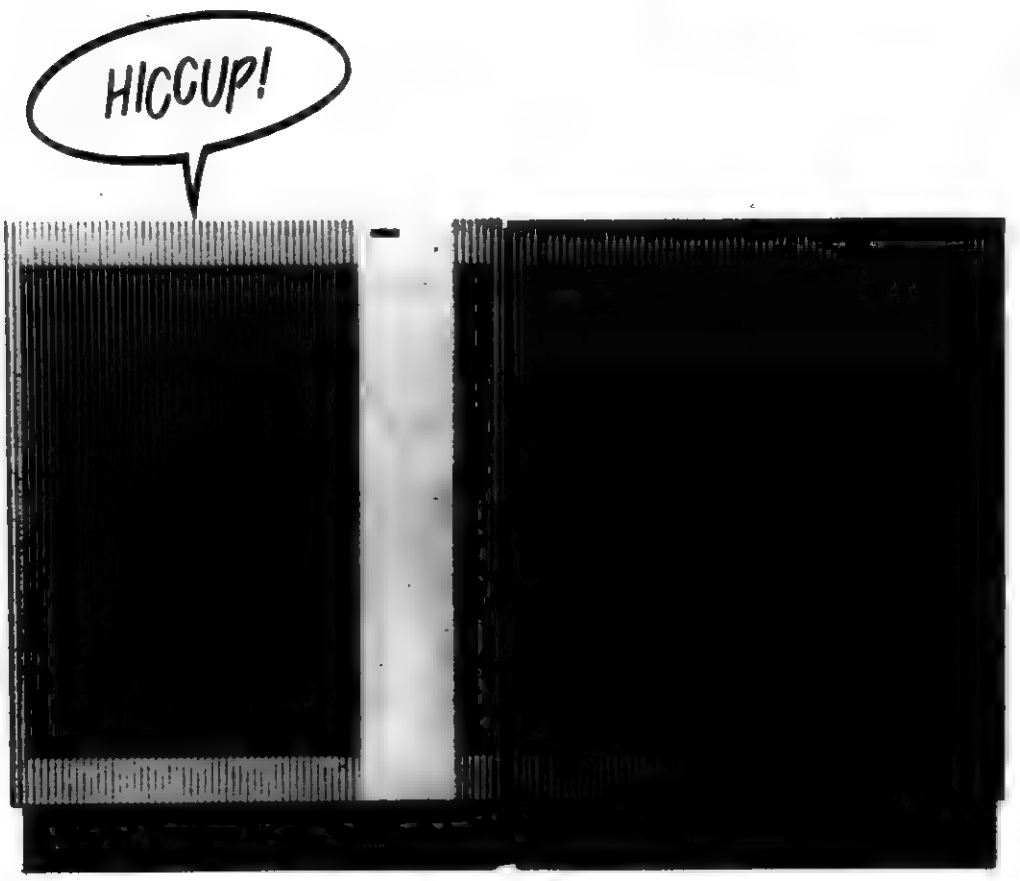
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trustee in bankruptcy?

• Do the escrow materials constitute property of the bankrupt's estate?

• Will the automatic stay procedure prevent the escrow agent from delivering the escrow materials to the licensee?

Although bankruptcy law could have an adverse impact on the effectiveness of an escrow, numerous commentators have suggested viable remedies that, while not eliminating the risk, serve to reduce it as much as possible under the law. When drafting an escrow agreement, legal counsel should be sought to ensure that the document provides maximum protection for both parties.

Role of the escrow agent

Traditionally, banks, accounting firms and lawyers undertook escrows. But, as the sophistication and complexities involved have increased, companies specializing in software escrows have emerged. An escrow firm must be knowledgeable in the legal and technical details required to furnish clear, flexible guidelines throughout the life of the software program.

> ***The 'liquidated damages' clause, common to real estate transactions, discourages the licensor from improperly objecting to release of the code.***

The duties of an escrow agent can be divided into two general categories: administration and physical protection.

Administration. An experienced escrow agent handles many escrows comprising a wide variety of needs and problems. The agent works closely with attorneys and is aware of the latest trends, techniques and legal developments. The agent's role can be as active or passive as the parties to the escrow feel is necessary.

Legal assistance is always necessary before executing an escrow agreement. Nevertheless, the escrow agent should be well qualified to suggest an escrow format that will meet the needs of the particular case.

Once the escrow framework has been established, ongoing administrative expertise is essential. The escrow materials must be deposited and acknowledged in writing to all parties.

Other administrative services that can be performed by the escrow agent include the following:

• Notification of opening of escrow. This establishes for all parties the actual completion of the escrow agreement and its commencement date, that is, the date of the original deposit.

• Acknowledgement process. Every receipt of material for an escrow should be acknowledged in writing, usually to all parties. Each item in the update or modification must be identified specifically in order to create an audit trail over the life of the escrow.

• Follow-up. Many of the events in the escrow process need to be tracked over time to make sure that every required procedure is performed when required. Computerized records management systems are an excellent means for an escrow agent to provide effective, ongoing administration and follow-up.

• Verification. As discussed earlier, the escrow agent can, at a minimum, examine the materials deposited to determine conformity to the agreement provisions. Depending upon the degree of verification desired by the parties and upon the technical complexity involved, the agent can act as, or arrange for, an outside expert in the verification process.

• Intermediary. Most escrows provide a mechanism for settling disputes, usually by means of the courts or arbitration. The escrow agent can also serve as an intermediary, but his role should be clearly defined in advance, preferably in the escrow agreement itself.

• Termination. The termination of an escrow must be carefully executed in writing by the escrow agent. The escrow agent must also return all materials to the proper party.

Physical protection. The other principal function of an escrow agent is to physically protect and preserve the material deposited in escrow.

Storage ideally should be in a vault or custom-built vital-records room designed to protect computer media over long periods of time. Climate control and fire protection are normal features of such depositories.

To preserve the integrity of each escrow, the documentation should be stored in individual safe deposit boxes or containers. Escrow materials should not be commingled, both to prevent errors and to provide accurate transaction records.

The escrow agent should be able to maintain absolute control of access to the storage area so that permanent logs of every access can be created. Authorization for any access should be in writing in advance.

Escrow agreements can provide a viable, effective means for satisfying the sometimes conflicting needs of the parties to a software licensing agreement. Although, as noted, the reliability of the escrow procedure in the event of bankruptcy is uncertain, escrow agreements still provide the parties to a software license agreement with a measure of protection that is difficult to achieve by any other means. ■

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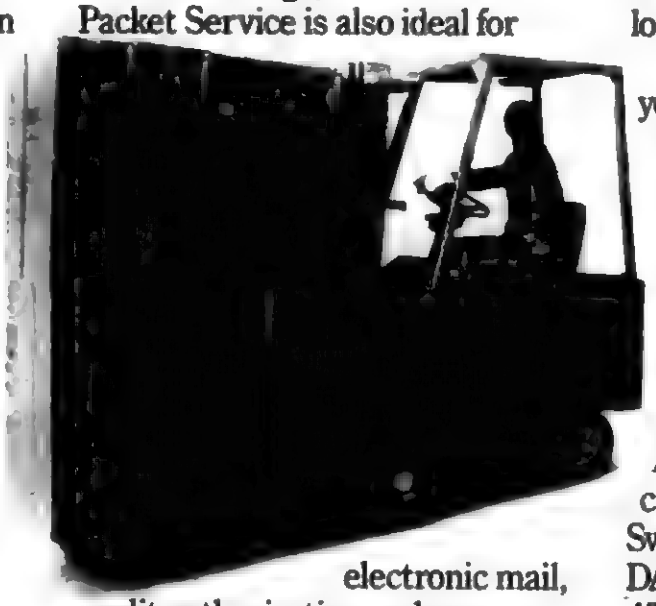
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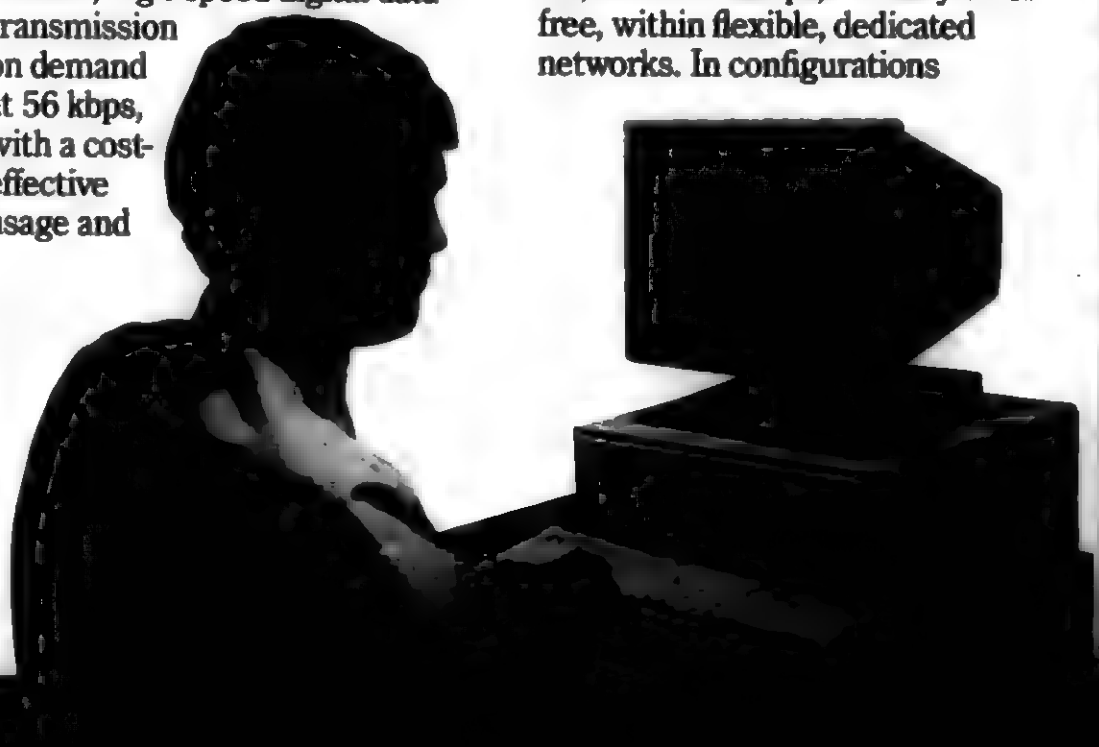
ACCUNET Switched 56 Service is currently available through over 30 access points in the U.S., with additional access points expected by the end of 1986.

3. Q: How can I efficiently manage consolidated processing of inventory, payroll and pricing information among my different locations?

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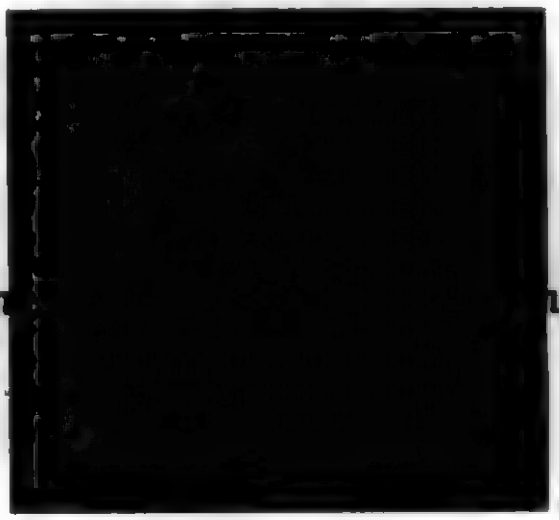
6. Q: I have a problem with timely communications between my engineering department in California and my manufacturing department in New Jersey. It's causing delivery time delays, production lags and reduced productivity.

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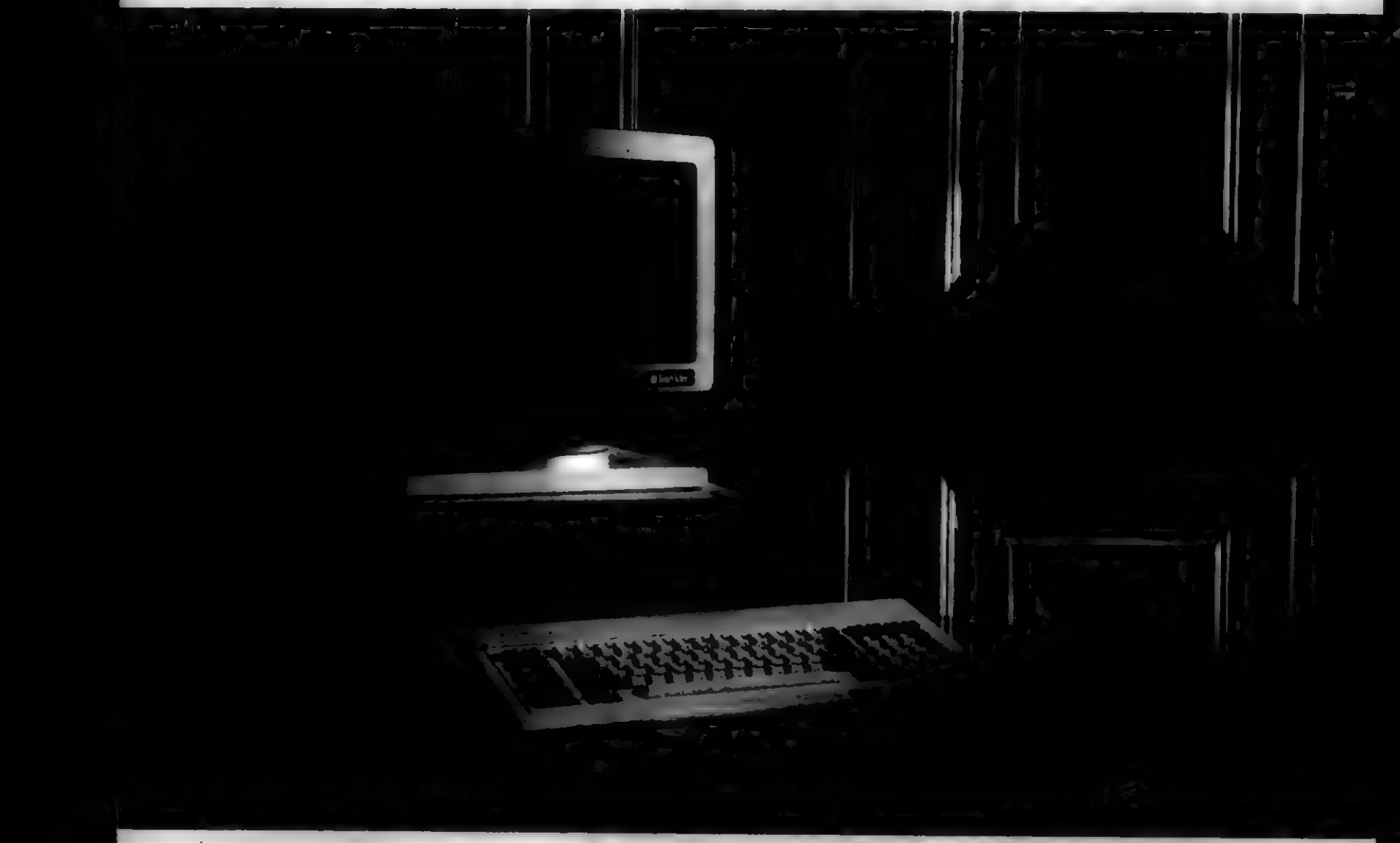
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In Depth

Revival of the fittest: New vigor for your development life cycle

Too many DP shops, taken with the wonders of 4GLs and code generators, let their systems development life cycle methodologies fall into disuse and disrepair. Best bet: Don't let rust set in to begin with.

By MARK DUNCAN

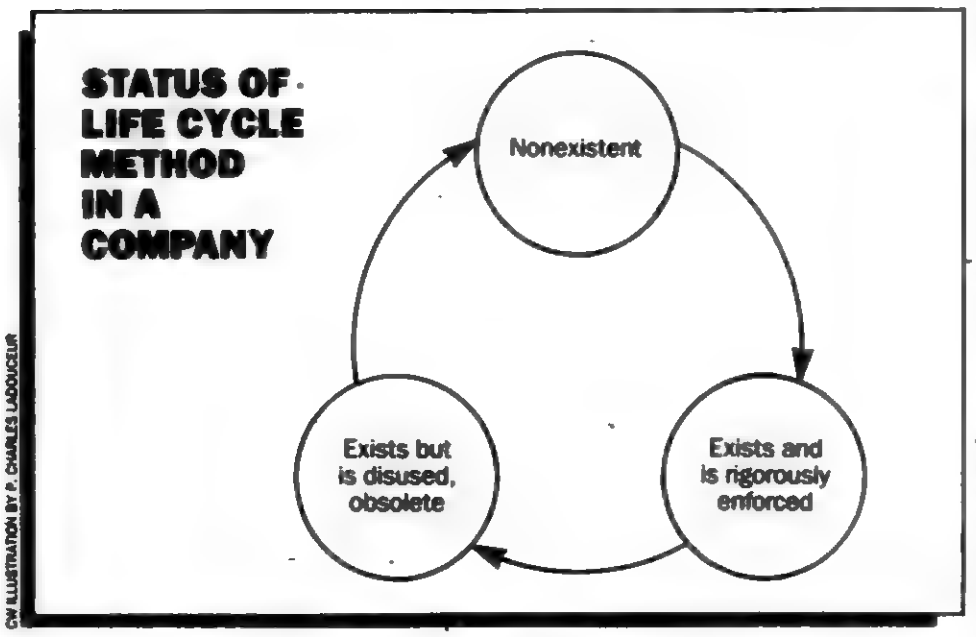
Some say the last thing the DP world needs is more talk about the systems development life cycle. A number of noticeable trends are beginning to make this remark ring true.

First, the tidal wave of commotion caused by the "instant productivity" of fourth-generation languages and program code generators makes a systems development life cycle methodology appear almost archaic.

Second, a glut of inexpensive, vendor-supplied packaged software, versatile enough to balance multicorporate financial statements as easily as domestic checking accounts, has given users a practical alternative to in-house applications development.

Finally, despite the young age of the DP industry, it would seem that we have experienced enough to obviate repetitive talk about "how best to do things." And yet the systems development life cycle is constantly topical. There seems to be no limit to the extent to which this methodology can be refined, embellished, modified, rewritten and even automated.

Duncan is a systems analyst in the quality assurance section of a major Dallas bank.



CW ILLUSTRATION BY P. CHARLES LABOUCEUR

It would be easy to conclude that all the attention paid to systems development life cycles occurs because they are inherently flawed, generate too many exceptions to the rules and, in a technological environment that changes daily, become more cumbersome than practical. But the cause is often a much more fundamental affliction — having insufficient means for supporting a systems development life cycle to keep it alive and kicking.

In the initial enthusiasm that generally accompanies the implementation of a new development life cycle methodology, an effective means for its continued support is easily overlooked, resulting in the premature death of the methodology. Before discussing how this may be prevented, two observations must be made concerning the systems development life cycle's definition and disposition.

Definition and status

The "IEEE Standard Glossary of Software Engineering Terminology" provides a practical definition for the software life cycle:

"The software life cycle is that period of time that starts when a software product is conceived and ends when the product is no longer available for use. The software life cycle typically includes a requirements phase, design phase, implementation phase, test phase, installation and checkout phase, operation and maintenance phase and, sometimes, retirement phase."

While this definition may not exactly represent all systems development life cycles, a logical, phased approach is a characteristic common to most systems development methodologies. Though the number of phases and phase names may vary, the constituent activities are generally constant.

Broadly speaking, the status of the systems development life cycle in most DP departments falls into three categories: In Category 1, the development life cycle is nonexistent; in Category 2, the life cycle exists and is rigorously enforced; and in Category 3, the life cycle exists, but it is not used or obsolete.

There are, of course, other situations — for example, one in which a life cycle method exists but is enforced

A diseased or obsolete systems development life cycle: Symptoms, causes and remedies

Symptom	Cause	Remedy
Staff unaware of existence of systems development life cycle	No publicity; buried among other standards or fragmented, unstructured with no identity	Publicize on a regular basis; ensure it is a formal, cohesive, identifiable set of procedures within overall standards
Staff aware of it but cannot get to it easily or thinks it is not meant for them	Degree of accessibility is low	Distribute generously — at least one per office or project; centralize with easy but well-controlled access; consider on-line option for critical parts
Staff does not know how to use it or has difficulty interpreting it	No training provided to new and existing staff and users	Provide rigorous and frequent training; quantify training into departmental policy; do not overlook needs of non-DP staff such as end users, audit personnel
Violations, adherence go unnoticed	No means for identifying violations or verifying adherence	Institute product reviews, one outcome of which will be documented adherence and violation
Becomes out of date, inappropriate, hence falls into disuse	No vehicle exists for updating it to keep up with technology, procedures and so on	Identify failures, weaknesses as well as alternative procedures — another outcome of a product review
Applied conscientiously, but product quality is still poor	No means for verifying it works, that is, produces quality applications	Record errors, produce statistics to show trends; relate error trends back; make recommendations to improve
Staff treats adherence very lightly, knowing consequences of not following will be harmless; nobody wants ownership	No visible management support	Best remedy is for management to provide adequate time and means for activity; foster joint ownership, since poor-quality applications reflect adversely at all levels

only weakly — but these are usually transient states falling either between categories 1 and 2 or 2 and 3. So the implication is that although the categories appear to be discrete, they may in reality represent a progression of events.

Consider this scenario: An organization recognizes the need for a systems development life cycle (Category 1) and acquires one. The promise of potential benefits, coupled with the novelty of applying a new methodology, give strength and stability to the development life cycle (Category 2). But various factors — rapid organizational growth or decay, increased work load, staff turnover, mandated deadlines — weaken this strength and stability. The development life cycle falls victim first to abuse, then to disuse and, almost unnoticed, assumes a Category 3 disposition.

Preventive measures

A systems development life cycle with any of these dispositions creates a problem, or at least a potential problem, if no means exist for supporting it. A Category 1 situation is easy to deal with: If an organization has diagnosed the lack of a formal systems development life cycle, it will undoubtedly go one logical step further and remedy this situation. Options that immediately come to mind include writing it in-house, using consultants to write a tailored methodology or selecting a vendor-supplied methodology with modifications.

With a Category 2 situation, if a systems development life cycle exists and is accompanied by a means for actively enforcing it, it is not unreasonable for an organization to leave well enough alone. But leaving well enough alone can sometimes be as harmful as overconsideration.

Nevertheless, in both categories 1 and 2, it is not too late to develop preventive measures to avoid a transition to Category 3. Once a development life cycle assumes a Category 3 disposition, significantly more effort will be required to revive and restore it and to develop a procedure for maintaining it, so that it does not once again fall into disuse.

The best way of developing preventive measures for a certain situation is to identify and examine the causes that led to it. A systems development life cycle methodology can fall into disuse for the following reasons:

- It is not publicized and has no identity.
- It has a low degree of accessibility
- No training in its use is provided for new and existing systems development staff and users.
- No means exist for verifying adherence to it or identifying violations against it.
- No vehicle exists for updating it to keep pace with technology, procedures, changing user expectations and so on.
- No means exist for ensuring that it still works.
- There is no visible management support.

> ***The software life cycle is the period of time that starts when a software product is conceived and ends when the product is no longer available for use.***

The systems development life cycle is not publicized and has no identity. The failure to publicize and give identity to a systems development life cycle is a fundamental failing of systems development management. To a certain degree, DP staff members are expected to possess enough initiative to ascertain what standards exist in an organization and to what extent they are enforced. But the onus is still on the organization to make explicit its methods and procedures.

Newly recruited programmers will probably continue to do things as they have been doing most recently unless told otherwise. Ultimately this could necessitate reworking to bring applications into line with company standards. It could also affect the performance evaluation of that programmer if adherence to development life cycle standards is a contributing factor to the evaluation.

A systems development life cycle will not be the only standard methodology active within a DP department. There will be administrative standards concerned with project control; operational standards governing computer resource usage; personnel standards related to professional conduct, dress code, punctuality and so on; and other technical standards that will affect DP staff daily.

Therefore, it is important that the development life cycle methodology does not get buried or lose its significance among all the other standard procedures. While it is essential that the methodology gain acceptance as an integral part of overall departmental standards, it is equally important that it retain its own identity within those standards.

The systems development life cycle has a low degree of accessibility. Having taken the trouble to identify and advertise the methodology, it makes sense to ensure it is easily accessible. DP workers are an adventurous breed by nature. Given the choice of referring to a manual to enable them to "do it right the first time" or making a few educated guesses, they will invariably opt for the latter. They have learned that people and computers are tolerant and forgiving in dealing with experimentation, while referring to a manual might be tantamount to losing face in the eyes of peers.

So everything possible must be done to put required information at the fingertips of those who need it. Systems development methodology documentation must enjoy generous distribution to all relevant staff. If there are limitations on this distribution, then access should be centralized with an efficient checkout system so that valuable time is spent not looking for the rules but applying them.

The documentation must also be current and accurate. Nothing will thwart the desire to do it according to the rules more than finding that the rules are out-of-date or that they simply do not work. Consideration should be given to implementing a systems development methodology that has partial or total on-line accessibility, especially when it governs critical development activities or when its application is universal within the company.

An on-line option will also facilitate updating the methodology. Changes can be disseminated instantly to all affected staff, and paperwork will inevitably be reduced.

No systems development life cycle methodology training is provided to new and existing systems development staff and users. Advertising a systems development life cycle methodology and making it easily accessible are insufficient measures to guarantee knowledge of the methodology. DP staff members, left to their own devices, quite naturally will take the easiest or shortest route to their destinations. This is not to say that they will deliberately develop an inferior product. On the contrary, given the time and means to do a good job, very few would abuse the opportunity.

However, shortest routes will differ from one person to another. This inconsistency is undesirable, if not unacceptable, in an environment in which effective system maintenance relies on uniform product quality. Doing a good job, therefore, entails

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more than simply getting the right answer. It means getting the right answer by applying the appropriate development life cycle methodology standards. This can only be done if those standards are known.

Training in the systems development life cycle methodology requires consideration at three levels.

The first and obvious level is for new DP employees. If they are complete novices, they will require more prolonged and intensive instruction than if they have come with experience from another company. In the latter case, they will in all likelihood be familiar with some form of systems development methodology and will probably only need to learn the new company's equivalent of what was practiced in the old.

The second level of training is directed at mature staff. "Mature" in this case refers to DP staff members who have been with the organization long enough to be familiar with the systems development methodology through first-hand use but require further training for one or more of the following reasons:

- The last time they used the systems development methodology was some time ago, and a refresher course is necessary before beginning another project.
- The work they have undertaken so far has only taught them a part of the methodology, and they now need to extend their knowledge.
- They have been assigned to train programmers or other DP staff and therefore require thorough familiarity with the methodology.

Because of these varied training requirements, it would help if the systems development methodology training materials were modular in structure. This not only will facilitate extensive training during which the whole methodology is presented but will also allow a particular module to be taken out of context and presented in isolation for a specific purpose.

Finally, the third level of training is directed at end users and the non-DP staff who play key roles in the life cycle of a project. It is more important that these employees understand the process by which an application is developed rather than be taught the inner workings of a computer.

Coping with change

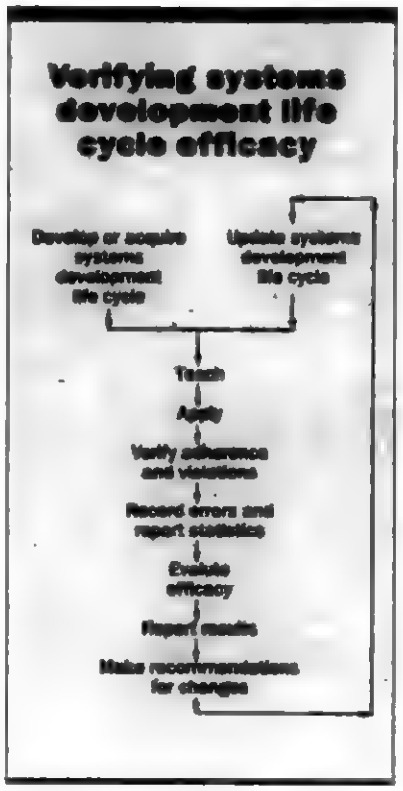
The impact of frequent change in end-user requirements must be demonstrated in dollars and cents, and the philosophy that "it is cheaper to fix it now than fix it later" must become second nature to them.

Training tends to be regarded as an isolated, one-time process with a definite beginning and conclusion. In some cases this is true, but systems development methodology training must be continual and open to change in order to cope with the improvements and technological advances within DP.

A good way to ensure that staff will be made aware of the changes automatically is to have a training program that is active throughout the year that all are obliged to take advantage of. An even better method would be stating the changes in a "departmental training policy."

To give an example: New employees will undergo 40 hours of systems development and other standards training in their first year. All other appropriate DP staff will receive 20 hours of training on an annual basis. These figures are only 2% and 1%, respectively, of a 50-week year. Quantifying development life cycle training in this way facilitates incorporating it into an individual's annual schedule and further emphasizes that the methodology is there to be learned and then applied.

No means exist for verifying systems development life cycle adherence or identifying violations. It would be ideal to develop a systems development methodology, teach it to the DP staff, tell them they have to apply it and then sit back and assume that is the end of it. Reality presents a somewhat different picture. Again, it is not that people willfully violate a standard procedure.



> ***While it is essential that the systems development methodology gain acceptance as an integral part of overall departmental standards, it is equally important that it retain its own identity within those standards.***

Rather, attitudes, performances under pressure, skill levels and interpretive abilities simply differ from one person to another.

True, the purpose of the systems development life cycle, or of any standard in general, is to smooth out these variations, yielding uniformity in product quality. But this process is not instantaneous. The methodology must be applied, the results must be evaluated, and then the methodology must be modified to eliminate any weaknesses, ambiguities and so on.

Thus, product reviews need to be incorporated into the development life cycle at appropriate points. These review outcomes are crucial in preventing the systems development methodology from taking on a Category 3 disposition. In this instance, a

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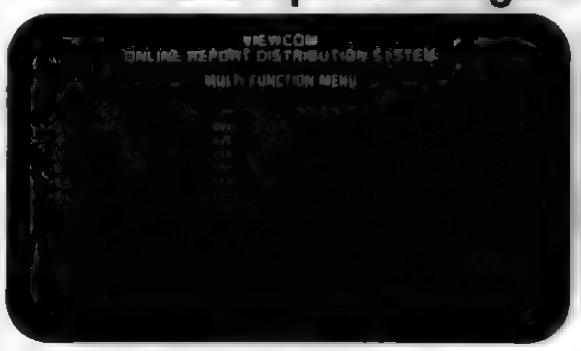
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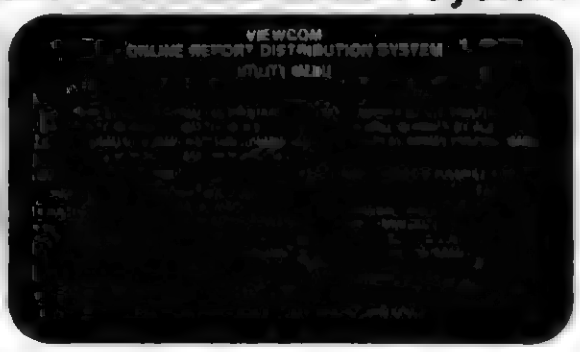
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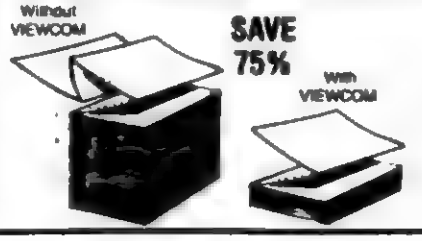
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review will provide a means for verifying development life cycle adherence and identifying violations, after which appropriate action may be taken.

It may appear unnecessary to verify adherence to the systems development life cycle explicitly, for if there are no standards violations, then the implication is obvious. But there is a potential benefit associated with verification: The outcome of a review should be balanced and objective, certainly identifying violations when present but commending with equal weight instances of development life cycle adherence. If this is known by the product developer beforehand, it will preclude feelings of defensiveness and hostility during the review.

If the sole purpose of a review was to bring to light a subject's weaknesses or faults, then the review is apt to generate more of a negative atmosphere than a positive one. It might even create a sense of inferiority in a person where it should not legitimately exist.

> ***The purpose of verifying the efficacy of a systems development life cycle methodology goes beyond merely establishing that it works. The act of repeatedly reviewing the same methodology keeps one alert to alternative, and possibly better, ways of developing systems. Just because a particular method works does not mean it cannot be improved.***

No vehicle exists for updating a systems development life cycle methodology to keep pace with technology, procedures, changing user expectations and so on. A systems development life cycle may fall into disuse very easily because it has become outdated, cumbersome or inappropriate. This results from not having a formal vehicle for updating the methodology with changes necessary for survival.

When a systems development methodology is found to be lacking or inapplicable for some reason — for example, a technological or environmental change or a change in end-user expectations — most enterprising programmers and analysts will find a way around the problem. They only have the timely completion of their task in mind.

However, two things need to be done in this situation. First, the deficiency or inapplicable procedure within the systems development life cycle needs to be documented. Second, the means, if any, by which the problem was circumvented needs to be recorded, for this could potentially be part or all of the recommendation to update the methodology.

The documenting of a problem within the systems development life cycle and the alternative procedure that was used in its place is another result of a product review.

Following that, the information should be passed on to the personnel responsible for investigating the cause of the systems development failure or incorrectness and formulating recommendations to resolve the problem.

No means exist for ensuring that a systems development life cycle methodology works. This is not strictly a condition that would cause a development methodology to assume a Category 3 status, for a methodology may be diligently applied and still not yield good results. What is required here is proof that a particular systems development methodology is as effective as it can be in terms of the quality of the applications that have used it.

Therefore, records need to be kept of the errors generated by these applications. The errors will need to be examined statistically for frequency and type. If trends are revealed, they should be a clue to which part of the development life cycle caused the errors.

The methodology is then modified to reduce the likelihood of the errors recurring, and another phase of recording and statistical reporting begins (see chart page 81).

The recording of errors produced by the application and the monitoring of error trends should be part of the testing phase of the systems development methodology and must also be continued for a mandatory period of time following system implementation — say, three to six months.

Care must be taken to attribute to the methodology only those errors that are genuinely the fault of a poor methodology, and not, for example, the fault of fluctuation in error trends that have been caused by hardware failure or inadequate operational procedures.

The purpose of verifying the efficacy of a systems development life cycle methodology goes beyond merely establishing that it works. The act of repeatedly reviewing the same methodology keeps one alert to alternative, and possibly better, ways of developing systems. Just because a particular method works does not mean it cannot be improved.

There is no visible management support of systems development life cycle. There is no fail-safe way to enforce a systems development methodology. The best methodology in the world will not necessarily

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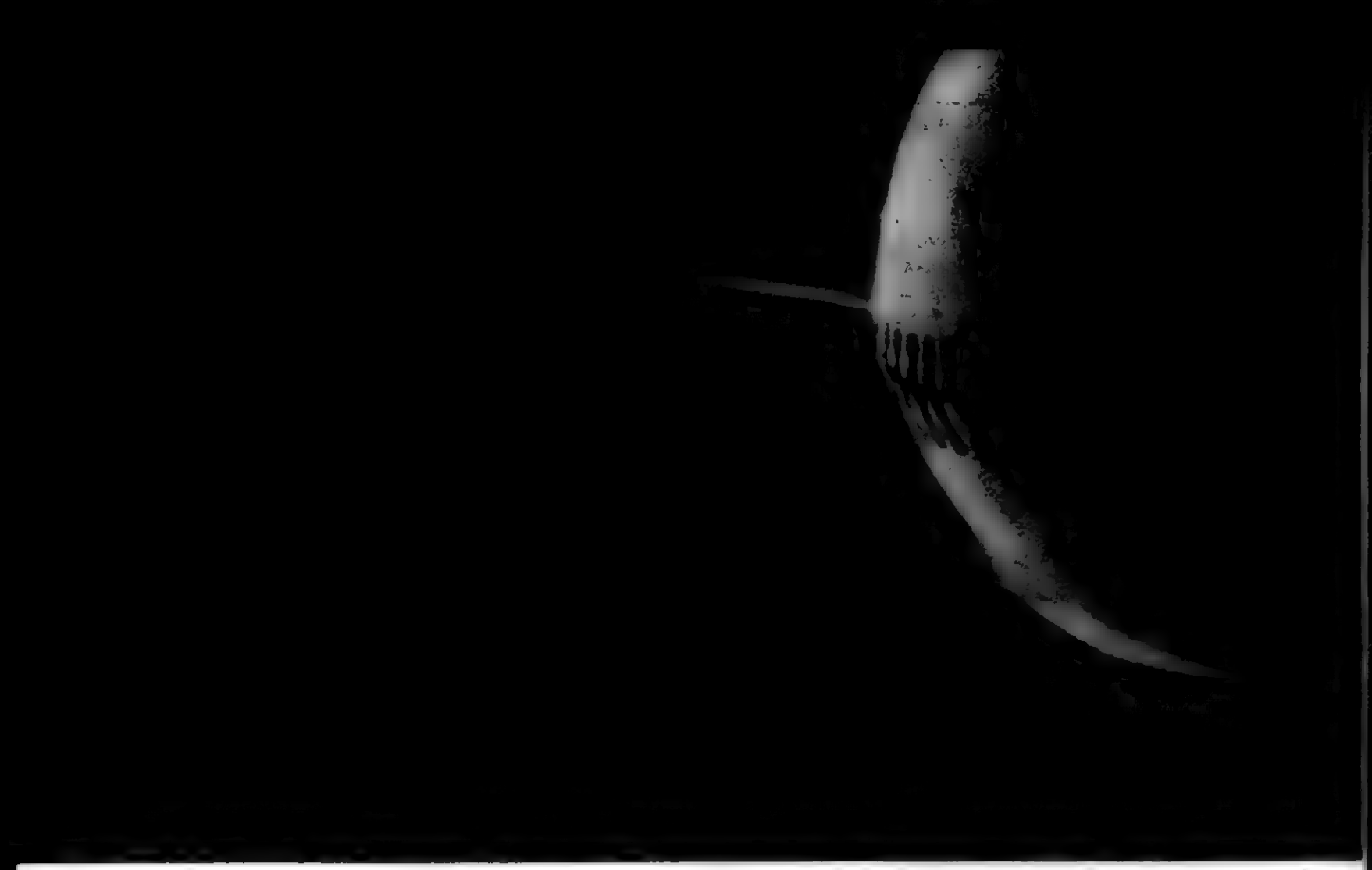
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> ***The essential purpose of any tool is to enable accomplishment of a task with greater ease than could be done without that tool. Furthermore, for a tool to be effective, it must be used correctly and kept in working order. A systems development methodology is nothing more than a tool for the developers of application systems.***

encourage or guarantee its application. Ultimately, it is the front-line programmers and analysts who will or will not apply the systems development methodology, and other than putting a gun to the head or promising a reward, what alternative is there to ensure the methodology is followed?

The answer has already been stated once: Given adequate time and means to do a good job, most people will do so without the need for additional coercion. And adequate time and means is probably the best form of management support that can be given. Its absence may easily be interpreted by DP staff as a clear signal that adhering to the systems development methodology is as of much — or little — consequence as not adhering to it.

Rather, the attitude should be one of shared concern. Management should endeavor to provide adequate time and means. They must remember that even though it is possible to pinpoint the culprits of systems development methodology violations, the repercussions of a low-quality product will be felt at their level as well.

Similarly, DP staff should be sympathetic to the fact that management is generally governed by deadlines and dollars. Therefore, the staff should endeavor to provide realistic resource estimates for applying the systems development methodology. Should there be limitations placed on them, then it is equally important that they apprise management of the consequences of not being able to follow the methodology.

A simple tool

The essential purpose of any tool is to enable accomplishment of a task with greater ease than could be done without that tool. Furthermore, for a tool to be effective, it must be used correctly and kept in perfect working order.

A systems development life cycle methodology is nothing more than a tool for the developers of application systems. It must be applied correctly and scrutinized regularly to ensure it is still capable of its intended purpose. If end results or operating environments change, then the tool must be changed accordingly, remembering that minor modifications, although frequent, are preferable to major modifications of any frequency.

In the context of data processing, there will always be a need for formal systems development life cycle methodologies. Certainly they are better suited to large business and scientific applications, which demand massive investments of time, money and human resources. But even small applications, if developed on a frequent basis, cannot ignore the safety of development via a repetitive and systematic pro-

A systems development life cycle does not have to be a prolonged, multiphase methodology. It can be as simple as a three-, four- or five-step process, as long as the steps retain the same sequence and dependencies from one application to another.

Neither fourth-generation languages — or fifth-generation ones, for that matter — nor the most sophisticated packaged software will make systems development life cycles redundant. There will always be a measurable distance in the path from concept to processed data. The simple but important point to remember is that a systems development life cycle is successful only if it works and keeps on working. ■

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NEW PRODUCTS

System offers conversion of type, image

Datacopy Corp. of Mountain View, Calif., has announced the Datacopy Jetreader and Jetreader Plus scanning system, said to provide optical character recognition (OCR) and image processing capabilities.

The scanning system converts stacks of hard-copy data to disk files formatted for standard word processing software or to images for use in documents or data bases.

According to a company spokesman, the Jetreader image scanner offers selectable resolutions of 200 dot/in. or 300 dot/in. and an automatic paper feed. Scan times are approximately 43 seconds at 300 dot/in. and 28 seconds at 200 dot/in.

The Jetreader comes with an interface to the IBM Personal Computer family and Datacopy's recently introduced OCR or OCR Plus software, along with its Word Image Processing System (WIPS). It accepts a stack of up to 10 sheets of legal-size or smaller paper, the vendor said.

WIPS provides image scanner control, image manipulation, file management, image display and hard-copy output. It also allows integration of images into documents prepared on standard word processing software for display or printing. It costs $695.

The OCR software is pretrained to read 12 standard office type styles and convert them into computer code for modification on word processing software. In addition to the standard type styles, the OCR Plus package can be trained by the user, using pattern technology, to recognize virtually any 10- or 12-pitch monospace type style.

The OCR software runs on any IBM Personal Computer or compatible and operates with Datacopy's Model 700 and 730 platen scanners and its other document scanners. OCR and OCR Plus are priced at $695 and $995, respectively.

Jetreader, including OCR software, sells for $2,950. Jetreader Plus, including OCR Plus software, costs $3,250.

Lee Data unveils terminal

Viewed as replacement for interactive IBM 3178 model

The Phaze Terminal Division of Lee Data Corp. in Minneapolis has announced the Model 1178 display, a plug-compatible replacement for the IBM 3178 interactive terminal.

According to the vendor, the Model 1178 has a 14-in. screen and operates with all models of IBM controllers for large-scale computer connectivity.

The compact terminal is said to be suited for interactive inquiry, data retrieval, record modification and program development tasks.

Footprint, display

The footprint of the Model 1178 measures 10½ by 11 in., and the display is said to weigh 23 pounds.

The ergonomic design features a tilt-and-swivel monitor, a detached, low-profile keyboard in four layout styles and an optional amber screen. It also features a key lock for added security, a company spokesman stated.

The Model 1178 is priced at $995 on a single-unit basis and $796 in quantities of 100. Larger quantity discounts are also available.

Other products of the Phaze Terminal Division of Lee Data include the P3278 monochrome terminal and the P3279 color terminal.



Lee Data Corp. Model 1178 display

Secure net debuts for micro users

The Federal Systems Division of Grid Systems Corp. of Vienna, Va., has introduced a Distributed Secure Information Network (DSIN) for laptop micro users. The network was designed to meet military and intelligence agency requirements for mobile and secure micro communications. The network also will be available for commercial sales.

The DSIN allows local or remote users to communicate with one another via fiber-optic cables, phone lines or satellite links using a recently released software package called Gridmail, a company spokesman said.

According to the spokesman, Gridmail ties all of the users and computers together. It permits the mobile users to continue to communicate even though they are continuously on the move.

DSIN will allow mobile users to communicate to other temporary or fixed locations and will allow users to be assured that all data is securely and correctly received, the vendor said. All of the products were designed to meet the Tempest security standard of the U.S. Department of Defense to prevent leaks of sensitive data.

The Tempest Gridcase (Model 1307), an extension of the Grid line of IBM-compatible laptops, will cost $11,250. The Gridserver (Model 1727) will sell for $24,695.

All of the products will be available in late summer, the vendor said.

Speech transcriber announced

Features 1,000-word vocabulary recognition

At the recent Speechtech '86 speech technology conference, Dragon Systems, Inc. of Newton, Mass., announced Voicescribe-1000, an automatic dictation transcription system.

Voicescribe-1000 has a 1,000-word active vocabulary speech recognition capability. According to the vendor, it runs near real time on a personal computer with an 8-MHz Intel Corp. 80286 processor.

Although intended as a large-vocabulary artificial language recognition system, Voicescribe-1000 is also said to be capable of limited natural language recognition tasks.

Voicescribe-1000 can be used for dictation of informal notes and documents with a limited vocabulary or repeated phrases.

Reportedly, the vocabulary is easy to customize, so the transcription system can be used for applications in which many letters are written on the same subject, such as sales letters.

Voicescribe-1000 is priced at $995. It includes an IBM Personal Computer XT- or AT-compatible peripheral board, the Voicescribe-1000 recognition software, user documentation and the Dragonkey voice-activated keyboard utility software.

The minimum system configuration is any IBM PC or compatible with 256K bytes of random-access memory (RAM) and a hard disk. To use the full 1,000-word vocabulary capacity, the user must have a personal computer with an 8-MHz 80286 processor and 640K bytes of RAM, the vendor said.

Graphics library allows Turbo Pascal to run under IBM, Hercules standards

The University of California at Berkeley Campus Software Office developed Turbo Graphic Tools, a transportable graphics library for Borland International, Inc.'s Turbo Pascal program.

Turbo Graphics Tools is a library of graphics primitives which, according to the vendor, overcomes the hardware differences of the Hercules, IBM Color Graphics Adapter (CGA) and IBM Enhanced Graphics Adapter (EGA) standards.

The Hercules Graphics Adapter offers a resolution of 720 by 348 pixels and two colors; the IBM CGA offers 640- by 200-pixel resolution and two colors; and the IBM EGA offers a resolution of 640 by 350 pixels and 16 colors.

According to a spokeswoman from University of California at Berkeley, Turbo Graphics Tools was designed for programmers who wish to write transportable Turbo Pascal graphics programs capable of running under both the IBM and the Hercules graphics standards. The same compiled code is said to run on any of the three adapters.

According to the spokeswoman, the library resides in less than 12K bytes of memory and runs on any IBM Personal Computer with Turbo Pascal.

The software determines the hardware configuration and selects the graphics mode offering the highest resolution and most colors.

Turbo Graphic Tools is available from the University of California at Berkeley Campus Software Office for $100. All source code and documentation are included.

INSIDE

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SOFTWARE & SERVICES

Systems software

Honeywell, Inc. has announced that its **CP-6** operating system is available on its DPS 90 information processing system.

According to the vendor, CP-6 on the DPS 90 is intended for engineering and scientific applications, such as finite element analysis or solids modeling. It allows users to take advantage of the DPS 90 Integrated Vector Processing without requiring special coding techniques.

CP-6 features time-sharing, batch processing and transaction processing.

Prices start at $20,000 per month.

Honeywell Manufacturing Systems Division, 2222 W. Peoria Ave., Phoenix, Ariz. 85029.

■

Century Analysis, Inc. has ported **Star**, its combined office and data system, to the NCR Corp. 9800 computer.

The Star system includes a set of integrated office tools for interuser communication, personal information manipulation and desk organization as well as multiuser data storage and retrieval and capabilities for interpretive development.

Star includes a networked office processing subsystem, a fourth-generation development language, a relational data base management system, a management query language and utilities.

Star is priced from $10,000.

Century Analysis, 114 Center Ave., Pacheco, Calif. 94553.

■

Graphic Software Systems, Inc. has announced that its **GSS-GKS** graphical kernel system development package is available for the IBM RT Personal Computer.

According to the vendor, GSS-GKS enables the user to port mainframe, mini and microcomputer graphics applications to RT PC systems. It also allows Microsoft Corp. MS-DOS- or IBM PC-DOS-based personal computers to connect to the RT PC as intelligent graphics workstations.

GSS-GKS supports two standard metafile formats, the GKS Metafile and the Virtual Device Metafile.

GSS-GKS costs $795.

Graphic Software Systems, 9590 SW Gemini Drive, Beaverton, Ore. 97005.

Applications packages

Computer Associates International, Inc. has added the **CA-Fund Accounting System** to its Advanced Business Software series of financial management applications for IBM's DOS/VSE and MVS operating systems.

The system was designed for public and nonprofit organizations. It provides general ledger, purchasing and accounts payable fund management capabilities.

The Advanced Business Software series is on-line and integrated. It is said to provide real-time updating.

The CA-Fund Accounting System is priced at $213,000 for the DOS/VSE environment and $256,500 for the MVS environment.

Computer Associates, 711 Stewart Ave., Garden City, N.Y. 11530.

■

Access Technology, Inc. has announced **Version 1.1** of its **20/20** integrated spreadsheet for Prime Computer, Inc. systems running Primos 19.4 or higher.

Version 1.1 reportedly offers support for PT 200 and Visual 550 graphics terminals and the Hewlett-Packard Co. HP7550 eight-pen plotter. It also offers increased print spooling options support.

Other enhancements include the ability to nest command procedures and an expanded model link or consolidated capability.

The spreadsheet costs from $500 to $15,000.

Access Technology, Six Pleasant St., S. Natick, Mass. 01760.

Languages

Language Processors, Inc. has ported its **LPI-RPG II** compiler to the AT&T Information Systems 3B family running under AT&T Unix System V.

According to the vendor, it features a high-performance optimizer, an interactive source-level debugger and cross-language calling, which enables programmers to employ multiple LPI languages in a single application.

LPI-RPG II is compatible with IBM System/34 computers.

End users are said to be able to port existing RPG-II applications to an AT&T system.

The LPI-RPG II compiler is priced at $3,000 for the 3B2 and $5,000 for the 3B5.

Language Processors, 400-1 Totten Pond Road, Waltham, Mass. 02154.

■

Hewlett-Packard Co. has introduced a validated **Ada compiler** for use on its HP 9000 Series 200 and 300 technical workstations.

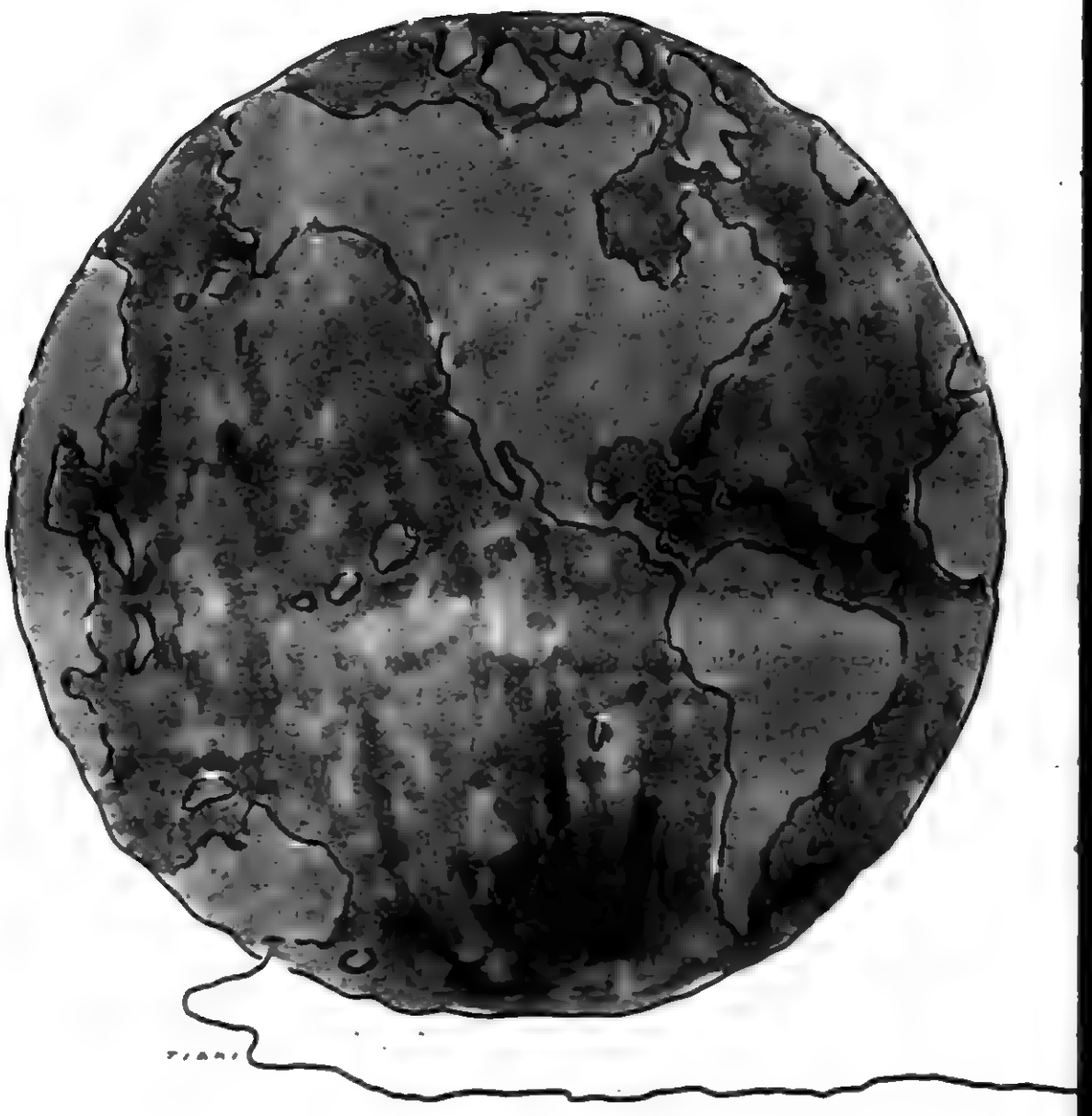
The compiler runs under HP-UX, which adheres to AT&T's System V Interface Definition Issue I and provides access to all HP-UX system services and utilities.

In addition to Ada program development, HP-UX provides an environment for program development in Fortran, Pascal, C, 680X0 Assembly, Common LISP and Technical Basic.

The Ada compiler costs $3,125 for the single-user version and $4,275 for the multiuser version.

HP, 3000 Hanover St., Palo Alto, Calif. 94304.

NOW IBM PROFS USERS



NEW PRODUCTS/SOFTWARE & SERVICES

Zeta Soft, Ltd. has announced **Release 1.1** of **Zeta-C**, a C compiler and development environment for Symbolics, Inc.'s 3600 series LISP machines.

According to the vendor, Zeta-C 1.1 is an implementation of industry standard C. It is compatible with the AT&T Unix System V compiler as well as the University of California at Berkeley Unix 4.2 compiler.

Features of the product include incremental compilation, runtime bounds checking on array and pointer references and an interactive C-syntax debugger.

Zeta-C Release 1.1 includes a user's guide and six months of support.

It costs $5,800 for the initial CPU license plus $1,000 for each additional CPU at the site.

Zeta Soft, P.O. Box 139, 94 Sciarappa #2, Cambridge, Mass. 02141.

Utilities

Compinfo, Inc. has announced **Findit**, a software utility for the Wang Laboratories, Inc. Wang VS series of computers.

Findit is said to allow users to find any file or library in a system.

The utility features wild card characters that reportedly enable users to find any part of a name including leading characters, trailing characters, embedded characters or a combination.

Findit integrates with six other Compinfo modules for functions such as reorganizing index files and copying multiple files.

The Findit system is priced from $300 to $500 depending on the utility functions purchased.

Compinfo, 381 Park Ave. S., New York, N.Y. 10016.

Sterling Software, Inc.'s Dylakor Division has introduced a **DOS/VSE version** of the **interface** between its DYL-280 and DYL-280 II information management products and Cullinet Software, Inc.'s IDMS/R data base.

The module utilizes statements predominant in the IDMS/R Cobol Data Manipulation Language and supports all IDMS/R verbs, according to the vendor.

Users can retrieve and update conventional records, Logical Record Facility records and IDMS/R table entries from IDMS/R data bases.

Access to IDMS/R integrated data dictionaries is also provided, the vendor said.

The DOS/VSE version of the interface is priced at $8,690 for customers who already own DYL-280 or DYL-280 II.

Sterling Software, Dylakor Division, 17418 Chatsworth St., Granada Hills, Calif. 91344.

■

Integrated Virtual Systems has announced **Release 2.0** of its **CL-1** productivity series package for Elxsi Co. System 6400 computers using EMBOS SR-11.

The package is said to allow Digital Equipment Corp. VMS and Apollo Computer, Inc. Aegis users to become productive in the Elxsi System 6400 environment.

CL-1 features file handling functions such as listing directories and copying files, hierarchical menu processing and support for electronic mail, remote printing and plotting and implementation of remote job submittal.

CL-1 is priced at $5,000.

Integrated Virtual Systems, 46627 Paseo Padre Pkwy., Fremont, Calif. 94538.

■

Advanced Technology Center has announced **Grafpak-CGM**, computer graphics metafiles available as Grafpak-GKS workstation modules.

According to the vendor, Grafpak-CGM enhances Graphical Kernal System (GKS) performance by providing long-term picture storage and transfer of images to computers and devices. Pictures created with GKS can be saved to be reused on the same system or on any compatible graphics system.

Grafpak conforms to the binary, character and clear text encoding formats of the ANSI/ISO Computer Graphics Metafile standard.

Grafpak-CGM costs $2,500. The personal computer version costs $500.

Advanced Technology Center, Suite 238, 5711 Slauson Ave., Culver City, Calif. 90230.

Data base management systems

Tom Software, Inc. has announced **Release 5.0** of its **Speed II** fourth-generation productivity tool and integrated data base management system.

Added features include a substring search, added memory files, enhanced application navigation and the ability to create, modify or delete records in a related master file without leaving the current function.

Speed II is said to integrate with Wang Laboratories, Inc. products, including Decision Support Software and Wang Office.

Speed II is priced from $10,000.

Tom Software, P.O. Box 66596, 127 S.W. 156th, Seattle, Wash. 98166.

Services

Electronic Catalog, Inc. has introduced **Electronic Catalog**, an on-line service said to provide information on microcomputer manufacturers, distributors, products and pricing.

The system is menu-driven and includes a Help facility. Features of the service include searches and listings of product families, functionalities, emulations and product clones.

The standard price of the service is $50 per hour with a minimum of one hour per month.

Electronic Catalog, 317 E. San Rafael, Colorado Springs, Colo. 80903.

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MICROCOMPUTERS

Software applications packages

Harris/Lanier Business Products, Inc. has introduced **Harrisdesk**, a word processing package for personal computers.

Harrisdesk is said to feature the vendor's Perspective user interface, Task and Speller. It can be run in a multiuser configuration via the Concept 4300 personal computer work group server or as a stand-alone product on the Harris 2000 Personal Computer or any IBM-compatible personal computer.

The Speller function uses a 90,000 word dictionary and a 6,500 word user-definable dictionary to verify spelling. Task allows users to write programs for frequently performed tasks.

Harrisdesk costs $695.

Harris/Lanier, 1700 Chantilly Drive N.E., Atlanta, Ga. 30324.

■

Lowell Systems, Inc. has announced **Time-Trak L3000**, a time and attendance package for Microsoft Corp. MS-DOS-based systems.

Time-Trak L3000 is said to generate management reports including daily absentee and tardy rolls, payroll and daily cost per work center.

It includes a module for productivity monitoring that tracks time spent by each employee on specific jobs and is capable of host communications for internal financial functions.

The system uses slot readers, function keys and a variety of scanning devices. Each employee is issued a bar-coded ID badge.

Time-Trak L3000 is priced from $12,000.

Lowell Systems, 140 Industrial Ave. E., Lowell, Mass. 01852.

■

Academic Press, Inc. has announced **Graph-Pad**, software said to produce graphs of scientific data.

The program offers flexible data entry, data manipulation and plotting. Users can enter data from existing graphs, type onto a built-in spreadsheet, read disk files created by Graph-Pad, Lotus Development Corp.'s 1-2-3 and other programs and save data on a diskette.

Other features include the ability to average replicate values, calculate and plot error bars, mathematically transform data, calculate linear regression and plot the best-fit line.

Graph-Pad runs on an IBM Personal Computer or compatible. It costs $340.

Academic Press, Orlando, Fla. 32887.

Software languages

Ryan-McFarland Corp. and **AT&T** have announced **Unix versions of RM/Fortran** and **RM/Cobol** for the AT&T Personal Computer 6300 Plus.

RM/Fortran is a complete implementation of the Fortran 77 standard. The AT&T Unix System V implementation executes the same source code developed for Microsoft Corp. MS-DOS and IBM PC-DOS implementations.

According to the vendor, RM/Fortran applications run faster on the Intel Corp. 80286-based PC 6300 Plus than on the Intel 8088-based PC.

RM/Cobol is an ANSI 74 Cobol implementation.

The products are priced at $895 each.

Ryan-McFarland, 609 Deep Valley Drive, Rolling Hills Estates, Calif. 90274.

Software utilities

Pro-Log Corp. has announced the **STD LIB 1.1**, a software library of initialization and driver routines said to allow application programs written in Basic, C or assembly language to link to STD Bus I/O cards.

The library supports the vendor's STD DOS system. It provides complete hardware initialization and I/O routines and consists of modules written in assembly language. Each module includes a set of routines related to a single I/O card or a family of cards. The library is delivered on two 5¼-in. IBM Personal Computer-compatible diskettes and comes with a manual.

STD LIB 1.1 costs $295.

Pro-Log, 2560 Garden Road, Monterey, Calif. 93940.

■

FEL Computing has unveiled **Release 2.0** of the **Mobius** micro-to-host integration system.

Mobius is said to allow transparent interaction between Digital Equipment Corp. hosts and a variety of microcomputers. Features of Release 2.0 include task-to-task communication, enhanced DEC VT100 emulation, a task definition facility and the ability to define as many as 26 micro disk drives on the host system and assign each a descriptive volume label.

The price for a system supporting up to five simultaneous users is $3,500 for the host and $250 each for the microcomputers.

FEL Computing, P.O. Box 72, 10 Main Street, Williamsville, Vt. 05362.

Software enhancements

Micrografx, Inc. has released **In-a-Vision Version 1.2**, an upgrade of its computer-aided design program for the IBM Personal Computer and compatibles.

Enhancements include command execution during redraw, an add window command, smaller dialogue boxes, an align command and simpler pie and elliptical arc creation.

Version 1.2 is available to registered users for $49.

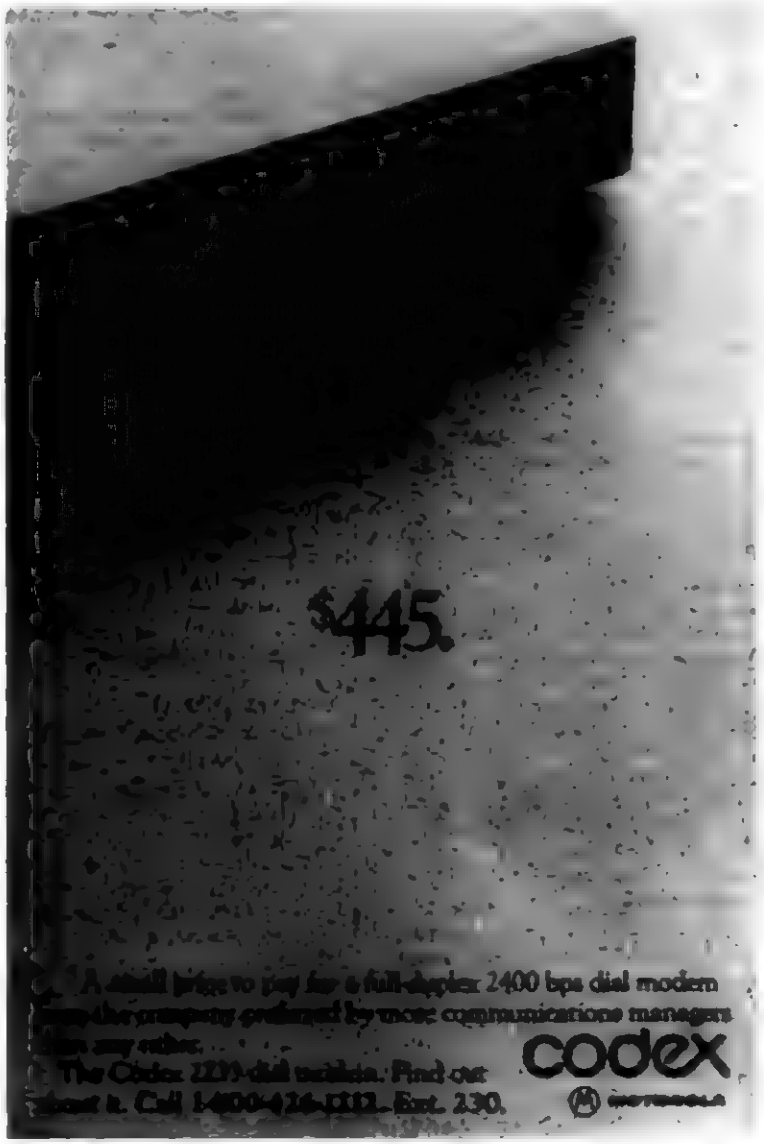
Micrografx, 1820 N. Greenville, Richardson, Texas 75081.

■

Applied Business Technology Corp. has announced **Project Workbench Release 2.2**, an enhanced version of its project management soft-

Continued on page 92

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Continued from page 91

ware package for IBM Personal Computers and compatibles.

Release 2.2 includes local-area network support, subproject capability, expanded scheduling and reporting capabilities, an expanded dependency network, expanded user interfaces and support for additional hardware, including plotters.

Project Workbench Release 2.2, including manual and on-line tutorial, costs $1,150. There is an optional annual maintenance fee of $250.

Applied Business Technology, 6th Floor, 365 Broadway, New York, N.Y. 10013.

■

Profidex Corp. has released **Revision 2.2** of its sales and marketing software package **Scamp**.

Scamp is said to support telemarketing, direct mail and field sales. It is available for all Data General Corp. multiuser computer systems as well the IBM Personal Computer family and compatibles.

Scamp provides data retrieval and update, management reporting options, data import and electronic lead distribution features, autodialer interface, automatic mail merge file production and six levels of security.

It costs $695 for microcomputers and starts at $3,000 for DG minis.

Profidex, 90 West St., New York, N.Y. 10006.

Communications

Questronics, Inc. has announced **Analycon**, a data communications performance analyzer for the IBM Personal Computer XT and compatibles.

According to the vendor, Analycon controls a set of Questronics' Multi-Line Analyzer Systems, up to 255 lines, and data base information regarding network performance. It coordinates the data collection, data basing and reporting of information and provides statistical reports and graphical presentations.

Analycon costs $3,496.

Questronics, 3570 S.W. Temple, Salt Lake City, Utah 84115.

■

Braegen Corp. has added **PC Networking Products** to its Elan System of IBM 3270-compatible products.

The line is said to allow networked IBM Personal Computers to directly access IBM mainframe channels via a single coaxial cable. The products are compatible with IBM's Netbios standard and run under IBM's PC Network Control Program or Novell Inc.'s Advanced Netware.

The series includes the Elan Network Adapter Card, priced at $1,295; the Elan Server Adapter for the IBM Personal Computer AT, priced at $2,495; and the Elan File Server, priced at $17,995.

Braegen, 525 Los Coches St., Milpitas, Calif. 95035

■

Gateway Communications, Inc. has announced the **Wide-Area Network Interface Module 186** (WNIM-186), a coprocessor option board for IBM Personal Computers.

The board supports communications speeds up to 800K bit/sec. It also supports various data transmission techniques including asynchronous, bisynchronous, CCITT X.25 and Systems Network Architecture/Synchronous Data Link Control.

The board costs $695 with 128K bytes of memory and $795 with 512K bytes.

Gateway Communications, 16782 Red Hill Ave., Irvine, Calif. 92714.

Data storage

Syquest Technology has announced the **SQ1500** family of integrated, removable hard disk subsystems for IBM Personal Computer XTs, ATs and compatibles.

Four models are available with single or dual removable drives or in a fixed drive/removable drive combination. A subsystem chassis houses two drives providing up to 90M bytes of fixed and removable on-line data storage. Data transfer rates are 7.5M bit/sec.

Prices for the subsystems range from $2,499 to $3,695.

Syquest Technology, 47923 Warm Springs Blvd., Fremont, Calif. 94539.

■

Vero Electronics, Inc. has announced the **451 48065, 3U form factor** and the **452 48056, 6U form factor**, two modules said to provide VMEbus-compatible 1M-byte dynamic random-access memories.

The modules feature 24-bit addressing with flexible address modifier decoding, addressability on any 64-byte boundary within the 16M-byte space, byte parity error detection and eight- or 16-bit data transfers.

The 451 48055 costs $899, and the 452 48056 costs $899.

Vero Electronics, 40 Lindeman Drive, Trumbull, Conn. 06611.

■

Optotech, Inc. has introduced a **write-once optical storage system** said to support the small computer systems interface (SCSI).

The storage system reportedly includes a 200M-byte-per-side disk drive, controller and software tools. The SCSI storage system is built around the Model 5984 write-once, read-only optical disk drive that provides a data transfer rate of 2.2M bit/sec.

The SCSI system drives are priced from $975 to $3,400 and the controllers from $350 to $650.

Optotech, 770 Wooten Road, Colorado Springs, Colo. 80905.

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June 9-12, 1986

World Trade Center, Boston

NM/TC is a highly focused, technical conference.

It is designed to brief network managers and technical control personnel on the latest products, services, concepts and software available to solve the problems of complex networks in today's rapidly changing telecommunications environment.

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The conference offers useful and to-the-point help in coping with a variety of management and technical issues from planning to SNA networks.

Conference Program — June 11th and 12th

The NM/TC conference offers a special opportunity for network managers, with hard-hitting and professional presentations. NM/TC is specifically designed for those managers who must operate at two levels - both managerial and technical. Forty sessions are offered.

Exposition — June 11th and 12th

The exhibits will display state-of-the-art equipment from the leading vendors in the industry where you can personally examine the next generation of network control centers, management systems, modems, multiplexers, diagnostic and test systems, and more.

NM/TC sponsoring exhibitors play a prominent role in the show — Avant-Garde Computing, Datacomm Management Sciences, and Racal-Milgo.



Exhibitors —

Atlantic Research, Connections Telecommunications, Digilog, Digital Communications, Digitech Industries, INFINET, Infotron Systems, NCR Comten, *Network World*, Northern Telecom/Spectron, *TP+P*, Telenex, Telephony, Venator Systems, Versa-Lite Systems, Wandel & Goltermann.



Keynote Speaker:
Richard J. Holleman
Director of Standards Practices, IBM Corp.

Featured Session:
Top Vendors of 1990
Will Zachmann
Chairman
VP/Research, IDC

In-Depth Tutorials — June 9th and 10th

Industry experts will instruct full-day courses on network control, IBM/SNA network management systems, strategic planning and network diagnostics.

Monday, June 9, 1986

9:00 am - 5:00 pm
Select One

T-1 **Fundamentals of Network Control**
Gabriel Kasperek, President, Kanzan, Inc.
The basics of network control, including problem diagnosis and repair, maintenance and operational issues.

T-2 **Integrated Voice/Data Corporate Networks**
Roshan Lal Sharma, Sr. Scientist/Consultant, Telecommunications Network Science.
Network topologies and their synthesis, cost-effective network planning, future trends in intelligent networks and their impact on network management and control.

T-3 **Cost Efficient Methods for Implementing New Tariffs**
Cheryl A. Cushing, Manager, Reference Services, Connections Telecommunications, Inc.
Post-divestiture tariff rules, including LATAs and POPs with a comparison of major common-carrier tariffs, and evaluation of intra-LATA access alternatives and a review of new regulatory alternatives to traditional network costs.

T-4 **ISDN I**
Samuel Lynch, Senior Consultant, Zatyko Associates.
Definition and concepts, application standards and world-wide status, plus comparison of ISDN against OSI Reference Model as standard.

T-5 **System Network Architecture I**
Thomas Routt, Senior Consultant, Zatyko Associates.
Current status of IBM's communication architecture, new extensions such as LU 6.2/APPC and NETBIOS and IBM LANs as "defacto" standards.

Printers/Plotters/Peripherals

Panasonic Industrial Co. has unveiled three **IBM-compatible monitors** for graphics and text displays featuring 80-line by 25-char. screens.

The TR-125M9T monochrome monitor offers 640- by 640-pixel resolution and displays 16 shades; a two-shade text mode offers 720- by 350- pixel resolution, and an alternate text mode offers 640- by 350-pixel resolution.

Model C-1310 is a 13-in. red-green-blue (RGB) monitor that displays 16 colors with 640- by 200-pixel resolution.

Model C-1350 is a 13-in. RGB monitor that displays 16 shades of 64 colors. It offers either 640- by 200- or 640- by 350-pixel resolution.

Prices for Models TR-125M9T, C-1310 and C-1350 are $199, $599 and $699, respectively.

Panasonic, One Panasonic Way, Secaucus, N.J. 07094.

■

Ziyad, Inc. has announced the **Paperjet 400**, a dual-sheet and envelope feeder.

The Paperjet 400 is said to automatically feed letter, 13-in. legal, 14-in. legal, monarch and European DIN A-size paper.

Users can store up to three different kinds of stationery at the same time, according to the vendor.

The Paperjet 400 is available for laser printers including the Wang Laboratories, Inc. LPS8, the Hewlett-Packard Co. Laserjet and Laserjet Plus and Canon, Inc. LPB-8 printers. It costs $1,895.

Ziyad, 100 Ford Road, Denville, N.J. 07834.

■

Ziyad, Inc. has announced the **Paperjet 2000**, an office print station.

The Paperjet 2000 features a letter-quality printer, cut-sheet paper and envelope feeder and accoustical sound hood.

It is said to print at more than 63 char./sec. and has both serial and parallel connector ports to connect with various hosts.

According to the vendor, the printer can also emulate printers including the Qume Corp. Sprint II, Diablo Systems, Inc. 630 and NEC Corp. 3550.

The Paperjet 2000 is priced at $44,495.

Ziyad, 100 Ford Road, Denville, N.J. 07834.

Thomson Consumer Products Corp. has announced the **VM3801DA/DG** 15-in. monochrome monitor, said to support 132-col. displays and transform color signals into 16 shades of amber or green.

The monitor features a dual-scan monitor and operates at both 15.7 kHz and 18.4 kHz. It has a built-in D-9 connector, so it can be plugged into both monochrome and color graphics adapters.

The VM3801DG with a green display costs $239. The VM3801DA with an amber display costs $249.

Thomson Consumer Products, #111, 5731 W. Slauson Ave., Culver City, Calif. 90230.

■

PC's Limited has announced a **monitor**, said to support enhanced graphics with up to 64 colors at 720- by 350-pixel resolution, and **Egads**, an enhanced graphics adapter.

The 13-in. monitor is also said to support standard color or graphics cards with 16 colors. The text mode allows switching to green for word processing.

Egads is said to support both color and monochrome displays. It comes with a light-pen interface. The card features a 256K-byte bit-mapped graphics buffer and a random-access memory-loadable character generator.

The monitor costs $479, and Egads costs $269.

PC's Limited, Building Three, 1611 Headway Circle, Austin, Texas 78754.

■

Softcorp, Inc. has enhanced its **Sidestep** horizontal printing program for IBM Personal Computers and compatibles and dot matrix printers.

Sidestep is said to rotate an entire document 90 degrees. It includes improved font files that enable it to print more of the extended ASCII character set than before.

Sidestep costs $60. Registered Sidestep users can upgrade for $10.

Softcorp, Suite 244, 2340 State Road 580, Clearwater, Fla. 33575.

■

Fujitsu America, Inc. Peripheral Products Division has announced that the **IBM Proprinter command set** is available for its Model DX2100 and DX2200 dot matrix printers

According to the company, the command set is available on a single personality card that is switch-selectable between IBM Proprinter and IBM graphics printer commands

The IBM Proprinter command set including an 8K-byte buffer costs $75.

Fujitsu America, 3055 Orchard Drive, San Jose, Calif. 95134.

■

Panasonic Industrial Co. has announced the **KX-P1080AP** dot matrix printer, said to be compatible with Apple Computer, Inc.'s Macintosh and Apple IIC.

The printer has a built-in RS-232C adapter. It prints near-letter quality in all pitches at 24 char./sec. and draft quality at 90 char./sec.

The KX-P1080AP costs $379.

Panasonic, One Panasonic Way, Secaucus, N.J. 07094.

Control Your Network

Control Conference and Exposition



T-4 Public/Private Data Network I
Daniel Zatyko, President, Zatyko Associates.
Current status of IBM's communication architecture, including applications and standards, and development of X.25 up to 1988 CCITT adoption.

T-7 MAP/TOP Systems Interconnection I
Donald Herring, Vice President, Zatyko Associates.
Status of seven layer OSI Reference Model as framework for future network compatibility, review of major vendor architecture - IBM, DEC, etc; migration to manufacturing automation and office communication protocols.

Tuesday June 10 1986

9:00 am - 5:00 pm
Select One

T-8 Planning the Network Control Center
Gabriel Kasperek, President, Kazcom, Inc.
User considerations in the design, equipment selection, software, and instrumentation of a network control center and related vendor issues.

T-9 Problem Resolution and Network Management in SNA Networks
Fred Cook, Senior Consultant Kaptronix.
Techniques useful in analyzing problems in SNA networks. Topics include detailed SNA sequences. VTAM trace, NCCF, NPDA, NLDM and a review of critical parameters in NCP System Generation.

T-10 Network Modeling/ Design Workshop
Larry Rhue, Vice President, Connections Telecommunications Inc.
Network design calculations using MNDS PC-based design software and the complimentary Borland SIDEKICK package. Also included, queuing calculations in simple and complex network models, reflecting SDLC, BSC and X.25 protocols, statistical multiplexers and distributed concentrator networks.

T-11 ISDN II
Samuel Lynch, Senior Consultant, Zatyko Associates.
Technology and system/network/switching of ISDN, and certification and network testing, including 1986/87 field trials/user implementation.

T-12 System Network Architecture II
Thomas Routt, Senior Consultant, Zatyko Associates.
Technology and systems impact of SNA and relation to open architectures and protocols on networks from DEC and other vendors, and higher layer SNA services - DIA/DCA, PU 2.1, etc.

T-13 Public/Private Data Network II
Daniel Zatyko, President, Zatyko Associates.
Technology and systems impact of long distance, regional and in-house data networks, including message handling systems and office document interchange formats under different operating systems.

T-14 MAP/TOP Systems Interconnection II
Donald Herring, Vice President, Zatyko Associates.
Session will cover MAP/TOP common protocol connectivity, GM, and Boeing programs, other vendor demos, user experiences and the implications of Corporation for Open Systems on MAP/TOP, vendor standards and products.

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NM/TC is brought to you by the Communication Networks show team and is managed by CW/Conference Management Group, a division of CW Communications/Inc., publishers of Computerworld and Network World.

CW2

NEW PRODUCTS/MICROCOMPUTERS

Houston Instrument has introduced the multipen **PC Plotter**.

The PC Plotter features a four-pen carousel and plots on paper, vellum or overhead transparencies. The plotter contains Houston Instrument's DM/PL plotting language and, according to the vendor, can be used with hundreds of graphics software packages.

Two models are available. The PC Plotter 595 enables users to produce 8½- by 11-in. graphics, and the PC Plotter 695 allows for both 8½- by 11-in. and 11- by 17-in. graphics. Both models work with any computer containing a standard RS-232C-compatible interface and feature a resolution of 0.004 in. and a plotting speed of up to 4.2 in./sec.

The PC Plotter 595 costs $699, and the PC Plotter 695 costs $799.

Houton Instrument, 8500 Cameron Road, Austin, Texas 78753.

■

C. Itoh Digital Products, Inc. has introduced the **Prowriter C-315** and **Prowriter C-310 XP** dot matrix printers.

The C-315 is a 136-col. wide-carriage printer said to feature speeds up to 300 char./sec., bottom, top and rear paper feed and a push/pull tractor. Other features include a graphic resolution of up to 240 by 216 dot/in., an 8-bit parallel or RS-232 serial interface and a variety of resident character fonts.

The Prowriter C-310 XP lets users choose between Epson America, Inc. FX-85 and IBM Proprinter emulation. It also features print speed up to 300 char./sec. and a resolution of up to 240 by 216 dot/in.

The C-315 costs $819 and the C-310 XP costs $649.

C. Itoh, Suite 220, 19750 S. Vermont Ave., Torrance, Calif. 90502.

■

C. Itoh Digital Products, Inc. has announced the **Chroma Pro CM 3000** red-green-blue monitor and the **Chroma Pro CM 4000** enhanced graphics adapter-compatible monitor.

The CM 3000 is said to function as a monochrome monitor at the flick of a switch. For color graphics, it offers a resolution of 640 by 240 pixels.

The CM 4000 incorporates both high-resolution, enhanced 640 by 350 pixel and medium-resolution 64 by 240 pixel color graphics displays, conforming to IBM standards.

The Pro CM 3000 costs $649, and the Pro CM 4000 costs $799.

C. Itoh, Suite 220, 19750 S. Vermont Ave., Torrance, Calif. 90502.

■

Star Micronics, Inc. has introduced the **NL-10**, a nine-wire dot matrix desktop printer.

The NL-10 is said to print draft quality at 120 char./sec. and near-letter quality at 30 char./sec. It features plug-in interface cartridges available for the IBM Personal Computer and compatibles, the Commodore Business Machines, Inc. 64/128 and standard parallel computers.

The NL-10 is priced at $319. Each interface cartridge costs $60.

Star Micronics, Suite 3510, 200 Park Ave., New York, N.Y. 10166.

■

Diconix, Inc. has introduced the **Diconix 150**, a portable battery-powered ink-jet printer.

The Diconix 150 prints on single sheets of letterhead or continuous-feed computer paper with near-letter quality at speeds up to 150 char./sec. in draft mode. It connects to computers with a Centronics Data Computer Corp. 8-bit parallel interface and has full emulation of the IBM Proprinter or the Epson America, Inc. FX printer.

The Diconix 150 costs $479.

Diconix, 3100 Research Blvd., Dayton, Ohio, 45420.

Board level devices

Computer Peripherals, Inc. has announced the **Overachiever** enhancement board for the IBM Personal Computer XT and AT.

The Overachiever includes 1.5M bytes of memory, expandable to 3M bytes with a piggyback board. The board includes two software packages: Flip-Up, which performs 13 office functions such as calculating and data transfer, and a utility software package, which offers disk management and printer spooling management.

The Overachiever costs $595.

Computer Peripherals, 2635 Lavery Court, Newbury Park, Calif. 91320.

■

Everex Systems, Inc. has introduced a **graphics board** combining its Piggyback enhanced graphics adapter (EGA) board with its Enhanced Evergraphics board, a Hercules Computer Technology, Inc.-compatible monochrome adapter.

The combined board, which occupies a single expansion slot, is said to support enhanced color graphics on an enhanced monitor while supporting monochrome text on a monochrome monitor at the same time.

The product is priced at $350 for the Piggyback EGA, $249 for the Enhanced Evergraphics board alone and $599 for the combined boards purchased as a unit.

Everex Systems, 48431 Milmount Drive, Fremont, Calif. 94539.

■

Verbatim Corp. has announced **Datalife Databank** 30M-byte and 30M-byte plug-in cards and **Datalife CPU-Card**, a half-slot accelerator card, for the IBM Personal Computer family.

Datalife Databank occupies 1⅛ ex-

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NEW PRODUCTS/MICROCOMPUTERS

pansion slots. Access time is 78 msec, and the product supports hard disks of any capacity as well as the Xenix operating system from Microsoft Corp. It features a 3½-in. hard disk with automatic locking heads.

Datalife CPU-Card is said to replace the Intel Corp. 8088 microprocessor chip with the 80286.

The 30M-byte Datalife Databank costs $1,445, and the 20M-byte model costs $1,195. The Datalife CPU-Card costs $745.

Verbatim, 323 Soquel Way, Sunnyvale, Calif. 94086.

■

Genoa Systems Corp. has announced the **Spectrum Plus** graphics card as well as a reduced-size version of its **Spectrum Prime** graphics card.

Spectrum Plus, designed to take advantage of the 640K-byte random-access memory of the IBM Personal Computer XT, features extra functions such as clock and calendar, serial port and parallel port in addition to the Spectrum card's graphics functions.

Spectrum Prime fits any slot in the IBM Personal Computer and runs at speeds up to 9 MHz. It features compatibility with all monochrome and color monitors.

Spectrum Plus costs $499. Spectrum Prime costs $399 with parallel printer port and $349 without.

Genoa Systems, 73 E. Trimble Road, San Jose, Calif. 95131.

■

Definicom Systems, Inc. has announced the **DSI** family of 32-bit coprocessor boards for IBM-compatible personal computers.

The boards are said to provide full 32-bit minicomputer architecture. Features include 32-bit very large-scale integration circuits said to run at a minimum of 10 MHz.

The basic board features up to 2M bytes of random-access memory (RAM). Larger boards are available with up to 12M bytes of RAM.

Prices start at $1,495.

Definicom Systems, Suite 108, 31324 Via Colinas, Westlake Village, Calif. 91362.

■

Intelligent Data Systems, Inc. has introduced the **PC-88 Turbo High Speed Personal Computer** and the **PC-286 Advanced Technology Personal Computer** processors.

The PC-88 is said to be IBM Personal Computer XT compatible. It operates at 4.77 MHz and 8 MHz. The product features a 16-bit Intel Corp. 8088-2 microprocessor and Microsoft Corp. MS-DOS 2.11 as well as 256K bytes of random-access memory (RAM).

The IBM Personal Computer AT-compatible PC-286 features the Intel 80286 processor and 512K bytes of RAM.

The PC-88 costs $1,275, and the PC-286 costs $3,360.

Intelligent Data Systems, 14932 Gwenchris Court, Paramount, Calif. 90723.

■

Intelligent Data Systems, Inc. has announced the **B-420** high-resolution text and graphics card for the IBM family of Personal Computers and compatibles.

The B-420 is a full-size Hercules Computer Technology, Inc.-compatible card featuring a resolution text mode with a capacity of 1,440 dots by 348 lines and an 18- by 14-char. box. In its high-resolution graphics mode, it contains 720 dots by 348 lines.

The B-420 costs $195.

Intelligent Data Systems, 14932 Gwenchris Court, Paramount, Calif. 90723.

■

Intelligent Data Systems, Inc. has announced the **EGA+** card, said to operate in 16 different text and graphics modes.

The card includes 256K bytes of random-access memory. It is a half-size card that supports the IBM family of Personal Computers and compatibles. It offers emulation of IBM's Enhanced Graphics Adapter with a resolution of 640 dots by 350 lines and Color Graphics Adapter with 320-dot by 200-line resolution.

EGA+ costs $465.

Intelligent Data Systems, 14932 Gwenchris Court, Paramount, Calif. 90723.

■

Everex Systems, Inc. has introduced the **Enhancer** board, an enhanced graphics adapter video card said to be compatible with the IBM Enhanced Graphics Adapter.

The Enhancer includes a parallel printer port and 256K bytes of display memory and comes with the vendor's Egmode software. It also is said to provide 640- by 350-pixel resolution in 16 colors from a palette of 64 colors.

The Enhancer board costs $425.

Everex Systems, 48431 Milmount Drive, Fremont, Calif. 94539.

■

Independent Business Systems, Inc. has announced a 12-slot and a 20-slot **S-100 Motherboard**.

Based on the IEEE-696 standard, the boards include a battery backed-up clock and calendar. According to a company spokesman, the boards are actively terminated at both ends and were designed to reduce radio frequency interference on the bus.

The 12-slot Motherboard is priced at $250, and the 20-slot board is priced at $300.

Independent Business Systems, 5915 Graham Court, Livermore, Calif. 94550.



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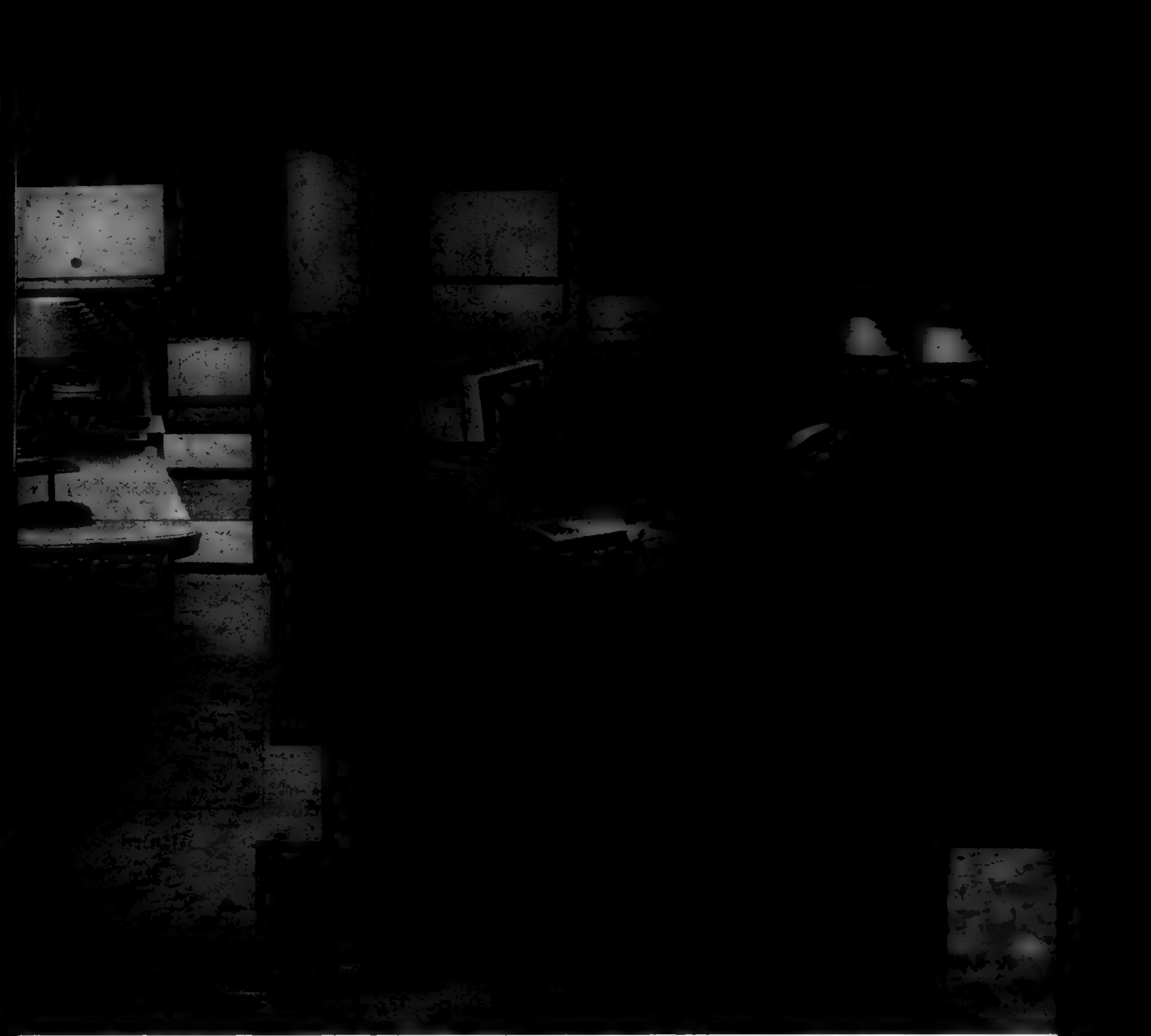
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Optional Graphics model	Yes	No	No
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Maximum non-volatile bytes per function key	256	4	64
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NEW PRODUCTS/MICROCOMPUTERS

Independent Business Systems, Inc. has announced the **Slavenet 186/512**, a 16-bit slave based on the 10-MHz Intel Corp. 80186 CPU.

The Slavenet 186/512 was designed for use in the IEEE S-100 bus. It features two serial ports with either 256K bytes, 512K bytes or 1M byte of dynamic random-access memory (RAM).

According to the vendor, it is capable of true 16-bit data transfers at 2M bit/sec.

Prices range from $995 for an 8-MHz 80186 with 256K bytes of RAM to $1,512 for a 10-MHz 80186 with a full megabyte of RAM.

Independent Business Systems, 5915 Graham Court, Livermore, Calif. 94550.

■

Gespac, Inc. has introduced the **GESMPU-4B**, a Motorola, Inc. 68000-based microcomputer board.

The board is built on a single-height eurocard and is compatible with the G-64 16-bit microcomputer bus. It uses a leadless 68000 microprocessor running at 8 MHz and can accommodate up to 64K bytes of CMOS random-access memory and 128K bytes of on-board erasable programmable read-only memory. The board also features three programmable timers and an RS-232 serial port. It can address up to 8M bytes of external memory.

The GESMPU-4B is priced at $395.

Gespac, 100 W. Hoover Ave., Mesa, Ariz. 85202.

■

Orchid Technology has announced the **Turbo PGA**, an IBM PGC-compatible graphics board for the IBM Personal Computer AT and RT.

The Turbo PGA offers a resolution of 640 by 480 pixels with 256 displayable colors out of a palette of more than a quarter-million colors. It features an on-board 8-MHz Intel Corp. 80186 processor and is said to be able to achieve a peak fill rate of 300 million pixel/sec.

The Turbo PGA costs $1,495.

Orchid Technology, 47790 Westinghouse Drive, Fremont, Calif. 94539.

■

Orchid Technology has introduced the **Turbo EGA** single-slot enhanced graphics adapter (EGA) for IBM Personal Computers.

According to the vendor, the Turbo EGA contains four video adapters, 256K bytes of graphics memory and an Intel Corp. 80286 processor. It is compatible with the IBM EGA, Color Graphics Adapter, MDA and the Hercules graphics card.

The Turbo EGA card costs $945.

Orchid Technology, 47790 Westinghouse Drive, Fremont, Calif. 94539.

■

Pro-Log Corp. has introduced **STD DOS Model OD 1.2**, a two-card configuration of its STD DOS system.

STD DOS is Microsoft Corp.'s MS-DOS 3.1 on industrial-quality STD DOS hardware.

The system consists of two circuit boards. The 7863 multifunction CPU card includes an Intel Corp. 8088 microprocessor, a BIOS programmable read-only memory (ROM), a clock and a tick interrupt.

The second board, a 7710 memory card, provides MS-DOS 3.1 in a 128K-byte ROM disk, a 128K-byte ROM disk for user programs, a 16K-byte work space random-access memory (RAM) and 112K bytes of static system RAM.

The Model OD 1.2 costs $1,195.

Pro-Log, 1560 Garden Road, Monterey, Calif. 93940.

■

TAT Graphics Group, Inc. has announced the **Galaxy GA1024**, a color graphics display controller board for use with personal computer computer-aided design systems.

The board is said to offer a noninterlaced 1,024- by 768-pixel display. It requires a red-green-blue monitor with a 48-kHz horizontal scan frequency. The Second Page option reportedly allows instant switching between two pictures on a single monitor.

The GA1024 costs $42,295. The Second Page option costs $300.

TAT Graphics Group, Building E, 1270 Lawrence Station Road, Sunnyvale, Calif. 94089.

Auxiliary equipment

Advanced Input Devices has unveiled the IBM-compatible **Ergokey EKT 82** keyboard.

The keyboard features 82 keys. It is said to be smaller in width than conventional keyboards and therefore suitable for travel. It features nonsilicone elastomer switch-mat switch technology.

The Ergokey EKT 82 costs $118.75.

Advanced Input Devices, W. 250 AID Drive, Coeur d'Alene, Idaho 83814.

COMMUNICATIONS

Controllers

Raycom Systems, Inc. has introduced the **Raycom 3200**, an IBM coaxial-compatible fiber data link.

The Raycom 3200 is said to allow optical-fiber replacement of coaxial cable used to interconnect the IBM 3274/3276 controller to 3278 terminals. It may also be used between Model 3299 coax multiplexers or between a remote multiplexer and its interconnected terminals.

The Raycom 3200 operates at a data rate of 2.36M bit/sec. It costs $695 a pair.

Raycom Systems, 6395 Gunpark Drive, Boulder, Colo. 80301.

Voice/data communications

Communications Analysis Corp. has announced the **Satellite-2M**, a private branch exchange data-collection device.

The package consists of a 2M-byte call buffer, a 1,200 bit/sec. modem, cable and Microsoft Corp. MS-DOS-based software. The unit connects to any private branch exchange's station message detail recording output using RS-232 cable. Its output connects to any standard telephone line with a modular RJ-11 plug.

The Satellite-2M holds from 15,000 to 32,000 call records. Records are transmitted to the call buffer and can be retrieved using an IBM

Continued on page 100

NEW PRODUCTS/COMMUNICATIONS

Continued from page 99

Personal Computer and a modem.

The package costs $2,495.

Communications Analysis, 100 Fountain . St., Framingham, Mass. 01701.

■

Kurzweil Applied Intelligence, Inc. has introduced the **KVS Porting Manual** and the **KVS Run-Time Library** for programmers wishing to integrate the Kurzweil Voicesystem (KVS) speech recognition device with host computers and operating systems.

The manual is said to describe the design, testing and operation of the KVS host-resident software. The run-time library is a collection of software subroutines called from a voice application program.

The KVS Porting Manual costs $2,500; a separate copy of the KVS runtime library costs $1,000. The KVS costs $6,500.

Kurzweil Applied Intelligence, 411 Waverly Oaks Road, Waltham, Mass. 02154.

■

Honeywell, Inc. has announced the **Delta-Plex Series 500** voice/data private branch exchange system, said to accommodate up to 120 stations initially, expandable to 240 stations.

The Series 500 includes a family of instruments. The CS10 is a 10-button programmable telephone with status lights and monitor capabilities. The CS20 is a 10-button programmable telephone with status lights, speakerphone and a 20-char. alphanumeric display. The CSD model is a 20-button digital set with speakerphone and menu-driven 80-char. display.

The Delta-Plex Series 500 is priced from $550 to $800 per station line.

Honeywell, Honeywell Plaza, Minneapolis, Minn. 55408.

Protocol converters

Industrial Networking, Inc. has introduced the **MIU-40 MAP Interface Unit**, a general-purpose Manufacturing Automation Protocol (MAP) interface.

The interface is said to enable most MAP host systems or factory automation devices to attach to the vendor's MAP/One local-area network system. The MIU-40 includes a controller board, a 10M bit/sec. token-bus modem board and the vendor's custom dual gate-array chip set.

Data is passed from the host to the MIU-40 at 56K bit/sec. using the High-Level Data Link Control serial communications protocol.

The unit is priced at $5,100.

Industrial Networking, 3900 Freedom Circle, Santa Clara, Calif. 95052.

■

Kentrox Industries, Inc. has introduced the **Slick Switch**, a T1 interface system said to provide digital termination for T1 subscriber and loop carrier systems at the fiber interface.

The Slick Switch provides error detection, format conversion capability and automatic protection switching compatible with AT&T's SLC-96. It is integrated with provisions for order wiring and fault locating and is said to be the first application set for the vendor's T-Term T1 facilities terminal.

Prices for typical configurations range from $2,000 to $5,000.

Kentrox Industries, P.O. Box 10704, 14375 N.W. Science Park Drive, Portland, Ore. 97210.

Software

Network Software Associates, Inc. has announced **Synctalk**, a peer-to-peer synchronous communications and file transfer program for IBM Personal Computers and compatibles.

Synctalk is said to allow two personal computers to communicate and exchange files at speeds up to 9.6K bit/sec. using IBM's Synchronous Data Link Control protocol. Synctalk features data compression techniques, support of leased and dialed lines, Help screens, password protection and optional automatic dialing and call-directory features.

Other features include interactive message exchange and file transfer capabilities.

Synctalk costs $195.

Network Software Associates, 22982 Mill Creek, Laguna Hills, Calif. 92653.

■

Honeywell, Inc. has announced **Mapstart**, a development tool for integrated automation using Manufacturing Automation Protocol (MAP) networks.

Mapstart is a hardware and software package said to let manufacturers simulate and test MAP-compatible systems with applications specific to their own operations. Users may also implement a MAP network in pilot applications on-line.

The hardware consists of a Honeywell WCC 1250 work center controller featuring up to 8M bytes of memory and programmable in either C or Cobol. It can handle 32 simultaneous I/Os for real-time, on-line control.

Mapstart costs approximately $176,000.

Honeywell, 2222 W. Peoria Ave., Phoenix, Ariz. 85029.

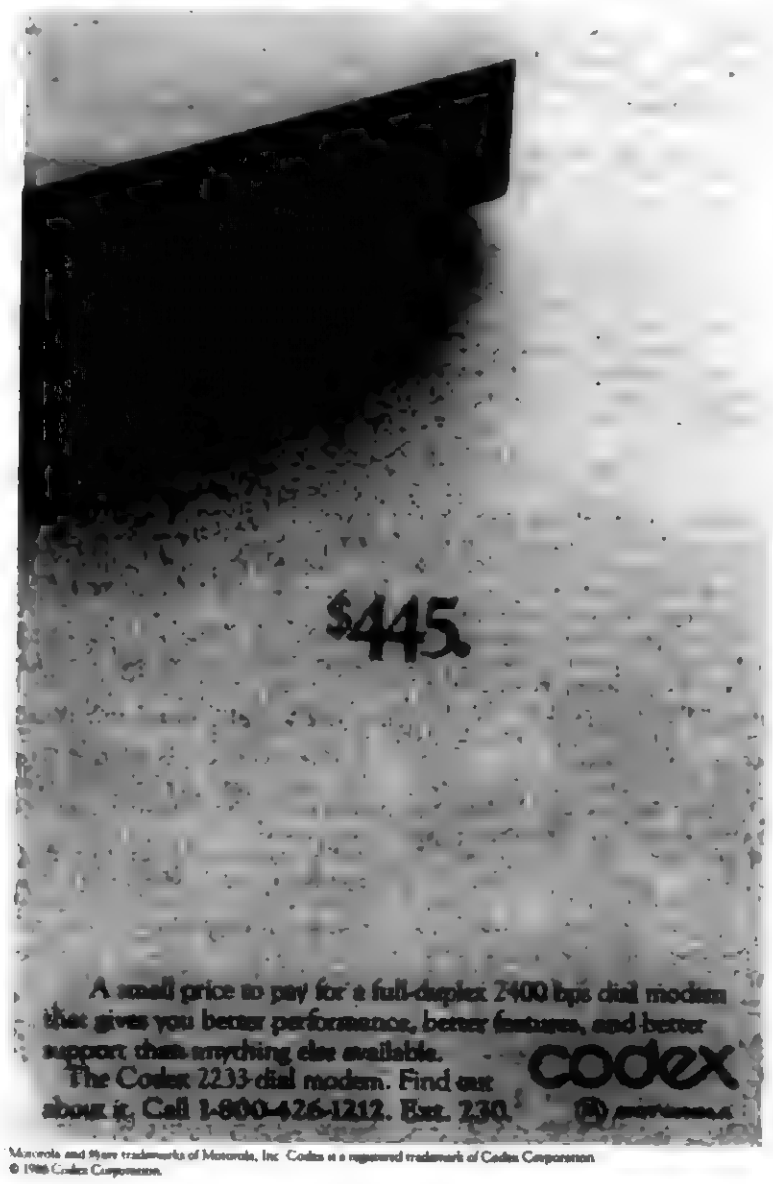
■

Pictel Corp. has annoucned **MCT-200**, a software package for its C-2000 Video Codec.

The software is said to boost the system's operating range to 168K bit/sec. The package employs proprietary compression technology, the vendor said. By operating at up to 168K bit/sec., MCT-200 is said to enable companies to create hybrid videoconferencing networks that contain both high-speed private transmission circuits and switched 56K bit/sec. networks.

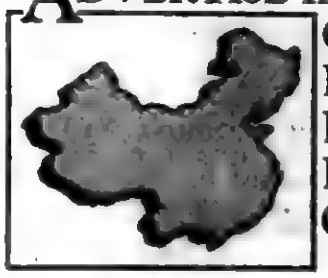
The MCT-200 will be available in the fall as a plug-in cartridge for $9,500.

Pictel, One Intercontinental Way, Peabody, Mass. 01960.



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NEW PRODUCTS/COMMUNICATIONS

Orion Software, Inc. has announced **Network Orion**, a set of integrated communications software programs designed for banking institutions using the IBM System/34, 36 and 38 computers.

The software is said to allow users to send messages into the international Telex network and access the international electronic mail networks. Banks can also integrate their application programs such as funds transfer, operational banking reports, letters of credit and end-of-day bank position reports with various networks and communications resources.

Network Orion costs $5,000 to $15,000 per site.

Orion Software, 1050 Waltham St., Lexington, Mass. 02173.

■

Frontier Software Development, Inc. has introduced **APAC**, a software package for automated and unattended control of Hewlett-Packard Co. protocol analyzers.

The APAC package is said to act as a master to one or more protocol analyzers operating as slaves. It combines real-time data gathering with number crunching and allows several tests to be linked together without user intervention.

Other features include the ability to share host resources and create statistical reports. It has autodial modem support, so analyzers can be located at remote sites.

APAC costs $1,995.

Frontier Software Development, 14 Livery Road, Chelmsford, Mass. 01824.

■

Communications Solutions, Inc. has introduced **Disoss/Talk**, said to provide a user interface to IBM office automation products such as the Distributed Office Support System (Disoss).

Disoss/Talk was designed as an option to the vendor's Access/DIA package, a portable software emulation of IBM's Document Interchange Architecture. Disoss/Talk enables users to distribute documents to one or more recipients, retrieve documents that have been sent by other users and search libraries to retrieve selected files.

Disoss/Talk runs on a range of multitasking operating systems, including Unix and Microsoft Corp. MS-DOS. When bought with Access/DIA, it costs $10,000.

Communications Solutions, 992 S. Saratoga-Sunnyvale Road, San Jose, Calif. 95129.

Multiplexers/Modems

Eventide, Inc. has introduced the **Cloverleaf** multiplexer/spooler for Hewlett-Packard Co. HP-IB-based devices.

The Cloverleaf is said to buffer data from up to three computers, queue each job and parcel out the material sequentially to up to two peripherals.

According to the vendor, the Cloverleaf can buffer files to pen plotters.

The Cloverleaf is available in three configurations: with 256K bytes of memory, the price is $1,695: with 1M byte of memory, the cost is $2,495; and with 2M bytes of memory, Cloverleaf is available for $3,295.

Eventide, One Alsan Way, Little Ferry, N.J. 07643.

■

DEI-Teleproducts Division has announced the **Model 1010** and the **Model 1011**, asynchronous short-haul modems.

Both models are said to derive power from the RS-232C interface and to transmit data up to six miles at up to 9.6K bit/sec. and up to five miles at 19.2K bit/sec.

The modems come equipped with a six-ft line cord terminating with an RJ-11 modular telephone plug, the vendor said.

The modems cost $90 each.

DEI, 230 N. Market Place, Escondido, Calif. 92025.

Anderson Jacobson, Inc. has announced the **AJ 2412-AD3H**, an IBM Personal Computer AT-compatible 2,400 bit/sec. modem.

The modem is said to offer a full-featured memory dialer, programmable software options, an extended AT command set, callback and answerback security and multilevel password security.

The AJ 2412-AD3H is said to communicate over the switched telephone network. It handles synchronous or asynchronous data and eight- through 11-bit characters and interfaces with most communications software packages.

The modem is priced at $599.

Anderson Jacobson, 521 Charcot Ave., San Jose, Calif. 95131.

■

Cylink Corp. has announced the **CIDEC-LS** a Data Encryption Standard-based low-speed digital encryptor.

The CIDEC-LS operates in the full-duplex mode for synchronous communciations between 1,200 bit/sec. and 112K bit/sec. It supports the RS-232C, CCITT V.35 and RS-449 interfaces.

The encryptor is said to

Continued on page 104

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AIM HIGH!

NEW PRODUCTS/COMMUNICATIONS

Continued from page 102

implement a proprietary, automatic electronic key management system called Seek. According to the vendor, even the system operator never has access to the Seek encryption method.

The CIDEC-LS is priced at $2,500.

Cylink, 920 W. Fremont Ave., Sunnyvale, Calif. 94087.

■

Omnitel, Inc. has introduced the **Encore 2400 HB**, a 2,400 bit/sec. half-board integral modem.

The asynchronous modem, designed for use with the IBM Personal Computer, Personal Computer XT, AT and compatibles is said to be compatible with Hayes Microcomputer Products, Inc. products. It operates on the switched telephone network in full- or half-duplex operation at 300, 1,200 and 2,400 bit/sec.

Features include a speaker with software-controlled volume, call-progress reporting and automatic speed selection and fallback.

The Encore 2400 HB costs $399.

Omnitel, 5415 Randall Place, Fremont, Calif. 94538.

■

Comdesign, Inc. has introduced the **TC-1000 Unibus Concentrator** and the **TS-1000 Switching Multiplexer**, two asynchronous multipoint multiplexers said to provide remote connectivity for personal computers and terminals to Digital Equipment Corp. CPUs.

The TC-1000 is a single hex-width board that supports 64 simultaneous sessions. It emulates the asynchronous portion of eight DEC DMF-32 communications controllers.

The TS-1000 is capable of connecting terminals from as many as four remote sites. Up to 32 computer ports and terminal connections are supported at each site at speeds up to 9.6K bit/sec.

Pricing starts at $2,100 for the TS-1000. The TC-1000 costs $7,500.

Comdesign, 751 S. Kellogg Ave., Goleta, Calif. 93117.

■

Western Telematic, Inc. has introduced the **SM-21 Modem Security Unit**, designed to prevent unauthorized computer system ac-

The unit allows users to set up security for incoming and outgoing calls. It connects to a computer's communications port and offers three levels of security using a 24-char. password and dial-back field of password only, number only or both password and number.

The SM-21 costs $495. With a built-in modem, it costs $695.

Western Telematic, 2435 S. Anne St., Santa Ana, Calif. 92704.

Local-area networks

SBE, Inc. has announced the **SBE-MLAN-11**, a plug-in Ethernet local-area network front-end processor for Intel Corp. Multibus systems.

The board is said to be able to handle gateway tasks linking local-area network and long-distance carriers. The board conforms to Ethernet IEEE 802.3 specifications.

According to the vendor, the board provides an effective Ethernet transfer rate of 10M bit/sec. Full-duplex direct memory access operation is provided through the serial/parallel and iSBX channels. Protocols supported include X.25, Synchronous Data Link Control, High-Level Data Link Control, bisynchronous and asynchronous.

In quantities of 100, the SBE-MLAN-11 costs $1,495.

SBE, 2400 Bisso Lane, Concord, Calif. 94520.

Network services

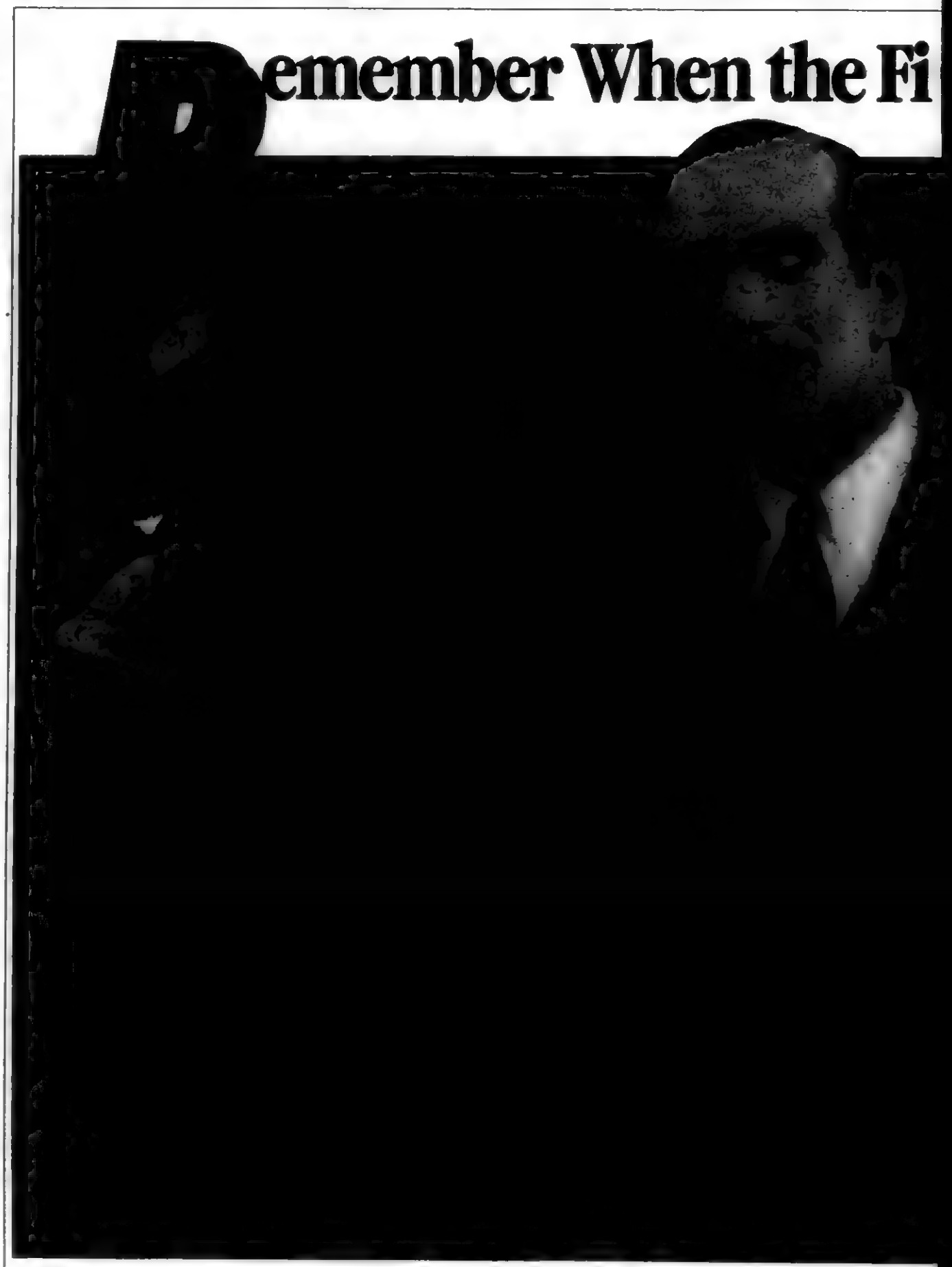
Timeplace, Inc. has announced that **Edvent II**, a data base containing descriptions of seminars and training programs, is available on the Compuserve, Inc. Information Service.

Users may select seminars by subject, state or date. Information about each event includes title, content summary, sponsor, location, date, duration and cost.

The data base is updated twice a month.

Access to the Compuserve Information Service is via personal computer, communications software and a modem.

In addition to the regular Compuserve connect rates, Edvent II costs $15 per hour, according to the vendor.



NEW PRODUCTS/COMMUNICATIONS

Timeplace, 460 Totten Pond Road, Waltham, Mass. 02154.

Test equipment

Mount Sinai Patient Care Control Systems has announced the **Response Time Monitor**, designed to pinpoint problem areas in a Burroughs Corp. communications network in graphic form.

The unit is said to measure the impact of operational procedures and program changes on system performance.

The Response Time Monitor operates on an IBM Personal Computer, Personal Computer XT or AT. It monitors traffic on a Burroughs poll-select asynchronous communications line and records the delay between transmission and receipt of message.

The Response Time Monitor costs $495.

Mount Sinai PCCS, Suite 406, 975 Arthur Godfrey Road, Miami Beach, Fla. 33140.

■

Atlantic Research Corp. has announced the **NTS 3000 Network Restoration, Test and Management System.**

The NTS 3000 is said to automatically monitor a network, restore service and access circuits with simple commands for troubleshooting.

It is composed of circuit alarms, A-B fallback and crossover switches, circuit access subsystems for testing, test equipment for troubleshooting, trouble tickets to document the problems and a data base management subsystem to summarize network activity.

A basic NTS 3000 configuration of 1,000 lines costs $190 per line.

Atlantic Research, 5390 Cherokee Ave., Alexandria, Va. 22312.

Atlantic Research Corp. has announced the **NTS 2000 Distributed Network Restoration and Test System.**

The NTS 2000 is said to restore service to remote data communications circuits from one location. Two configurations are offered, the LSC-2 system for CRT control of A-B fallback switches and the RCS-100 Remote Control Switch system for automatic reconfiguration, Touch-Tone or terminal control.

A basic NTS 2000 configuration of 1,000 lines is priced at $155 per line.

Atlantic Research, 5390 Cherokee Ave., Alexandria, Va. 22312.

SYSTEMS & PERIPHERALS

Turnkey systems

Syntrex, Inc. has introduced its **Concorde** family of 32-bit computers designed for the legal profession.

Continued on page 106

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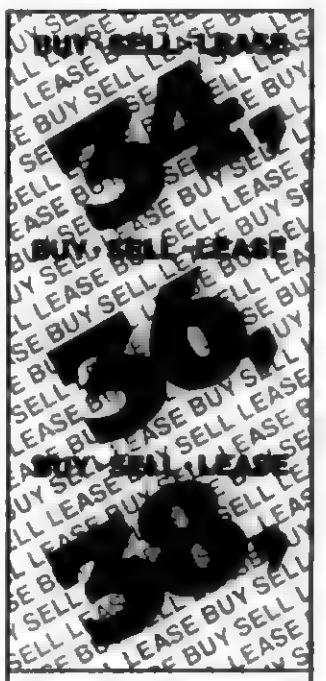
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Continued from page 106

The Model 10 microcomputer has 2M bytes of memory and 67M bytes of hard disk storage. Models 30, 40 and 50 support up to 8M bytes of main memory, 16K bytes of bipolar cache memory and more than 1,800M bytes of data storage. The Model 60 has up to 16M bytes of main memory and 65K bytes of bipolar cache memory as well as more than 10,000M bytes of on-line data storage.

Prices start at $15,000.

Syntrex, P.O. Box 657, 246 Industrial Way W., Eatontown, N.J. 07724.

■

Phonetics, Inc. has introduced the **Sensaphone Computer Monitoring System**, designed to watch computer rooms, offices, laboratory facilities and any unattended property 24 hours a day.

The system warns users of environmental changes and alarm conditions.

If there is a problem, the Sensaphone Computer Monitoring System automatically calls up to four phone numbers and reports the alarm condition in English.

According to the vendor, the user can also call at anytime to check operating conditions.

Sensaphone Monitoring Systems are priced from $250 to $500.

Phonetics, 101 State Road, Media, Pa. 19063.

Processors

Ironics, Inc. has announced the **Performer 32/D** VMEbus Unix V.2 development/target system.

The multiuser system is based on two of the vendor's VMEbus boards. Features include memory management and floating-point coprocessor facilities as well as parallel and serial I/O interfaces.

Mass storage includes floppy disks, 80M-byte Winchester disks, removable cartridge tapes and optional 9-track tape.

A C-compiler and Motorola, Inc. 68000 assembler are provided with all Unix systems.

Prices start at $17,335.

Ironics, 798 Cascadilla St., Ithaca, N.Y. 14850.

Graphics Systems

Graphon Corp. has added the **GO-235** to its GO-200 series of composite terminals.

According to the vendor, the GO-235 offers 1,024- by 780-pixel resolution and 60 Hz noninterlaced video.

It features graphics emulation of the Tektronix, Inc. 4010 through 4015 graphics devices and alphanumeric emulation of the Digital Equipment Corp. VT220 and VT100.

The GO-235 is said to write up to 52 lines of text to the 80 by 132-col. screen in alpha mode.

The GO-235 costs $1,695.

Graphon, 5th Floor, Tower One, 1901 S. Bascom Ave., Campbell, Calif. 95008.

■

TAT Graphics Group, Inc. has announced the **Galaxy EGX2**, a graphics display controller said to provide 800- by 600-pixel resolution.

The Galaxy board offers a multiplexing feature. It can display separately either IBM Enhanced Graphics Adapter board output at 640 by 350 pixels or Color Graphics Adapter output at 640 by 200 pixels monochrome and 320 by 200 pixels color.

The board comes with the Galaxy ADI driver for Autodesk Corp.'s Autocad. It is also available combined with the Digital Equipment Corp. Multisync monitor as the Sextant 814S display system.

The EGX2 graphics board costs $1,195. The Sextant 814S costs $1,995.

TAT Graphics Group, Building E, 1270 Lawrence Station Road, Sunnyvale, Calif. 94089.

■

Seiko Instruments U.S.A., Inc. has announced the Screenplay digitizing tablet.

According to the vendor, the tablet is plug compatible with the Summagraphics Corp. Bit Pad Two. Screenplay is an 11-in. by 11-in. tablet featuring sampling rates up to 200 point/in. and resolution up to 1,000 line/in.

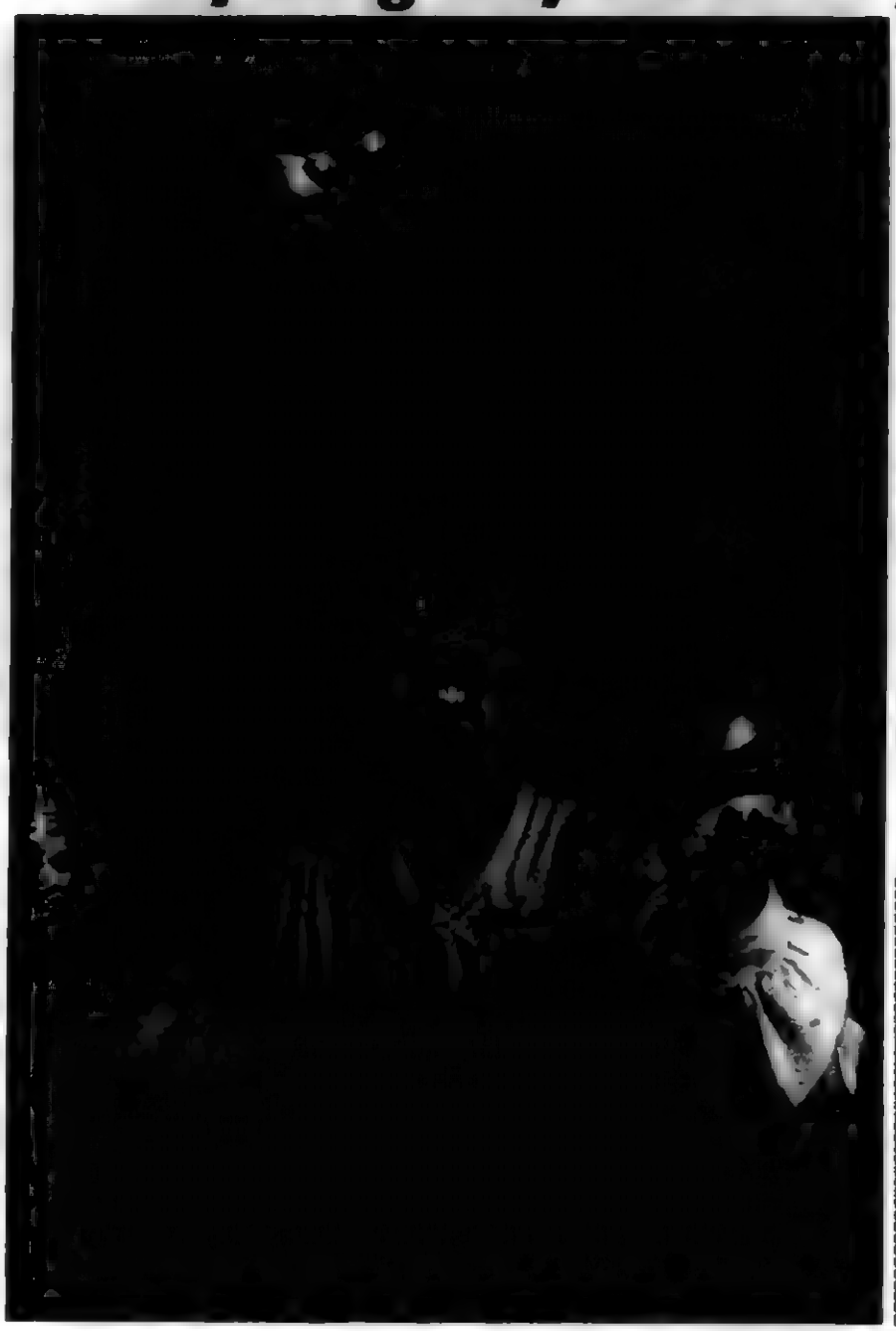
Screenplay reportedly supports three input device types: a four-button cursor, a mouse-like three-button cursor and a one-button stylus pen.

Seiko Instruments said that built-in diagnostic functions include power-on confidence test, on-line self-test and loop-back self test.

Screenplay is priced at

Continued on page 108

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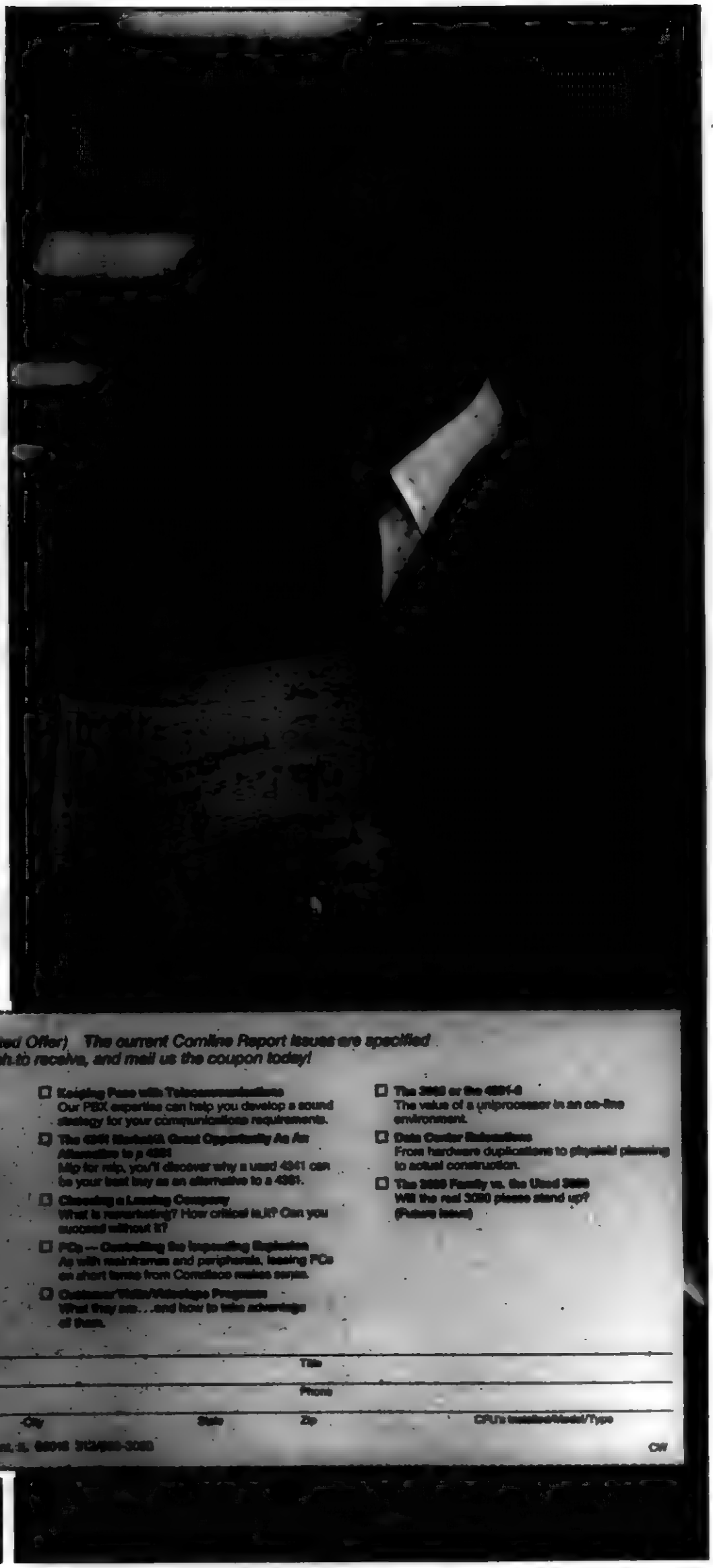
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NEW PRODUCTS/SYSTEMS & PERIPHERALS

Continued from page 104

$495.

Seiko Instruments U.S.A., 1623 Buckeye Drive, Milpitas, Calif. 95035.

■

AMF Logic Sciences, Inc. has introduced the **Turbograph 2100**, a high-speed processor for recording computer-generated images on color slide or print film.

According to the vendor, the vector-to-raster processor can accept graphics data from a variety of host computer systems, including PCs.

It is compatible with industry standard graphics command languages or Hewlett-Packard Co.'s Graphics Language.

An image is transferred to the Turbograph 2100 via an RS-232C serial data link. The digital controller converts the image to a 2,048- by 2,048-pixel raster format and passes it on to a digital film recorder.

The Turbograph 2100 costs $7,995.

AMF Logic Sciences, 10808 Fallstone Road, Houston, Texas 77099.

■

Westward Technology, Inc. has announced the **Model 2315** graphics terminal and the **Model 2216** color desktop graphics terminal.

The 2315 features a 15-in., full square tube display with 1,024- by 784-pixel resolution, two independent graphics planes and Digital Equipment Corp. VT100 compatibility. It also includes 512K bytes of display-list memory.

The 2216 provides 640- by 490-pixel resolution, 16 simultaneous colors and serial line speed to 38.4K bit/sec. It also has a 15-in., full square tube display, DEC VT100 and VT220 emulation and Tektronix, Inc. 4105 compatibility.

Both terminals are priced at $4,995.

Westward Technology, 63 Great Road, Maynard, Mass. 01754.

■

Greyhawk Systems, Inc. has announced **Softplot 2122**, a 5-ft high graphics display device.

Softplot 2122 is said to display full-color D-size drawings. A black or white background can be selected.

It features a 16-level gray scale and lines that can be drawn at widths ranging from 10mm to 50mm in a single pass. There are 120 million addressable points.

According to the vendor, the Softplot 2122 connects to existing computer-aided design and manufacturing networks and emulates software plotting standards such as Hewlett-Packard Co.'s Graphic Language, Calcomp Co.'s 906/907 and Versatec, Inc.

Softplot 2122 is priced at $46,176.

Greyhawk Systems 1557 Centre Pointe Drive, Milpitas, Calif. 95035.

■

Versatec, Inc. has announced **Acris II**, the Model 950 aperture card raster input scanner, as a replacement for its Acris I.

Acris II is said to offer users fine line detection capability as well as output resolution settings to accommodate the vendor's electrostatic plotters. It includes selectable variable windowing that provides users with the capability to define their own custom-image window size and magnification level.

Acris II is priced at $16,750.

Versatec, 2710 Walsh Ave., Santa Clara, Calif. 95051.

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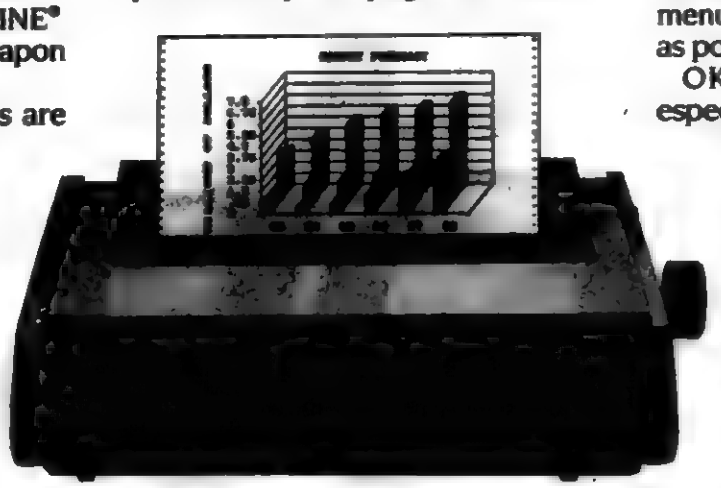
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OKIDATA MICROLINE 290's are faster than other leading printers in their class. And we can prove it. We recently compared the MICROLINE 292 to the IBM® Proprinter and the Epson® FX286.

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Laser printers with the print quality your work deserves and the versatility your applications demand.

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To find out more about the LN03, write: Digital Equipment Corporation, 129 Parker Street, PK03-1/9D, Maynard, Massachusetts 01754. Or call your local Digital sales office or Authorized Terminals Distributor.

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NEW PRODUCTS/SYSTEMS & PERIPHERALS

Data storage

Cambex Corp. has introduced the **Cambex Certainty 250 series**, a disk storage system for IBM Series/1 users.

The series is available in 200M-byte increments that can be expanded up to 800M bytes per system. The system comes with an on-board cache memory of 512K bytes.

According to the vendor, users can mount up to two disks in the standard IBM 4967 mounting space. The disk storage system is said to be IBM 4967 software compatible.

The Certainty 250 series is priced at $20,000.

Cambex, 360 Second Ave., Waltham, Mass. 02154.

■

Storage Concepts, Inc. has announced the **MV21** parallel transfer disk storage system for use with Digital Equipment Corp.'s Microvax II.

According to the vendor, the MV21 offers a sustained transfer rate of more than 8M bit/sec. It also provides a high-speed port for up to 9.3M bit/sec. data transfers.

The MV21 is comprosed of a rack-mountable disk processor, a single quad-height board assembly, a parallel transfer disk and a device driver for the MicroVMS operating system. It has five parallel channels.

A complete system is priced at $42,400. The Microvax device driver is priced at $2,000.

Storage Concepts, 3198-G Airport Loop Drive, Costa Mesa, Calif. 92626.

■

NCR Corp. has announced the **ADP-53**, a small computer systems interface (SCSI) to ½-in. Pertec Peripherals Corp. tape controllers.

The unit was designed to control up to four streaming tape drives using the industry-standard Pertec tape interface. It supports multiple tape speeds and densities as well as data formats.

Features include an SCSI copy function, a 64K-byte intelligent buffer memory with parity, sequential tape I/O and standard SCSI initiator and target roles.

The single-ended board is priced at $1,100.

NCR Corp., 3718 N. Rock Road, Wichita, Kan. 67226.

Printers/Plotters

Versatec, Inc. has announced the **Model 250 RGB Video Controller**, said to produce hard copy in color or monchrome from digital video sources.

The controller is said to allow video images to be output as hard copy on Versatec printers and plotters. It can capture color images from any screen resolution up to 1,280 by 1,024 pixels. It has a selectable pixel expansion feature and an image-rotate option.

The RGB Video Controller is priced at $2,500.

Versatec, 2710 Walsh Ave., Santa Clara, Calif. 95051.

■

Polaroid Corp. has introduced the **Chromajet 4000** ink jet printer, manufactured by Advanced Color Technology, Inc.

The printer offers four colors that can be combined for a palette of 1,000 color shades with resolutions up to 300 dot/in. Text can be printed in seven colors using bold, italic, double-width or condensed type styles.

Letter print mode operates at 27 char./sec. and 360 by 144 dot/in., and draft mode at 100 char./sec. and 120 by 72 dot/in.

The Chromajet 4000 will be available in the third quarter of this year for prices ranging from $2,000 to $3,000.

Polaroid, 575 Technology Sq., Cambridge, Mass. 02139.

■

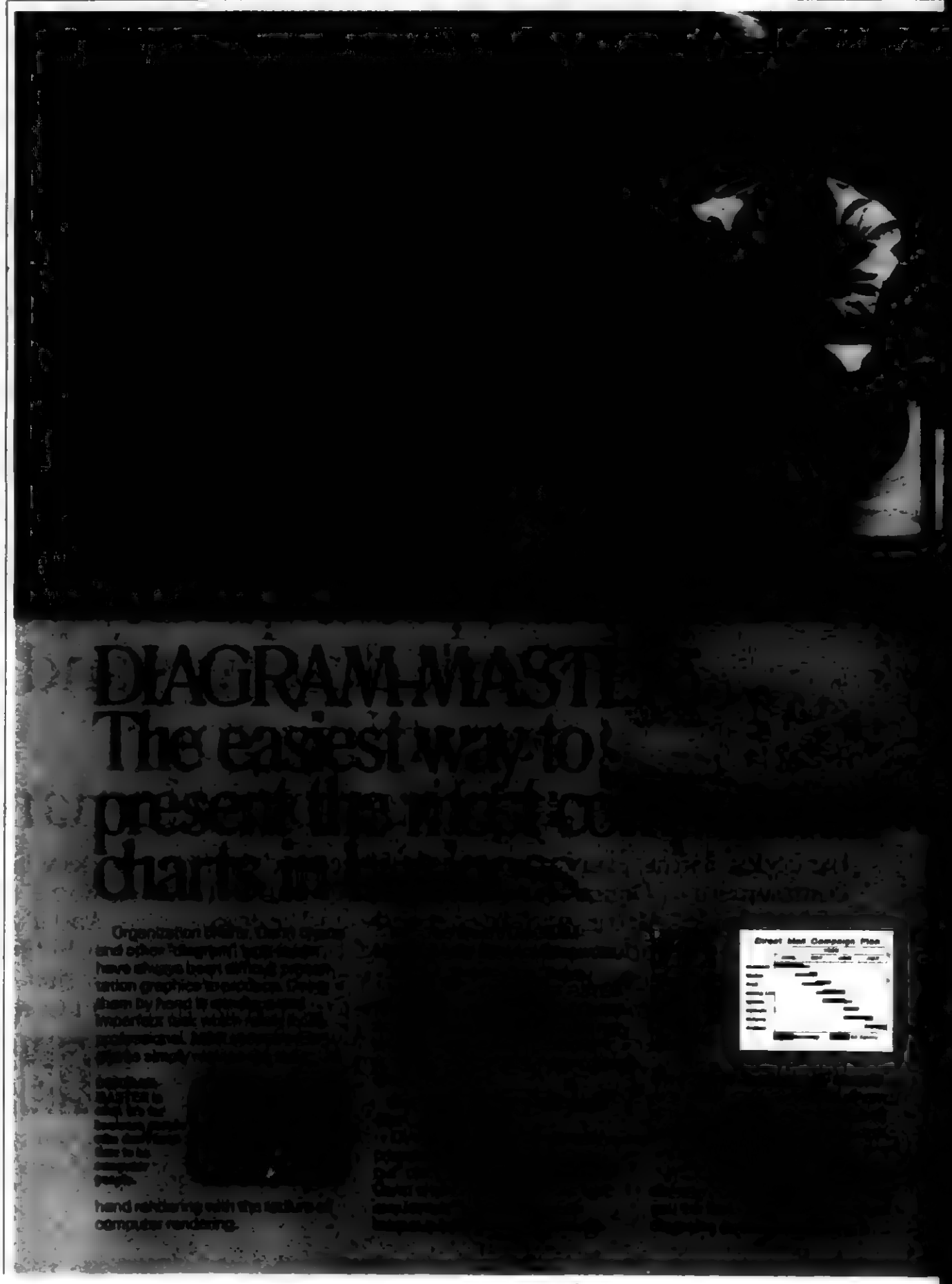
General Business Technology, Inc. has introduced the **GBT 6640XP** ion printer for the IBM System/34, 36 and 38.

The nonimpact printer has a print speed of 30 page/min and a resolution of 300 by 300 dot/in. It uses standard letter 8½- by 11-in. or legal 8½- by 14-in. paper.

Dual input feeders hold up to 500 sheets each. User features include program- and operator-selectable page orientation, font, lines per inch, characters per line, copies and I/O feeder.

The GBT 6640 ion printer costs $14,995.

General Business Technology, 1891 McGraw Ave., Irvine, Calif. 92714.



NEW PRODUCTS/SYSTEMS & PERIPHERALS

Tektronix, Inc. has introduced the **4696 Color Inkjet Printer**, a desktop personal printer.

The printer features addressability of 120 dot/in. It offers four inks and can produce output on paper and transparency media.

Two system configurations are available. The 4696S Color Graphics Output System combines the 4696 and the 4510 Color Graphics Rasterizer. It is host-based and performs as a shared plotting resource off ASCII-based computers.

The IBM-compatible CX4696S Color Graphics Output System is priced at $8,995.

The 4696 is priced at $1,795, the 4696S costs $6,995, and the CX4696S costs $8,995.

Tektronix, P.O. Box 1700, Beaverton, Ore. 97075.

Auxiliary equipment

Dataproducts Supplies Division has announced the **Centronics 350** nylon cartridge ribbon and the **Burroughs 9246/Hitachi wide-ribbon** printer ribbons, said to be compatible with printers from Centronics Data Computer Corp., Burroughs Corp. and Hitachi Ltd.

The Centronics 350 ribbon is priced at $107 per six-pack. The Burroughs 9246/Hitachi ribbons cost $34 each for the 0.005 width ribbon and $36 each for the 0.004 width ribbon.

Dataproducts Supplies Division, Suite 310, 15250 Ventura Blvd., Sherman Oaks, Calif. 91403.

■

Allied Electronic Services, Inc. has introduced the **Tempo RTM Coax**, a response time monitor (RTM) for use with IBM's 3179 and 3180, ITT Courier and most IBM terminal look-alikes.

The RTM Coax is said to interface with most terminals using coaxial cables or an IBM 3274 controller. It records each transaction and compiles the daily information into a statistical data base. It is portable and provides software identification.

The Tempo RTM Coax is priced at $3,295. The pollable model, for use in remote sites, costs $3,495.

Allied Elecronic Services, P.O. Box 819, Stonybrook Road, Lebanon, N.H. 03766.



PRICE REDUCTIONS

On-Line Software International, Inc. has reduced the prices of its **Omnilink/34, Executrieve/34** and **Data Entry/34** software products for the IBM System/34.

Omnilink/34 is a System/34-to-personal computer file transfer software link. It now costs $1,000. The file reformatting utility costs $200 per copy, $185 per copy for up to 10 copies and $160 per copy for more than 10 copies.

Executrieve/34 is a data management package for retrieval, ad-hoc query, report writing and graphics. It costs $1,500.

Data Entry/34 is an application tool for use with Executrieve/34 and is said to give users the ability to design single-screen applications for data entry and storage. It costs $500.

On-Line Software, Two Executive Drive, Fort Lee Executive Park, Fort Lee, N.J. 07024.

■

Verticom, Inc. has announced price cuts on its **VG series** of Tektronix, Inc. terminal emulation packages.

The packages allow the IBM Personal Computer family and compatibles to take the place of Tektronix 4107 and 4109 devices. The packages incorporate Grafpoint's Tgraf-07 software and Verticom's graphics controller.

The new prices are as follows: VG-07, $3,495; VG-07A, $5,995; VG-09, $2,795; and VG-09A, $2,695.

Verticom, 545 Weddell Center, Sunnyvale, Calif. [illegible]

■

Independent Business Systems, Inc. has announced price reductions on its 16-bit multiuser **Ultraframe** computer systems.

Ultraframe systems support from two to 32 users. They are available in configurations of hard and floppy drives as well as tape backup systems.

Prices now start at $6,995. A typical 16-user system with a 74M-byte hard disk now costs $24,235.

Independent Business Systems, 5915 Graham Court, Livermore, Calif. 94550.

NEWS

CALENDAR

WEEK OF JUNE 8

JUNE 8-11, NEW ORLEANS — **Ethernet Decision-Makers Group Exchange Conference.** Contact: EDGE International, Inc., Suite 260, 1539 N. China Lake Blvd., Ridgecrest, Calif. 93555.

JUNE 8-11, TORONTO — **World Computing Services Industry Congress V.** Contact: Co-Ordination Plus, Inc., Suite 2102, 65 Queen Street W., Toronto, Ont., Canada M5H 2M8.

JUNE 9-10, TEANECK, N.J. — **Machover on Business Graphics.** Contact: Carol Every, Industry Representative, Frost & Sullivan, Inc., 106 Fulton St., New York, N.Y. 10038.

JUNE 9-11, MYRTLE BEACH, S.C. — **The Association of Small Computer Users in Education 18th Annual Summer Conference.** Contact: Jack Cundiff, Horry-Georgetown Technical College, Conway, S.C. 29526.

JUNE 9-11, NORCROSS, GA. — **Time and Motion Study Fundamentals.** Contact: Institute of Industrial Engineers Registrar, 25 Technology Park/Atlanta, Norcross, Ga. 30092.

JUNE 9-12, BOSTON — **Network Management/ Technical Control Conference and Exposition.** Contact: CW/Conference Management Group, 375 Cochituate Road, Framingham, Mass. 01701.

JUNE 9-12, CHICAGO — **Com Lease Spring, The Computer Leasing Conference and Expo.** Contact: Show Management Offices, 3825-I S. George Mason Drive, Falls Church, Va. 22041.

JUNE 9-13, SAN DIEGO — **MUMPS Users' Group 15th Annual Meeting.** Contact: MUMPS Users' Group, Suite 510, 4321 Hartwick Road, College Park, Md. 20740.

JUNE 11, NEW YORK — **The Semiconductor Industry — Its Changing Structure 1986.** Contact: Robert Burton, L. F. Rothschild, Unterberg Towbin, 55 Water St., New York, N.Y. 10041.

JUNE 11-13, MAINZ, WEST GERMANY — **International Tandem Users' Group 1986 Spring Conference.** Contact: ITUG Headquarters, Suite 600, 111 E. Wacker Drive, Chicago, Ill. 60601.

JUNE 11-13, TEANECK, N.J. — **Machover on CAD/ CAM.** Contact: Carol Every, Industry Representative, Frost & Sullivan, Inc., 106 Fulton St., New York, N.Y. 10038.

JUNE 13, DETROIT — **James Martin Seminar — The End-User Revolution.** Contact: Thomas J. Bisacquino, Director of Education, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

WEEK OF JUNE 15

JUNE 15-20, LONG BEACH, CALIF. — **1986 Government Management Information Sciences Conference.** Contact: Tom Lang, Assistant Chairman, Data Processing Department, 9150 E. Imperial Highway, Downey, Calif. 90242.

JUNE 16-18, UNIVERSAL CITY, CALIF. — **Synergy '86, Conference on Functional Interfacing for Computer-Integrated Manufacturing.** Contact: Cheri Willetts, Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

JUNE 16-19, LAS VEGAS — **The 1986 National Computer Conference.** Contact: National Computer Conference, 1899 Preston White Drive, Reston, Va. 22091.

JUNE 16-20, CAMBRIDGE, MASS. — **Managing Information Technology: New Responsibilities in a Changing Environment.** Contact: Center for Information Systems Research, Sloan School of Management, MIT, E40-193, 77 Massachusetts Ave., Cambridge, Mass. 02139.

JUNE 17-18, PLYMOUTH, MICH. — **Robotic End Effectors: Design and Applications Seminar.** Contact: Mary Dombrowski, Special Programs Division, Robotics International of the Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

JUNE 17-19, ATLANTIC CITY — **Plas-Tech '86.** Contact: Delia Associates, P.O. Box 338, Delia Marketing Communications Center, Whitehouse, N.J. 08888.



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End users were amazed to see how data popped and how mistakes

NEWS

JUNE 18-20, TOKYO — **Marketing Opportunities Seminar.** Contact: Agnes M. Pavel, Program Director, U.S. Telecommunications Suppliers Association, Suite 1618, 333 N. Michigan Ave., Chicago, Ill. 60601.

WEEK OF JUNE 22

JUNE 22-27, PHILADELPHIA — **Management Information Systems for Strategic Advantage.** Contact: The Registrar, Office of Executive Education, 200 Vance Hall, The Wharton School of the University of Pennsylvania, Philadelphia, Pa. 19104.

JUNE 23-25, ALBUQUERQUE, N.M. — **Integrated Fiber-Optic Technology Training.** Contact: Linda Castle, Optoelectronic System Consultants, P.O. Box 35525, Albuquerque, N.M. 87176.

JUNE 23-25, MIAMI — **Electronic Data Processing Auditors Association 14th Annual International Conference.** Contact: EDPAA, P.O. Box 88180, Carol Stream, Ill. 60188.

JUNE 23-26, BOSTON — **ATE East '86.** Contact: Registrar, Morgan-Grampian Expositions Group, 1050 Commonwealth Ave., Boston, Mass. 02215.

JUNE 23-27, AMSTERDAM — **Fourth Annual European Fiber-Optic Communications and Local-Area Networks Exposition.** Contact: Information Gatekeepers, 214 Harvard Ave., Boston, Mass. 02134.

JUNE 23-27, CHICAGO — **A/E/C Systems '86: The Computer and Management Show for the Design and Construction Industry.** Contact: Conference Director, A/E/C Systems '86, P.O. Box 11318, Newington, Conn. 06111.

JUNE 24-26, CHICAGO — **Structured Techniques Association III/Structured Techniques in the Eighties: Practice and Prospects.** Contact: Heller Financial Corp., 105 W. Adams St., Chicago, Ill. 60603.

JUNE 24-27, CHICAGO — **Autocad Expo '86.** Contact: William Ryan, Autocad Expo '86, Autodesk, Inc., 2320 Marinship Way, Sausalito, Calif. 94965.

JUNE 25, CHICAGO — **International Facility Management Association's Computer Applications for Facility Management.** Contact: IFMA, Suite 1410, 11 Greenway Plaza, Houston, Texas 77046.

WEEK OF JUNE 29

JULY 2-3, LAS VEGAS — **Full Meeting of the Design Automation Standards Subcommittee.** Contact: Ron Waxman, Design Automation Standards Subcommitee Co-Chairman, IBM FSD, 9500 Godwin Drive, Manassas, Va. 22110.

WEEK OF JULY 6

JULY 9-11, NEW YORK — **The Fourth Annual PC Expo.** Contact: PC Expo, P.O. Box 1026, Englewood Cliffs, N.J. 07632.

WEEK OF JULY 13

JULY 13-18, CHICAGO — **Guide 65.** Contact: Guide International Corp., 111 E. Wacker Drive, Chicago, Ill. 60601.

WEEK OF JULY 20

JULY 23-25, BOSTON — **Microtrends '86, Education: Redirecting the Revolution.** Contact: International Communications Industries Association, 3150 Spring St., Fairfax, Va. 22031.

WEEK OF JULY 27

JULY 27-31, ANAHEIM, CALIF. — **Third Annual Information Center Conference & Exposition.** Contact: Information Center Conference & Exposition, Weingarten Publications, Inc., 38 Chauncy St., Boston, Mass. 02111.

JULY 28-30, RENO, NEV. — **1986 Summer Computer Simulation Conference.** Contact: The Society for Computer Simulation, P.O. Box 17900, San Diego, Calif. 92117.

WEEK OF AUG. 3

AUGUST 4-8, ANN ARBOR, MICH. — **Contemporary Data Communication Networks: Planning, Management and Computer-Based Design.** Contact: Engineering Summer Conferences, 300 Chrysler Center/N. Campus, Ann Arbor, Mich. 48109



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COMPUTER INDUSTRY

Section begins on page 150

DCA seeks more acquisitions to maintain market status

Anticipates rise of LAN, gateway technologies

By James A. Martin

ALPHARETTA, Ga. — The direction of the market dominated by Digital Communications Associates, Inc. (DCA) is expected to shift dramatically in the next few years. To stay on top, DCA is depending on both internal development and more acquisitions within the data communications market.

Although terminal emulation boards, such as DCA's trademark Irma, are expected to almost double in sales this year compared with last year, analysts are predicting that that method of linking micro to host will eventually be replaced by the more sophisticated local-area network (LAN) and gateway products.

For DCA, then, the key to maintaining its status as market leader is to continue its market focus but also to "expand horizons" within that focus, according to President and Chief Executive Officer Bertil D. Nordin.

Nordin confirmed in a recent interview that DCA seeks to acquire at least one additional data communications company this summer, probably in California or Georgia. DCA now has a strong presence in Silicon Valley after its merger earlier this year with the San Jose, Calif.-based micro-to-mainframe vendor Forte Communications, Inc.

Without specifying potential acquisitions, Nordin says the next logical step for DCA would be in the realm of LAN, gateway and T1 multiplexer products. Those areas, Nordin says, "will be very significant, and we will be in those businesses in a significant way. But it's hard to tell how fast users will embrace LAN technology, for example, when it's still a whole lot easier to use boards and coax cable."



Bertil Nordin

"DCA is not completely wedded to any particular technology," says analyst Mark Dunkel, vice-president of research for Robinson-Humphrey Co. in Atlanta. "Instead, they are wedded to their marketplace. I don't see the end of Irma anytime soon. However, DCA is aware of the fact there are competing technologies and is searching to acquire those products and companies that will give it those technologies."

DCA must plan for the technology emerging from its main competitor in the terminal emulation market, IBM. The LU6.2 communications protocol, for example, "is certainly going to have a profound impact on the market, as it gives the best of both worlds, allowing PC-to-PC and PC-to-host transactions," Nordin says.

Both LU6.2 and IBM's Token-Ring architecture are expected to become standards, and DCA is planning to develop products with those standards in mind. "I can't comment on how successful IBM's Token-Ring will be, but IBM's market impact is very significant, and we have to assume the Token-Ring will become dominant as a result," Nordin says.

In addition, DCA hopes to gain a stronger position in the emerging T1 market, with future enhancements of its high-speed multiplexer known as Netlink to include an interface with the Integrated Services Digital Network.

DCA was founded in 1972 and is credited with introducing the first commercially available statistical multiplexer. In 1983, the company acquired Technical Analysis Corp. (TAC) of Atlanta, the developer of the Irma technology, now DCA's flagship product line.

DCA has weathered the computer industry downslide remarkably well. In the third quarter ended March 31, DCA's sales were $36 million, up from $23 million the previous year. Income was $5.8 million, compared with $2.7 million. Sales and profits have risen steadily over the past five years. In fiscal 1985, ended last June, DCA reported sales of $83.7 million, compared with $51 million for fiscal 1984. Net income was $10.5 million, up from $6.7 million.

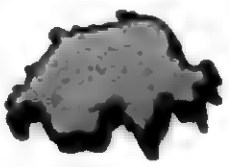
Forte is to become fully integrated under DCA's personal computer communications group, with Forte's president, Jim Ottinger, as head of that group.

Forte products will continue to be sold under their name.

"The Forte acquisition gives DCA a number of things it didn't have in the past," says Dunkel. "It increases their market share dramatically to about 60%, as Forte was the third-largest producer of communications boards behind IBM and DCA. Forte brings technological capabilities in graphics as well as the ability to support the LU6.2 protocol and Systems Network Architecture."

"We want to be a full-line data communications supplier, and there are certain parts of our product line we need to fill out in order to do that," Nordin said.

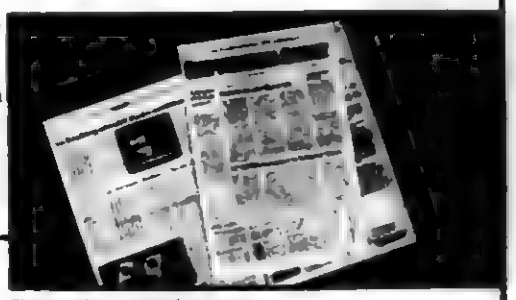
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Justice approves GE's takeover plan for RCA

WASHINGTON, D.C. — After five months of deliberation, the U.S. Justice Department recently approved General Electric Co.'s plan to take over RCA Corp. for $6.46 billion.

The antitrust clearance calls for slight modification of GE's plan, to which GE has agreed, signaling the beginning of the largest non-oil company merger in history. The merger could be completed by the end of this month, analysts say. The combined income of the potential merger could be higher than $40 billion per year.

IBM OKs stock buyback

By Clinton Wilder

ARMONK, N.Y. — IBM last week announced its first corporate stock purchase plan in eight years, authorizing a buyback of up to 10 million shares, or 2% of shares outstanding.

The company said the move reflects its belief that its shares are a good investment at current price levels.

Analysts said they felt that IBM is trying to boost its stock price. IBM's stock has lagged behind the current bull market, reflecting the company's sluggish first-quarter earnings and cautious outlook for the balance of the year.

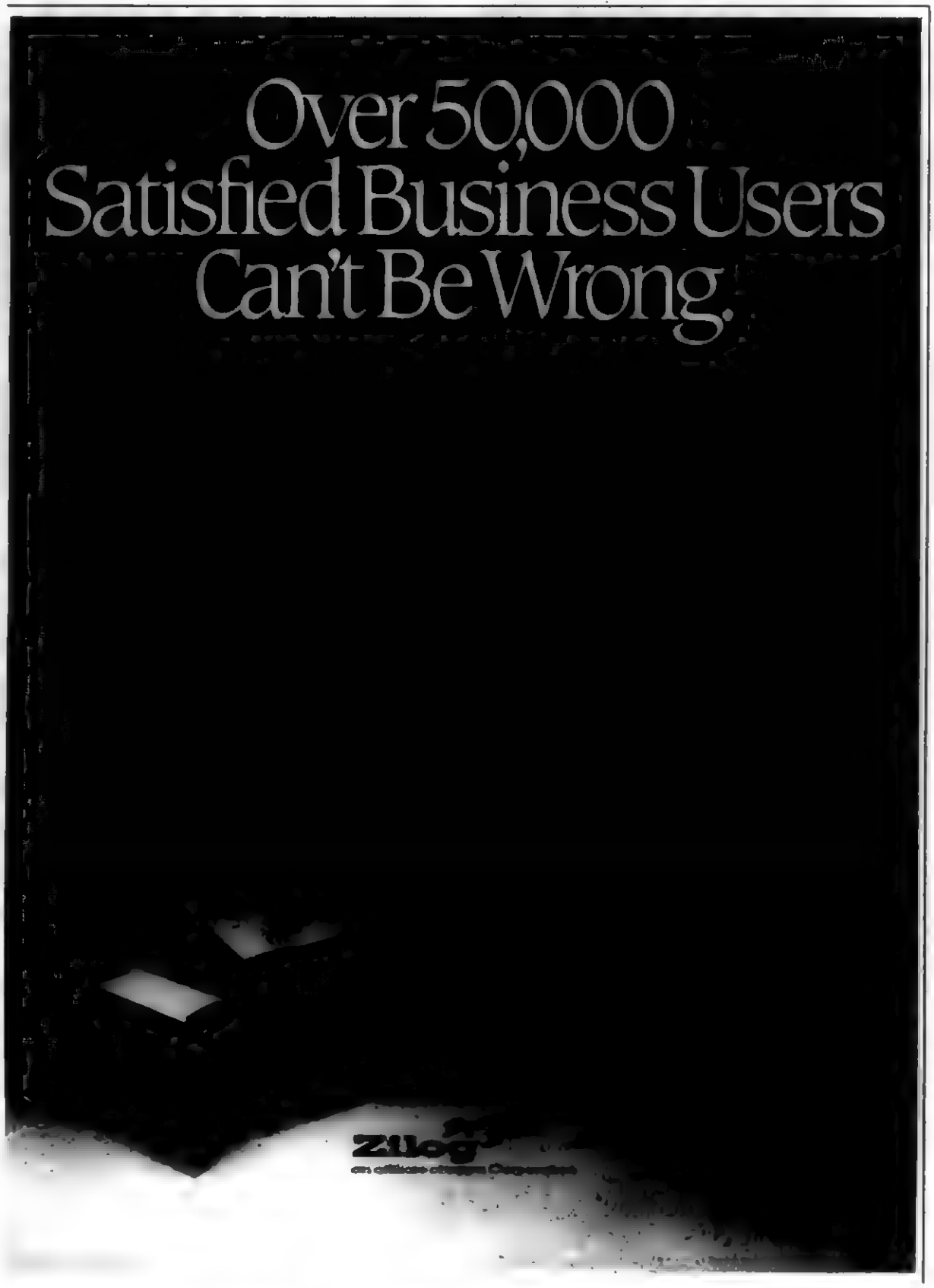
IBM stock was trading last week in the $145- to $147-per-share range, down from its 52-week high near $162.

The program authorizes IBM to spend up to approximately $1.47 billion in cash for stock repurchase purposes.

IBM has developed a strong cash position despite its slower earnings growth, and it held $6.73 billion in cash and securities at the end of its first quarter March 31.

IBM also has an ongoing stock purchase plan to acquire shares for use in its employee and shareholder stock-option plans, according to company officials.

The company purchased approximately 12.8 million of its shares under that plan in 1984 and 1985.



Bandwagons give a shaky ride

From page 150

bursting during its rapid rise in the '60s and '70s, suddenly had lots of empty seats. Many of those riders hopped onto the fast-moving DG and Wang bandwagons or chose to squeeze onto the ever-crowded Big Blue coach. Bandwagon riders unabashedly hitch their fortunes to a rising star.

While DEC descended, DG and Wang took flight. The consultants and computer press gushed about DG's beautifully conceived office strategy and lauded its landing of several multimillion-dollar accounts. They crowed loudly about Wang's willingness to open its architectures in order to preserve annual growth figures that rivaled Imelda Marcos' shoe budget.

But bandwagons have a funny way of collapsing under their own weight. In just a couple of years, the headlines have changed dramatically. Suddenly, DEC is everyone's darling while the gates of Wang are burning. DG just quietly disappeared.

Computer industry section begins on page 150.

Other vendors know the phenomenon just as well. Where are all the Apple polishers of yore, and why are people now saying all those bad things about Lotus Development Corp., Cullinet Software, Inc. and AT&T? Even IBM feels the sting of desertion in a down market.

Make no mistake. The players generally deserve the bandwagon riders, because they themselves struck up the band. If the road to glory is built upon false hopes and empty catch phrases, then flat tires are inevitable.

But more often, the true picture takes a lot longer to develop. Short-term problems, as in DEC's case, can give way to long-term promise. One company may react to an industry-wide slump better than another, but that may not spell doom or Chapter 11. High fliers may need to operate at lower altitudes, but that does not portend a crash.

The companies themselves are not the ones most affected by bandwagons, anyway. It is the users who face the toughest challenge in distinguishing between momentary lust and true long-term affection.

How must MIS directors feel today after purchasing $1 million worth of equipment from yesterday's superstar? Should they feel abandoned by the consultants, analysts and writers they believed three years ago?

The enlightened user will have to look beyond the thundering bandwagon to find the answers. A bad fiscal quarter is no more reason to abandon a vendor's equipment than a good one is to buy from a vendor. It is incumbent upon MIS departments to check out long-term strategies, product lines and compatibility issues before pledging allegiance.

Though morale may currently be low in some vendors' boardrooms and the New England Patriots' locker room, good seasons may still lie ahead.

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IBM OSI-based network predicted first on European mart

Early bird efforts aim to unite Big Blue's systems

By Edward Warner
Computerworld News Service

AMSTERDAM — IBM will be the first firm on the European market with an International Standards Organization's Open Systems Interconnect (OSI)-based network, a telecommunications industry analyst predicted at Eurocomm '86, a communications trade show held recently.

IBM will use OSI, which allows machines from different vendors to communicate, as the means to tie together all of its incompatible computers, according to Rudolf Strobl, a senior consultant with Software Research Corp., a Natick, Mass.-based firm that tests software for compatibility with industry standards. "The name of the game is openness — so IBM can sell more of its own computers," Strobl said at the conference.

Although he could not say when IBM would unveil a full implementation of OSI as an alternative to Systems Network Architecture, Strobl reported IBM has been showing selected customers an implementation of OSI, completed up to Levels 4 and 5 of the seven-layer OSI architecture.

By becoming the first to fully implement the OSI architecture, Strobl said IBM will beat European vendors to the OSI market and solidify its position in Europe where OSI compatibility is becoming a hot issue and where IBM derives about 25% of its revenue.

A group of 12 European vendors — including Siemens AG, N.V. Philips, Olivetti SPA, Nixdorf Computer AG and International Computers, Ltd. — has been working since 1983 to produce an implementation of all layers of OSI, but they are currently stymied by problems at the two uppermost layers, said R. W. Sutton, an assistant technical director for the UK's General Electric Co.

These problems will keep the group of European computer vendors, known as the Standards Promotion and Applications Group, from achieving its goal before IBM, Strobl claimed.

In the U.S., a group of computer vendors came together late last year to form the Corporation for Open Systems (COS), a nonprofit group that would develop an OSI implementation and certify compliance with it. COS membership now boasts more than 40 vendors — including IBM — and the organization's war chest totals hundreds of thousands of dollars in membership fees.

Based on the interest in OSI shown by its competitors, IBM has rightfully decided OSI represents a major market opportunity and is pursuing OSI research on its own, Strobl said.

By beating its competitors to the market with full OSI implementation, IBM will be able to build special functions into the upper levels that only IBM users will be able to receive, although the specification will be available to its competitors.

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See page 125

COMPUTERWORLD
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IBM selected as world distributor of Autodesk tools

SAUSALITO, Calif. — Autodesk, Inc. recently announced that IBM has acquired exclusive rights to distribute three Autodesk software products outside the U.S. for use with the IBM Japan Personal Computer, Models 5540, 5500 and 5560. IBM Japan will distribute the products in Japan, China, Southeast Asia and Australia.

The Autodesk products are Autocad drafting software in Japanese and other language versions; CAD-/camera, a scanning package that converts paper drawings to Autocad drawings; and Archicadd, a program that customizes Autocad for use in an architectural engineering environments.

IBM Japan demonstrated the Autodesk products at the Japan Business show in Tokyo recently.

Firms sign ISDN R&D agreement

ATLANTA — The concept of a worldwide integrated communications network may have moved a step closer to reality recently with a research agreement between Northern Telecom, Inc. and Motorola, Inc.

The companies will collaborate on research and development of a new family of semiconductor components for use in the Integrated Services Digital Network (ISDN).

Northern Telecom will reportedly provide Motorola with network and system architectures, semiconductor device specifications and ISDN testing and evaluation results. Motorola will bring to the project design expertise in advanced semiconductor technology suitable for low-cost, high-volume manufacturing.

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Bell Atlantic helps Sorbus

From page 150

company that leases all types of products, including airplanes," Ross notes.

Ross, who joined Sorbus last September after a 31-year career with IBM, hopes the broader exposure will enable the $190 million firm to grab a larger chunk of the $1.4 billion third-party maintenance market. The market is expected to grow about 12% this year, according to International Data Corp. (IDC) of Framingham, Mass.

"Sorbus is growing as fast as the third-party maintenance market and has the second-largest market share in 1985, with about 12.9%," says IDC's Rebecca Segal. Bell Atlantic does not report Sorbus revenue separately, but IDC estimates that Sorbus grew 19% from $160 million to $190 million last year.

While sluggish sales of computer-related equipment in the past 18 months have wreaked havoc on suppliers, the slowdown has not hampered third-party maintenance companies like Sorbus, Ross claims. He notes that enhanced maintenance enables corporations to retain existing equipment, instead of purchasing more costly gear.

Yet since the third-party maintenance business is inextricably tied to the computer industry, a prolonged downturn could eventually affect Sorbus. "Our business depends on the availability of more and more products to service," he says.

The third-party maintenance business continues to attract additional competitors, especially computer manufacturers looking for a way to offset shrinking hardware profit margins. Firms like Sperry Corp., NCR Corp. and Honeywell, Inc. are finding the higher profit margins of the third-party maintenance industry a significant attraction during the current industry slowdown, analysts say.

"It's easier to say who isn't in the third-party business as opposed to saying who is," suggests D. R. MacNaughton, president of Business Development International, a Franklin Lakes, N.J., firm that tracks the maintenance industry.

But Ross contends that Sorbus has not seen much competition from the computer manufacturers yet. "If you peel back the veneer and look very carefully, it appears that these companies are not going to eat their own children by servicing a competitor's product," he explains. "Most would never give 360 degrees of total service anyway. They see it as a way of enhancing product sales."

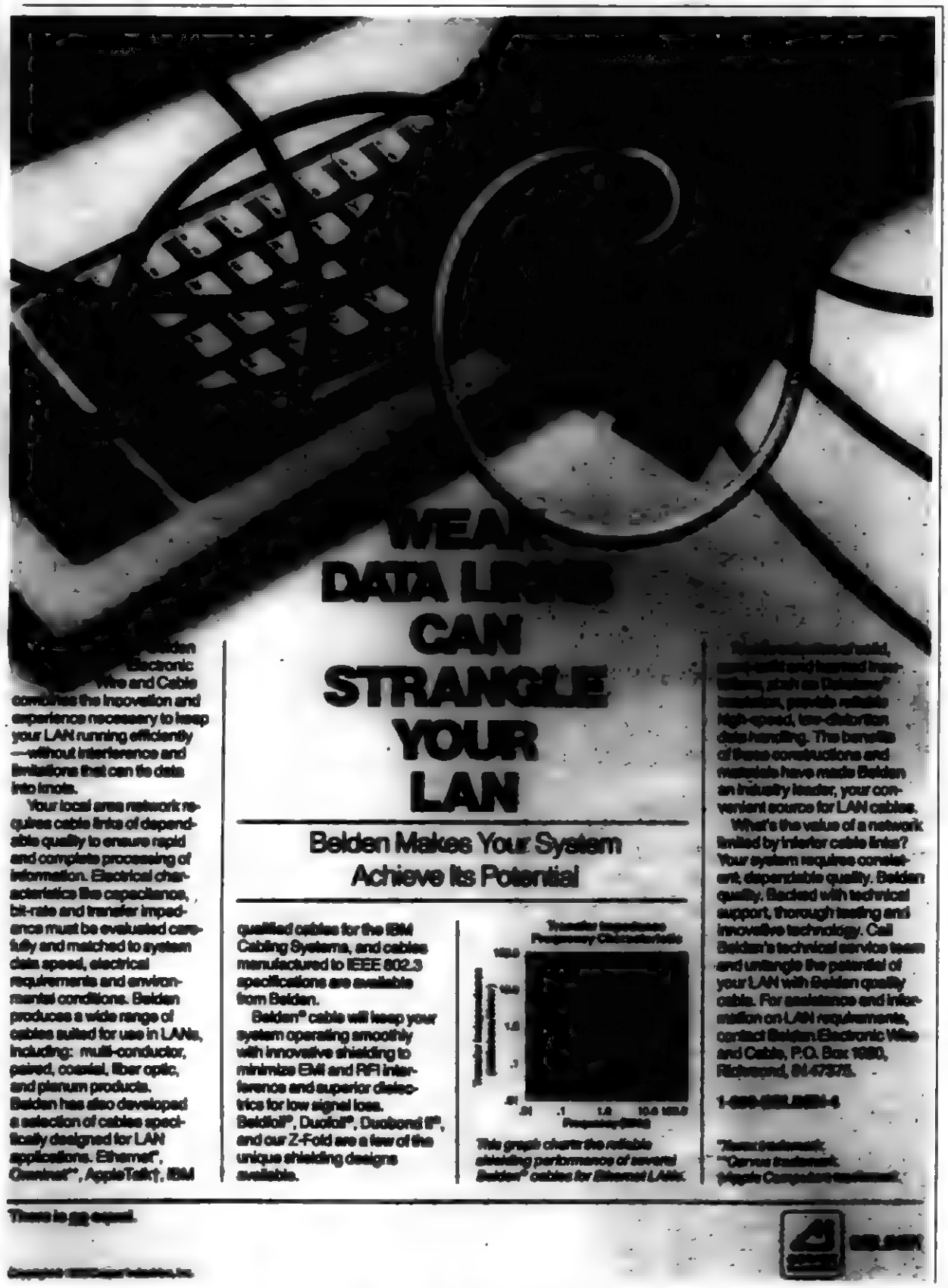
Spare parts availability

An issue more troubling to Ross is the lack of spare parts support provided by some computer vendors [CW, Oct. 21, 1985]. Only IBM, by virtue of a 1956 U.S. Department of Justice consent decree, is required to supply spare parts to the third-party industry, but other vendors are ostensibly free to do as they please.

"Theoretically, though, OEMs have to sell parts to customers," Ross says. "If these customers contract with a service company that can't service their equipment because they can't get parts, it doesn't reflect well on the manufacturer."

Sorbus, whose Greek name refers to a strong, multibranch tree that bears edible fruit, is branching out into a variety of new businesses. It has recently begun servicing disk drives on personal computers and is pushing into multivendor environments. The firm has also recently joined archrival TRW by entering the so-called fourth-party maintenance business of refurbishing used equipment for computer lessors and other service companies.

To remain successful, Sorbus will be sticking to its knitting: servicing end users of IBM and compatible products as well as those of its former sibling company Basic Four. "The key to this business is quality. You can't just promise it; you have to deliver it," Ross concludes.



Bill said to aid U.S. high tech

From page 150

mandated retaliation can keep the pressure on other countries to open their markets to U.S. firms," said James J. Florio (D-N.J.).

In other provisions related to the computer industry, the bill would provide the following:

- Strengthen procedures under Section 301 of the Trade Reform Act of 1974 and require the president to retaliate against certain foreign trading practices within strict time limits.
- Add "export targeting" to the list of unfair trading practices that require retaliation. This would cover the kind of preferential treatment that Japan and Brazil give to their computer industries, according to legislators.
- Support the U.S. semiconductor industry's complaints against Japanese manufacturers as specified by an amendment that passed by a 406-5 vote.
- Require countries with excessive trade surpluses to reduce them by 10% per year or face U.S. penalties. Critics said this highly controversial provision, which would affect Japan, Taiwan and West Germany, will invite retaliation against U.S. exports.
- Require a 40% reduction in the number of products on the export-control list, which regulates technology exports that could be used by the military of Soviet-bloc countries.

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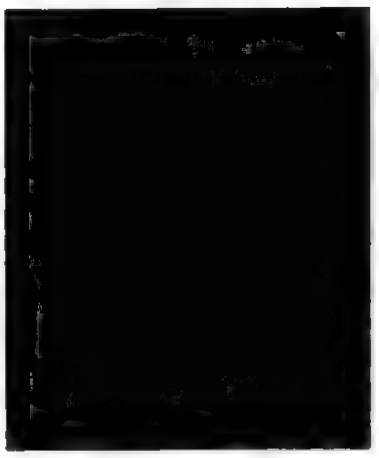
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✓WordPerfect 4.1 ..... 239.
Software Group *(not copy-protected)*
✓Enable 1.1 ..... call
Software Publishing *(copy-protected)*
✓PFS:File B:01 ..... 84.
✓PFS:Write C:01 ..... 84.
✓Harvard Total Project Manager 1.1 ..... 269.
Not copy-protected versions due to be released soon—call

TRAINING

ATI *(copy-protected)*
✓*SKILL BUILDER PROGRAMS*
Intro and How to Use:

Data Bases	MS-DOS	
Compaq	PC-DOS	
IBM-PC	BASIC	each 33.

✓*TRAINING POWER PROGRAMS*
How to Use:

dBase II	dBase III	Lotus 1-2-3
Multimate	Framework	Displaywrite 3
Multiplan	Wordstar	
WordPerfect	Symphony	each 43.

Individual Software *(copy-protected)*
✓The Instructor II ..... 26.
✓Professor DOS ..... 33.
✓Tutorial Set *(both items above)* ..... 49.
✓Typing Instructor ..... 26.
✓Training for Lotus 1-2-3 *(for vers. 1A & 2)* ... 37.
✓Training for dBase III ..... 37.

HARDWARE

Manufacturer's minimum limited warranty period is listed after each company name. Some products in their line may have longer warranty periods.

AST Research *(1 to 2 years)*
SixPakPlus 64k *includes Sidekick vers. 1.5 not copy-protected & DESQView* ..... 169.
SixPakPlus 384k *(fully populated)* ..... 219.
✓AST-5251-11 ..... 579.
✓AST-3780 ..... 579.
✓Advantage 128k ..... 369.
RAMpage! *upgrades to 2Mb* ..... call
✓RAMpage! AT *upgrades to 2Mb* ..... call
Both RAMpage boards support EMS and fully support EEMS.
Amdek *(2 years)*
✓Video 310A mono monitor *(amber)* ..... 159.
✓Color 722 - RGB *(EGA compatible)* ..... 519.
Curtis *(lifetime)*
ACCESSORIES
✓Low Profile Tilt and Swivel Pedestal ..... 25.
✓PC Pedestal *(for IBM Mono or Color)* ..... 27.
Portable Pedestal *(for portable computers)* 38.
✓Printer Stand ..... 18.
System Stand *(for IBM-PC & XT)* ..... 19.
✓Universal System Stand ..... 25.
CABLES
Smartmodem to IBM Cable ..... 17.
✓Keyboard Extension Cable *(3 to 9 feet)* ... 27.
✓Extension Cables for IBM Mono Display .. 33.
SURGE SUPPRESSORS
✓Diamond *(6 outlets)* ..... 29.
✓Emerald *(6 outlets; 6 ft cord)* ..... 36.
✓Sapphire *(3 outlets; EMI/RFI filtered)* .... $47.
✓Ruby *(6 outlets; EMI/RFI filtered, 6 ft cord)* 55.
✓Command Center ..... SPECIAL ..... 79.
DCA *(1 year)*
✓Smart Alec ..... 639.
✓Irma ..... 769.
Epson *(1 year)*
We are an authorized Epson service center.
✓LX-80 printer *(80 column)* ..... call
✓FX-85 printer *(80 column)* ..... call
✓FX-286 printer *(136 column)* ..... call
✓LQ-800 printer *(80 column)* ..... call
✓LQ-1000 printer *(136 column)* ..... call
Hayes *(2 years)*
✓Smartmodem 300 ..... 139.
✓Smartmodem 1200 ..... 389.
✓Smartmodem 1200B *(w/Smartcom II)* ... 349.
✓Smartmodem 2400 ..... 579.
✓Smartmodem 2400B *(w/Smartcom II)* ... 539.
✓Smartcom II 2.1 *(software)* ..... 69.
Hercules *(2 years)*
✓Hercules Color Card *(parallel port)* ..... 159.
✓Hercules Graphics Card *(parallel port)* ... 299.
Intel *(chips: 1 year; boards: 5 years)*
Above Board PC 64k *(upgrades to 2 Meg)* call
✓Above Board AT 128k *(upgrades to 2 Meg)* call
Above Board PS 64k C/S/P *(upgrades to 1.5 Meg)* ..... call
8087 *(for IBM-PC & XT)* ..... 129.
8087-2 *(works on 8 Mhz computers)* ..... 177.
✓80287 *(for 6 MHz IBM-PC AT)* ..... 225.
✓80287-8 *(for 8 MHz IBM-PC AT)* ..... 269.
Kensington Microware *(1 year)*
✓Masterpiece ..... 94.
Key tronic *(90 days)*
5151 keyboard *(deluxe)* ..... 169.
✓5153 keyboard *(with touch pad)* ..... 279.
Mouse Systems *(2 years)*
✓PC Mouse with PC Paint+ ..... 139.
✓PC Mouse with Ready and PC Paint+ .... 149.
NEC *(90 days)*
✓Multisync monitor *(EGA compatible)* .... 549.
Orchid Technologies *(1 to 2 years)*
Conquest Multifunction Board 2Mb *upgrades to 2Mb, fully supports LOTUS/INTEL expanded memory specification (EMS)* ..... 264.
Tiny Turbo 286 ..... 459.
PC Turbo 286e w/1 Meg ..... 749.
✓Excell Multifunction Board for the AT 2Mb *upgrades to 1 Meg, fully supports LOTUS/INTEL expanded memory specification (EMS) and Error Correction Code (ECC), serial and parallel ports optional* ..... 399.
Paradise Systems *(1 year)*
✓Color/Mono Card ..... 149.
✓Modular Graphics Card ..... 275.
Princeton Graphics *(1 year)*
✓MAX-12E Amber monochrome monitor .. 179.
✓HX-12 RGB monitor *(690 x 240)* ..... 449.
Quadram *(1 to 2 years)*
Expanded Quadboard 2Mb *(upgrades to 384k)* ..... 169.
384k *(fully populated)* ..... 219.
Silver Quadboard 2Mb *(upgrades to 576k)* 249.
✓Microlazer Printer buffer *(parallel)* w/copy MP 64 *(64k) upgrades to 512k* ..... 159.
✓QuadEGA+ *(half-card)* ..... 369.
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✓DOS/Basic 3.0-3.1	WordStar
✓Lotus 1-2-3	✓WordStar 2000
✓Symphony	Turbo Pascal
Framework	✓WordPerfect
dBase II	✓dBase III

✓MultiMate ..... each 12.
Toshiba *(90 days)*
All Toshiba printers listed are 24 pin dot matrix.
✓P321 serial/parallel printer *(80 col.)* ..... 519.
✓P351 serial/parallel printer *(136 col.)* .... 1089.
Video 7 *(2 years)*
✓VEGA *(half-card)* ..... 369.

DRIVES

IOMEGA *(90 days)*
✓Bernoulli Box 20 Meg w/PC2 card .. $1999.
✓10 Meg cartridge ..... 51.
✓Bernoulli Box 40 Meg w/PC2 card .... 2499.
✓20 Meg cartridge ..... 69.
Mountain Computer *(1 year)*
Drive Card 20 Meg ..... call
PC Connection *(1 year)*
20 Meg Hard Drive Card ..... 489.
Seagate *(1 year)*
20 Meg Internal Hard Drive *(w/controller and cables)* ..... 449.
Toshiba *(90 days)*
PC, XT 360k Drive *(5¼" half-height)* 109
✓AT 360k Drive *(5¼" half-height)* ..... 117.

MEMORY

64k Memory Upgrade Set for IBM-PC or XT system board or any memory board
150 nanosecond *(set of 9)* ..... 15.
200 nanosecond *(set of 9)* ..... 12.
✓128k Memory Upgrade Set for IBM-AT System Board *(9 chips piggybacked)* ..... 39.
✓256k Memory Upgrade Set for any IBM-AT memory board *(9 chips)* ..... 39.

DISKS

All disks have a lifetime warranty.
DS/DD Disks for the PC & XT (40 TPI).
10 disks per box.
✓Verbatim Datalife ..... 17.
✓Maxell MD-2 ..... 19.
DS/High Density Disks for the AT (96 TPI).
10 disks per box.
✓Fuji ..... 27.
✓Maxell ..... 34.
✓Verbatim ..... 34.

✓Flip Sort *(holds 75 disks)* ..... 15.
✓**Floppiclene** Disk Drive Cleaner *(5¼")* .... 18.

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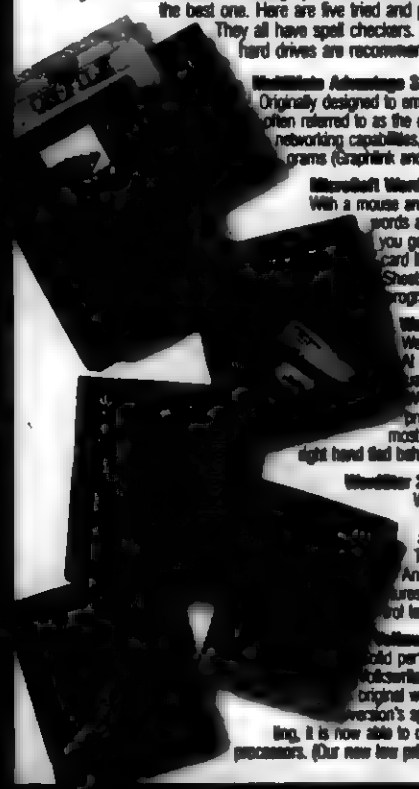
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Word-a-holics unite!

Trying to decide which word processor to buy is like trying to decide which college to go to. The decision will change your life forever, but you may never know if it was the best one. Here are five tried and proven professional packages. They all have spell checkers. None are copy-protected. And hard drives are recommended for all. See PC Magazine 1/28.



MultiMate Advantage 3.6 with GraphMate and On-File $399
Originally designed to emulate the WANG word processor, MultiMate is often referred to as the corporate word processor. It offers sophisticated networking capabilities, and, with two free-for-a-limited-time software programs (GraphMate and On-File), also has built in graphics and database.

Microsoft Word 3.0 with Outline $307
With a mouse and a graphics card, MicroSoft Word lets you move words around without touching the keyboard, and see what you got without squinting. Without a mouse or a graphics card it's still a powerful word-processor, with "Style Sheets" that simplify formatting, and a built-in outline program.

WordPerfect 4.1 ..... $229
We have a friend who writes for computer magazines. At one time or another he has used and reviewed virtually every major word processor. He now swears by WordPerfect and swears at all the others. Use this program for a while and you'll be able to touch type most of your commands with your eyes closed and your right hand tied behind your back.

WordStar 2000 Plus Release 2 ..... $295
WordStar has had some trouble shedding its image as the lumbering dinosaur of the microcomputer age. But hundreds of thousands of people use it. There are a lot of programs out there to back it up. And this new version gives it the same advanced features as any top-quality word processor. Even the control keys are starting to make some sense.

Rottweiler 3.0 ..... $147
Old performance with a reasonable price continues to be Rottweiler's claim to fame. It's fast, and boasts one of the original what-you-see-is-what-you-get screens. With the new version's spell checker and more sophisticated print formatting, it is now able to compete functionally with the other high-end word processors. (Our new low price is pretty persuasive too).

Buy one. Get two.



Hey, got a friend? Don't know? Check your database! What? No database? Have we got a deal for you (and your friend). Until June 30, Microrim will send you a *complete* second copy of Rbase 5000 free when you send in your warranty card and a copy of our sales invoice. So you can get together with your friend, split the cost for one and get two! Or, you can keep the extra copy at home, at a branch office, or down the hall. Rbase 5000 is easy to learn and operate, and has the custom reporting features most users need. Remember, the two for one offer is only good from April 15 till June 30.

Rbase 5000 ..... $359
(Additional Rbase 5000 from Microrim) ..... $Free

Chips

Fully tested, factory fresh 9-chip sets from the leading chip manufacturers, such as TI, Samsung, NEC, Hitachi, Oki, etc. All chips and chip sets come with complete instructions.

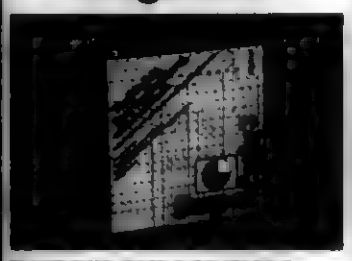
64K (200Nts)	$12 ea. set
64K (150Nts)	$15 ea. set
128K or 256K (150Nts)	$39 ea. set

Bernoulli Berserk!

We've got a problem. The prices we're able to offer on Bernoulli boxes are changing about 10 times faster than we can change this ad. Probably because the machines are selling almost 10 times faster than anyone ever dreamed they would. The 20 Meg and 40 Meg versions feature two 5¼ height drives with removable cartridges. There's a 90 day warranty, and we're an authorized Bernoulli service center—turnaround on repairs is usually 24 hours. Here are our latest up-to-date, but probably obsolete-by-now prices!

Bernoulli Box 40 Meg $2499
Additional 20 Meg Cartridges $89
Bernoulli Box 20 Meg $1595
Additional 10 Meg cartridges $51
Bernoulli Care Kit $79

Supercalc ifragilistic!



SuperCalc 3 is the kind of product that you'd be proud to bring home to your mother. Like Lotus 1-2-3 it offers spreadsheet, information management and presentation graphics. But it only needs 128k of RAM, and is not copy-protected. It also is compatible with the Hercules Monochrome Card, as well as the Enhanced Memory (EMS) and Enhanced Graphics (EGA) standards. And you get a free copy of Sideways, the program that lets your printer think horizontal is vertical.

SuperCalc 3 2.1 (with Sideways) .....
20% off our usual unusual low price—call!

SixPakPlus Minus$!



AST is so wrapped up in Enhanced Memory and other arcane subjects that they've been holding the price slip on their original claim to fame—the AST SixPakPlus, one of the original and best multifunction cards. So if you're just starting in computing, or outfitting a second unit for home, now's a great time to buy this basic piece of hardware. You get a clock calendar, serial port, parallel port, up to 384k of memory, and copies of two classic unprotected programs—Sidekick 1.5 and DESQView. A genuine deal.

SixPakPlus 64k $169
SixPakPlus 384k (fully populated) $219

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The Hercules monochrome graphics card has saved hundreds of thousands of PC owners from terminal myopia, by supplying crisp clean monochrome graphics. The Hercules color card is the industry standard for color graphics. Both come with a parallel printer port, and a *full two* year warranty. And from May 1 through August 31, Hercules is offering a $50 rebate on either card.

Hercules Monochrome Graphics Card $299
(and get $50 rebate from Hercules)
Hercules Color Card (1/2 slot) $159
(and get $50 rebate from Hercules)

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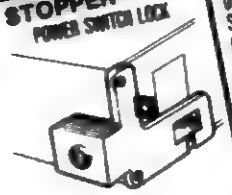
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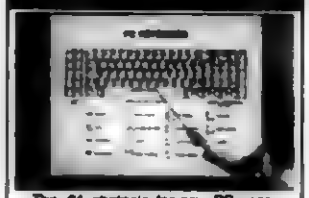
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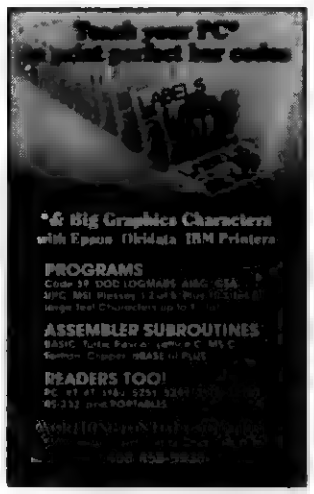
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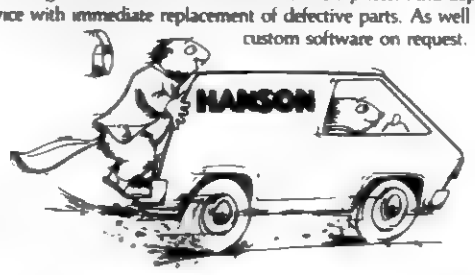
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General Request for Proposal No. 1100, due Tuesday, July 8, 1986, 3:30 p.m. This is a general RFP for the acquisition of communicating electronic typewriters for the State of Mississippi during fiscal year 1987.

General Request for Proposal No. 1101 due Tuesday, July 8, 1986, 3:30 p.m. This is a general RFP for the acquisition of video display word processors and peripherals for the State of Mississippi during fiscal year 1987.

General Request for Proposal No. 1102, due Tuesday, July 8, 1986, 3:30 p.m. This is a general RFP for the acquisition of shared logic/shared resource word processors and peripherals for the State of Mississippi during fiscal year 1987.

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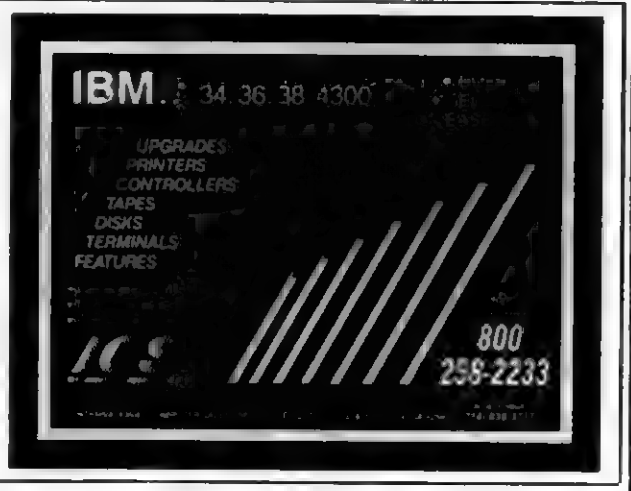
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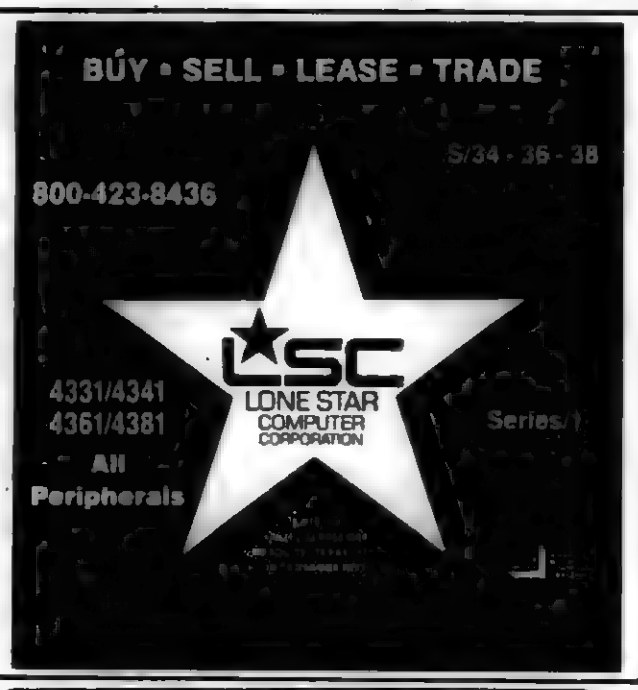
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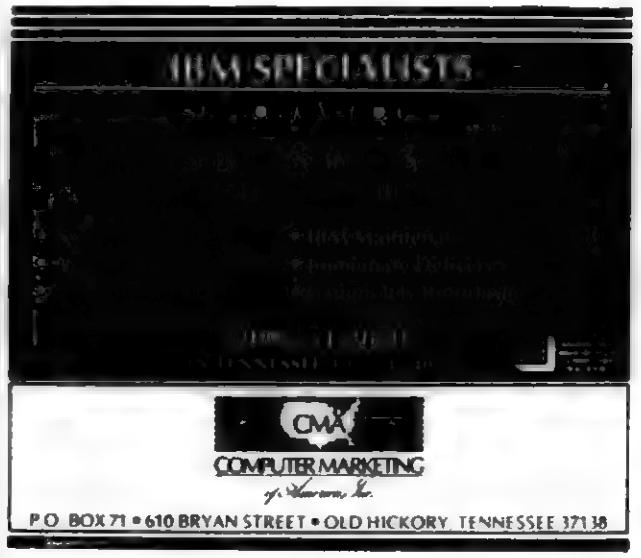
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THE BULLETIN BOARD

A Low-Cost Way to Sell Hardware and Software in Computerworld

What is The Bulletin Board?

It's a classified section in Computerworld designed especially for the selling and buying of individual pieces of hardware in a convenient, low-cost format. It is especially suited to companies that have a piece of used equipment they want to sell. For one low price, you can inform more that half a million Computerwold readers around the country of your equipment's availability.

How Does The Bulletin Board Work?

Bulletin Board ads come in standard units (one column wide by one inch deep) and standard typefaces. (Units may be combined to produce deeper ads, but one column is the maximum width and no units of less than one inch are available:) Ads are arranged under headings (such as "IBM", "DEC" or "Printers"). The headline of the ad is set in larger, bold type, and should contain the standard equipment identification. The body copy should describe the equipment very briefly and give the person to contact. This is all the information an interested buyer needs to follow up. No ad should have more than one piece of equipment or software

Price for each standard unit is only $160. There is an one unit minimum and no fractional units available.) Anyone can place an ad, but no agency commissions are paid, no quantity discounts allowed, and no credit toward rate is given for contract advertisers who advertise in other sections of Computerworld. It's a simple and effective system for buying and selling hardware and software.

How to Place an Ad in the Bulletin Board.

Ads are accepted in the mail, by phone or by telecopier only, no camera ready ads will be taken. Ads can be accepted up until the Monday before issue (7 days in advance of issue date). You should write out your ad before submitting it. (The standard size will hold approximately 25 words of copy.)

Once you've written your ad, send it in with the coupon below or call one of our ad-takers. (If your company has never advertised with us before we request a check with your order.)

Remember that all ads are standard. No special typefaces, no borders and no logos are allowed. Ads are set on a six-column page in our classifed section under the heading "The Bulletin Board.". We assume no liability for errors beyond the price of the ad in the case of material errors.

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Submit replies to: Computer Services Bureau
Phoenix Police Department
620 W. Washington
Phoenix, Arizona 85003
Attn: Mr. Joe Hindman
(602) 262-1893

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Compugraphic is located off Route 128, "America's High Technology Highway," just 20 minutes from all the educational and cultural resources of Boston and close enough to the many recreational opportunities of New England's beautiful mountains and beaches.

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You can have it all! Satisfy your desire for diversity while becoming a key contributor on this crucial team.

- Immediate involvement in PC based platform projects
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Look ahead to the future and beyond! Join the leading team in graphics and develop your future!

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- UNIX™
- Assist in evaluation of 3rd party software packages
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- Project leader experience a plus

For the preceding 2 areas, please send your resume to Mike Walsh.

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Sr. Software Engineers

We have the opportunities to match your abilities! You need a Bachelor's degree and at least 4-5 years' software experience.

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IBM System 38

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The position offers excellent benefits and a competitive salary commensurate with educational background and experience.

For immediate consideration submit resume with salary history and requirements in strict confidence to: Robert D. Newcombe, Industrial Relations Department.

cyclops CORPORATION

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Bryn Mawr College seeks applications for the position of Director of Academic Computing to supervise services in a networked environment of mainframe mini- and micro-computers. Experience in academic computing is required. Salary will be commensurate with qualifications and experience.

Current hardware includes: VAX 8200, MicroVAX II, HP9000 on ETHERNET. The College will open a new $4.1 million computing center in June 1986 to house sixty micro-computers and terminals attached to the network. A new academic wordprocessing facility with Apple Macintoshes and laser printers is also planned. The College has reserved an additional $250,000 for hardware acquisitions in the next several years.

This is an exceptional opportunity for a creative person to provide leadership and direction for computing in a Liberal Arts environment. Bryn Mawr College has a tradition of academic excellence and scholarly research in the arts and sciences and is committed to providing an outstanding computing environment. Send letters of application, resumes and three letters of recommendation to: Dr. Judith Shapiro, Academic Deputy, Bryn Mawr College, Bryn Mawr, PA 19010. For further information (215) 645-5370. Application deadline: June 30, 1986. AA/EOE.

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Research Equipment, Inc., an Affiliate of the University of Minnesota, provides leading-edge supercomputing services to a national community of academic, government and industrial users. This position requires a highly motivated individual who will be responsible for day-to-day operation of a nationwide data communications network including equipment installation, monitoring, troubleshooting and reconfiguration. The position will also involve work with communication vendors and oversight of communication costs and performance.

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Manager, Computer Systems.

Develop computer interfaces for scientific test equipment. Develop programming in Forth language for software for test equipment, implement programs, and train staff in areas of programming and computer interfaces. Minimum 2 to 4 yrs college in Electrical Engineering and 7 to 10 yrs experience computer hardware/software development. Strong background in hardware/software interfaces, VLSI technology and Forth programming experience required. $50,000 per year. Job site: Mountain View, California. Applicants send all with resume to PO Box 9560, Sacramento, CA 95823-0560 by June 12 and refer to Job # CR3131.

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Manager needed in Hayward area for CCITT and ISO Communications Software Development Team of national computer products company. Position involves technical supervision and follow-up of team efforts, design review and evaluation, technical support for marketing staff, supervision of new product development. Applicants must have a Bachelors Degree or comparable in Electronic Engineering or Computer Science, three years experience in UNIX, C, CCITT, and ISO protocols, especially involving X.25, and three years experience in computer software development. One year experience as Technical Manager or two years experience managing software development required. Salary $48,000 per year.

Job site: Hayward, CA. Send this ad and a resume to Job #CR 3213, P.O. Box 9560, Sacramento, CA 95823-0560 not later than June 18, 1986.

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Conn fin'l client seeks indiv to provide an IBM/MVS environ. Excellent long term growth oppty to move into mgmt. To $43,000

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SYS-36 P/A
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ROBERT HALF
of Boston
100 Summer Street
Boston, MA 02110
(617) 423-1200

BUFFALO

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of Buffalo
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Buffalo, NY 14202
(716) 843-0901

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of Providence
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Providence, RI 02903
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ROBERT HALF
of St. Louis
7733 Forsyth Blvd.
St. Louis, MO 63105
(314) 727-1535

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Degree preferred. Super fringes! 3+ years on IBM 30XX, OS/MVS, COBOL-IMS DB/DC required. Insurance applications, would prefer "Universal Life" package experience with policy processing. $29-34,000

SYSTEMS PROGRAMMER
Large IBM 3090 shop. Must be very hands on SAS, JES, OS/MVS-XA, IMS. Extensive internals a +. Company moves quickly for right person. Excellent upward mobility. $42,000

ROBERT HALF
of Austin
920 East Anderson
Suite 334
Austin, TX 78752
(512) 835-0883

SEATTLE

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IDMS DBA
Seeking individual with 2+ years experience developing physical & logical data base design in IDMS environment.
To $40,000

IDMS S/A
Seeking individual with strong analytical skills and IDMS/COBOL experience for major project development effort
To $37,000

Marjie Peterson
ROBERT HALF
of Washington State
600 University St., #2355
Seattle, WA 98101
(206) 624-9000

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(616) 956-9525

WISCONSIN

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$26-33,000

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Frank LaPoint or Dick Bird
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777 E. Wisconsin Ave.
Milwaukee, WI 53202
(414) 271-HALF (271-4253)

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Take charge of 5 person technical support group specializing in CICS. Ability to supervise technical personnel required. Prior CICS exp preferred. Be responsible for interface between applications groups & technical support for maximization of CICS. To $40's

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To $38,000

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of Kansas City
127 W. 10th Street
Kansas City, MO 64105
(816) 474-4660

MINNEAPOLIS ST. PAUL

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Well-established Twin Cities financial services firm has unique growth opportunity for Project Leader to lead design/development of new systems on IBM mainframe. Requires functional and coding experience in CICS and/or IMS. To High $30's

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Fast-growth retail/wholesale firm in Twin Cities seeks person to do installation work with 8100's for distributed processing. Requires COBOL, 8100, and DPPX experience. To $40,000

Mark David or Tim Smith
ROBERT HALF
of Minnesota
3535 IDS Center
Minneapolis, MN 55402
(612) 338-0001

SOUTHERN CALIFORNIA

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Salaries $40-60,000

ROBERT HALF
of L.A.
3600 Wilshire, #2000
Los Angeles, CA 90010
(213) 386-6805

SAN ANTONIO

PROGRAMMER ANALYST
Must have solid exp w/DPSX and COBOL. Helpful if good Data Base, IDSII. Company will move quickly for the right skills. To $35,000

SR PROGRAMMER PROJECT LEADER
Must have solid HP3000-skills. Will involve heavy programming with proven service bureau. Will be Sr DP person. Good opportunity
To $42,000

SR PROGRAMMER DP MANAGER
Must have 1½ years RPGIII exp with inventory appl. Ideal for Sr Prog to move into mgmt. Excellent visibility-reports to president. To $40,000

EDP PLANNING ANALYST
Need an ARTIFICIAL INTELLIGENCE specialist to work in R&D dept. Must be a creative type with broad technical background. Challenging environment
$45,000

ROBERT HALF
of San Antonio
9243 IH 10 West, Ste 660
San Antonio, TX 78201
1-800-531-5402
In TX dial (512) 736-2467

TENNESSEE

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Many Tennessee companies are expanding their DP staffs due to rapid increase in business. Willing to relocate sharp candidates with 2+ years COBOL and IBM OS JCL. Pluses include fourth generation languages, CICS or any data base experience. Industry background in banking, insurance or manufacturing preferred.
To Mid $30's

ROBERT HALF
of Tennessee
1101 Kermit Dr., Ste. 407
Nashville, TN 37217
(615) 361-4500

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SYSTEMS DEVELOPMENT MANAGER
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Start $45,000

Dick Starnes
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PROGRAMMER

(Work Location: Las Vegas, Nevada)

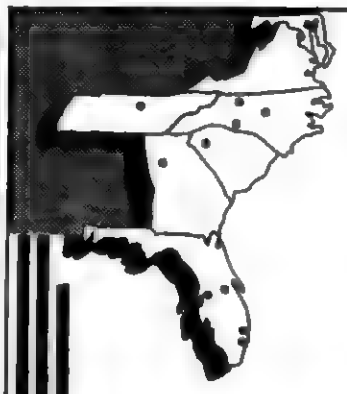
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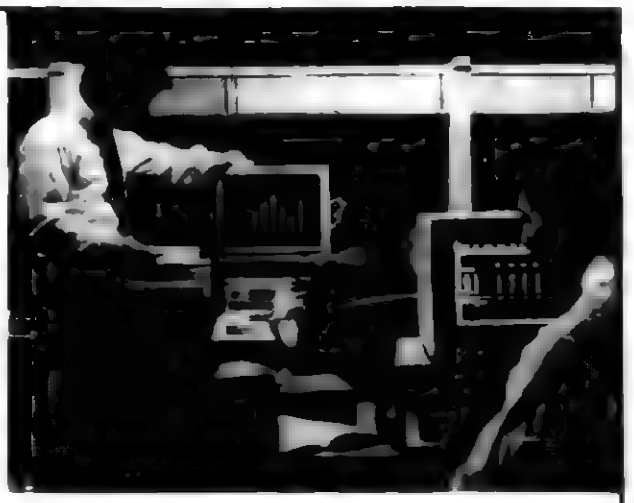
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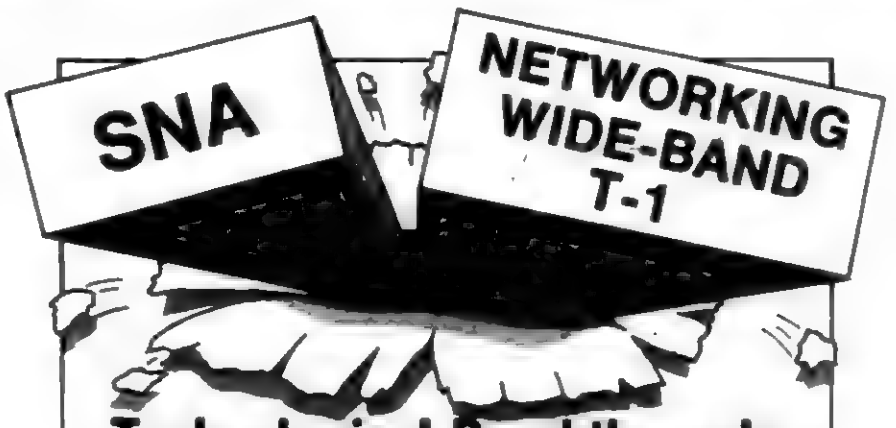
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KUWAIT UNIVERSITY
STATE OF KUWAIT
CENTER FOR EVALUATION AND MEASUREMENT

Kuwait University invites applications for a position in the field of educational measurement. The person appointed will report to the Director of the Center for Evaluation and Measurement and his/her responsibilities will include the following:

- Planning, developing and implementing strategies and procedures for program and project evaluation.
- Designing, developing and administering questionnaires, interviewing forms, and other data gathering instruments.
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Qualifications

- Earned doctorate or master's degree in the field of educational measurement and/or evaluation.
- University teaching experience and a functional knowledge of Arabic is desirable.

Salary

- Basic starting salary and occupational allowances for a Ph.D. holder range from KD 660 to KD1210 monthly, according to University equivalent rank for faculty members. Salary for other degree holders will depend upon experience and will be equated with University employees with salary ranging from KD 320 to KD 412 monthly (1KD currently averages $3.45)

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Applicants should send their curriculum vitae with copies of academic credentials by July 24, 1986, together with sample publications, if any, and names and addresses of three referees who can attest to suitability to:

Kuwait University Office
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3500 International Drive N.W.
Washington, D.C. 20008

Qualified applicants will be interviewed by the Director of the Center for Evaluation and Measurement in Washington after July 25th.

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Salary: Commensurate with training and experience. AA/EOE. Send letter of application, resume and salary requirements by June 25, 1986, to:

Director of Personnel/AA
SUNY College of Technology, Drawer 8011
P.O. Box 3050
Utica, NY 13504-3050

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S/38
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This individual will develop overall real-time, on-line system architecture including development and migration/implementation strategies, hardware configurations, and selection of environmental software (TP monitor/DBMS).

Requirements include 8 + years overall DP experience, including 4 + years of experience in the technical design of large scale real-time, on-line systems utilizing data base technologies (several hundred modules and multiple data bases). A working understanding of MVS/XA TP monitors (CICS/IMS DC), VTAM/SNA, and DBMS (IMS/IDMS) is also necessary. Experience with development of project plans, development methodologies, productivity tools, and intelligent terminals/distributed processing is desired, as well as experience leading new system development within the past 3 years.

PERFORMANCE SPECIALIST/102

Responsibilities include developing predictive performance models and capacity plans relative to hardware/software configurations.

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EDS offers competitive salaries and one of the best benefits packages in the industry, along with excellent opportunity for career advancement. Take the challenge. Call or send your resume (specify job title and number) to: **Jack Sparks, Electronic Data Systems Recruiting, 12200 Park Central Drive, Suite 200, Dept. 4CW1536, Dallas, Texas 75251, 1-800-922-9060. In Texas call (214)392-8658.**

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USAIR

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Requires 3+ years programming experience; COBOL and IMS DB/DC experience a must. Some experience with TSO/SPF, MFS, BTS, PL1, Mark IV, and SAS helpful.

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Call on customers to sell computer equipment and systems; Evaluate clients needs and design a line of sales to fit their specific use; Prepare cost estimates. Provide technical services. Bachelor in Electronic Engineering with 2 yrs. exp. in the job or 2 yrs. related exp. involving installation and maintenance of computer equipment and systems. $30,000/yr. 40 hrs/wk. Job location in Anaheim.

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Martin Marietta Data Systems offers excellent benefits, a stimulating professional environment, and the opportunity to advance your career as far as your initiative will allow. For immediate consideration, please send your resume including salary history/requirements to: **Martin Marietta Data Systems, Dept. SB-86, 6303 Ivy Lane, Greenbelt, MD 20770.**

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Judi Berzon
EAST BAY MUNICIPAL UTILITY DISTRICT
P.O. Box 24055
Oakland, CA 94623
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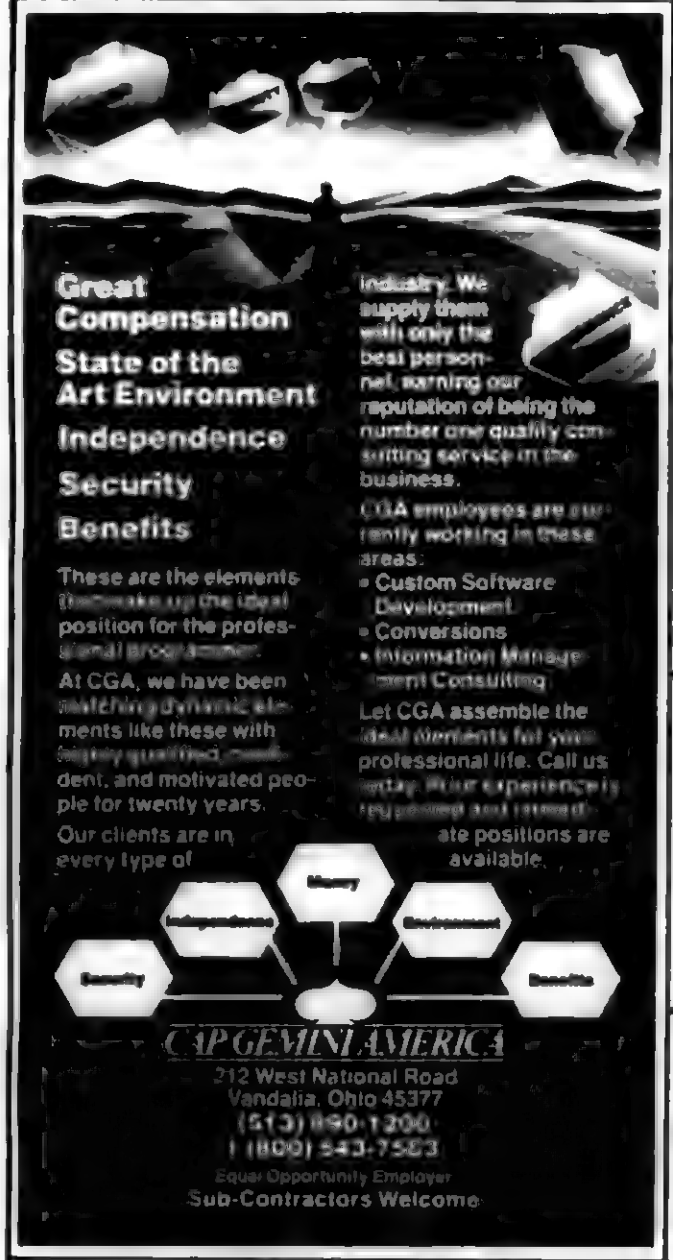
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Pact to alter U.S. chip trade

Aims to increase U.S. share of Japanese mart

By Maura McEnaney

An agreement between the U.S. and Japan on semiconductor trade issues could change the way American chip companies are doing business, some observers said last week.

After almost a year of negotiations, the U.S. and Japan reached a preliminary agreement aimed at solving long-standing trade disputes and increasing the U.S. share of the Japanese semiconductor market.

Sources said the pact, due to be finalized in the next few weeks, will increase the U.S. share of the Japanese chip market from 10% to 20% within five years. It will also establish an export monitoring system and dismiss pending antidumping cases.

To capture 20% of the Japanese market, U.S. chip companies may have to change their product strategies. In Japan, most semiconductors are used for consumer and telecommunications applications, while the majority of U.S.-made chips are designed for computer systems and defense applications.

"The burden is now on U.S. companies to build a product that the Japanese companies will buy," said Jerry Crowley, president of Oki Semiconductor Corp., based in Sunnyvale, Calif., a unit of Oki Electric Co. in Japan.

Some vendors were puzzled over exactly how the agreement would increase the U.S. share of the Japanese market. "I haven't a clue as to how that is going to get done," Crowley said.

Others in the industry were reluctant to comment on what they said was speculation about the contents of the trade agreement. "It's apparent that both governments felt this was a highly sensitive issue," said Tom McDannold, vice-president of administration at NEC Electronics, Inc.

The news of the trade accord came two days after the International Trade Commission ruled that U.S. firms were damaged by Japanese chipmakers' dumping, or selling below cost, 64K-byte dynamic random-access memory (RAM) chips in the U.S. market. That ruling, the result of a suit from Micron Technology, Inc. of Boise, Idaho, slapped Japanese firms with import duties ranging from 11.87% to 35.34%.

Before last week's agreement becomes final, it must first be reviewed by the U.S. departments of State, Justice, Treasury and Commerce.

William Tanaka, Washington, D.C.-based counsel for the Electronics Industry Association of Japan, called the published details of the agreement speculative and declined comment for fear of jeopardizing final negotiations.

Other antidumping suits involving 256K-byte dynamic RAMs and erasable programmable read-only memory chips are still pending, but could be dropped as a result of the trade agreement.

Mini vendor Norsk Data good European investment



ACTIVE ISSUES
Kathy Porteus

Many U.S. computer companies are grateful for Europe's brisk business climate, which has significantly offset continued weakness in domestic orders. Individuals can also benefit from Europe's strength by investing in European computer suppliers that are traded on one of the U.S. stock exchanges.

One such company is Norsk Data (NORKZ — 26¾), a $250 million minicomputer vendor based in Oslo. Norsk's stock, which recently underwent a 2-for-1 split, doubled in value last year. Analysts following the company estimate its price-per-share may jump another 50% by year's end.

Norsk sells a fully compatible line of minicomputer systems, offering up to 3.3 million instructions per second (MIPS), for both IBM and non-IBM environments. According to Le-Ellen Spelman, vice-president with Martin Simpson & Co., about 60% of Norsk's installations are for commercial DP and 40% for scientific or technical applications.

Spelman says she expects Norsk to introduce a new high-end, 10-MIPS to 15-MIPS uniprocessor in early 1987. Norsk claims that its current high-end CPU, the ND670, provides roughly the same performance as Digital Equipment Corp.'s VAX 8600 at half the price.

In 1985, Norwegian sales accounted for 50% of Norsk's revenues and two-thirds of its profits. However, the firm is lessening its dependence on domestic business by concentrating its marketing on France (through a partnership with Matra SA), West Germany and the UK.

Robert L. Cole, analyst with Reinheimer Nordberg, Inc., says, "Matra is taking several times the amount of product from Norsk that was promised in the initial sales contract." Simpson's Spelman expects Norsk "to rank fourth in the 1986 European minicomputer market after IBM, DEC, Hewlett-Packard Co. and Wang Laboratories, Inc."

Norsk has a minor presence in the U.S., with two small sales offices selling primarily to the military.

Last year, the firm's pretax margin widened to 19.3% from 17% in 1984. "Norsk achieves such margins because it is a very well-run company," Spelman says.

Norsk benefits from operating efficiencies by offering a product line with a single architecture and single operating system. In addition, the company is not vertically integrated, which has enabled it to take advantage of lower component prices. Finally, by not focusing on the U.S. market, Norsk avoids intense price competition.

But Norsk may not be able to avoid the current oil glut's effect on Norway's economy. Cole of Reinheimer foresees some softness in Norwegian sales, but expects Norsk's increased foreign business to significantly offset such domestic weakness. Low oil prices have improved business conditions for those European countries that are major importers of energy.

Although 40% to 50% revenue growth is not expected to continue, owing to the company's larger size, Norsk should experience several years of over 30% growth, according to analysts. Spelman estimates the company will earn $1.75 per share in 1986 and $2.20 per share in 1987. Cole is looking for 1986 earnings of $1.85 per share.

Both analysts recommend purchase of Norsk stock, which currently sells at a discount to the price/earnings multiples of other minicomputer companies. Norsk is undervalued, they say, because U.S. investors tend to shy away from foreign firms, although, as in Norsk's case, such stocks present a good investment opportunity.

Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

Citicorp on verge of Quotron buy-out

LOS ANGELES — Without formally agreeing to be acquired by Citicorp, Quotron Systems, Inc. paved the way for a takeover last week by telling its shareholders it would "not actively oppose" Citicorp's $19-per-share tender offer.

Most stockholders are expected to tender their shares at that price, which would give the U.S.'s largest bank a strong presence in the financial information services market. Quotron's stock quote service is expected to benefit technologically from increased research and development funds after the proposed takeover.

About 40% of Quotron's stock is owned by institutions and an estimated 25% by risk arbitrageurs.

Lotus acquires graphics firm

From page 150

sheets; Isys Corp., developer of products that allow data from public data bases to be input into spreadsheets; Infocenter Software's Ilink, a micro-to-mainframe link; and Software Arts, Inc., developer of Visicalc, Spotlight and TKsolver

Lotus announced its intention to enhance the ability of Graphic Communications products to work with Lotus' 1-2-3 and Symphony.

However, analysts were unsure about Lotus' specific plans for the products.

"I think the strategic question is to what extent the graphics packages get incorporated into future releases of 1-2-3 or Symphony to improve their graphics capability," said David Readerman, a computer and software services analyst with Smith Barney, Harris Upham & Co.

Both firms expect no layoffs to result from the acquisition. "We don't see any change in staffing as a result of the acquisition, which is good news for everybody," said Lotus spokeswoman Janet Logan.

Graphic Communications currently employs approximately 50 people.

"We have got some very strong products we can sell on Day 1, and we can add a lot of value by raising the visibility of those products through our marketing channels," Kolowich said.

"We are also acquiring an organizational capability and some first-class development talent in the graphics area," he said.

CORRECTION

James J. Renier was recently named president and chief operating officer of Honeywell, Inc. [CW, May 26, page 144].

Sytek loses IBM contract, lays off 50

By Clinton Wilder

MOUNTAIN VIEW, Calif. — Sytek, Inc. recently became the latest victim of a canceled IBM OEM contract, as the local-area network vendor announced the layoff of 50 manufacturing employees, or about 10% of its work force.

IBM, continuing the pattern of cutting off product suppliers such as Computer Memories, Inc. and Seagate Technology, Inc., recently told Sytek it would not renew its contract for Sytek to supply the PC Network. L. George Klaus, the new president and chief operating officer of Sytek, said both companies had signed a one-year extension of the contract, but that IBM "changed its mind." The contract will expire within the next two months.

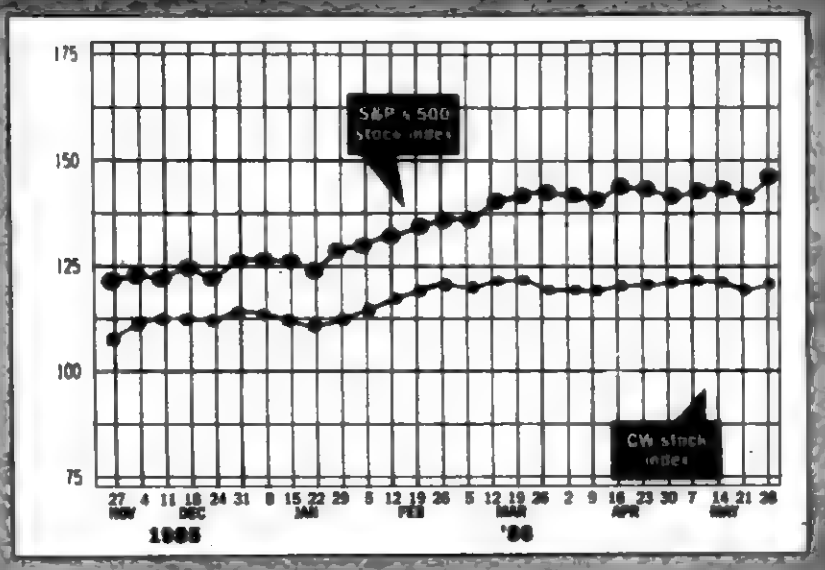
Klaus predicted that Sytek, unlike other firms that have had similar experiences, will not experience losses as a result of the lost business. "Over a year ago, we planned that this might happen," he said. "We've had less time to adjust than we would have liked, but 50% to 55% of our business has always been end-user sales. We'll continue to grow that."

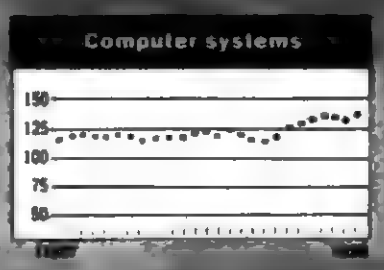
Klaus said that Sytek's revenue will experience a minimal drop in the quarter ended last week and a "more significant drop" in the quarter ending Aug. 29. Sytek recorded sales of $20.3 million and profits of $2 million in the quarter ended Feb. 28.

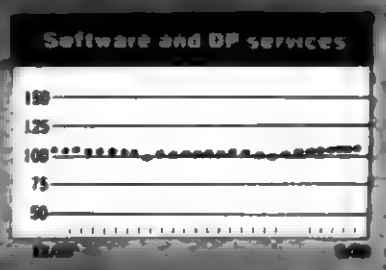
COMPUTER INDUSTRY

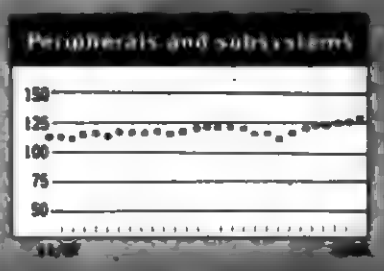
MITCHELL J. HAYES

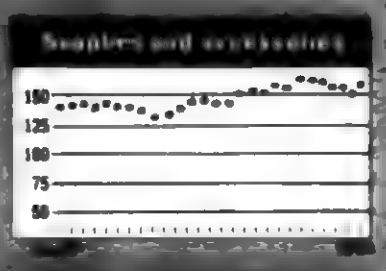
Computerworld stock trading index

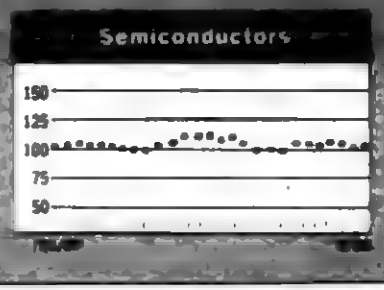


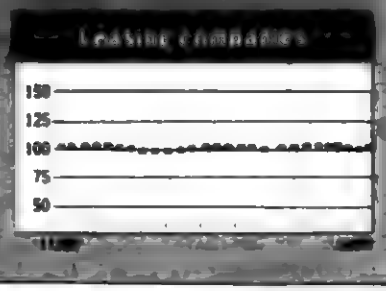












All indexes started at a base of 100 on Dec. 31, 1984, and they show market performance in relation to that time. The CW stock index was set to correspond broadly to the performance of the stocks in the CW computer industry index.

	5/21/86	5/28/86
Computer systems	127.6	136.5
Software and DP services	106.1	106.4
Peripherals and subsystems	125.9	126.4
Supplies and accessories	150.9	155.8
Semiconductors	106.2	106.4
Leasing companies	104.6	104.6
CW stock index	120.0	121.3
Standard and Poor's 500 stock index	140.8	147.5

Computerworld stock trading summary

CLOSING PRICES WEDNESDAY, MAY 28, 1986

COMPUTER SYSTEMS

EXCH		52-WEEK RANGE (1)		CLOSE MAY 28 1986	WEEK NET CHNGE	WEEK PCT CHNGE
O	ALPHA MICROSYSTEMS	5-	9	6 3/4	0	0.0
O	ALTOS COMPUTER SYST	9-	19	16 1/8	-1 3/8	-7.8
A	AMDAHL CORP	10-	18	15 3/4	+1 1/8	+7.6
O	APOLLO COMPUTER	9-	31	15 1/4	0	0.0
O	APPLE COMPUTER INC	14-	37	37 1/4	+ 1/4	+0.6
N	AT&T	19-	28	25 1/8	+1	+4.1
N	BURROUGHS CORP	52-	71	58 5/8	- 1/8	-0.2
O	COMPAQ COMPUTER CP	5-	18	17 1/4	- 1/8	-0.7
O	COMPUTER AUTOMATION	1-	9	3 1/8	+1	+47.0
A	COMPUTER CONSOLES	5-	14	10 3/4	+ 1/8	+1.1
N	CONTROL DATA CORP	15-	39	25 7/8	+2 3/8	+10.1
O	CONVERGENT TECHNOL	5-	13	10	+ 1/8	+1.2
O	CPT CORP	4-	8	4 3/8	+ 1/8	+2.9
N	CRAY RESEARCH INC	25-	69	69 1/8	+2 5/8	+3.0
O	DAISY SYSTEMS CORP	11-	38	12	1/4	-2.0
N	DATA GENERAL CORP	31-	76	38 1/8	-1 1/2	-3.6
N	DATAPOINT CORP	5-	22	7 7/8	+ 1/8	+1.6
N	DIGITAL EQUIPMENT	42-	91	90	+2 7/8	+3.2
A	EECO INC	13-	19	18 7/8	+1 1/2	+8.6
N	ELECTRONIC ASSOC.	3-	7	5 7/8	+ 1/8	+2.1
N	FLOATING POINT SYST	18-	42	37 1/4	- 5/8	-1.6
N	FOXBORO	22-	31	30 3/4	+1 1/2	+5.1
N	GOULD INC	20-	38	23 1/4	+ 1/8	+0.5
N	HARRIS CORP	22-	35	32 1/4	+ 7/8	+2.7
N	HEWLETT-PACKARD CO	29-	46	46 1/8	+2 7/8	+6.6
N	HONEYWELL INC	54-	87	77 1/4	+ 1/4	+0.3
N	IBM	117-	158	151 3/8	+6 7/8	+4.7
O	IPL SYSTEMS INC	1	4	3	0	0.0
N	ITT CORP	28-	48	48 3/8	+2 7/8	+6.3
N	M/A-COM INC	13-	24	16 7/8	+ 3/4	+4.6
N	MANAGEMENT ASSIST	2-	28	2 3/8	0	0.0
N	MATSUSHITA ELEC(ADR)	69-	98	89	+1 1/2	+1.7
O	MENTOR GRAPHICS	13-	30	16 1/2	- 1/4	-1.4
N	MODULAR COMPUTER SYS	6-	9	8 7/8	0	0.0
N	MOHAWK DATA SCI	1-	13	3 1/8	- 1/4	-7.4
N	NBI INC	11-	20	11 1/2	+ 1/2	+4.5
N	NCR	25-	55	54 7/8	+1 1/8	+2.0
N	PERKIN-ELMER	22-	38	30	+ 3/8	+1.2
N	PRIME COMPUTER INC	15-	27	20 1/8	- 3/8	-1.8
N	SPERRY CORP	38-	75	74 5/8	+2 3/8	+3.2
O	STRATUS COMPUTER INC	9-	25	21 3/4	-1 3/4	-7.4
O	TANDEM COMPUTERS INC	13-	33	30 7/8	-1 5/8	-5.0
N	TANDY CORP	24-	44	42 1/8	+2 3/8	+5.9
O	TELEVIDEO SYSTEMS	2-	4	3 1/2	+ 1/8	+3.7
O	TELXON CORP	6-	21	21 1/8	+ 1/4	+1.1
N	TEXAS INSTRUMENTS	86-	141	134 5/8	-2	-1.4
A	ULTIMATE CORP	8-	34	34 1/4	+3 1/2	+11.3
O	VECTOR GRAPHICS INC	1-	1	1 1/8	0	0.0
A	WANG LABS "B"	15-	29	16 1/2	- 3/4	-4.3
A	WANG LABS "C"	15-	29	16 7/8	- 3/8	-2.1
N	XEROX CORP	37-	72	61 5/8	+3 7/8	+6.7

SUPPLIES & ACCESSORIES

EXCH		52-WEEK RANGE (1)		CLOSE MAY 28 1986	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMERICAN BUS PRODS	21-	38	33	+ 1/4	+0.7
N	BARRY WRIGHT	17-	29	23 5/8	+ 1/2	+2.1
A	DUPLEX PRODUCTS INC	13-	22	21 3/4	- 1/2	-2.2
N	EWINS BUS. FORMS	14-	28	24 7/8	+1 1/8	+4.7
N	3M COMPANY	74-	107	105 1/2	+7	+7.1
N	MOORE CORP LTD	15-	27	26	+2 1/8	+8.9
O	STANDARD REGISTER	22-	45	39 1/2	+ 3/4	+1.9
N	WALLACE COMP SERVICE	30-	49	49	+1 5/8	+3.4

SOFTWARE & DP SERVICES

EXCH		52-WEEK RANGE (1)		CLOSE MAY 28 1986	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	2-	8	6 1/4	+ 5/8	+11.1
N	ADVANCED SYSTEMS INC	9-	20	17 1/2	+ 1/2	+2.9
N	AGS COMPUTERS INC	10-	25	21 1/2	+ 3/4	+3.6
O	AMERICAN SOFTWARE	9-	15	12 3/8	+ 3/8	+3.1
N	ANACOMP INC	2-	6	5 7/8	+ 1/4	+4.4
O	ANALYSTS INTL CORP	5-	11	7 1/2	+ 1/4	+3.4
O	ASHTON TATE	6-	31	31 3/8	+2 7/8	+10.0
O	ASK COMPUTER SYSTEMS	7-	25	12 1/8	0	0.0
B	ASTRADYNE COMP IND	1	3	1 5/8	0	0.0
N	AUTOMATIC DATA PROC	35-	77	76 5/8	+6 5/8	+9.4
O	COMPUTER NETWORK	5-	9	7 3/4	- 1/8	-1.5
O	COMPUTER ASSOC INT'L	9-	24	23 3/4	+ 3/4	+3.2
O	COMPUTER HORIZONS	5-	11	13 7/8	0	0.0
N	COMPUTER SCIENCES	13-	38	37 1/2	+2 7/8	+8.3
O	COMPUTER TASK GROUP	10-	28	25 3/4	+1 1/2	+6.1
O	COMPUTER USAGE	1-	3	3	0	0.0
O	COMPUTONE SYSTEMS	3-	11	4 1/4	1/8	-2.8
O	COMSERV CORP	1-	6	3 1/4	0	0.0
O	COMSHARE	7-	13	13 1/8	+ 1/8	+0.9
N	CULLINET SOFTWARE	12-	33	18 1/4	+1	+6.5
O	CYCARE SYSTEMS INC	13-	27	16 3/4	+ 1/8	+0.7
O	HOGAN SYSTEM INC	4-	12	10 1/8	5/8	-5.8
N	GENERAL ELECTRIC CO	56-	81	81	+4 1/2	+5.8
N	GENL MOTORS E (EDS)	20-	49	48 1/8	- 1/8	-0.2
N	GTE CORP	38-	54	50 3/8	+ 7/8	+1.7
O	INFORMATION SCIENCE	1-	5	3 3/8	0	0.0
O	INFOTRON SYSTEMS CP	13-	24	16 1/2	+ 1/2	+3.1
O	KEANE ASSOCIATES	10-	20	14	0	0.0
N	LOGICON	25-	43	37 7/8	+1 1/2	+4.1
O	LOTUS DEVELOPMENT CP	15-	37	38 1/2	+1 3/4	+5.0
O	MCI COMMUNICATIONS	7-	13	9 3/4	1/4	2.5
O	MNGT SCI AMER INC	7-	16	15 3/4	+1 3/8	+9.5
O	MATHEMATICAL APP GRP	1-	8	1/2	0	0.0
O	MICOM SYSTEMS INC	12	35	14 3/4	1/4	1.6
O	MICROPRO INT'L CP	2-	4	2 1/2	+	+2.5
O	NATIONAL DATA CORP	8-	25	21 1/4	-1 1/8	-5.0
O	ON-LINE SOFTWARE INT	4-	16	16	+2 1/2	+18.5
O	PANSOPHIC SYSTEMS	14-	34	34 1/4	+ 3/4	+2.2
N	PLANNING RESEARCH	11-	23	21 3/8	5/8	2.8
O	POLICY MGMT SYSTS CP	16-	35	20 1/4	+ 1/2	+2.5
O	PROGRAMMING & SYS	4-	10	8 3/4	+ 1/8	+1.4
O	REYNOLDS & REYNOLD	30-	65	31 1/4	+ 1/4	+0.8
O	SEI CORP	13-	27	23 1/2	- 1/2	-2.0
O	SHARED MEDICAL SYST	26-	38	35 5/8	-1	-2.7
O	SCIENTIFIC COMPUTERS	4-	8	4 3/4	0	0.0
O	SOFTWARE AG	12-	22	20	- 1/4	-1.2
N	URS CORP	10-	18	16 5/8	+ 3/4	+4.7
N	UCCEL	11-	21	21 3/8	+1 1/8	+5.5
O	VMI SOFTWARE	17-	30	29 1/2	+1 3/4	+6.3

SEMICONDUCTORS

EXCH		52-WEEK RANGE (1)		CLOSE MAY 28 1986	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADVANCED MICRO DEV	22-	36	26	+ 5/8	+2.4
O	ADV'D SEMICONDUCTOR	7-	23	11 1/4	0	0.0
N	ANALOG DEVICES INC	14-	24	22 7/8	- 1/8	-0.5
O	ANALOGIC CORP	11-	16	12 3/8	- 1/8	-1.0
N	APPLIED MAGNETICS CP	9-	19	18 7/8	+ 3/8	+2.0
O	AMMTEK	18-	26	19 3/8	+1 1/8	+6.1
O	HADCO CORP	3-	7	5 1/2	- 1/4	-4.3
O	INTEL CORP	21-	33	26	1/2	-1.8
O	MICRO MASK INC	5-	12	5 3/8	- 1/8	-2.2
N	MOTOROLA INC	28-	46	46 1/2	0	0.0
N	NAT L SEMICONDUCTOR	10-	15	14 3/8	+ 1/2	+3.6
N	TERADYNE	17-	33	25 3/4	- 1/4	-0.9

PERIPHERALS & SUBSYSTEMS

EXCH		52-WEEK RANGE (1)		CLOSE MAY 28 1986	WEEK NET CHNGE	WEEK PCT CHNGE
P	AM INTERNATIONAL	3-	8	8 3/8	+ 1/4	+3.0
A	ANDERSON JACOBSON	2	5	2 1/4	0	0.0
O	AST RESEARCH INC	7	33	15 3/4	1 1/4	7.3
O	AUTO-TROL TECHNOLOGY	3-	13	4 3/8	5/8	12.5
O	AVANT-GARDE COMPUTING	3-	21	4 1/8	+	+1.5
O	BANCTEC INC	6-	13	12 1/2	- +1	+8.6
O	BEEHIVE INT'L	1	2	1/8	0	0.0
N	BOLT,BERANEK & NEW	20-	47	47	+2 3/4	+6.2
O	CAMBEX CORP	1	3	1 1/2	0	0.0
N	CENTRONICS DATA COMP	3-	11	6 1/2	+ 1/4	+4.0
A	CETEC CORP	6-	9	6 7/8	5/8	-8.3
A	COGNITRONICS	4-	7	4 5/8	+ 1/2	+12.1
N	COMPUGRAPHIC CORP	23-	36	23 3/4	+ 3/4	+3.2
O	COMPUTER TRANSCEIVER	0-	1	7/8	0	0.0
N	COMPUTERVISION CORP	9-	44	17 7/8	+1 1/4	+7.5
N	CONRAC CORP	12-	18	17 1/2	+ 3/4	+4.4
A	DATAPRODUCTS CORP	11	20	17 1/4	+ 1/4	+1.4
A	DATARAM CORP	4	17	16 7/8	+ 3/8	+2.2
O	DATA SWITCH CORP	4	9	7 1/4	1/4	3.3
O	DATUM INC	5-	9	6 3/4	0	0.0
O	DECISION DATA COMPUT	10-	20	12 7/8	+ 3/8	+3.0
O	ENDATA, INC	2	8	8 1/4	+ 1/8	+2.0
O	EVANS & SUTHERLAND	12	27	26 1/8	+ 1/8	+0.4
O	GANDALF TECHNOLOGIES	5	13	6 5/8	+ 1/8	+1.9
N	GEN'L DATA COMM IND	8-	21	13 3/8	+ 1/2	+3.8
N	HAZELTINE CORP	17	30	17	+ 1/2	+3.0
O	ICOT CORP	3	12	12	0	0.0
O	INFORMATION INTL INC	10	17	15 1/2	+ 1	+6.8
O	INTECOM INC	3	11	5 5/8	+1 1/4	+28.5
O	MEGADATA CORP	3	8	3 1/8	+ 1/8	+4.1
A	MSI DATA CORP	7	14	13 7/8	+ 1/4	+1.8
N	NASHUA CORP	24	53	52 3/4	+3 3/4	+7.6
O	NETWORK SYSTEMS CORP	11	27	13 7/8	+ 1/8	+0.9
N	NO AMERICAN PHILIPS	32	47	41 3/4	+ 1	+2.4
N	NORTHERN TELECOM LTD	26-	41	29 7/8	+ 3/4	+2.5
O	OMEX	1	3	1/4	0	0.0
N	PARADYNE CORP	6-	18	11	+ 1/4	+2.3
A	PENRIL CORP	7	14	7 3/8	1/8	1.6
N	PLESSEY CO (ADR)	19-	38	34 1/2	0	0.0
O	PRINTRONIX INC	9-	18	13 1/8	3/8	2.7
O	QMS INC	6-	16	13 3/4	0	0.0
O	RAMTEK CORP	2	7	5 5/8	+ 1/8	+2.2
N	RECOGNITION EQUIP	9	17	16	3/8	2.2
N	SANDERS ASSOCIATES	29-	44	29 5/8	+ 1/4	+0.8
O	SCAN TRON CORP	9	22	19 3/4	+ 3/4	+3.9
N	SCIENTIFIC ATLANTA	10-	15	10 3/8	0	0.0
O	SEAGATE TECHNOLOGY	5-	13	12 3/4	1/8	-0.9
N	STORAGE TECHNOLOGY	1-	5	4 1/8	1/8	2.9
O	SYKES DATATRONICS	0-	2	1/8	1/8	-41.5
A	T BAR INC	5	9	5 7/8	+ 1/8	+2.1
A	TAB PRODUCTS CO	9	15	14 1/8	0	0.0
O	TANDON CORP	3	9	7 1/8	3/8	6.0
A	TEC INC	5	13	5 3/8	1/8	2.2
N	TEKTRONIX INC	47	68	62 1/8	+2 3/8	+3.9
N	TELEX	34	68	62 1/8	1	1.5
O	TESDATA SYSTEMS CP	0	3	5/8	0	0.0
N	TIMEPLEX INC	15-	23	18 3/8	+ 1/8	+0.6
N	TITAN CORP	4	11	10	+ 1/4	+2.5
O	VISUAL TECHNOLOGY	1	3	5/8	0	0.0

LEASING COMPANIES

EXCH		52-WEEK RANGE (1)		CLOSE MAY 28 1986	WEEK NET CHNGE	WEEK PCT CHNGE
N	COMDISCO INC	7	24	20 1/2	1/4	1.2
N	CONTINENTAL INFO SYS	5	21	19 5/8	+ 1/4	+1.2
O	FINALCO GROUP INC	3	5	3 1/2	+ 1/8	+5.6
O	PHOENIX AMERICAN INC	2	6	4 3/4	+ 1/8	+2.7
O	SELECTRA INC	6-	12	7 3/8	+ 1/8	+1.7
N	U.S. LEASING	32	46	41 7/8	+1 7/8	+4.6

EXCH: N=NEW YORK; A=AMERICAN; P=PACIFIC; B=BOSTON; [illegible]=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Source: Trade Quotes, Inc.

COMPUTER INDUSTRY

INSIDE

DCA eyes acquisitions to stay on top in the shifting micro-to-mainframe mart/117

IBM will be the first in Europe with an OSI-based network, an analyst predicts/122

A tentative semiconductor trade agreement with Japan may change the way U.S. chipmakers do business/148

INSTANT ANALYSIS

"I hope we do not have to retaliate against our trading partners. But let's face it, we've done a lot of talking with countries like Japan but are getting nowhere. Whether it be in semiconductors, telecommunications or fiber optics, they are not opening their markets to U.S. competition."

— U.S. Rep. Stan N. Lundine (D-N.Y.), during debate on the House trade bill

Lotus buys graphics firm

Hopes to tap growing market, round out line

By Douglas Barney

CAMBRIDGE, Mass. — Continuing its product acquisition strategy, Lotus Development Corp. last week announced that it had signed a letter of intent to acquire Graphic Communications, Inc., a Waltham, Mass.-based developer of the popular Freelance and Graphwriter micrographics software packages.

The acquisition fills an important gap in Lotus' product line as the spreadsheet leader continues to diversify into other business software markets. Lotus expects the microcomputer graphics market to enjoy healthy growth, largely owing to reduced costs of hardware and graphics devices such as plotters and printers.

"There is a significantly large group of users of 1-2-3 and Symphony who are looking for something more in business graphics," said Michael Kolowich, corporate vice-president of marketing for Lotus.

According to securities analysts, Lotus paid some $7 to $10 million in cash and agreed to an earn-out formula, under which Graphic Communications principals receive a portion of the revenue from Graphic Communications products.

Graphic Communications, a 5-year-old private firm with about $5 million in annual sales, is considered one of the top micro graphics software vendors behind market leader Decision Resources, Inc., developer of Chartmaster.

After the acquisition is approved, Graphic Communications will become part of Lotus' Business Products Division. The acquisition is expected to be completed by June 15, pending approval of the boards of both firms and Graphic Communications' shareholders.

Since early 1985, Lotus has acquired GNP Development Corp., maker of HAL, an English-language interface for 1-2-3; Dataspeed, Inc., developer of products that input stock quotations into Lotus spread-

See LOTUS page 148

Bell Atlantic helps Sorbus cash in

By Alan Alper

FRAZER, Pa. — Eighteen months after it was acquired by Bell Atlantic Corp., third-party maintenance firm Sorbus, Inc. today finds itself in a complete role reversal.



Sorbus' Ross

As part of Management Assistance, Inc., Sorbus was a cash cow and its profits were used to finance the beleaguered operations of its sister company, minicomputer maker Basic Four. In 1984, Sorbus was underfinanced and fading fast. By early 1985, as part of arbitrageur Asher Edelman's piecemeal divestiture of Management Assistance, Sorbus was sold to Bell Atlantic for $185 million.

Sorbus is currently benefiting from the deep pockets and service-industry savvy of its acquisitive $9 billion parent. Continuing to concentrate on IBM and compatible large-systems service, Sorbus is now in a position to cash in on maintenance opportunities presented by its various sister companies within Bell Atlantic Enterprises.

"We're part of a total solution at Bell Atlantic Enterprises, and customers are comfortable buying from a 100-year-old Bell operating company," notes Louis Ross, Sorbus president.

Sorbus is picking up maintenance revenue from relationships with customers of Bell Atlantic's telephone companies, its telecommunications subsidiary Bell Atlanticom and the retail Bell Atlantic Business Centers in the Compushop, Inc. chain — another Bell Atlantic acquisition.

"We also get customer leads from Tricontinental Leasing Corp., a Bell Atlantic

See BELL page 124

INDUSTRY INSIGHT
Glenn Rifkin

Bandwagon a shaky ride

Last December, as the historically disappointing New England Patriots football team piled victory upon important victory, their hastily built bandwagon began creaking under the weight of converts, reawakened diehards and fair-weather fans. But after their embarrassing dissection at the hands of the Chicago Bears in the Super Bowl, the Patriots' bandwagon emptied quicker than a six-pack at a poker game.

For the players in the big leagues of the computer industry, the bandwagon effect is a familiar and unpleasant fact of life. As the industry has run into some hard times of late, one-time superstars have learned how fickle bandwagon riders can truly be. It works both ways.

Take Digital Equipment Corp., for example. In late 1983, DEC, once a high flier and darling of consultants and the press alike, became the object of scorn and derision.

The company was in the midst of one of the more poorly conceived personal computer strategies to come down the pike, and internal accounting problems had failed to catch and alert analysts to a poor fiscal quarter. This, combined with a lengthy reorganization, caused DEC to be painted as a stumbling giant, in no way positioned to compete with IBM or even its more suitable foes Data General Corp. and Wang Laboratories, Inc.

The DEC bandwagon, crowded to

See BANDWAGONS page 120

Rifkin is a Computerworld senior editor.

Bill said to aid U.S. high tech

Fights 'unfair' imports, sends message overseas

By Mitch Betts

WASHINGTON, D.C. — The massive trade reform bill approved recently by the U.S. House of Representatives contains a variety of provisions designed to help the U.S. telecommunications, semiconductor and computer industries. Some provisions attempt to fight "unfair" import practices, while others try to improve the climate for U.S. exports.

The 295-115 vote approving the Trade and International Economic Policy Reform Act of 1986 was intended to send a signal to foreign trading partners that the U.S. will not tolerate the continuing erosion of its trade balance, several legislators said.

The U.S. Senate, which will write its version of trade legislation this summer, is expected to approve more moderate legislation than did the House. President Ronald Reagan said last week he would veto the House version as "kamikaze legislation." He claimed the U.S. has made progress in opening foreign markets, citing an agreement for more sales of U.S. semiconductor chips in Japan (see related story on page 148).

For the telecommunications industry, the House bill would require the president to negotiate trade agreements that remove foreign barriers to exports of U.S. telecommunications products. If the negotiations fail, the president would be forced to restrict access to the U.S. market.

"Only the threat of legislatively

See BILL page 124

DATA VIEW

Quarterly earnings: Autodesk, Novell and

Company	Net income Feb.-April, 1986 (thousands of dollars)	Percent Change From 1985	Revenue Feb.-April, 1986 (thousands of dollars)	Percent Change From 1985
[illegible]	[illegible]	+116	[illegible]	+116
Analog Devices, Inc.	5,979	-30	82,996	0
[illegible]	[illegible]	-4	[illegible]	-6
Encore Computer Corp.	(2,719)	–	650	+842
[illegible]	[illegible]	+6	[illegible]	+7
Intelogic Trace, Inc.	5,315	+1	40,052	-1
[illegible]	[illegible]	+181	[illegible]	+135
Ultimate Corp.	4,533	+48	41,213	+47

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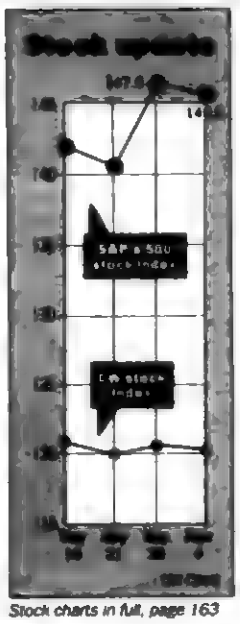
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COMPUTERWORLD

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Managing MIS staff incentive programs requires finesse to avoid alienating those not rewarded. **Page 103.**

■

User concerns over IBM's mixed signals on the future of System/36s and 38s have been noted and are being addressed, a senior IBM executive says. **Page 16.**

■

Distributed data base management is offered to large users of the Ingres DBMS from Relational Technology. **Page 31.**

■

Ashton-Tate axes two Multimate packages and freezes efforts to port word processing to larger systems. **Page 25.**

■

The long-awaited automatic loader for IBM's 3480 cartridge tape system arrives. **Page 8.**

■

Bridging a gap between IBM's DOS/VSE and VM operating systems, Applied Data Research unveils a new version of Librarian. **Page 4.**

■

Digital Research rolls out an operating system that can concurrently run MS-DOS and CP/M applications and take advantage of expanded memory. **Page 15.**

■

Sources say John Thibault, Wang Laboratories' vice-president of corporate quality, will be named CEO of Intecom, Inc., the Allen, Texas, PBX manufacturer being acquired by Wang. A Wang spokesman would only confirm that Thibault will join a transition team managing the acquisition, but an Intecom spokesman said a Wang employee will be named as CEO.

Intecom President and Chief Operating Officer Erik Ringkjob will remain in his positions, while current Chairman and CEO C. Michael Bowen will become a consultant to the Wang subsidiary.

■

IBM Japan's decision to slash prices on IBM's two 3090 series processors and peripherals by up to 20% is expected to spark a price war among Japanese main-

See **NEWS** page 4

Tool targets CICS crashes

Users: Storage violation flaw causes downtime loss

By Charles Babcock

FORT LEE, N.J. — A long-standing storage glitch in IBM's popular data communications monitor, CICS, has been addressed by a product from On-Line Software International, Inc.

Users say the "infamous storage violation" in CICS causes repeated system crashes and has been inherent in the product since its introduction in 1968.

While welcoming Stabilize/CICS, introduced last week by On-Line Software, beta-test site users say they have not had enough experience with it to know for certain that a solution to the CICS bug

See **TOOL** page 4

Windows opens on Wall Street

By Douglas Barney

NEW YORK — Several leading financial and investment firms last week disclosed plans to use the Windows operating environment from Microsoft Corp. as the user interface for the financial trading systems they will use in-house or sell commercially.

The announcements were presented by Microsoft as a key endorsement by the financial community — a target market for the product — and came during a company briefing at which several enhancements to Windows also were unveiled.

Although some software developers

See **WINDOWS** page 2

Honeywell ties OA, DP, other systems

By James Connolly

NEW YORK — A strategy of linking office systems with manufacturing, control and mainframe DP systems was at the root of Honeywell, Inc.'s introduction last week of an integrated office software system, communications products and a 32-bit minicomputer.

The announcements focused on Honeywell's need to support communications among competing systems produced by diverse vendors, to make office systems work with manufacturing and control systems and to let users access mainframe data as well as exchange documents.

Honeywell officials acknowledged that it is common for large-systems users to operate three or more different vendors' mainframes and minicomputers.

"Because we are already a leader in integrating the functions of all kinds of buildings, we believe we have an edge in integrating the office systems that our customers need to run their businesses, regardless of whose equipment is already in place," said Honeywell Chairman Edson W. Spencer at the New York product introduction.

Honeywell officials said the offerings are intended to tie together office, data center, factory floor and building controls systems through both IBM's Systems Network Architecture and the International Standards Organization's Open Systems Interconnect model, as well as through private branch exchanges.

But the minicomputer hardware and software announced last week also will provide the building blocks for future product developments in the buildings controls and manufacturing markets.

In addition, Honeywell marketing officials said their sales force has been re-

See **HONEYWELL** page 6

CW EXCLUSIVE

User views: Survey finds mainframe satisfaction up, memory size growing

By James Connolly

DELRAN, N.J. — In the face of industrywide talk of a mainframe market slump, the number of large systems installed in DP shops continues to grow, and user satisfaction levels remain steady.

The levels of growth and user satisfaction — with Burroughs Corp. users voicing the greatest overall satisfaction — were among the findings of Datapro Research Corp.'s annual survey of mainframe users.

Officials at Datapro, based in Delran, noted that despite minor movement in the scores for most vendors, the patterns of satisfaction were consistent with the results of the previous two years.

Datapro reported a response rate of 24% for the mailing of 5,342 questionnaires to users.

The study showed main memory capacities increasing, with 40% of the users having at least 16M bytes of memory, 26% using 16M to 32M bytes and 5% using more than 64M bytes. Just two years ago, the majority of the users reported between 2M and 8M bytes of memory. Disk storage also increased,

See **SURVEY** page 45



NCC due next week

Computerworld previews the 1986 National Computer Conference, the industry's largest end-user show, set to kick off next Monday in Las Vegas. Featured: the state of the industry, show schedules, listing of exhibit wire.

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NEWSPAPER

No service problems reported in first week of AT&T strike

Prolonged action may cause equipment delays

By Mitch Betts

WASHINGTON, D.C. — Data communications managers reported no network service problems during the first week of the Communications Workers of America (CWA) strike against AT&T, but observers said a prolonged strike may cause delays in the installation of equipment and new networks.

August H. Biegen, executive director of the Association of Data Communications Users in Bloomington, Minn., said he has heard no reports of service problems from members so far. However, he said the strike is likely to delay the planning phase of big networks as AT&T managers are diverted to other tasks.

Biegen asserted that the strike may prompt managers of large data networks to seek out other vendors. "I think they're going to look at alternative sources of supply, because no one knows how long this might go on," he said.

AT&T is now meeting its commitments to large business customers for installations of equipment and networks, spokeswoman Edith Herman said last week.

Noting that a 1983 strike caused a large backlog in private-line installations, Herman said, "We're keeping an eye on that. Down the road that could be a problem, but we've seen no major problems yet."

Talks to settle the strike recessed last week with little or no progress reported. The strike by 155,000 members of the CWA union began June 1, with the expiration of the union's contract with AT&T.

The union has rejected AT&T's proposal of an 8% wage increase over three years.

The CWA objects to AT&T's demand for an end to cost-of-living wage adjustments, limits on incentive pay for factory workers and certain job reclassifications.

AT&T management argued that it needs the contract revisions to be competitive with its mainly nonunion rivals.

Windows opens on Wall Street

From page 1

have criticized Microsoft as being heavy handed in its promotion of the product, corporate developers last week said it met their needs.

"Windows gives us a tremendous opportunity to take a tool-kit approach," said Gary Handler, project manager for briefing participant Merrill Lynch, Pierce, Fenner and Smith, Inc. "We can build a system of cooperating modules that are coordinated with hot links [real-time data transfer] and build outward from that," said Handler, underscoring Windows' flexibility in enhancing applications.

Merrill Lynch's Windows-based program, called the Merrill Lynch Municipal Trading System, will be used internally by the firm's Capital Markets trading desks throughout the country. The system is built around an IBM Personal Computer AT and exchanges data with larger systems, including an IBM 3090 and an NCR Corp. Towers.

"We wanted to establish local and centralized data bases, so we can have an overall management view from the central office here in New York but also allow the trading managers and the traders to really understand where their markets are going at any point in time," Handler said.

Reuters Holdings PLC showed its Advanced Reuters Terminal. "The system receives live stock market data and can do key word searches of news wire stories simultaneously. It is a very live system," said Ronald A. Owens, client systems manager for Reuters Holdings. The system will be marketed to traders and will be available July 1.

Applications by Midland Bank PLC, Investment Data Corp. and Neuron Data were also demonstrated.

Most of the systems shown at the briefing allow PCs to act as financial workstations, accessing data from larger systems, such as Digital Equipment Corp.'s VAX line of minicomputers and IBM mainframes, and continuously updating information on the workstation screen. "Financial applications very commonly need real-time data," said William H. Gates, chairman of Microsoft.

Microsoft also announced extensions of Windows, including the Dynamic Data Exchange (DDE) protocol. This will allow applications to exchange data in either one-time transfers or through an established "ongoing dialogue," without having to first capture the data in a clipboard approach.

"The idea is that data can move between applications without cutting and pasting," Gates said, referring to the feature as a "hot link."

Developers interested in taking advantage of DDE face only "small changes in application code," said Paul J. Davis, a member of the marketing group for Microsoft. Prior to DDE, developers reportedly had to create their own private format for a "hot-link" type of data exchange.

Additionally, Microsoft introduced the Rich Text Format (RTF), a specification that allows applications to exchange text while maintaining their particular fonts, colors, sizes and styles. RTF is of prime importance for desktop publishing applications and for the transfer of reports and text enhanced by full justification, boldface type and italics, Trower said.

Also last week, Digital Communications Associates, Inc. (DCA) announced that its Irma micro-to-mainframe communications software will be rewritten to allow the Irma 3278 terminal emulator to run as a Windows application. The first DCA products will be available later this year.

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HCC PREVIEW

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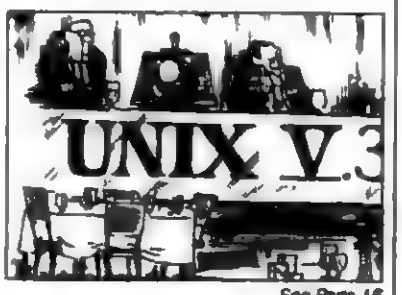
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ILLUSTRATIONS ON PAGES ONE AND 17 BY ALAN WITSCHONKE

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Librarian shares VSE, VM source code

Users say ADR manager bridges mainframe gap

By Charles Babcock

PRINCETON, N.J. — Formerly incompatible source code may now be shared across IBM DOS/VSE and VM operating systems, according to early users of a release of Librarian announced last week by Applied Data Research, Inc. (ADR).

Librarian is ADR's source code management facility, with 6,000 copies sold since it was issued in 1969. With Release 3.5, Librarian bridges one of the few remaining gaps between IBM mainframe operating systems.

Release 3.5 may prove particularly useful in shops in which VM is used as the development environment but VSE still is used for production, the users noted.

At a Midwest hospital, where that combination is in use, the VM system manager noted, "I could find no other tool that would provide access to source code in both operating systems."

Earlier releases of Librarian provided what ADR now refers to as Cross-Operating System Sharing between OS, VSE and MVS operating systems. With the latest release, a Librarian master file containing a source code program may be simultaneously updated from any of the IBM mainframe operating system environments, according to Richard Parente, Librarian product manager.

At a site that is making the conversion from VSE to MVS, with a VM development environment, Librarian would allow programmers to continue to update VSE applications still in use, even though they would soon be migrated into the MVS environment, Parente said.

Release 3.5 contains several other new components. One is the Change Control Facility, which creates strict controls over how source code is modified.

"The problem we've run into [without controls] is that more than one programmer checks out the same source code at the same time," said David B. Richards, storage administrator at United Pacific Insurance Co. in Federal Way, Washington.

"Each puts it back into production at separate times, with the work of the one nullifying the work of the other," he said.

Under the Change Control Facility, only one programmer may work on a source program at a time.

When combined with Librarian's archiving facility, the new capability allows a data processing manager to both control changes to source code and keep a chronological record of changes to it. The archiving facility not only can establish original and latest versions of the programs but also can reconstruct any version in-between. A total of 255 copies may be stored, Parente said.

The Change Control Facility is currently available for the ADR/Roscoe development environment used under the MVS operating system.

Release 3.5 also includes a Comparator for comparing two source code programs and reporting their differences.

Librarian is available immediately for $19,000 in the DOS version and $29,400 under OS environments. VM/CMS support is available for an additional $9,500.

Tool targets CICS crashes

From page 1

has been found.

The storage violation allows a CICS programmer to exceed memory allocation without being warned, resulting in an overlay of whatever application or CICS control code is nearby on the disk, said Donald Andrews, systems programmer at St. Mary's Methodist Hospital in Rochester, Minn. When the code is affected, the system crashes the next time the code is invoked.

The remedy after a crash entails a tedious search of a system dump for corrupted code and for the transaction that called it, according to an assistant treasurer who manages CICS for securities processing at a New York bank.

The bank uses MVS/CICS as its data communications system to connect applications used by stocks and bonds traders at terminals, its IBM 3090 mainframe and outside information and trading services.

When the bank's system crashes, "it takes an average of 45 minutes to get it back up again," said the assistant treasurer, who requested anonymity.

The bank attempted to get around CICS crashes by training programmers to stay within their memory allocations. The crashes, which used to occur at least once a week, still occur intermittently, he said.

"You ask for so much storage, and CICS gives you the address of where it starts. But nothing prevents you from going beyond that limit, especially when you're using macros," St. Mary's Andrews said.

The On-Line Software product that addresses the problem is aimed primarily at CICS production environments in which system operators have been forced to waive automatic crashes that are induced by the operating system when an overlay is about to occur, according to Rick Holtmeier, executive vice-president of On-Line Software.

Stabilize/CICS can detect the CICS signal to the operating system that calls for an automatic crash, and it can activate substitute procedures, Holtmeier claimed.

Another cause of CICS crashes is an application that goes into a loop. Because it is an interactive, on-line system, CICS can be frozen by a single looping application, with a system crash being the only way out, he said.

With Stabilize/CICS, applications are constantly monitored for loops, and when one is detected, that application is crashed, and standard CICS recovery routines are invoked, he said.

Stabilize/CICS is available for all MVS environments for a one-year, $12,000 license or a three-year, $36,000 license, company officials said.

TOP OF THE NEWS

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frame vendors and possibly have repurcussions in the U.S. market. The reductions are interpreted as IBM's response to user complaints that the 3090 prices had become unacceptable because of the increased value of the yen against the U.S. dollar. The price of IBM's 3090 Model 200, which went on sale last September for $8.08 million, was cut 9%. The price of peripherals such as the 3380 D/E disk storage unit and 3380 21/23 disk controller was reduced 11%. Deliveries of the 3090 Model 400 are set to begin late this year.

■

Former DEC and Encore Computer Corp. executive C. Gordon Bell has officially left the corporate world. Effective July 1, he will head the National Science Foundation's directorate for research in computer and information science and engineering.

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Main Editorial Office
Box 9171, 375 Cochituate Road,
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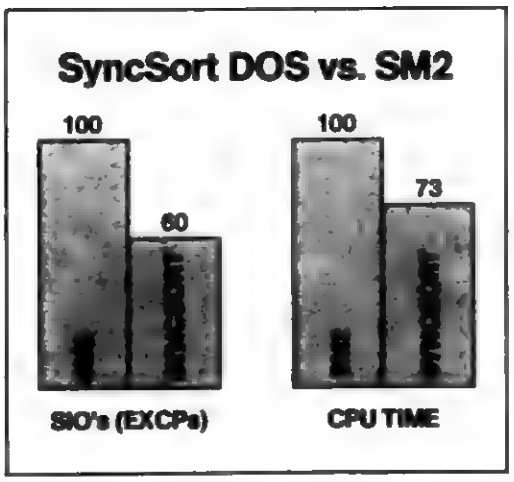
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Honeywell ties OA, DP, others

From page 1

structured and expanded to support collaborative sales approaches, under which they hope to coordinate offerings to address each customer's office, DP and building and manufacturing systems requirements.

The announcements include the following:

- The first two members of the DPS 6 Plus line of 32-bit virtual memory mini (see story below).
- The Office Network Exchange (ONE) Plus integrated office software system, which was designed along the lines of Digital Equipment Corp.'s All-In-1 and Data General Corp.'s CEO, with support for non-Honeywell systems, multimedia document creation and intersystem data base access.
- The Honeywell Virtual System (HVS) 6 Plus operating system, which Honeywell said will allow programs written for earlier DPS 6 systems to run on the DPS 6 Plus processors.
- Three applications packages for the health care industry.

Communications products

Communications products announced at the same time included enhancements to the Honeywell-to-SNA network gateway, OSI session layer and transport layer products for small computers, a local-area network for personal computers, expanded Ethernet capabilities and a Digital Multiplexed Interface (DMI) link between Honeywell's small computers and PBXs.

The DMI voice and data link, which will be available for AT&T's System 75 and 85 PBXs later this year and for Honeywell PBXs in 1987, is a step toward implementing an integrated digital systems network, according to Honeywell spokesmen.

The SNA gateway enhancement, Release 4.0, reportedly allows IBM 3270 terminal users interactive access to applications on Honeywell DPS 6 and DPS 8 systems. In addition, Onelink, an enhanced IBM Distributed Office Support Systems connection, will be available in early 1987.

The LAN, to be available in July, is said to support direct Ethernet attachments for Honeywell Personal Computers, IBM Personal Computers and other IBM-compatible PCs through a $683 PC-LAN card.

Honeywell officials said all of the announcements are targeted at the company's installed base of mainframe users and its 40,000 DPS 6 users as well as new accounts, particularly small businesses running other vendors' minicomputers and IBM PCs.The products drew mixed responses from analysts.

"I think it is a fairly significant announcement. They came out with a comprehensive and easy-to-understand plan for their future direction," said Elizabeth Levy, an analyst with market research firm Dataquest, Inc. Levy said ONE Plus is likely to be competitive with CEO, All-In-1, Wang Laboratories, Inc.'s Wang Office and Hewlett-Packard Co.'s Personal Productivity Center.

"The crux of the announcement, in my opinion, is that they are thinking about the importance of departmental processors and are willing to support other vendors and the IBM PC," she added, citing the examples of links to HP and DG application packages. Levy noted that multivendor support, as well as flexibility to buy the DPS 6 Plus hardware in configurations ranging from one to four processors with additional support for a Unix coprocessor, makes Honeywell attractive to new accounts running other vendors' equipment as well as government agencies and manufacturers that need Unix.

CW CHART

Honeywell, Inc. DPS 6 Plus: Two models

	Model 410	Model 420
Processors	1-4	1-4
MIPS[1]	1-4	1-4
Disk drives	10	20
Memory (M bytes)	4-16	8-64
Disk capacity (G bytes)	2.5	5.0
Local-Area Network Controllers	1	2
Communications ports	64	192
Peripheral Ports	3	7
Number of users	10-30	60-180
Typical Price	$115,000[2]	$410,000[3]

1 Millions of instructions per second, assuming 32-bit words.
2 Includes one CPU, 4M bytes of memory, 10 disk drives, communications processor, basic office system and high level...
3 Includes four CPUs, 16M bytes of memory, 20 disk drives, 10 tape drives, communications processor, basic office system and high level...

Advertised pricing by Honeywell

Outdated packages

However, Ronni Marshak, associate editor for Seybold's Office Computing Group, Inc., noted, "I don't find their announcements nearly as exciting as Honeywell does." She said the idea of linking manufacturing, office and building controls is not new and that despite gains in communications abilities and ease of use, some of the software packages are outdated.

The improvements that Marshak cited include the ability for users to bypass menus and Honeywell's hiring of a dedicated sales force for the small-business market. But she noted that word processing software is still page-bound, meaning that users cannot view portions of two pages simultaneously.

She added, "Honeywell is not doing as badly as we in America might think. They are No. 1 in Canada and No. 1 or No. 2 in Australia and Great Britain. They don't have that many installations, but each installation has hundreds of users. You never hear bad things from customers about Honeywell. It's just that you don't hear anything exciting."

Eugene Manno, group vice-president for Honeywell's Small Computer and Office Systems Group, said the company developed ONE Plus because of the changes in customer requirements. Honeywell hired a research firm to examine end-user needs with an emphasis on features for which the user, rather than the MIS department, asked.

"There has been a proliferation of personal computers, and most organizations own computers from different vendors," Manno said. "ONE Plus enables personal computer users to contribute to the overall development of work-group productivity."

ONE Plus is a modular system composed mostly of programs that have been available previously but have been modified with common menu-based interfaces. All of the modules run on the DPS 6 Plus and on earlier DPS 6 systems with the GCOS 6 Model 400 Revision 4.0 operating system. The first group of modules, scheduled for September delivery, includes electronic mail, document processing, time management, spreadsheet, list processing and asynchronous communications.

A key element of the second group of modules, to be available in December, is Onexchange, a document library module that lets users of different systems exchange data and collaborate on creating documents.

It reportedly stores documents in native format and translates them into the native format of the user's system and application. For example, a document written under the Onetext word processing system could be edited using an independent personal computer word processing package.

Another element of the second group is Onebase, a departmental information base running on the DPS 6 and designed to use the Oracle Corp. Oracle relational data base management system to let PC users query Honeywell and non-Honeywell mainframes and minicomputers. Oracle acts as a bridge to DPS 6 data bases or mainframe data bases.

The software modules are priced individually and in packages, with prices for the modules ranging from $500 for the Onebase Data Translator to $6,500 for Onelink. A package called ONE Plus Integrated Office System, including Onexchange, Onemail, Onetime and Onetext costs $8,930. The ONE Plus Office Exchange System, including Onexchange and Onemail, costs $3,275.

DPS 6 Plus takes the torch

By James Connolly

NEW YORK — The 32-bit virtual memory minicomputer introduced as Honeywell, Inc.'s new basic office system platform last week features the addition of shadow processors, a Unix coprocessor and a built-in local-area network (LAN) controller.

Honeywell offered the DPS 6 Plus as the successor to its 11-year-old DPS 6 minicomputer line, although a company official said the previous product line remains available.

David W. Cleary, Honeywell vice-president and general manager for the Office Marketing Systems Division, said Honeywell replaced eight CPU boards in the DPS 6 with one board in the DPS 6 Plus. He also said the company, which released two basic, mid-range models of the new line, will offer low-end models next year and high-end versions in late 1987 or early 1988.

Current DPS 6 users reportedly can move programs written for the DPS 6 GCOS 6 Model 400 operating system to the new processors, which run Honeywell Virtual System (HVS) 6 Plus. Those GCOS programs will run at about the same speed on the new system as on the old unless they are recompiled to run faster under HVS, Honeywell said.

The DPS 6 Plus Models 410 and 420 can be configured with one to four processors each, with a single processor performing 1.1 million instructions per second (MIPS) and a quadratic processor offering approximately 4 MIPS, Cleary said.

The 32-byte virtual memory unit reportedly supports demand paging with 1,024 segments and a maximum segment size of 2M bytes. The office environment system also features shadow processors that provide error checking. The system includes a LAN controller that reportedly will allow support for both Ethernet and token-ring networks and includes a Unix coprocessor to allow concurrent Unix and HVS operations.

"I thought the real sleeper was the shadow processors in there. That sort of thing gives me the idea that they are thinking of making the system fault tolerant at some point," said Molly Upton, an industry analyst for International Data Corp. of Framingham, Mass.

She added that the network controller will position the DPS 6 Plus well as a network server, particularly as lower cost systems debut.

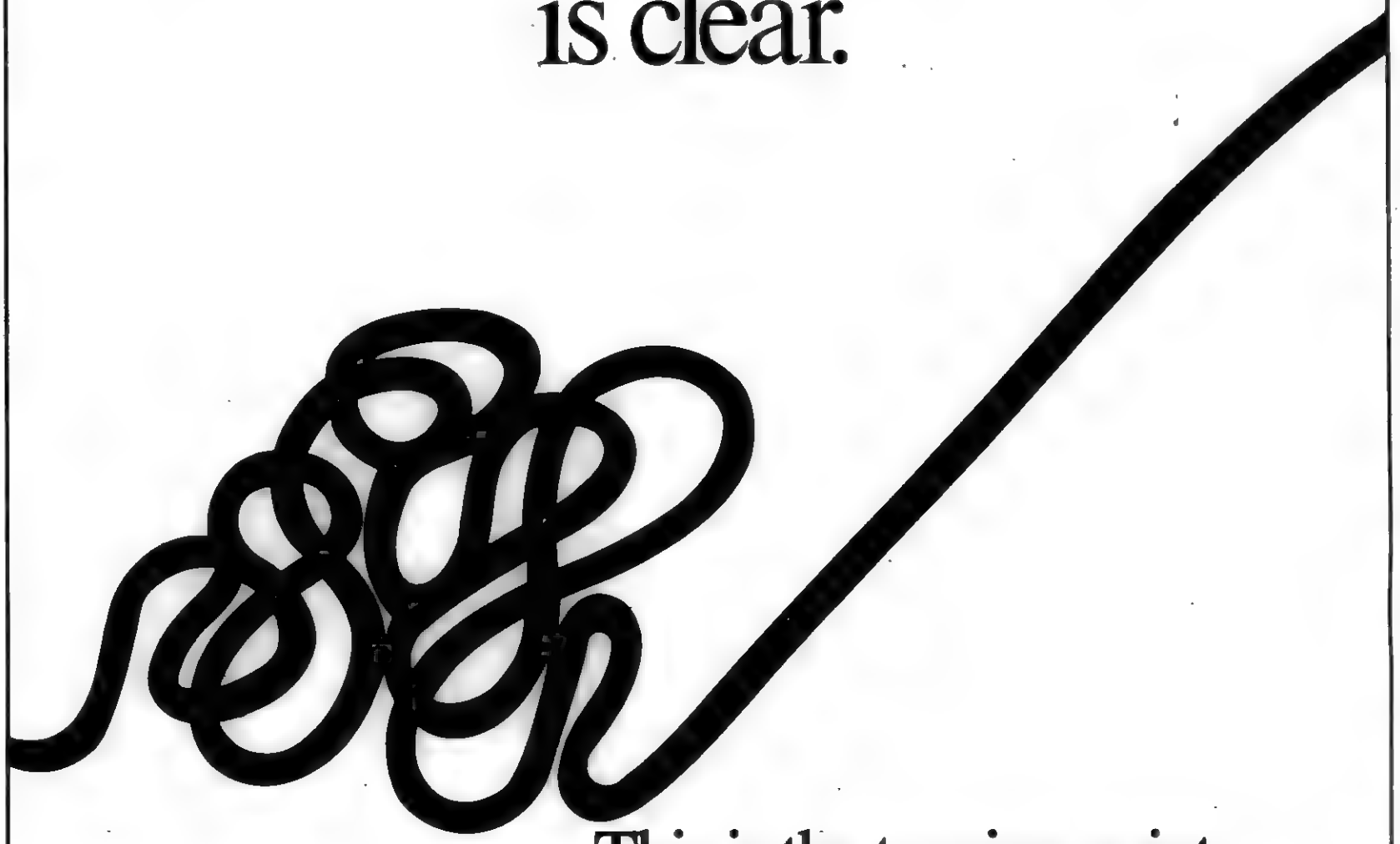
Blumenthal meets with Sperry users

NEW YORK — Officials of three Sperry Corp. users groups last week met with top executives of Sperry and Burroughs Corp. to discuss the impact the proposed merger of the companies will have on customers.

In a prepared statement, officials of Use, Inc., AUUA, Inc. and the Sperry Users Association/Europe — together representing 2,000 user sites — said the meeting was held "to obtain assurances that the investment of Sperry users, now and in the future, will be fully protected after the merger is completed."

The users group representatives met with W. Michael Blumenthal, chairman and CEO of Burroughs, and Joseph J. Kroger, president and chief operating officer of Sperry.

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IBM adds five-cartridge autoloader to 3480 tape subsystem

Long-expected feature reduces operator tasks

By Jim Connolly and Donna Raimondi

RYE BROOK, N.Y. — In a move that has been expected since the cartridge tape drive debuted more than two years ago, IBM last week announced an automatic loader for its 3480 Magnetic Tape Subsystem.

The 3480 Automatic Cartridge Loader feature, which holds up to five 4-in. by 5-in. cartridges, is intended to minimize the human role in running the tape drive. When the 3480 was announced in early 1984, analysts and users were surprised that there was no autoload feature, which was seen as a potential advantage over the 3480's predecessor, the 3420 reel-to-reel drive that requires an operator to change tapes.

The autoloader, which attaches to the front of the 3480 Model B22, requires seven seconds to remove one cartridge and insert another. It can operate under manual control, sequential control or control of the IBM MVS operating system. It runs under IBM VM only with an MVS guest.

However, even with the five cartridges moving through the autoloader, operator intervention to add more cartridges is apparently still necessary when performing a task such as backing up a 2.5G-byte IBM 3380 or 5G-byte 3380 Model E disk drive, because each cartridge holds a maximum of only 200M bytes of data, according to IBM product literature.

IBM analyst Thomas Henkel of the Boston-based Yankee Group noted that the autoloader was not unexpected and said that some IBM competitors, such as Storage Technology Corp., National Advanced Systems Corp. and Amdahl Corp., have been rumored to be planning autoloaders for the 3480-compatible drives that they have under development.

Henkel, asserting that the five-cartridge limit appears too low to justify the price of the autoloader, added, "My feeling is that this is only part of the story. I still think IBM has some sort of a tape library on the way and that this would be a part of it."

The autoloader has a list price of $8,900 and will be generally available in August. However, IBM said that customers with 3480s already installed can order one for $7,600 by Sept. 30 under a special introductory price.

Ruth Weiland, data control supervisor at American Cyanamid Co. in Clifton, N.J., said her company is in the process of installing 3480s. "It is difficult to say if the automatic cartridge loader will be valuable, because we are really not using the product yet."

Wyse augments PC line with AT-compatible Wysepc 286

By Maura McEnaney

SAN JOSE, Calif. — Terminal manufacturer Wyse Technology, Inc. today enhanced its personal computer product line with the introduction of an IBM Personal Computer AT-compatible computer. The company also introduced three new monitors and two graphic display boards.

Wyse introduced its first PC product in late 1984. The new AT version will be sold through Wyse distributors and OEMs. Analysts say they believe Wyse will have to stick to its existing distribution channel in order to compete in the well established market for PC ATs and compatibles.

"That's an awfully competitive market today, and they are not going to compete with Compaq Computer Corp.," said Don Sinsabaugh, of New York-based Swergold, Shefitz & Sinsabaugh, Inc.

The Wysepc 286 runs at 10 MHz for increased speed over the standard 8-MHz PC AT, the company said. It provides 640K bytes of random-access memory and eight PC AT expansion slots.

The computer includes a choice of standard PC AT keyboard or IBM Enhanced Personal Computer keyboard. Display options include a medium-resolution monochrome and color graphics monitor or high-resolution graphics monitor in monochrome or color.

The product can be configured with a 1.2M-byte, half-height, single floppy disk drive, a 20M-byte half-height hard disk drive and a 40M-byte full-height hard disk drive. The single, floppy version costs $2,499; the 40M-byte version costs $4,199.

Transatlantic digital cable planned

By Elisabeth Horwitt

ATLANTA — In a move that will provide customers with a terrestrial alternative to satellite-based high-speed data links, AT&T, British Telecom International, Inc. and France Telecom, Inc. jointly announced digital transmission services that will run over TAT-8, the first optical-fiber transatlantic cable system.

The announcement, which was made at International Communications Association's Telecom '86 conference, heralds "the first opportunity to establish a fully digitized terrestrial link" between the U.S. and Europe, according to France Telecom spokesman Alain Coursaget.

"Right now, anyone that wants to transmit 56K bit/sec. or faster must use satellite links," said British Telecom International President Michael Ford.

Two days after the announcement, British Telecom obtained customer commitments from several companies, including Mobil Oil Corp., British Airways and Barclays Bank PLC.

Although TAT-8 is not scheduled to go into operation until 1988, businesses will be able to place their orders with AT&T for AT&T's TAT-8-based International Accunet Digital Services on July 2 if the company's tariff filing is approved by the Federal Communications Commission.

AT&T's four International Accunet Digital Services will provide customers with private dedicated channels at data rates of 56K, clear 64K, 1.5M and 2.05M bit/sec.

Customers will be charged separately by AT&T for the U.S. side of the link and by either British Telecom or France Telecom for the European part of the link, company spokesmen said. AT&T's portion of the 56K and 64K bit/sec. services will be priced at $4,000/mo. Its portion of the 1.5M bit/sec. service will cost $40,000/mo, and the 2.05M bit/sec. service will cost $52,000/mo.

AT&T will offer links between its 56K bit/sec. International Service offering and domestic transmission facilities such as AT&T Dataphone Digital Service and local telephone company connections, the firm said. A link between the 1.5M bit/sec. International Service and AT&T's domestic Accunet T1.5 Service will also be provided. Domestic links for the 64K and 2.05 bit/sec. International Services have yet to be announced.

Satellite-, ground-based networks vie for overseas mart at ICA show

By Elisabeth Horwitt

ATLANTA — Competition between satellite- and terrestrial-based network offerings, particularly in the overseas market, reached a new high at Telecom '86, the International Communications Association's annual convention, which was held last week.

Several satellite companies brought forth new high-speed links between the U.S. and Europe, and AT&T, British Telecom International, Inc. and France Telecom, Inc. jointly announced high-speed digital transmission services that will run on TAT-8, the optical-fiber transatlantic cable scheduled to be operational in 1988 (see story, left).

A number of communications managers spent a lot of time seeking insight into the satellite-vs.-terrestrial dilemma. "We're looking at everything — fiber, satellite, local-area networks," said Martin Konrad, a manager within E. F. Hutton & Co.'s data communications future planning department.

The brokerage giant already has a C-band broadcast satellite network based on Equatorial Communications Co. equipment, he said. "Now we're looking at interactive C-band networks; we can't use Ku-band because the earth stations are too unreliable in bad weather."

Optical fiber links city building

However, E. F. Hutton also is installing an optical-fiber terrestrial network to link its buildings in the New York City area. "Some of our data applications require a 24M bit/sec. capacity, so we need fiber," Konrad said.

AT&T Communications seemed determined to capture communications business in both the satellite and terrestrial markets. At the conference, the company announced its International Accunet Digital Service, high-speed dedicated channels that will run on the TAT-8 optical-fiber overseas cable. Shortly before that, AT&T received approval from the Federal Communications Commission to offer its Skynet Star Network satellite-based service.

Satellite vendors seemed determined to prove to communications managers that their network offerings have advantages over terrestrial connections. "Propagation delay problems can make satellite links less feasible for some kinds of high-speed transmissions, but they are less expensive and far more reliable and available than terrestrial lines," said Mary Kay Williams, a spokeswoman for GTE Spacenet Corp. She cited a recent incident in which a trawler accidentally snagged three transatlantic cables at once, resulting in major service outages.

GTE Spacenet announced Skystar International, a satellite-based overseas service that will directly compete with AT&T's International Accunet Digital Service. Through GTE Spacenet's gateway in Chicago, users of the company's U.S. satellite network, Skystar, can transmit overseas via Intelsat Business Service. Intelsat Business Service provides satellite-based links between the U.S. and Europe. Skystar International will support transmission rates of 56K bit/sec. and up.

GTE Spacenet awaits FCC approval

GTE Spacenet is currently awaiting FCC approval and working out agreements with foreign Postal Telephone and Telegraph administrations, according to Williams. Pricing for the U.S. portion of the link provided by GTE Spacenet will range from $4,000/mo to $6,000/mo, she added, with foreign administrations offering similar pricing.

GTE's terrestrial networking subsidiary, Telenet, announced an agreement in principle with Telecom Canada to file a tariff that would create a permanent virtual circuit between the two companies' packet-switched services.

RCA Network Services, Inc. introduced Microstar Ku- and C-band International Business Satellite Services, which provide Intelsat-based connections between the Eastern Continental U.S. and Europe at speeds ranging from 64K bit/sec. to 1.544M bit/sec.

Also announced were Microstar Co. 56K bit/sec. and 1.5M bit/sec. domestic services. RCA provides customer Ku-band earth stations and a space segment on RCA Satcom K-Series satellites as part of its domestic offerings.

ORACLE RELATIONAL DBMS ROCKETS TO #1 IN THE 1986 SOFTWARE USER SURVEY. WHY?



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COMPATIBILITY

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Today, minicomputer users polled in the *Software User Survey* rank Oracle Corporation as their number one vendor choice for 1986. ORACLE is the number one relational DBMS, with thousands of installations on IBM mainframes, DEC, DG, HP and most other vendors' minis and micros, including the IBM PC. In fact, *INC. MAGAZINE* ranks Oracle as the fastest-growing major software company in the USA.

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ORACLE Seminar Schedule

AK Anchorage ..... Jun 24
AZ Phoenix ..... Jun 5, Aug 5
CA Los Angeles ..... Jun 10
Jul 10, Aug 6
Newport Beach ..... Jul 15
San Diego ..... Jun 17, Aug 7
San Francisco ..... Jun 19, Aug 5
Sunnyvale .. Jun 10, Jul 8, Aug 7
CO Denver ..... Jun 17, Jul 17
CT Hartford ..... Jul 16
New Haven ..... Aug 20
FL Jacksonville ..... Aug 5
Tampa ..... Aug 6
GA Atlanta ..... Jul 15
IA Des Moines ..... Jun 25, Aug 27
ID Boise ..... Jul 31
IL Chicago ... Jun 12, Jul 8, Aug 14
IN Indianapolis ..... Jun 17, Aug 19
KY Louisville ..... Aug 7
LA New Orleans ..... Jul 11
MA Boston ..... Jun 19, Jul 16
Burlington ..... Aug 12
MD Bethesda ..... Jun 12
Jul 9, 23, Aug 7
ME Bangor ..... Jul 3
MI Detroit .... Jun 10, Jul 15, Aug 19
Grand Rapids ..... Jun 13
MN Minneapolis ..... Jun 26, Jul 22
MO St.Louis ..... Jun 11, Jul 30
NE Omaha ..... Jul 9
NJ Cvl. Station ..... Jun 5, Aug 7, 28
Iselin ..... Jul 8, 22
NY Albany ..... Jul 23
New York City ..... Jun 12, 25
Jul 24, Aug 12, 26
Rochester . Jun 19, Jul 10, Aug 13
NY Syracuse ..... Aug 19
OH Akron ..... Jul 23
Cincinnati ..... Aug 5
Cleveland ..... Jul 22
Columbus ..... Aug 12
Dayton ..... Jul 8
OK Oklahoma City ..... Jun 24
Tulsa ..... Aug 26
OR Portland ..... Jul 24
PA Harrisburg ..... Jul 8
King of Prussia ..... Jul 24
Philadelphia ..... Jun 18
Pittsburgh ..... Jun 19, Aug 7
Scranton ..... Aug 5
RI Providence ..... Jul 8
TX Austin ..... Jul 10, Aug 19
Dallas ..... Jun 11, Jul 22
Ft.Worth ..... Jul 15
TX Houston ..... Jun 10, Aug 19
San Antonio ..... Jul 8, Aug 27
UT Salt Lake City ..... Jun 5, Aug 6
VA Norfolk ..... Jun 4
Richmond ..... Jun 19
VT Burlington ..... Aug 6
WA Seattle ..... Jun 12, Jul 15
WI Milwaukee ..... Jul 17

Canadian Seminars

Calgary ..... Jun 3
Halifax ..... Aug 20
Ottawa ..... Jun 12, Jul 12, Aug 14
Chicoutimi ..... Jun 18
Toronto ..... Jun 3, Jul 8, Aug 5
Vancouver ..... Jul 10
Winnipeg ..... Jun 3, Aug 5

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NEWS

Computer Associates users get first opportunity to air gripes

Problems abound, but forum is welcomed

By Charles Babcock

ST. LOUIS — Kenneth D. Moore and Robert G. Keller, MIS managers at a specialty chemical company, had reason to appreciate the first user conference staged by Computer Associates International, Inc. last week.

For one, the company provided technical experts on its security, tape management and scheduling packages, which Keller and Moore were trying to evaluate for purchase.

For another, it was convenient. Moore is director of the corporate computing facility, and Keller is the director of technical services for Mullinckrodt, Inc. in St. Louis. That city served as the Long Island, N.Y.-based Computer Associates' conference site because it was central to its customer base.

A third reason was timing. After being in business for 10 years, Computer Associates staged its first users group meeting three weeks before a major competitor, Uccel Corp., was scheduled to come to St. Louis for its users group conference. So Moore and Keller could get live demonstrations of competing packages without having to leave home.

"We're talking to company officials about a product during the day, then at night we're asking their customers over drinks exactly what it does and doesn't do," Moore said with a broad smile.

Much the same sort of process was going on among the other 400 attendees, who sat through Computer Associates' talks and demonstrations in the Adam's Mark Hotel during the day and lounged on the paddle-wheel riverboats at night.

Attendees welcomed conference

Many attendees expressed satisfaction that Computer Associates finally decided to stage a user conference, and several pointed out that former customers of Value Software, Inc., a Cherry Hill, N.J., firm acquired by Computer Associates a year ago, were used to regular user conferences and brought pressure to bear on the company to start its own.

Several of Computer Associates' best-selling products, Scheduler, Optimizer and Eztest, came with that acquisition, and Computer Associates has an interest in cultivating the former Value Software's customer base, company officials said.

Computer Associates' rapid rate of acquisition was a frequent topic, with several attendees complaining that the company was growing too fast to manage all the related support issues successfully.

"Most of their products we purchased before Computer Associates bought up the companies. We're not that crazy about Computer Associates," said Bill Jones, manager of technical support at Durham Life Insurance in Raleigh, N.C.

Some customer dissatisfaction

While other users praised Computer Associates support, especially when the originators of the product were still providing hot-line and on-site support, company officials sometimes encountered customer dissatisfaction on their own. James Lansing, Computer Associates' director of MIS operations, addressed one session and cited several Computer Associates products used in-house. "How do you find support?" questioned a voice from the audience as the rest of his listeners chuckled. "We're not a paying customer," Lansing responded, adding, "We have our ways of getting support, and you have yours."

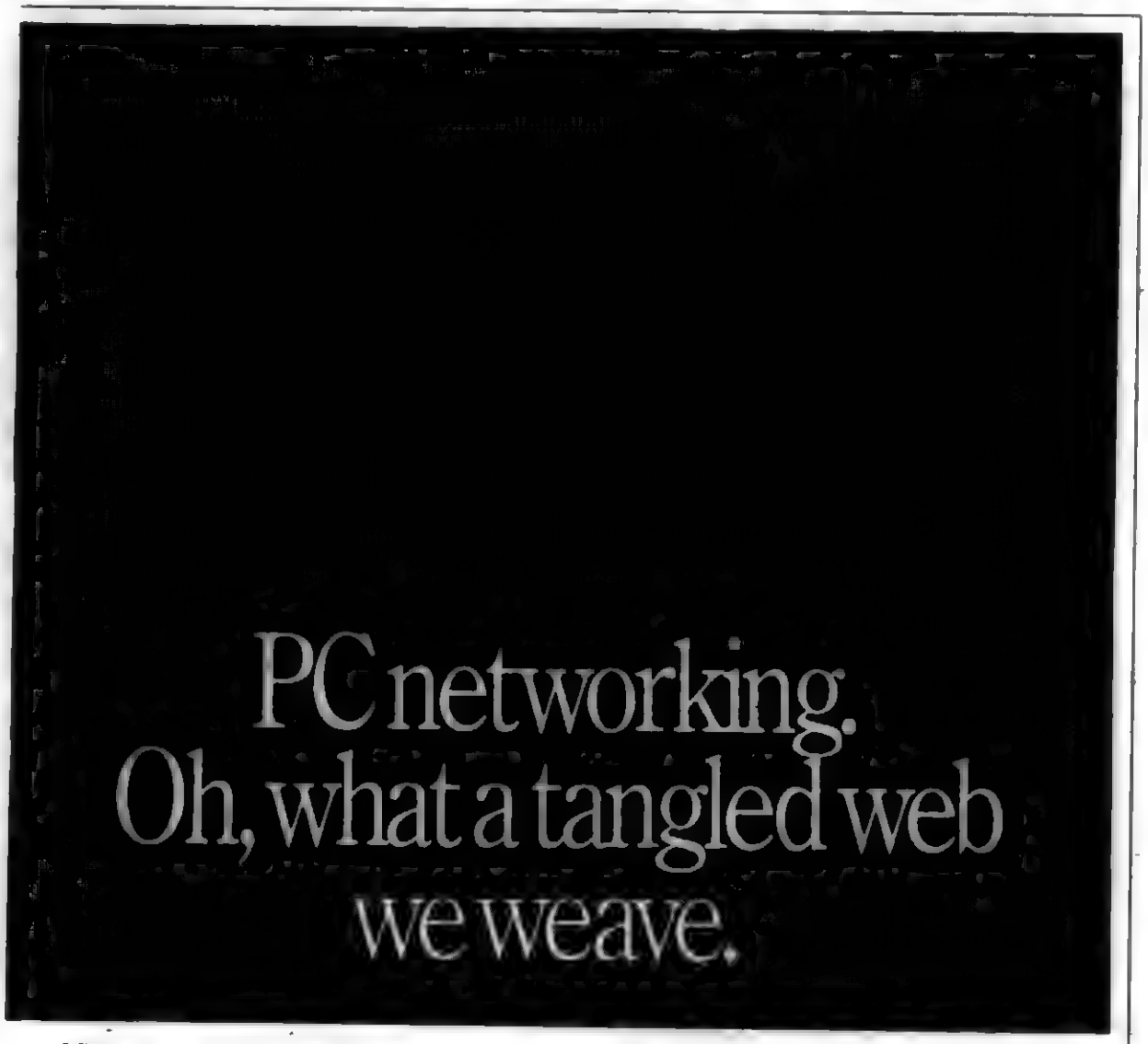
Other customers complained about documentation. A spokesman for a Toronto firm said he had pointed out several mistakes in documentation to Computer Associates support personnel last fall, and the mistakes were not corrected when new documentation was issued. Company officials, including Chairman Charles Wang in a luncheon speech, acknowledged the problem, saying steps were being taken to correct it.

Another customer recounted his experience as an alpha site for Computer Associates' Release 6.2 of Scheduler. The customer, who asked to remain anonymous, said there were so many problems getting the software up and running, however, that he would "never again" serve as an alpha site.

Reaction to session speakers, drawn mostly from the ranks of Computer Associates executives, also varied. Many users came away impressed with Computer Associates' expertise in IBM operating systems and systems utilities, but some wanted to see experienced users put in front of conference attendees.

Coming out of a presentation on Computer Associates' relational data base management system, CA-Universe, one listener, Mary Beutler, a systems programmer with the city of St. Louis, complained, "It wasn't very informative. I didn't like it."

Speaking at Tuesday's lunch, Wang cited the company's growth to $191 million in revenue in fiscal 1986, an increase of 48% over 1985. The growth was attributed to the pace of acquisitions and the expansion in sales of mainframe and micro software.



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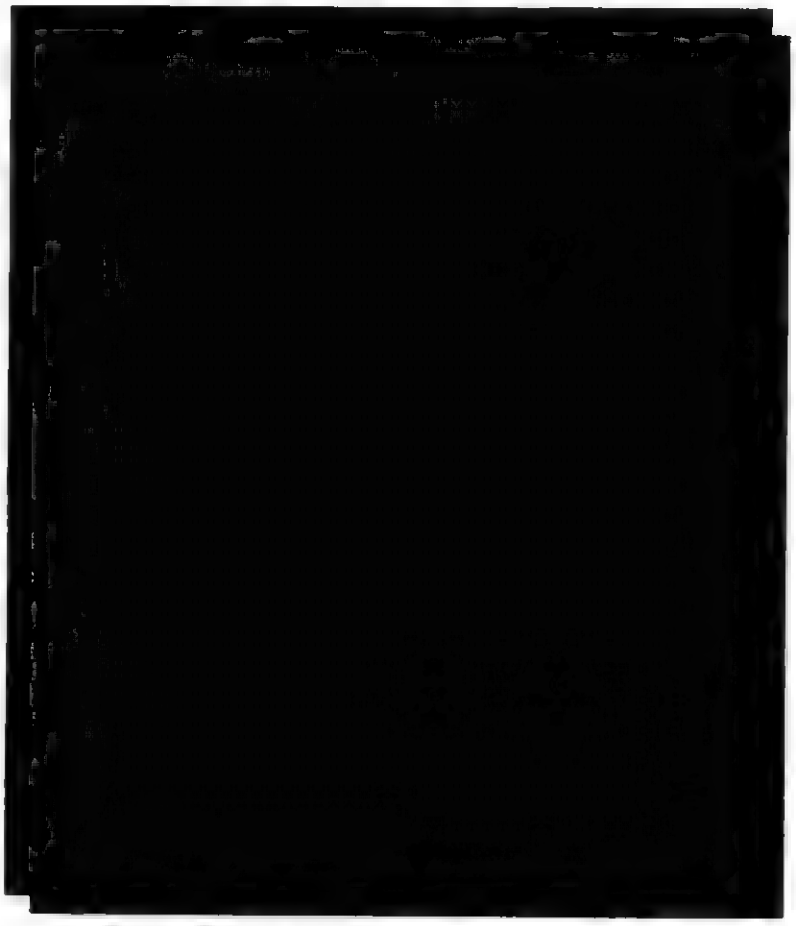
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IBM adds three processors to 10-year-old Series/1 line

Minis offer 5¼-in. disk drives; age of family in question

By David Bright

RYE BROOK, N.Y. — Apparently aiming to extend the life of its 10-year-old Series/1 minicomputer line, IBM last week introduced three models with 5¼-in. disk drives.

Among the processors is IBM's second Personal Computer AT-compatible Series/1, incorporating the 8-MHz Intel Corp. 80286 CPU made available in PC AT versions earlier this year [CW, April 7].

While some observers suggested that IBM has been clinging too long to an outdated architecture, the Series/1 has seen a fair degree of popularity as a niche machine, particularly in communications applications.

First introduced in 1976 as a general-purpose system, the Series/1 has an installed base of more than 42,000 systems worldwide, with 8,000 units shipped in 1985, according to estimates from International Data Corp., a market research firm in Framingham, Mass.

IBM's intentions perplexing

Nevertheless, some IBM watchers do not see much of a market for the new products and are perplexed as to IBM's intentions. "I don't want to call it obsolete, but it's certainly not a growth product anymore," said Harry Edelson, president of Edelson Technology Partners, a consulting and venture capital firm in Saddlebrook, N.J.

Edelson predicted that within two or three years, IBM will finally phase out the Series/1 line and replace it with "fancier" systems. But he praised the Series/1 for lasting 10 years when the average product life cycle at IBM is only six years.

Edelson added that IBM's PC family has been cutting into Series/1 sales. In fact, one consultant, George Best, president of Cherry Hill, N.J.-based Systems Consulting, Inc., has been helping two clients replace Series/1s with groups of IBM PCs. Best said the result has been greater performance at lower cost.

"I'm not really sure what IBM's strategy is," Best said. "The first Series/1 PC they announced [CW, March 11, 1985] is pretty much nowhere, marketwise."

IBM boosts two uses

However, speaking at an executive conference in Palm Springs, Calif., last month, William Grabe, IBM vice-president and assistant group executive for the Information Systems and Products Group, said IBM is especially enthusiastic about two uses for the Series/1.

The first is IBM's collaboration with General Motors Corp. on GM's Manufacturing Automation Protocol (MAP). The second is in IBM's own manufacturing. Grabe said a pilot installation being developed with the Series/1 will help IBM evaluate MAP for all of its manufacturing sites.

Available in September, the three processors are the Series/1 4956 Models G10 and H10 and the desktop Series/1 5170 Model 496, which is integrated within the IBM PC AT. Prices begin at $16,500 for the G10, $18,500 for the H10 and $10,695 for the 496. Prices on previous Series/1 4956 models were up to $22,266.

Operating systems available on the three models are new versions of the Series/1 EDX and Realtime Programming System that support the 5¼-in. disk drives. EDX Version 5.2 is available for a one-time cost of $750 to $5,500, depending on the processor model; the Realtime Programming System Version 7.2 costs $7,000 to $12,500, also depending on processor model.

According to IBM, much of the new systems' improved performance and lower costs stem from the use of the 5¼-in. hard disk drives. The G10 and H10 each come with a 40M-byte hard disk drive and a 1.2M-byte 5¼-in. floppy disk drive. Space is provided within the systems for two optional drives — a floppy and a hard disk or two hard disks. The three processors each come with 1M byte of random-access memory, expandable to 2M bytes on the H10.

On the G10 and H10 models, a 400K-byte, microprocessor-driven cache memory is used to increase disk throughput.

According to IBM, customers can run many current Series/1 applications on the AT-based Model 496. While PC ATs currently support just one terminal under IBM's PC-DOS operating system and three under Unix, the Model 496 hosts up to six terminals and, with an additional card, can host 12.

The IBM PC AT's 8-MHz Intel 80286 microprocessor serves as an I/O controller for the Series/1; when not in Series/1 mode, the computer can operate as an IBM PC AT. A second floppy or hard disk can be added as an option.

To cost-effectively increase storage capacity on Series/1 systems, IBM introduced the 358M-byte 3CA disk subsystem and the 358M-byte 3CB expansion unit. The 3CA costs $24,000; the 3CB costs $19,900.

Plus Development unveils 20M-byte version of Hardcard for IBM PCs

By Maura McEnaney

MILPITAS, Calif. — Hard disk expansion board pioneer Plus Development Corp. today joined its competitors with the introduction of Hardcard 20, a 20M-byte version of its 10M-byte Hardcard for use on the IBM Personal Computer, Personal Computer XT and compatible microcomputers.

Although a late entry into the 20M-byte arena, the Hardcard 20's 45-msec average data access time is a considerable improvement over competitive products and will increase performance of software that requires multiple access or data storage capabilities, analysts said.

The Hardcard 20, priced at $895, is a single-slot expansion board the same size as the Plus Hardcard, originally priced at $1,095. It consumes eight watts of power, compared with 14 watts for the Hardcard, and is available immediately.

Through a voice-coil actuator used in parent company Quantum Corp.'s 5¼-in. Model 540 disk drive, the Hardcard 20's access time is faster than the 65-msec average access time of Hardcard and the 85-msec average access time of the PC XT drives.

"This puts the PC add-on market almost in a class with the early PC ATs, which had a 20M-byte, 40-msec access time," noted Phil Devin, personal computer storage analyst at Dataquest, Inc.

Users running Unix or data base management system packages that require large disk access requirements can benefit from the Hardcard 20's faster access time, noted Jim Porter, publisher of "Disk/Trend News."

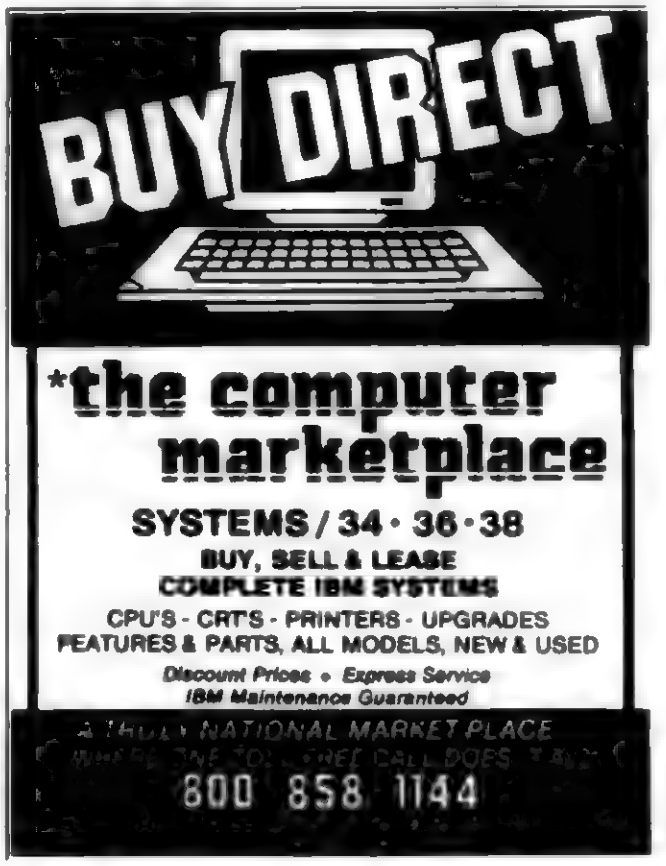
Since Plus introduced Hardcard last year, approximately 23 vendors have introduced versions of a hard disk on a card. Current 20M- and 30M-byte expansion board versions take up 1½ slots, however.

Plus has been criticized for its late entry into the 20M-byte market, as other vendors offer more capacity in their products at a cheaper price. "Almost immediately, the market was established as a 20M-byte market," Devin said. "Unfortunately, Plus has been awfully late in developing it."

Alert users got an early view of Hardcard 20 recently when a photo of the then-unannounced product accidentally appeared in print ads for the Hardcard 10. Nevertheless, analysts like Devin are impressed with Hardcard's increased access time and the product's single-slot capacity.

"Call it a just-in-time market introduction, because if they waited much longer, they would have blown it," Porter said.





House passes 'federal interest' interstate computer crime bill

Computer fraud, abuse penalized

By Mitch Betts

WASHINGTON, D.C. — The U.S. House of Representatives last week approved the Computer Fraud and Abuse Act of 1986, a bill that would give the federal government authority to prosecute interstate computer crimes involving private-sector computers.

The bill covers computer-assisted fraud, malicious data tampering and trafficking in stolen passwords with penalties of up to five years in prison. It now goes to the U.S. Senate, where the Senate Judiciary Committee is expected to send the bill to the full Senate for enactment sometime before November.

As most states have laws against intrastate computer crimes, the federal bill is carefully designed to extend jurisdiction to only so-called "federal interest computers." These are defined as computers used by the federal government or financial institutions and computers involved in an interstate computer crime.

Rep. William J. Hughes (D-N.J.) sponsored the bill and maneuvered it through the House after six months of negotiations over language to win the support of key members of the Senate and the U.S. Department of Justice.

Uncontroversial bill

The negotiations apparently paid off, since the bill was considered so uncontroversial that, under expedited rules, it passed the House by a voice vote with no opposition. Discussion of the bill on the House floor lasted little more than 20 minutes.

Hughes noted the bill is the culmination of four years of bipartisan work in Congress on computer crime legislation. He said that business and goverment have a dual responsibility to fight computer crime, the former with technical security controls and the latter with appropriate laws and prosecutions.

The legislator, who is chairman of the House Subcommittee on Crime, said computer criminals combine "technological skill with old-fashioned greed and criminal intent to rob banks or destroy business records or steal trade secrets."

Hughes added, "Unless we act now to secure the locks and provide the laws, computer crime will be the crime wave of the next decade."

The measure would establish two felony offenses for those who intentionally, and without authorization, gain access to a federal interest computer. One felony covers access to commit a fraudulent theft; the other covers access to alter information in the computer, or prevent use of the computer, thereby causing a loss of $1,000 or more in a year.

A third offense, a misdemeanor, has been established for members of pirate bulletin board systems who are caught trafficking in computer passwords belonging to others with the intent to commit interstate commerce fraud.

Specifically covered as financial institutions are federally insured banks, thrifts and credit unions; members of the Federal Reserve System, the Federal Home Loan Bank System and the Farm Credit System; and registered securities brokers.

Rep. Bill Nelson (D-Fla.), a leading supporter of the bill, said the measure will "flesh out the skeletal structure that was passed in 1984," referring to the computer crime legislation enacted two years ago that covers only federal government computers.

Provisions covering private-sector computers were stripped from the 1984 bill by Sen. Paul Laxalt (R-Nev.), who argued they would intrude on state authority. This year, Laxalt, Hughes, Sen. Paul S. Trible Jr. (R-Va.) and the Justice Department negotiated a compromise bill that covers private-sector computers involved in interstate computer crimes.

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Digital Research aims new operating system at corporate mart

Concurrent DOS faces uphill battle

By Douglas Barney

MONTEREY, Calif. — In an effort to regain ground lost to Microsoft Corp. in the microcomputer operating systems market, Digital Research, Inc. today is scheduled to announce Concurrent DOS Expanded Memory (XM) and is aiming it directly at large corporations.

"Our target end user is the corporate user," said John Rowley, president of Digital Research. According to Rowley, users in large corporations who desire multitasking and who wish to use existing applications will be a key market.

But Digital Research will have a tough time selling Concurrent DOS against Microsoft's MS-DOS. "I don't think the outlook is very good. Microsoft is pretty well entrenched, and IBM is still shining on them," said Thomas Roberts, a research analyst with Framingham, Mass.-based International Data Corp. (IDC). Despite the skepticism, Roberts sees the product as succeeding in market niches.

The new $395 operating system, which will be available next month, takes advantage of the two most popular expanded memory specifications, allows multiple programs to run concurrently and addresses up to 8M bytes of random-access memory.

Although Concurrent DOS can run existing applications written for MS-DOS, IBM PC-DOS, Concurrent DOS and CP/M 86 without modification, the ability to run IBM-compatible applications is the system's strongest suit. "For us, IBM compatibility is essential," Rowley said.

The ability to run CP/M applications concurrent with MS-DOS applications is a feature prized by some. According to Damian Rinaldi, director of software research for IDC, many users will appreciate Concurrent DOS' support of "orphan software." "It gives you the ability to run multiple vendors' programs. My reaction to the product was positive."

Digital Research also announced a joint marketing agreement with Quadram Corp. under which Concurrent DOS will be bundled with Quadram's Quad EMS+ family of expanded memory boards. Cynthia Ringo, manager of Quadram's Board Products Division, claims the firm held back on releasing a product until "the availability of a viable companion software product."

According to Rowley, strategic alliances like the Quadram arrangement will help boost the popularity of Concurrent DOS. "There is the opportunity to make this product much more visible and much more mainstream in the PC marketplace," he said.

One of the major differences the combination of Concurrent DOS and the Quadram board has with other expanded memory schemes is the program code's ability to access expanded memory, analysts said. Other expanded memory schemes, such as the Lotus/Intel/Microsoft Expanded Memory Specification and the AST/Quadram/Ashton-Tate Enhanced Expanded Memory Specification, only allow data to access expanded memory.

Digital Research will distribute Concurrent DOS mainly through its 87 OEMs and 250 value-added resellers. The firm has so far shipped some 250,000 copies of Concurrent DOS, resulting in $30 million in sales.

> ***'It gives you the ability to run multiple vendors' programs. My reaction to the product was positive.'***
>
> — Damian Rinaldi
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VIEWPOINT

EDITORIAL

Learning by listening

The good news out of IBM, via its recent Palm Springs, Calif. executive conference, is that Big Blue has heard its users loud and clear. The fact that many, many IBM users are disgruntled and unhappy is no secret, since they have been very public with their frustration at IBM's snail's pace in offering a clear direction for future systems.

A case in point is the confusing saga of System/36 and System/38. Speaking in Palm Springs, William Grabe, an IBM vice-president whose group is responsible for the two systems, once again reinforced the System/36's status as IBM's departmental solution. He also reaffirmed the company's commitment to the System/38: "It clearly has the most advanced architecture and data base of our entire mid-range systems product line." Grabe even admitted that IBM had work to do on both systems.

More important, though, Grabe addressed — at least obliquely — the growing confusion among users about which direction IBM will take in choosing one of these systems as the backbone to office integration. He pointed out that IBM is "growing the System/36 and System/38 together," taking the best of both to "establish enhanced system capacity, performance and range."

Deciphering this IBM-speak isn't easy, but it does seem to send the message that IBM is moving the System/38 architecture closer to the System/36 architecture, rather than closer to the 370-based mainframe and intermediate systems.

We applaud IBM's openness in admitting its shortcomings and its apparent effort to correct them. Whether sparked by users' complaints or a slumping market, IBM is starting to listen to its customers.

New this week

As AMR Corp. Chairman Robert Crandall tells *Computerworld* in an exclusive interview in this issue, data processing — with American Airline's SABRE reservation system as its heart — is expected to contribute $100 million in 1986 pretax profits.

Clearly not every company can — or should — market its information services to the degree that American has. But American's strategy highlights an important fact of life for MIS managers: More and more, they must understand how information technology relates to the business as a whole. More and more they must interact with executives and computer users throughout the corporation who are unfamiliar, and perhaps uncomfortable, with information technology.

Such trends have prompted *Computerworld* to launch a new Management section, which begins this week. In addition to charting trends, however, the section will focus on more conventional concerns of information system managers at all levels, such as staffing, budgeting and keeping up with constantly evolving technology. On a more personal level, the section will also address education and career issues.

The section will not tell you how to create another SABRE system. But it will eschew myth for reality and help lay the groundwork for successful information systems management. It debuts on page 103.



LETTERS TO THE EDITOR

Developers add to IBM environment

Your summary of the discussion of software source code at the IBM annual meeting, "Akers sees 'demanding year' " [CW, May 5], was correct but misleading. Since I was the "independent software developer" mentioned, I'd like to clarify the discussion.

I raised the issue of source code in the context of the partnership between IBM and its customers and customers' ability to use IBM products as a base for innovation, sometimes using the products in ways not anticipated by IBM. Source code is a major factor in permitting customers to meet unique business requirements independent of IBM priorities and resources. I also mentioned that IBM often has not followed its own guidelines for converting products to "object code only."

Akers indeed mentioned the need for protecting assets and asserted the correctness of the 1983 decision, but he did so much more graciously than your article indicated. He also agreed with my request for balancing asset protection against maintaining the IBM/customer partnership and invited continued discussions on source code. His remarks recognized that independent software developers often provide products that add value to IBM computing environments rather than competing directly with IBM. The statement "we feel no obligation to serve our competitors" was directed at true competitors not independent software developers or customers.

Gabriel Goldberg
VM Systems Group
Arlington, Va.

Bankruptcy law on software service

As a practicing lawyer specializing in software law, I must commend Irwin B. Schwartz on his approach to the software escrow problem as stated in "When bankruptcy threatens software service contracts" [CW, May 26]. Unfortunately, there is one slight problem with it: It will not work in real life.

No matter how Schwartz designates his security interest, it is, in effect, related to the inability or refusal of the software developer to provide service. If this inability or refusal is in any way related to an appointment of a trustee, an assignment of assets for the benefit of its creditors or filing for bankruptcy (either voluntary or involuntary), then it comes under the 1978 Bankruptcy Act.

Under the act, the filing of a bankruptcy creates an estate that owns all rights, legal or equitable, the debtor might have in any property. Specifically included are such rights as copyrights, trademarks, patents, processes and other types of intellectual property. It does not matter where the property is held or by whom.

So long as the escrower debtor in bankruptcy retained any title to it at the time of the bankruptcy filing, it is property of the estate. The fact that the escrower debtor previously agreed to transfer of the escrowed material upon bankruptcy or other condition is unimportant.

Even if the debtor manages to remain in business, the escrow beneficiary may still not be home free. The trustee, with the court's permission, may assume or reject any executory contract. Simplistically stated, an executory contract is a contract "on which the performance remains due to some extent on both sides."

As a general rule, if the software escrow contract is part of another contract that requires the parties to do some future action, even if it is unrelated to the escrow, that contract is executory. If it is executory, it can be rejected. If rejected, the software user/escrow beneficiary cannot protest the nondelivery of the escrowed material.

Besides rejecting the escrow agreement as executory, the trustee can also lease, sell or otherwise use the assets of the debtor in bankruptcy in a manner that is opposed to the interest of the escrow beneficiary or some other third party.

Furthermore, if the escrow agent owns its copy of the escrowed material outright and goes bankrupt, the bankruptcy trustee may be able to terminate any executory contract to keep the material secret and sell the source code and documentation on the open market to the highest bidder free and clear of any promise to hold the material secret.

The filing of bankruptcy enjoins any immediate action by the escrow beneficiary to get the escrowed material.

If the escrow beneficiary wants possession of the escrowed material, and is not suffering a present harm, it can file a petition under subsection D, provided it has some interest in the escrowed material. If it is suffering some present harm, then subsection F can be used to get immediate relief. Regardless of the type of injury involved, it will be necessary to get the court's permission.

L. J. Kutten
University City, Mo.

VIEWPOINT

Searching for the bright side of dark screens

At a recent conference, a speaker blamed the computer industry slowdown on the sudden discovery by executives in user organizations of "dark screens." That is, personal computers that are not in use eight hours each day.

Of course, this is the usual tempest in a teapot. If managers are actually worried about dark screens, perhaps they should ask themselves a few questions: How many hours, on average, does an employee use his phone? And how would he do without one for the times when it's needed? And how many hours per day does the average American worker use his car?

In short, how many hours a day do you use any of the useful things you own or have the use of? Think of razors, irons, exercise machines, bicycles, skis and office calculators. The real point isn't how often you use something but how important the availability of the object in question is to you for that usage — however limited.

Cost-justifying personal computers

We are often asked by users or their managers to help cost-justify personal computers and/or office automation. There are several approaches to this problem.

One is to insist that the value of the workstation be paid back over a relatively short period of time, by additional work done by the particular worker who is getting the PC. This is the strictest requirement, possibly applying only to those people whom we know in advance will use the PC for work whose usefulness is agreed upon. Financial analysts doing spreadsheet-type analysis and typists doing word processing are the examples that spring to mind.



By AMY WOHL

If the user organization is willing to look at the quality of the work performed rather than at the quantity, we have lots more justifications to examine. Take the example of a typist who can create 15 pages per day on a typewriter (taking revisions and mistakes into account) and 15 pages per day of near-typeset-quality output with graphics, multiple columns and multiple fonts on a personal computer equipped with a desktop publishing software package. The quantity hasn't increased at all, but the value of the output from a communications point of view has increased quite a lot.

Some organizations look at this differently. Let's assume that there is a reason (or several reasons) to believe that the employee getting the PC will be able to do more or better work but not enough to add up to the cost of a PC over a year or two. And let us further assume based on our experiences that on average, a PC user will find additional useful but largely unpredictable things to do with the PC on his desk.

Who, for instance, could have predicted the usefulness of Borland International, Inc.'s Sidekick and its brothers — or justified buying a PC based on their use? And yet, if you make lots of phone calls (think of stock brokers, telemarketers, salesmen) this may be the most useful — and most used — package on your PC.

In fact, if the PC screens in your company are dark more often than you like, this is more likely to be caused by lack of adequate education and training than to the usefulness of PCs. If you haven't taught users what a PC can do, either through formal training or through the availability of useful software and an opportunity to become acquainted with it, then you shouldn't be surprised if users don't know what to do with their new high-status paperweight.

It's important to realize that, for some workers, stand-alone PCs, unattached to anything except the worker's desk, aren't really very useful. Senior professionals and managers may spend most of their time in informal communication and coordination, activities that can be readily supported by computer-based activities such as information access, scheduling and electronic mail, but such activities assume a readily accessible environment to attach to.

Interconnection makes PCs useful

In fact, it is the new availability of interconnected environments — urged on by the economics of less expensive, easier-to-use, and more useful local-area networks and departmental processors — which will make PCs useful to those who do not have their own high-productivity applications as secretaries, clerical workers and lower level professionals more often do.

Of course, we could solve the dark screen problem in other ways:

- Give out "tickets" to users who don't have their workstation turned on (and used) an adequate number of hours per day. And perhaps we could have a traffic cop to remove PCs (precipitously and in the dark of the night, of course) that accumulate too many nonuse tickets.
- Think of other uses for a PC. How many times have you noticed a PC covered with notes? Even people who don't have their PCs turned on all the time may use them often enough in small spurts to make them one of the best places to leave a message.

Maybe it's time for us to admit that the usefulness to the organization of being able to give all workers useful information access and communication devices will far exceed the cost of these devices. Some of our clients in the information-intensive industries already see it that way — and their competitors will ignore this at their peril.

Wohl is president of Wohl Associates in Bala-Cynwyd, Pa., and editor of "The Wohl Report on End-User Computing" newsletter.

Legislation, litigation threaten health of U.S. chip industry

According to a report in the May 11th *Japan Times* (dispatched from Washington, D.C., by the Associated Press), Rep. Les AuCoin of Oregon introduced a resolution in the U.S. House of Representatives calling upon Japan to open its markets to American manufacturers of semiconductors.

It should come as no surprise that those politicians most vociferous on the chip-trade issue represent areas with unusually large voting blocks working in local semiconductor plants; for example, Intel Corp. is in AuCoin's district.

To nullify the doubtless unwarranted allegations of those of us inclined to be cynical of AuCoin's motives, he says that he introduced the resolution for the sake of our Japanese friends: They might suffer the ill effects of growing American protectionist sentiment if the U.S. legislature doesn't force Japan to open her marketplace.

Industry converted to a battleground

From where I sit, it appears that the semiconductor industry is being converted to a battleground by the U.S.' overpopulated community of politicians and lawyers. This is particularly unfortunate since the industry is problem ridden anyway. Given an industry that is cyclic in nature, incredibly competitive and as cash intensive as any, no U.S. manufacturer of chips has managed to survive without a built-in marketplace for its products or some form of governmental subsidy. As if this weren't enough, our chip industry is now plagued by a growing storm of litigation; charges of "unfair" now filling legislative committee halls like never before.



By CHARLES P. LECHT

Falling on us is a blizzard of charges and countercharges of patent infringements, failure to perform and all the other stuff lawyers write to show that they mean to win something whatever the cost to their clientele.

Fanning the fires of discontent in both the Japanese and U.S. chip industries are the various industry associations and trade organizations like Japan's Ministry of Trade and Industry, the U.S. Commerce Department, the Semiconductor Industry Association, the Electronics Industry Association (EIA) and the Electronics Industry Association of Japan (EIAJ), to name a few of the most important. Their propaganda mills work day and night to ensure that the "just" causes of their constituancies be properly acknowledged.

For example, in November 1985, the EIAJ countered charges by our EIA that Japanese firms controlled far more of the U.S. marketplace than U.S. firms did of Japan's marketplace. EIAJ said this wasn't true because U.S. firms had 19.1% of the Japanese marketplace, whereas Japanese firms had 9.6% of the U.S. marketplace. EIA said EIAJ's figures were wrong, citing 17% and 11% (respectively) as the true numbers.

Throwing these numbers around cannot have much meaning without other key facts like the nature and size of the marketplaces, facts that are themselves too often misunderstood.

Meanwhile, Intel is suing Nippon Electric Co. (NEC) for patent infringement. NEC is suing Texas Instruments, Inc. as is Toshiba. TI is suing one Korean and eight Japanese companies. National Semiconductor Corp. is suing Linear Technology Corp., which is countersuing National Semiconductor. Hyundai Electronics, Hyundai Electronics America and Hyundai Heavy Industries are suing Inmos Co. and attempting to drag their British owners, Thorn EMI Ltd. and Inmos International Ltd., into the fray.

At least 25 combatants

At last count, I tallied at least 25 industry combatants, many of which are engaged in "batched" (several companies teamed up against one or more opponents) actions against one another. If you count the number of suits by the number of companies that are involved without regard to batching, the number is in the hundreds. If you then include the blockbuster suits launched by the various trade organizations in one country, notably the U.S., against one or more companies on foreign soil, notably Japan, this number reaches the thousand mark.

If you can distill right from wrong in this entanglement, you may be a candidate for a Nobel laureate in metaphysical economics. There is little doubt in my mind that the entire mess has its origin in the legal and political communities of the countries involved.

Capital intensive as any may be, the chip industry can hardly afford this, and it is my forecast that many companies involved in litigation may be forced into capitulation, leeched of their last funds not by their adversaries but by their own lawyers

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer technologies. He divides his time between Tokyo and New York.



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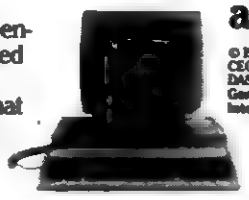
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COMMUNICATIONS



DATA STREAM
Walter Ulrich

Thriving after divestiture

Ever since divestiture, many companies have been complaining more and more about their communications systems. Telephone calls are cut off, and the transmission is poor. No one vendor accepts responsibility when problems arise. Products from different vendors just do not work together. The corporate communications bill is getting bigger and bigger.

To quote Shakespeare, "The fault, dear Brutus, is not in our stars, but in ourselves." Any change creates confusion. Now that companies can no longer turn to one vendor to solve their problems, planning and managing communications is hard work — harder than it has ever been before.

However, the hard work is well justified. The choices are complex, but in choice there is opportunity. With the help of new communications technologies and products, companies are finding ways to optimize their communications while minimizing their costs. They are solving problems they could not even address before.

The following management actions must be taken in order for a company to profit rather than suffer from the complex, competitive postdivestiture communications environment:

- Review and re-engineer your communications environment periodically. The quality and price of products, services and facilities are changing rapidly. An annual analysis is warranted in most companies to minimize costs and optimize performance.

See THRIVING page 24

Ulrich is president of Houston-based consulting firm Walter Ulrich Consulting.

Satellite links extended through terrestrial network

By Rosemary Hamilton

CHICAGO — Satellite Broadcast Network (SBN), which markets a C-band satellite service, recently introduced a second communications service that combines both satellite and terrestrial communications and will be offered as either a C-band or Ku-band system.

SBN plans to offer both the broadcast service as well as the associated hardware. Customers will pay a one-time fee for the hardware and monthly fees for both network management and data transmission.

"Two-way satellite is so, so expensive," said Madeleine Sayer, SBN general manager. "With terrestrial return, it turns out to be real cheap." She said the system targets companies that cannot afford or do not require a two-way satellite system but do have multiple sites to which they regularly transmit data.

The system includes a communications processor, designed by Intelligent Communications Networks, Inc., (Incomnet) that can be used to build either local- or wide-area networks or a combination of the two. The Incomnet portion of the network enables customers to distribute on a local or regional basis documents or other transmissions received from the satellite portion of the network.

Customers typically use ordinary dial-up telephone lines to send the documents to SBN's earth station, so they can be transmitted via satellite to multiple company sites, Sayer said.

SBN's offering was designed for "companies that send 80% of their data one way, only 10% the other — a company sending new price lists or inventory to a number of stores, for example, or memos sent out from corporate headquarters." Recipients usually only have to transmit back to the central site in order to send either an acknowledgment, or a request for a specific report, according to Sayer.

"One of our customers, an insurance

See SATELLITE page 23

LAN limits classified data access

Verdix claims multilevel security an industry first

By Mitch Betts

WASHINGTON, D.C. — Verdix Corp. of Chantilly, Va., recently unveiled the industry's first multilevel, secure local-area network designed for the transmission of sensitive or classified information over an Ethernet/IEEE 802.3 network.

The Verdix Secure Local Area Network (VSLAN), announced at a military electronics show held in Washington, D.C., targets government agencies, defense contractors and large corporations, according to George Cowan, Verdix president and chief executive officer.

"The need to protect personnel, engineering, payroll, financial, legal or other types of information is as vital to the viability and integrity of a commercial organization as the protection of classified information to national security," Cowan said.

VSLAN is a series of products that provide multiple security levels to ensure that sensitive data can be sent or received over an Ethernet-based local-area network by authorized users only, Verdix said.

The Network Security Center is a dedicated workstation that offers centralized management of the network's security system. The center monitors the entire network, tracks activations and initializations and notifies the operator of attempted security violations by an alarm. It enables the network security officer to establish secure paths between nodes and perform other control functions.

The Network Security Device is a board-level product that implements multilevel

See LAN page 24

INSIDE

MCI slashes its rates to undercut AT&T/23

NEW THIS WEEK

- Software AG offers two network management products
- IBM introduces a series of modems

For more on these and other new products, see pp. 115-128.

INSTANT ANALYSIS

"A few years ago, we used to joke that SNA meant Shall Not Attach. It's clear now it stands for Shall Not Abandon."

— Michael Ziemer, CEO, Soft-Switch, Inc., at the recent Kutnick/Wohl office automation forum

Ex-NSA director gets open standards group off ground

Faurer to play role of liaison, chief negotiator

By Mitch Betts

The new man at the helm of Corporation for Open Systems (COS), President and Chief Executive Officer Lincoln D. Faurer, has signed up for the job of steering the fledgling organization through the major staff hiring and recruitment efforts that he says should get COS "up to full strength" by year end.

COS is a consortium of vendors and users dedicated to fostering industry acceptance of communications standards and developing testing services to assure product conformance. In a recent interview, Faurer spoke of the goals of COS and his own role.

Faurer attained the rank of lieutenant general in the U.S. Air Force, held a senior position in the North Atlantic Treaty Organization (NATO) and was most recently the director of the National Security Agency (NSA).

CW: What part of your background will be most relevant and useful to COS?

FAURER: I think the experience I gained both in NATO and as the director of NSA, interacting with a number of senior-level officials who hold disparate views and managing to seek consensus and compromise solutions, creates a parallel to the kind of situation I'm going to face here.

CW: What do you see as the role of the president of COS: government liaison, staff director, chief negotiator, public persona?

FAURER: I think my role is probably most of what you said. It's a management position in which I'll be keeping the corporate entities of our group happy and feeling that they are getting a return on their investment, interacting with bodies with related purposes such as the National Bureau of Standards and other standards bodies and overseeing the structure here. Once we get started, I'll be relying on a vice-president for technical matters.

CW: Do you think you'll be doing a lot of negotiating with vendors?

FAURER: We have all signed up to a common purpose, but when one starts to follow that purpose through — with the creation of testing capabilities to evaluate products and the selection and development of standards and the certification of products — all of these steps are going to require what you might refer to as negotiation. I suspect that, with as many different companies as we have, we are going to have several different views of what is the right answer at each of those junctures.

CW: What are the big challenges for COS?

FAURER: The big challenge is making this large consortium, which hopefully will become even larger, function in a harmonious way. It has the

See STANDARDS page 23

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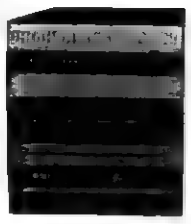
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INFOTRON SYSTEMS

MCI follows AT&T with rate cuts

By Elisabeth Horwitt

As part of the escalating telecommunications price war brought on by recent cuts in local telephone company access charges, MCI Communications Corp. recently announced pricing changes that will reduce domestic long-distance service rates as much as 17%.

MCI spokesmen said the cuts will enable customers to continue to save more than AT&T's rates, despite the fact that AT&T made radical reductions to many of its telephone services in the last few weeks.

Under the new pricing structure, which will go into effect July 1, rates for MCI Prism I service, designed for major customers with monthly bills of more than $10,000, have been reduced to maintain a 10% price advantage over AT&T's competing Megacom service.

Direct-dial charges cut

WATS rates are being lowered as much as 15%. Direct-dial call charges will be reduced up to 15%. The reductions cover all three calling time periods.

The cuts were made possible by "network efficiencies" and a Federal Communications Commission ruling that resulted in reductions in regional operating company access charges, which MCI is passing on to its customers, a company spokesman said.

MCI also announced that users of Satellite Business Systems, which MCI acquired February 28, will become MCI customers and, as such, will enjoy volume discounts and an overall reduction in rates.

Satellite links extended

From page 19

company, sends out actuarial tables to thousands of companies each week; you can't imagine what their Federal Express bill was before they started using our service," Sayer said.

The SBN hardware package is made up of a satellite dish, either C-band or the smaller Ku-band, a receiver, demodulator, communications processor, modem and a basic software package.

It has a starting price of $2,500, and, according to Sayer, the C-band and Ku-band packages cost "approximately the same."

The entry-level processor, which has 128K bytes of program storage and 512K bytes of data storage, has two serial ports and one parallel port.

The software includes basic communications functions, such as electronic mail, as well as the ability to receive satellite data and send it on to a local- or wide-area network based on Incomnet products.

Another standard feature is the ability to send an acknowledgement of a transmission automatically over dial-up lines. Users can customize the systems by adding ports, memory and software, such as an encryption function. The processor accommodates a maximum of 16 ports, but users can also buy additional processors.

Unlike some other one-way satellite services that offer fixed-rate monthly fees, SBN's monthly transmission charges vary depending on the amount of data received, the time of day it is sent and the response time.

For example, data transmitted with a three-second response time during workday hours costs $84 per megabyte for C-band systems and $126 per megabyte for Ku-band systems.

> ***"Satellite Broadcast Network's monthly transmission charges vary depending on the amount of data received, the time of day it is sent and the response time."***

If customers request immediate response during evening hours, the cost is $66 per megabyte for C-band and $99 for Ku-band.

Overnight delivery requests cost $42 per megabyte for C-band, $63 for Ku-band.

There is also a same-day service option, which costs $54 per megabyte with C-band and $81 per megabyte with Ku-band.

The cost of transmission decreases as the amount of data increases.

For instance, if a user receives between 100M bytes to 250M bytes of data per month, the cost of immediate response during prime time hours is $21 for C-band and $32 for Ku-band.

There is a service charge of $10 for each downlink per month.

Standards group begins

From page 19

size and strength to do wonderful things. It also has the size to come flying apart. A major goal for me is to make sure the latter doesn't happen and the former does.

CW: Who will have the most power in the organization, vendors or users?

FAURER: I think, intuitively, you would say that vendors have the most power because they have the ultimate say about what they produce. The principle intention of this organization, however, is to give equal voice to the user. I would admit to you that at the moment we are predominantly a vendor consortium, and we are going to be pushing hard to get more users in in order to achieve a closer numerical balance. Ultimately, it's still a matter of the user putting the pressure on the vendor.

CW: How has IBM's entry changed the corporation?

FAURER: I would say that it's a far healthier corporation with IBM as a member, joining in our intentions, than it would be if they were out. If they were out, I'm afraid there would have been a tendency for the corporation to become a force in opposition to IBM, sort of a counterbalance. That would have been unfortunate because it would have diluted the true purpose of the corporation. Now with IBM in, there need be no wasted energy in that direction. It's now the entire computer and communications industries working together.

CW: Are you concerned that the vendors might use the corporation as a public relations tool — that is, to claim they support open systems but then balk at the necessary compromises?

FAURER: That is one of the reasons for having users in this; it makes it much harder for a vendor tactic such as you have hypothesized.

CW: Will there come a time when vendors will stamp their products or advertisements with the message "Approved by COS"?

FAURER: That is the philosophical goal. A seal of approval that means a product has passed tests for conformance to a standard and therefore is interoperable in that context.

CW: COS has provoked both admiration and skepticism that it can reach its lofty goals. How do you react to the skepticism?

FAURER: I think the skepticism is entirely justified. There has long been recognition of the value of what we're undertaking, but the success has been minimal. So one is entitled to be skeptical that suddenly this organization is going to find the formula and pull it off.

But a year from now when one can point to the beginnings of clear success — certified products and vendor acceptance and enthusiasm for production — I think you'll start to see many of those skeptics admitting that just possibly this is the answer.

CW: What's next? I hear you'll soon start to hire some staff.

FAURER: I sit here now as the sole employee of the corporation. What's next obviously is to man up to our ultimate strength. To do that we have to do some more basic tasks: lay out the organization that matches our philosophical goals, prepare job descriptions and start recruiting.

It's going to take several months to get through the start-up phase. I hope to actually see the first employees walk in the door here between now and summer, and we should be close to full strength by the end of the year.

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Thriving after divestiture

From page 19

Network costs increase rapidly whenever networks get out of phase with changing costs or traffic patterns. Sometimes the cost per communications unit can be used as a measure of optimization; normally, it will improve with each successive optimization.

• Focus on network control. Intelligent planning depends on a solid base of reliable data that network control can provide.

Effective network control and monitoring address the problems that most frustrate end users, such as unwanted disconnects, poor transmission quality and degrading transmission rates. With good control, changes can be instituted more quickly, problems solved faster and service improved.

• Consider several vendors when making a major procurement. Not only does this offer a broader spectrum of solutions, but also simple human nature dictates that suppliers will be more attentive, flexible and cost-conscious in a competitive situation.

The judicious mixing and matching of different vendors' products always gives better price/performance.

One of Walter Ulrich Consulting's clients had a proposal from its preferred vendor on a telecommunications system last year. We encouraged the company to consider competitive proposals.

By doing so, they saved 20% and got a system better suited to their requirements.

In a current case we are looking at, the proposal from an incumbent vendor is $1 million higher than the lowest price proposal.

• Write off communications hardware rapidly. Telephone equipment used to be amortized with the building.

Today, seven years is too long a depreciation period, and equipment often is obsolete in three years. Realistic estimates of a system's useful life must be made.

We have known communications managers whose proposals for new equipment were rejected because the financial people did not want to write off the remaining book value of the old equipment. Faster depreciation now will allow timely replacement in the future.

• Last but certainly not least, communications strategic plans must be documented and well thought out. Operational decisions must be made within an overall framework.

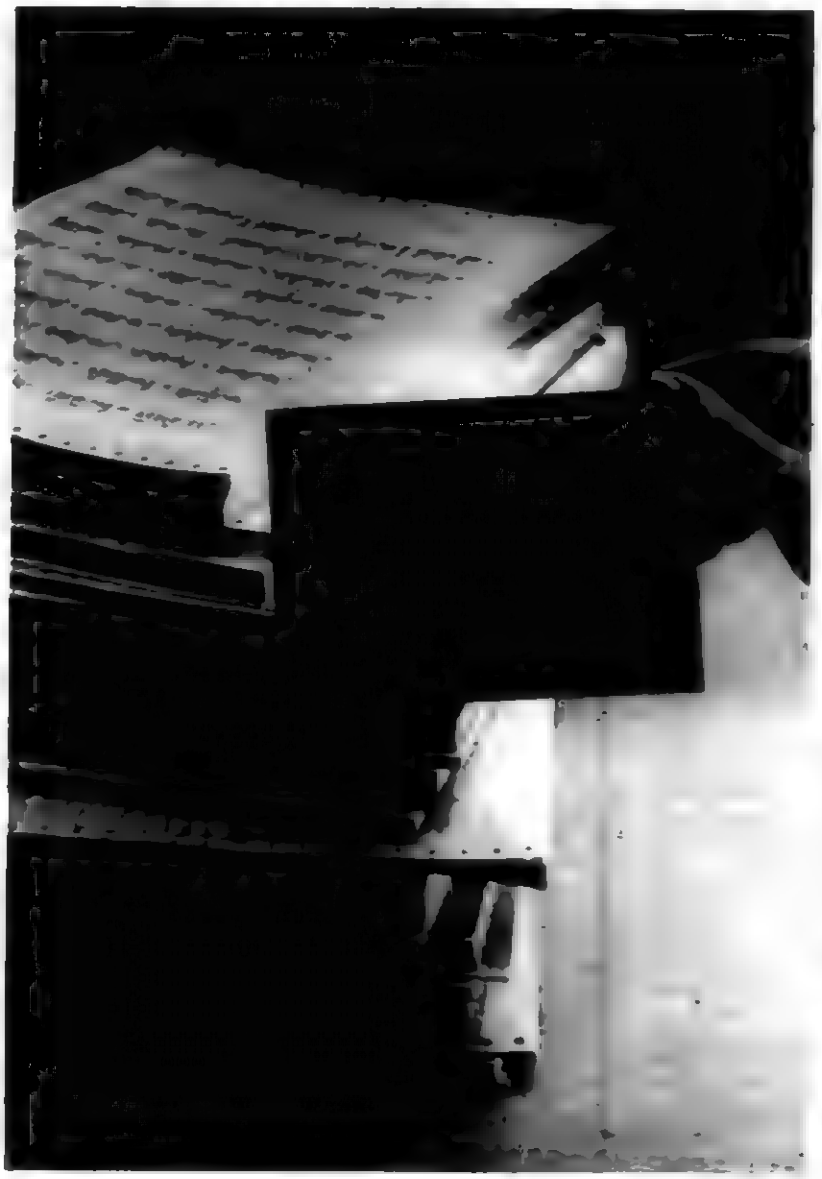
Each purchase should leverage on previous decisions and build toward future objectives.

Many companies failed to prepare a long-term technology plan in 1984. We look at those companies today and lament the waste that was caused by incompatible equipment, dead ends and prematurely obsolete systems.

Companies without plans are always tearing down their solutions and starting over.

Companies with good plans already have a good start and are building on their previous investments.

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LAN limits access to classified data

From page 19

security on IBM Personal Computer and Multibus network connections. It also provides protocol conversion for communication between different types of devices.

The Secure LAN Interface Unit is a communications server that links computers and terminals to the network via an RS-232 port connection. It performs the same security functions as the Network Security Device.

The types of security implemented by the above products are as follows:

• Encryption of each network packet is accomplished before it is transmitted over the network according to the specifications of the Data Encryption Standard (DES) developed by the National Bureau of Standards. Communications between users and the Network Security Center are also encrypted.

• Datakey is a physical device that the user inserts in a Network Security Device in order to gain access to the network. The Datakey enters a code, which is then sent to the center for authorization.

• Security windows, which define what type of data can be received and transmitted by a given user, are created by the security operator on the Network Security Center and downloaded to each security device.

The vendor said VSLAN will be formally evaluated by the National Computer Security Center in 1987 and is targeted for an A-1 rating, the highest security classification established by U.S. Department of Defense Trusted Computer System Evaluation Criteria.

The product will be available for product shipments by the end of this year, after beta-site testing in the late fall, according to Gaurang Shah, manager of secure products marketing at Verdix. He said the Network Security Center costs $20,000, and the Network Security Device costs $5,150.

Verdix is a 4-year-old company specializing in hardware and software products serving government and industry needs for Ada language development systems and computer security.

VSLAN is the first offering in a forthcoming family of related security products, officials said.

MICROCOMPUTERS

SMALL TALK
Eric Bender

Users must take OA reins

"What do users really want today? A personal computer that acts like a mini, that hides in a closet, that gives them everything they want but that they don't have to manage as a DP resource."

Dream on, suggested Dale Kutnick of the Gartner Group, Inc.

Speaking late last month at a Boston conference he co-sponsored with Amy Wohl of Wohl Associates, Kutnick warned against that kind of expectation, arguing that customers must grit their teeth and overcome office automation hurdles themselves.

"Users are going to have to take more charge of their own departments," Kutnick said. "Otherwise MIS is going to do it, and it will all drag out longer and longer. . . . MIS simply has too much to do to run the corporation."

As office systems initiatives stall at many firms, "I think the users are almost as much at fault as vendors," Kutnick continued. "Users wanted PCs, and that's what they got, and they kind of abrogated their responsibilities.

"Users need to start thinking about making investments, and vendors need to be more open with users about how they're going to make the investments pay off," he added.

This suggestion struck a nerve with the vendors present at the conference, who responded with predictable enthusiasm about risking their competitive advantages. But they made a more striking point — why should they tell their customers more than their cus-

See USERS page 28

Bender is Computerworld's senior editor, microcomputers.

Multimate packages axed

Ashton-Tate drops low-end tools; mini software on hold

By Douglas Barney

EAST HARTFORD, Conn. — Since the acquisition of Multimate International Corp. by Ashton-Tate in December 1985, two low-end Multimate products have been quietly dropped. And development of word processing software for mini and mainframe computers, which Ashton-Tate executives had questioned before the formal completion of the buyout, has been put on hold.

Both the Just Write and Multimate Executive word processing packages were discontinued in the first quarter of 1986, said Lydia Dobyns, director of integrated and word processing product marketing for Ashton-Tate. Ashton-Tate discontinued Just Write as a result of disappointing sales, which Dobyns attributed to a lack of resources to promote the product.

Multimate Executive was successful as a promotional vehicle to interest executives in Multimate's more powerful packages, Dobyns said, but like Just Write, its sales were disappointing and the product discontinued. "We will continue to consider the low-end market," Dobyns said. Neither product was sold or licensed to another firm.

The development of Multimate word processing for minicomputers, especially the IBM System/36, and for mainframes, an effort that was widely publicized last year prior to the acquisition, has essentially been put on hold while Ashton-Tate reviews the need for such products.

The firm, however, has yet to formally announce that development of these products has ceased due to the acquisition and to changes in the minicomputer market. Under the original Multimate plan, the first of these products was to ship by the start of 1986. "The whole area of mini and mainframe development efforts is under serious consideration. IBM has confused the issue with changes to the System/36 and 38 and the introduction of the Personal Computer RT," Dobyns said.

Another factor in Ashton-Tate's decision is that customers realized that Multimate software will not perform as well in a shared processor environment. "The demand begins to weaken when you talk about what performance will be like," Dobyns said.

"The best technical analysis that we

See MULTIMATE page 30

Gridcase gets discount, interface

By David Bright

MOUNTAIN VIEW, Calif. — Responding to increased competition in the laptop computer market, Grid Systems Corp. last week cut prices on its Gridcase laptops and announced an IBM Personal Computer-compatible expansion interface option.

The price reductions on the Microsoft Corp. MS-DOS-based systems range from 17.5% to 28%.

Grid President Samuel Wiegand said that "manufacturing economies" and an effort to respond competitively to the rapidly growing laptop market are behind the pricing changes.

In the past two months, both IBM and Data General Corp. have introduced laptop computers with respective starting prices of $1,995 and $1,795.

Later this year, Wang Laboratories, Inc. and possibly AT&T and Compaq Computer Corp. are also expected to release laptops.

According to the vendor, the price of the Gridcase2 with a recently enhanced yellow LCD has been reduced from $3,150 to $2,595. The company's most popular model — Gridcase3, outfitted with a gas plasma display — has been reduced in price from $4,350 to $3,125.

Priced at $325, the expansion interface option enables Gridcase systems to connect to a standard IBM PC expansion chassis and take advantage of third-party hardware cards. It also gives the systems the ability to connect to local-area networks and mainframes.

INSIDE

Blyth Software upgrades Omnis data base manager for Macintosh with new macro commands/**28**

Symantec plans corporate licensing program for Q&A package/**30**

NEW THIS WEEK

- Unipress Software ports Lattice C cross compiler to AT&T PC 6300
- Pansophic Systems offers Easytrieve Plus PC DBMS for IBM compatibles

For more on these and other new products, see pp. 115-128.

INSTANT ANALYSIS

"I don't see APPC taking off until the 640K-byte barrier is broken. On an 8088, where are you going to put it?"

— Dale Kutnick, executive vice-president for research, the Gartner Group, Inc.

Micropro enhances low-end word processor, drops price

Easy Extra includes mail-merge, labeling

By Peggy Watt

SAN RAFAEL, Calif. — Micropro International Corp. has added mail-merge and label-printing functions to an upgrade of its low-end Easy word processor, which is available for the original $149 price. The firm also will sell Version 1.5 of the word processor alone for $99.

The new combined package, called Easy Extra, runs on the IBM Personal Computer and compatible systems and is scheduled to be available in June.

Easy Extra includes a predesigned data base form suitable for mailing lists and labels. Besides such common fields as name, title, address, telephone numbers and several fields for notes, each data base can hold up to eight subsets. Easy Extra can manage as many as 750 records on a floppy disk system and 32,000 records on a hard disk.

Easy Extra was first demonstrated at Comdex/Fall '85 as Easymail, a companion product to Easy. It was scheduled for release earlier this year, but the company decided not to ship it separately and hopes instead to boost Easy sales with the enhanced product.

Easy Release 1.5, which requires 256K bytes of random-access memory, offers faster cursor speed and more complete paragraph reformatting, said Fritz Feiten, product manager. It also provides fail-safe methods of saving data when a disk is full — the system monitors disk space and beeps a warning when it nears full, and even stops and saves the file when no more data can fit.

Easy can now read Lotus Development Corp. spreadsheet files directly. However, data from another format cannot be merged into the Easy Extra data base, because Easy Extra is intended as a starter data base from which a user might graduate to a more powerful manager, Feiten said.

Micropro also offers a $25 utility to convert files to its Wordstar 2000 and IBM Document Content Architecture formats. The program also supports the IBM 3270 Personal Computer, Enhanced Graphics Adapter and Professional Graphics Adapter.

The Easy spelling checker has also been enhanced, to include 87,000 words, up from 65,000 in the original dictionary. The spelling checker offers alternative spellings, and a word can be changed with one keystroke.

Easy program now supports more than 240 printers, twice the number supported by the original release.

Feiten said Micropro aims Easy at current and prospective users of Software Publishing Corp.'s PFS:Write and of IBM's Writing Assistant, a modified version of PFS:Write.

Easy was first released last August as the third in Micropro's stepping-stone line-up of word processing programs. Wordstar, the flagship product, is now positioned as the mid-range package, and Wordstar 2000 targets high-end users.

Easy upgrades are being automatically sent free of charge to all registered users.

Blyth Software upgrades Omnis, offers Mac font support

Includes tutorial, frequent data saves

By Peggy Watt

SAN MATEO, Calif. — Blyth Software, Inc. has introduced an upgrade to its Omnis data base management program that features full support of Apple Computer, Inc. Macintosh fonts, extensive macros, immediate saving of records to disk and a new tutorial package.

Available now, Omnis 3 Plus is the latest version of the Omnis data base, originally introduced in 1982 for the Apple II and first made available for the Macintosh in 1984. The new release runs on all versions of Apple's Macintosh, including the 6-month-old Macintosh Plus.

Cost of a single-user version remains at $495. The multiuser version is available for several Macintosh local-area networks, including the Corvus Systems, Inc. Omninet, Sunol Systems Co.'s Sun Disk Server with Appletalk and 3Com Corp.'s 3Server under Ethermac or other Ethernet networks. Prices range from $990 for fewer than five users to $2,995 for 64 users.

More than 60 new commands

With Omnis' newest version the data base designer has more than 60 new macro commands to enter field data or output. Also new are time fields with time-arithmetic, multiline linked-text fields with word wrap as well as the ability to create scroll boxes. Through the use of macros, the user can bypass the Macintosh desktop and go directly to other Macintosh programs through a pop-up menu.

Additionally, a single data base record can now contain multiple fonts and font sizes and any fonts that are available on the Macintosh system in use.

The Omnis 3 Plus system automatically saves to disk each record as it is entered without going through the Save procedure in a Macintosh pull-down menu.

'Resilient and robust'

"It's supposed to be resilient and robust against data damage, the same way you have protection on a mainframe, so that when you see it's done on the screen it's done on the data base disk," says Jeff Galvin, Blyth vice-president of sales.

He says the method is not a memory cache, but a fast Save algorithm that writes records and indexes immediately when the user hits Return to signify data entry is complete.

Omnis 3 Plus' manual includes both a tutorial and a reference manual. The tutorial was added particularly for use in corporations, in which in-house developers often create vertical operations with Omnis, a spokeswoman said.

Variety of users

Omnis users range from corporate developers and individual users to independent developers who design specific data bases for value-added systems, she said.

While Blyth does not offer a standard site-licensing program, it negotiates such contracts with corporations that prefer volume purchase and special arrangements for support and upgrades.

The program is copy protected but requests the insertion of a key disk randomly — often only once in several dozen times it is run, Galvin said. However, once the original disk is requested, the program will not run, even after a restart, until the disk is inserted.

The upgrade is free of charge to all registered owners who purchased Omnis 3 after April 15. They will also receive a disk of sample applications for the data base, including models for setting up data bases of accounts receivable, inventory control, personnel management and time/cost recording.

Users who registered Omnis 3 before April 15 can obtain an upgrade to Omnis 3 Plus for $49.50 until Aug. 31.



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SOFTWARE & SERVICES

Prototyping, [redacted] join [redacted]

AT&T Communications [redacted]

By [redacted]

CINCINNATI — DP managers at AT&T Communications say they have made productivity gains of three to one by using application prototyping in combination with the Cullinet Software, Inc. ADS/Online development language.

Tripling the productivity rate was the average gain for 15 communications applications developed over the last 18 months, says Richard E. Ash, district manager for AT&T Communications' data center in Cincinnati. In some cases applications were developed twice as fast, while in other cases they were created five times as fast.

[redacted]

productivity gain, Ash thinks the three-to-one average applies to them as well.

"Prototyping really works. The function-by-study, definition and preliminary design are collapsed into a single step," Ash says.

It is like building "a straw man," he adds. "You put a series of screens up there that helps people focus on how the application will run."

AT&T Communications set a productivity increase of 50% as the minimum needed to justify retraining and the expense of the new tools. To see if it met that criterion, Ash's department used a procedure recommended by IBM, function point analysis, to measure its gains.

Function point analysis attempts to define standard transactions and business functions within an application and record how long it takes to program them, explains Roger A. Evans, manager of information management at the Cincinnati center. While there is no one definition of

[redacted]

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Users must take OA reins

From page 25

tomers tell them?

"Very few users are willing to describe what they're going to do with all their equipment," commented Ralph DeMent, Digital Equipment Corp.'s manager of strategic planning for distributed systems engineering. That leaves a gap vendors can't always be expected to fill in smoothly.

Wohl agreed, noting that at one recent forum where artificial intelligence applications were being bandied about, 100 end-user companies working on such packages were represented, and "zero were willing to discuss their application."

Other vendors cited cases in which customers discussed their needs and just got them wrong or demanded products prematurely.

Take IBM's Distributed Office Support System (Disoss), suggested Michael Zisman, chief executive officer of Soft-Switch, Inc. Competitors like Wang went to their users, who said that Disoss sounded nice and that maybe they would need it. So Wang and others plowed into implementations — but the customers had never really nailed down justifications for their requests.

Not surprisingly, Disoss was the target of a few other potshots at the conference. "It's creating a new category for de facto standards — one that doesn't require a significant installed base," Kutnick remarked.

Zisman found other curiosities in the nitty-gritty of document exchange below Disoss, particularly in Document Content Architecture (DCA). While micro word processor developers and everyone else have busily piled onto the DCA train, that train may derail at unexpected intervals, he maintained.

Document definition "has to be precise, and it has to be robust," he said. "DCA is neither. You can't have three ways of underlining, but DCA does."

No office automation conference is complete without a little genteel IBM-bashing, and Big Blue's mid-range systems got the most attention, with various predictions for how System/36 and 38 architectures might converge.

Lewis Crawford, IBM's manager of office systems strategic planning, noted that IBM has shipped its 100,000th System/36. But he acknowledged that "performance on the 36 has been a problem. . . . You can expect significant performance increases by the end of the year."

As always at office automation sessions, the subject of networks could not be escaped. "The key today is the cost of the environment you start to create when you run wire out through the building," remarked David Mahoney, president of Banyan Systems, Inc.

"The biggest problem with workstations today is that they are too expensive," said DEC's DeMent. He declared that those who think IBM Personal Computer-style nodes priced at $5,000 (not counting all the associated software and support costs) are appropriate "are really going in the wrong direction."

Lastly, the Wohl/Kutnick meeting displayed a resurgence of interest in end-user interfaces that go well beyond Apple Computer, Inc.'s Macintosh.

John Butler, marketing vice-president at Applix, Inc., pointed toward "changes in user interface that allow you to treat anything on the screen as an object you can point to and manipulate. That's really a more profound concept than pointing at a little picture on the screen."

Butler also outlined a long, tough march toward an object-oriented document architecture that permits users to edit all graphics in the same way, regardless of what kind of screen and machine they're working with.

So what will these new interfaces give us? Everyone's standard word processing will begin to evolve into something better designed for communication — something now traveling mostly under the name of desktop publishing, Butler said. (Does anyone but Apple really like that term?)

And while the industry is now concentrating on the what-you-see-is-what-you-get features of early desktop publishing software, more important are changes in the user interface that will make text and graphics much more accessible for nonsecretarial users, he maintained.

Versasoft revs up DBman

Dbase compatible gets 'assist' pull-down menus

By Douglas Barney

SAN JOSE, Calif. — Versasoft last week unveiled DBman 2.1, a faster version of its DBman data base software, scheduled for release later this month. The company also cut the price of the product nearly in half.

The network version of DBman costs $695 total, and a single-user version goes for $295. Both versions include the DBman runtime package.

Although the firm has not completed benchmarks, both the performance and user interface of DBman have been improved, according to Richard Post, vice-president of sales and marketing.

DBman was designed for compatibility with Ashton-Tate's Dbase III Plus and, like Ashton-Tate's product, provides a new "assist" front end with pull-down menus. "You can do operations without having to specifically know the command needed to do it," Post said. DBman also allows developers to create menus.

In addition, the product can use up to 640K bytes of random-access memory (RAM) for the caching of program files and data. "Previously you couldn't use additional memory that was available," Post said. "Now it will go out and use up to 640K bytes that are available for any open data base files, or index files, or for command and procedure files. Previously you had to go to disk for every single command that executed, and that slows things down quite a bit."

DBman, which now includes more global memory variables, can handle 128 fields and 4,000 bytes per record and will support up to 2 billion records per data base. The package runs on local-area networks such as the IBM PC Network and Novell, Inc. Netware and is 90% compatible with Dbase III Plus, according to Post.

"The data base files themselves are not compatible; there is a built-in convert command to convert from their format to ours," Post said. Versasoft chose not to use the Dbase file format "because it is incredibly slow," he remarked. Versasoft claims its product runs up to 40 times faster than Dbase when adding records.

Post noted that the new DBman prices of $695 for a network version and $295 for a single-user version represent dramatic cost-cutting.

"The multiuser interpreter retailed for $1,100 previously. The runtime package as a separate unit was $350, and we charged a $150 license fee per network but never charged a per-user fee on the network like Ashton-Tate does."

Existing customers can upgrade for $25 for the single-user and network versions. DBman runs on IBM Personal Computers and compatibles with at least 270K bytes of RAM.

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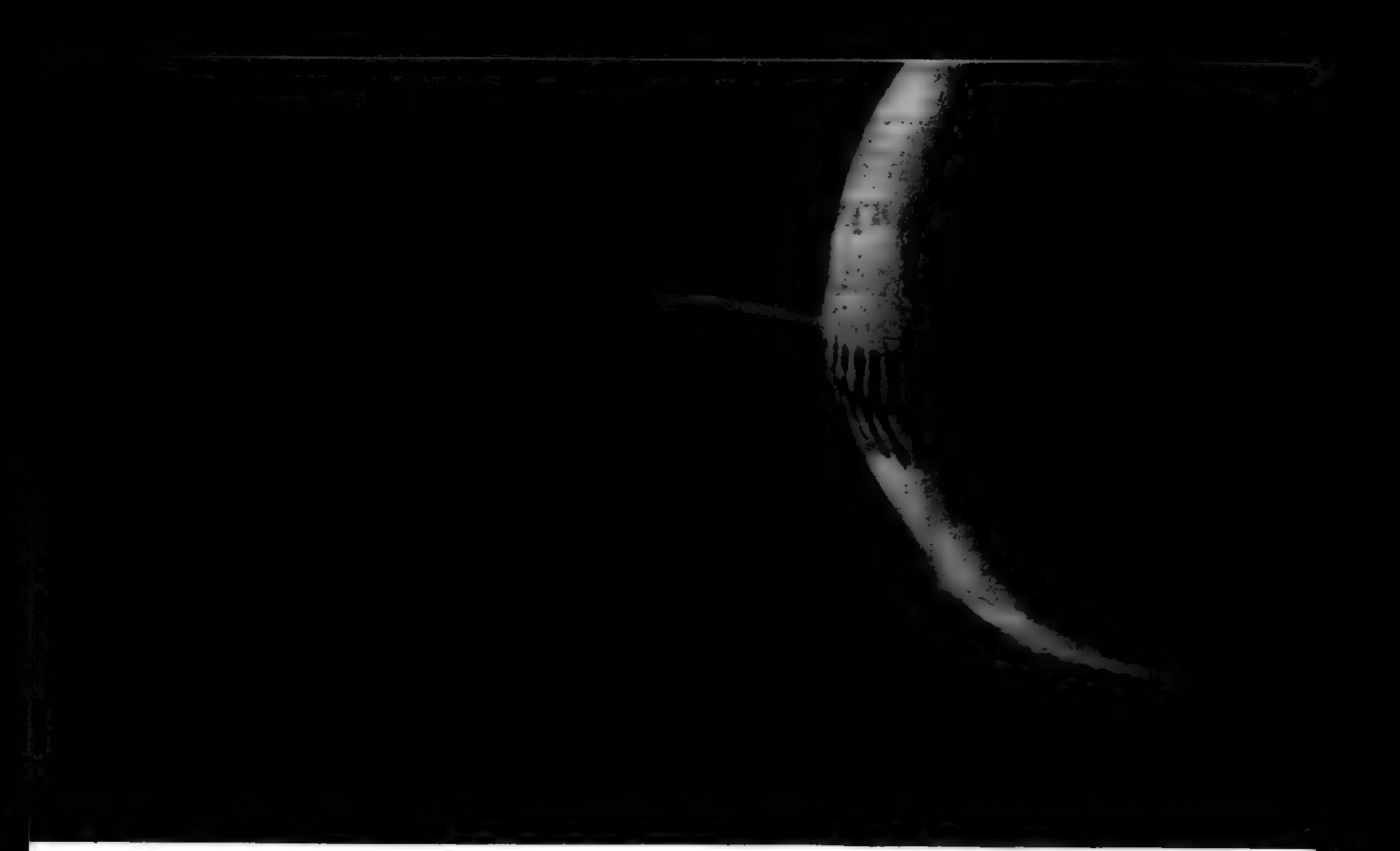
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Symantec to lure corporate market with Q&A site licensing

By Peggy Watt

CUPERTINO, Calif. — This summer Symantec Corp. is scheduled to launch a site-licensing and corporate support program for Q&A, its natural language data base and word processing package, as part of a major push for the corporate market.

Symantec also is shifting its sales focus from general retail to direct corporate operations so that by the end of the year, 80% of the sales force will be aimed at corporate customers, says Rod Turner, executive vice-president for marketing and sales. "But we're still leveraging off our retailers," who will be involved in corporate purchases when possible, he adds.

Q&A's price tag will also go up on July 15, to $349 from $299. Symantec maintained the original price when it released an upgrade just two months after the product's introduction. Turner says the price hike reflects an unusual trend by some dealers to sell the package at more than the suggested retail price.

Each package includes a coupon for a $50 discount on the Turner-Hall Card, a $99.95 half-slot memory board with clock, calendar, random-access memory disk and print spooler capabilities, produced by Turner-Hall Publishing, a Symantec division.

Turner says total sales have grown 10% to 15% each month. Since January, Q&A has been among the eight top-selling products from Softsel, Symantec's only distributor.

Symantec's site-licensing program will be similar to the Ashton-Tate program of offering several levels of support for sliding fees, with options for methods of making and distributing copies and documentation.

Symantec selectively seeded copies of Q&A in corporations for evaluation, and eight months after its introduction, that tactic is beginning to pay off.

Among Q&A's first buyers, 95% are small business owners and professionals. Corporate users now account for 25%, and Turner expects that share will rise to 50% or 60%.

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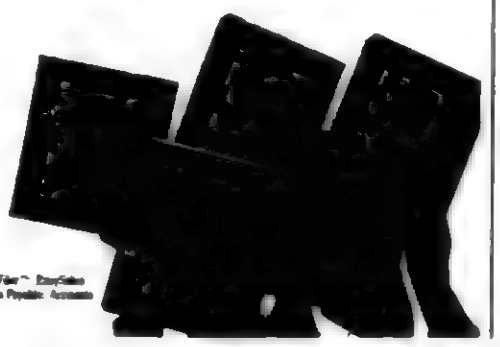
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Multimate line gets ax

From page 25

have done, using Multimate people as well as our own, shows that the System/36 is pretty underpowered for interactive word processing," said Roy E. Folk, Ashton-Tate's executive vice-president of marketing and strategic planning, in an interview earlier this year.

"An important component in what customers want from the System/36 implementation is Document Content Architecture compatibility. A sensible degree of compatibility, as I can understand it, would be to be able to write files on a micro that could be transferred and read by various document processing software packages on the minis and mainframes," Folk said.

Development of Multimate software versions for Unix, a popular operating system for supermicrocomputers, is under consideration, Dobyns said, declining to elaborate.

For now, Ashton-Tate will focus on networking versions of Multimate software, rather than porting its software to larger systems. As part of that effort, the firm said in May that it is shipping its local-area net version of Multimate 3.60, its most advanced word processing package.

There are three versions of Multimate 3.60: one for the IBM PC Network, one for Novell, Inc.'s Advanced Netware/86 and Netware/86 and another "universal" version for most other networks.

Though Ashton-Tate has faced stiffer competition in the word processing mart, Dobyns said Multimate software sales have increased every month since December.

SOFTWARE & SERVICES

SOFTLINE
Robert Morison

Buying a 4GL: Be forewarned

As the pitfalls of implementing fourth-generation languages have become better known, some purchasers may be shying away from them on the grounds that they can't risk their potential for failure.

The accounts of backlogged updates, slow response times and possible loss of data integrity at the New Jersey Department of Motor Vehicles last fall was one case that raised such fears. In the criticism of the department that followed, I was bothered by two points:

- That vendors, even established ones with well-respected products, equivocate regarding the viability of their fourth-generation languages for large production applications.
- That consultants can sell clients on the latest technology but lack the expertise to employ the technology effectively.

Equivocal vendors plus a shortage of implementation expertise equal surprises for unwary users. If you don't adjust your methods for fourth-generation language implementation, you may be surprised not only by the speed of development but also by the speed with which the product eats your computer resources. Such surprises can and should be avoided.

Experienced practitioners have long known that fourth-generation languages must be handled carefully. Show me a fourth-generation language, an associated data base manager and a

See **BUYING** page 33

Morison is a senior associate at Index Systems, Inc., a management consulting firm on information technology in Cambridge, Mass.

RTI pioneers Ingres into distributed data territory

By Charles Babcock

Relational Technology, Inc. (RTI) is attempting to establish distributed data base management with the introduction today of a product said to allow data bases at scattered sites to be accessed as one relational data base.

Distributed data base management has been cited for years as a potential boon to large organizations, but the hindrances to retrieving data across different operating systems, machine makes and sizes in most cases have been too formidable to overcome.

RTI, the Alameda, Calif.-based producer of the Ingres relational data base management system, says it has overcome that obstacle, albeit only for large users of its Ingres DBMS and Ingres/Net network manager.

Ingres/Star "will allow application builders to build applications that span the islands of information," drawing data from Ingres data bases used on different machines and porting it to different machines, said Peter Tierney, vice-president of marketing at RTI.

Analysts reacted favorably to the product, but they cautioned that there is no established market for it. "RTI will pioneer; they're going to set the standards" for distributed data bases, according to H. Michael Braude, vice-president of the software management strategy service with the Stamford, Conn.-based Gartner Group, Inc.

George Schussel, president of Digital Consulting Associates, Inc. in Andover, Mass., noted, "Because the capability hasn't been there, there is no market for distributed data bases." But, he added, "I think there will be a big and important market in the future."

Versions of Ingres currently run under the Digital Equipment Corp.'s VMS operating system, AT&T's Unix System V and IBM's VM/CMS.

In 1983, the company brought out Ingres/Net, a data base networking product

See **RTI** page 32

PCS ports Pro-IV to System/36

By Eddy Goldberg

LAGUNA HILLS, Calif. — Pro Computer Sciences, Inc. (PCS) recently announced that its Pro-IV applications development system has been ported to the IBM System/36.

Pro-IV is a 10-year-old product installed in 1,200 sites worldwide, according to Lloyd D. Tanaka, marketing director.

PCS claims Pro-IV is the first fourth-generation language product for the System/36 environment. According to Tanaka, its availability will make it easier to develop applications at the departmental level where the System/36 is commonly used. An application developed on a mainframe can be transported directly to a departmental setting on a System/36 then down to the end-user's microcomputer.

PCS President Sushil Garg said a fourth-generation language for the System/36 allows more effective control of departmental computing within corporate data processing.

The first customer for Pro-IV on the System/36 is Sellers Software Services Co. of Atlanta, which will use it to develop application programs for Bell South Advanced Systems, Inc.'s, Telecommunications Information Processing Software System.

Pro-IV is scheduled for release in July. Pricing for the System/36 Model 5360 is $13,000 for the full development system and $6,000 for the runtime system. For the System/36 Model 5362, the full development system is $7,000 and the runtime version $3,000, and for the System/36 Model 5364, the full system is $3,500 and the runtime version $1,500.

INSIDE

Relational Technologies' Ingres relational DBMS gets an interface to Ada/**32**

NEW THIS WEEK

- IBM announces a building design addition to its Catia graphics design software

For more on this and other new products, see pp. 115-128.

INSTANT ANALYSIS

"Concomitant with a 4GL's ease of use comes ease of abuse. A 4GL allows you to both develop systems faster and screw them up faster."

— **Robert Morison, senior associate, Index Systems, Inc., Cambridge, Mass.**

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If you'd like to know more about the Database Derby, and how ORACLE wound up in the winner's circle, join us for a free half-day seminar at a city near you. Call 1-800-345-DBMS, or write Oracle Corporation, 20 Davis Drive, Belmont, CA 94002.

And check our full-page ad earlier in this issue for further details about ORACLE.

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RTI pioneers Ingres

From page 31

that cut across operating systems by translating the SQL queries issued by one Ingres DBMS into SQL commands understood by Ingres on a different operating system.

Ingres/Star sits atop Ingres/Net, where it supplies a data dictionary and data management services for the network. The data dictionary keeps track of where data is located on the network, so a user may access it without having to specify its location.

A query that requires data to be retrieved from different locations is transparent to the user, who formulates the query as if the data were resident in a local data base, Tierney claimed.

"Distributed processing over a network requires that all the data requested in a query must be present on a single node. Distributed data base technology, such as Ingres/Star, removes that restriction," Tierney said.

RTI spokesmen said the firm plans to bring out a PC-DOS version of Ingres this fall and an MVS Ingres by the end of the second quarter in 1987. These will be designed to plug into Ingres/Star, adding more potential sites for distributed data base management, Tierney noted.

Applications are portable across the different versions of Ingres because front-end applications are kept separate from the background data base management system and networking facilities.

Availability, pricing

Ingres/Star will be sold with Ingres/Net for the VMS and Unix operating systems at prices ranging from $2,000 on a microcomputer to $62,000 on a mainframe. It will be available in the fourth quarter of this year, with a second release slated for 1987 that supports VM/CMS, MVS and PC-DOS.

Outside observers say one of the most immediate benefits of distributed data base management will be the ability to develop applications on a microcomputer that could be run on a mainframe.

Because of its use of SQL, gateways to allow Ingres/Star to access IBM's DB2 and other SQL-based relational products "will be relatively easy to do" and should be part of the second release of the product, Tierney claimed.

RTI is still developing its version of SQL, which is only "90% compatible" with IBM's, he said. Building gateways to other data bases, including IBM's well-established IMS, as well as independent vendor's data bases, "will be harder," he acknowledged.

In its initial release, Ingres/Star will support multi-site reads but only single-site updates. All Ingres application development tools will work with the new product, company spokesmen said.

RTI is pursuing an open architecture approach that seeks to connect Ingres products to other vendor data bases and operating environments, Tierney said.

Senior writer Eddy Goldberg contributed to this report.

Ada interface out from RTI

By Eddy Goldberg

ALAMEDA, Calif. — Relational Technology, Inc. (RTI) recently announced ESQL/ADA, an interface to the Ada programming language for Ingres, the company's relational data base management and application development system.

ESQL/ADA contains an Ada preprocessor that allows Ada programmers to integrate Ada source code with the SQL data base language and to call Ingres forms from within an Ada program.

Vice-President of Marketing Peter Tierney claimed his company is the first DBMS firm to interface its product to Ada. The interface gives Ingres users access to Ada procedures and allows Ada programmers to access tables in an Ingres data base.

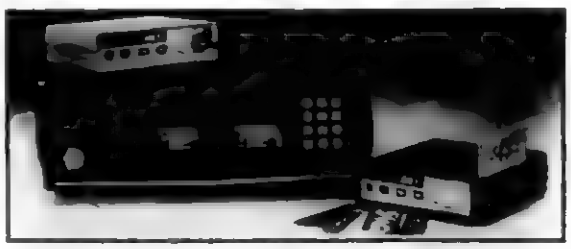
The interface reportedly will allow applications writers to use Ada along with the Ingres fourth-generation language.

The Ada preprocessor will work with any Ada language compiler implemented for Digital Equipment Corp.'s VAX/VMS, IBM's VM/CMS or the Unix operating system. Currently, ESQL/ADA for the VAX/VMS compiler is available for $5,000. The Unix version is expected to be out in the third quarter of this year, and the VM/CMS version is under development.

RTI has also announced the Ingres/Graphics Visual-Graphics-Editor (Vigraph), a business graphics package that works with Ingres. It replaces the company's Graph-By-Forms product, introduced in 1982.

Vigraph is priced according to system size, with packages ranging from $1,500 on DEC's Microvax I to $18,000 on the VAX 8600 and 8800. VAX/VMS and Unix versions are available now; no release date has been set for the planned IBM VM/CMS version.

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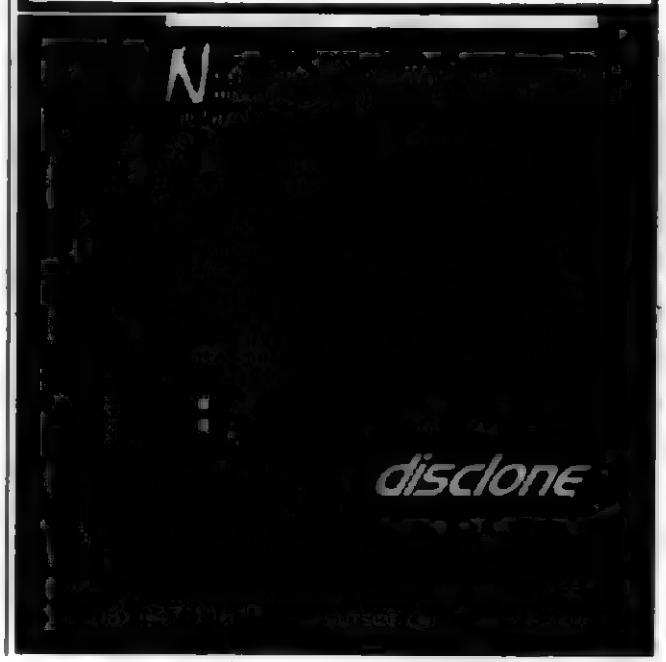
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Buying a 4GL: Be forewarned

From page 31

sample data structure, and I'll show you the opportunity to write a program that I/Os itself to death. With the fourth-generation language's ease of use comes ease of abuse. A fourth-generation language allows you both to develop systems faster and to screw them up faster.

These observations do not, however, negate the value of fourth-generation languages when properly used. They can still deliver vast productivity gains, maintainable programs and applications capable of evolving as business needs change. These benefits can extend even to large applications of the kind traditionally written in Cobol. But you must recognize that fourth-generation languages are a relatively new technology, and large systems may push the limits of that technology.

The following are four actions to help avoid the unpleasant surprise of an oversized and underperforming fourth-generation language system.

First and foremost, pin the vendor down regarding the software's capabilities and limitations.

Few are Cobol substitutes

Vendors routinely claim their fourth-generation language to be effective Cobol substitutes , but few really are. Vendors also uniformly claim their fourth-generation languages to be suitable for production applications — an equivocal term if ever there was one.

Recently the president of a well-known fourth-generation language company displayed a list of production systems built with its product. A representative example supported a factory's shift scheduling. While this sounds impressive, the application probably requires a handful of logical record types and could be implemented on a micro. If your definition of production application is a high-volume shop-floor feedback and control system (of which shift scheduling might be a small part), then you should be skeptical.

You've got to demand proof of a fourth-generation language's viability — proof in the form of live reference installations supporting your anticipated capacity profile. Live means in operation, not in development. Capacity profile includes simultaneous user populations, response time ranges and batch and on-line transaction volumes, all on the same hardware you use.

If the fourth-generation language appears capable of handling most, but not all, of your applications, then pay special attention to the quality of its Cobol exit or interface.

Perform stress tests

Second, test the fourth-generation language application as you've never tested before. Develop functional tests to prove the system produces the expected results, including protecting data integrity after user abend programs and system crashes. Perform stress tests in which you overload the system with users and/or transactions to determine its practical limits. Also test on-line and batch components with equal thoroughness; you may find it necessary to redistribute the batch and on-line mix to accommodate product limitations.

Thorough testing frequently forces redesign; therefore, you should begin benchmarking and testing as early as possible. Choose your fourth-generation language and associated DBMS partly on the basis of how adaptable and forgiving they are when it comes time to redesign for efficiency. Also be sure to consider the quality and completeness of the fourth-generation language product's performance monitoring and tuning tools.

Third, get expert help — with the emphasis on expert. You probably want to develop in-house expertise in the fourth-generation language; nonetheless, if the product is new to you, it brings new pitfalls, and you need help avoiding them. Sources of expertise may include the vendor, other fourth-generation language users, consultants and services companies. Vendors may be the likely first choice, but a surprising number are understaffed in technical support and underskilled in their own products. Regardless of the source, you need two types of expertise.

One is skill in fourth-generation language application development. Talk to people who've developed fourth-generation language applications before and who know how it changes the pace, priorities and management of development projects. Beware of consultants who have simply repackaged traditional implementation methods with a fourth-generation language label.

The other required expertise is in fourth-generation language programming and troubleshooting. Find people who know the tricks of the trade in your specific language and in fourth-generation language programming in general. Vendors regularly defend their products by pleading that their fourth-generation languages are being used in ways they never intended. But how many can document just how the product is intended to be used?

Finally, seize every opportunity to streamline your application design. If you are using the fourth-generation language to replace an existing production application, take the opportunity to redesign, not simply replicate, the old system's functionality. Let your first instinct be to streamline, not expand, the application. Include in the new system only functions with demonstrable business value. A good fourth-generation language will allow your application to expand and evolve over time.

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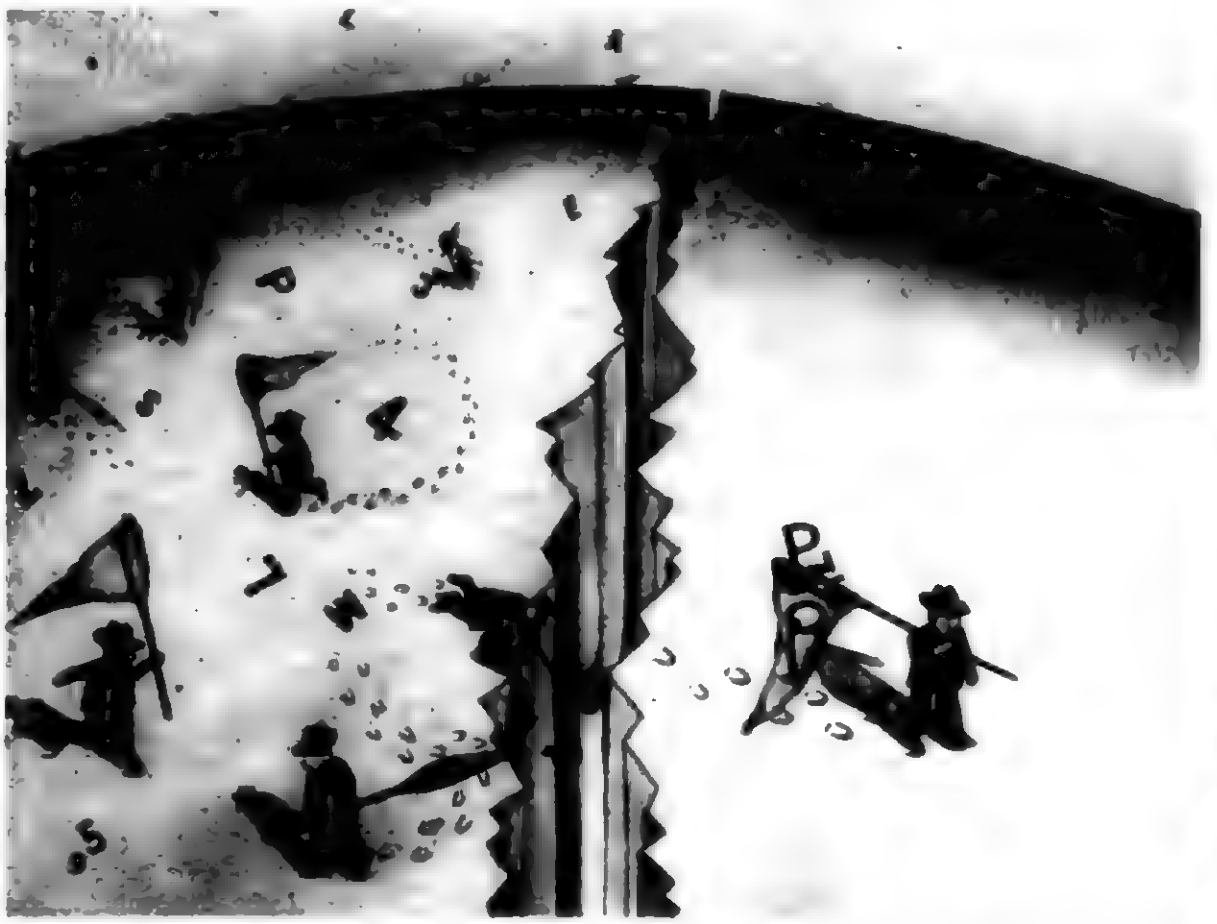
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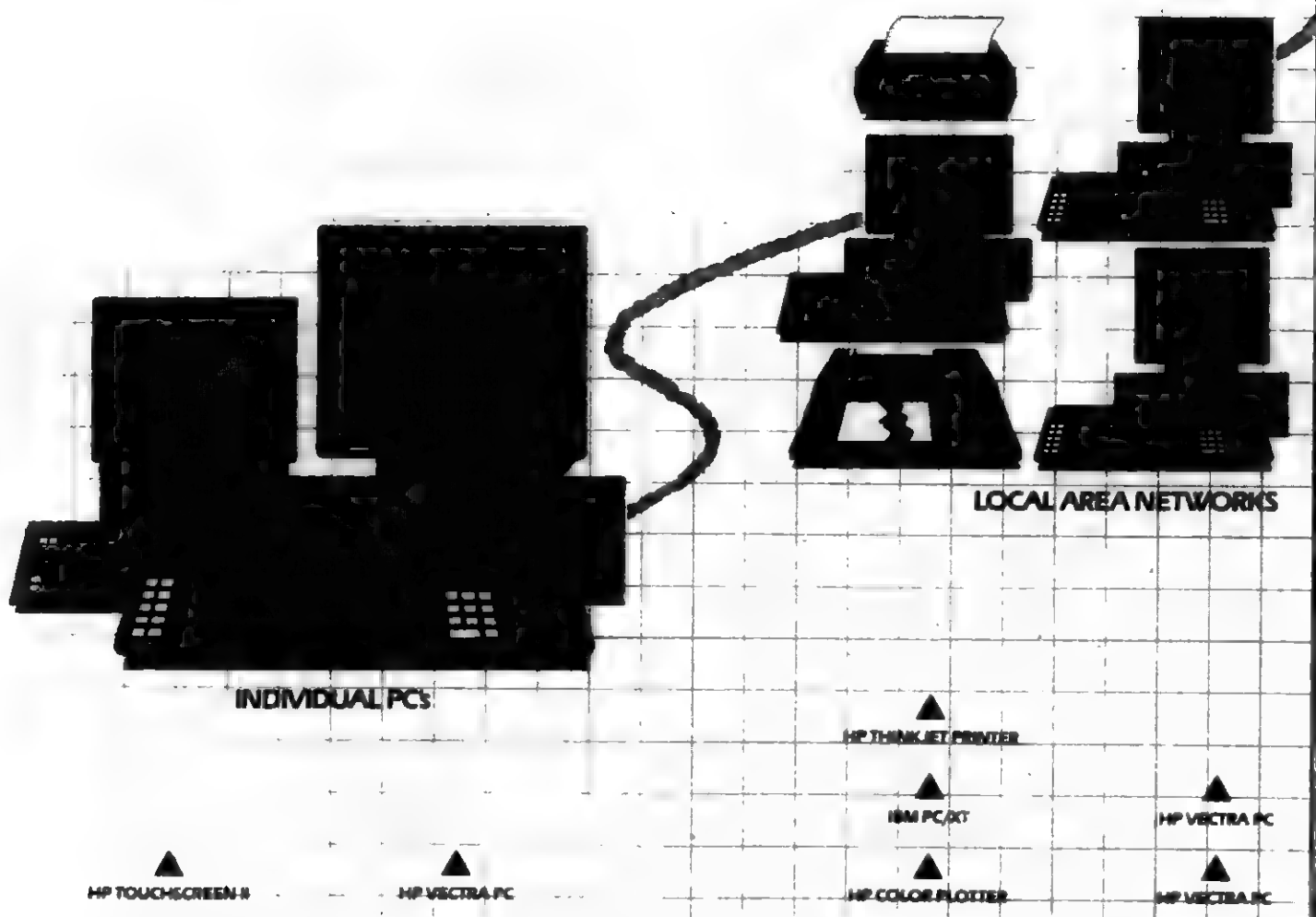
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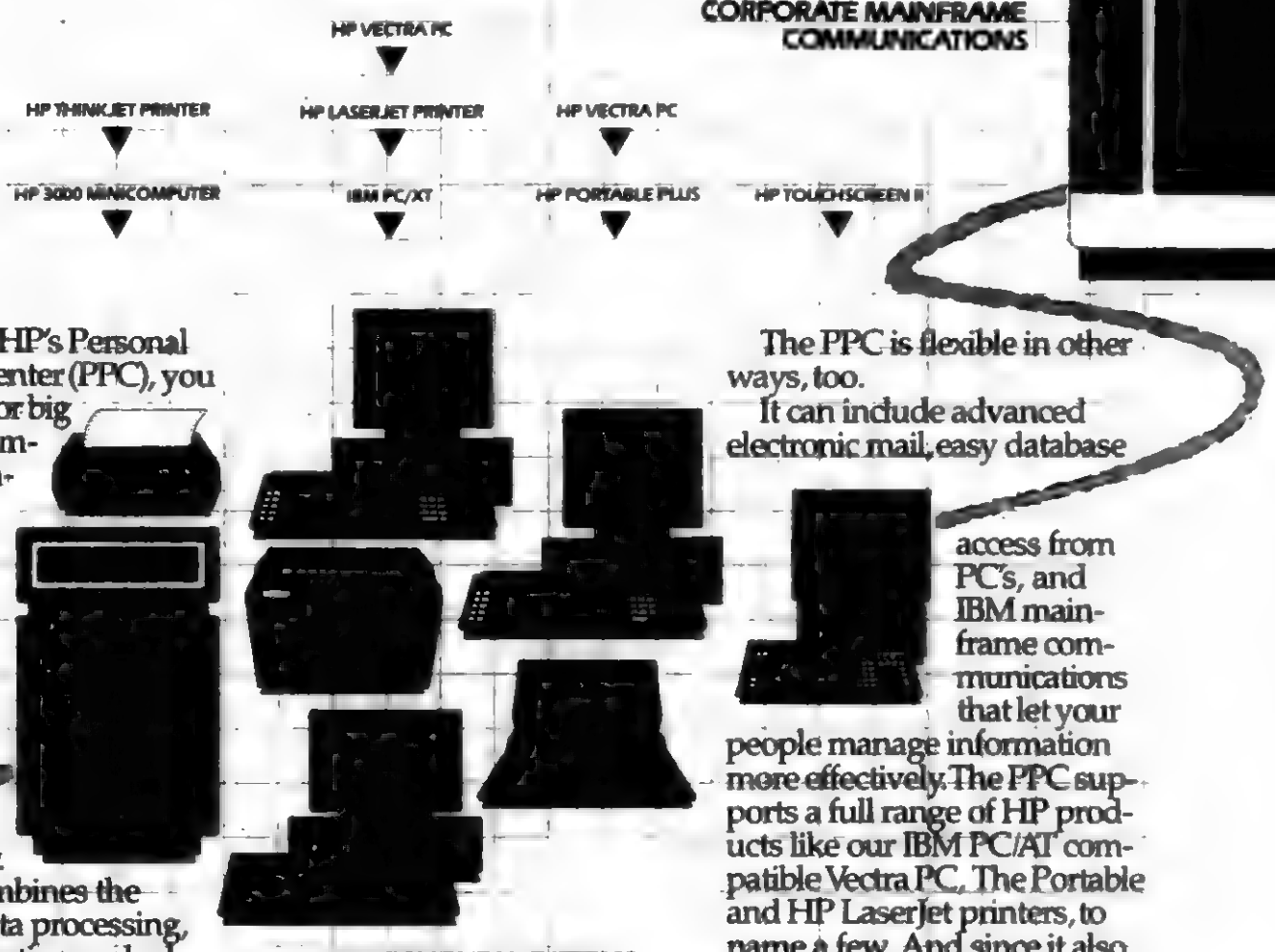
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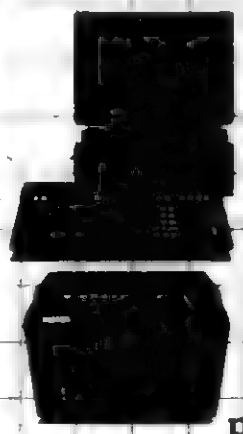
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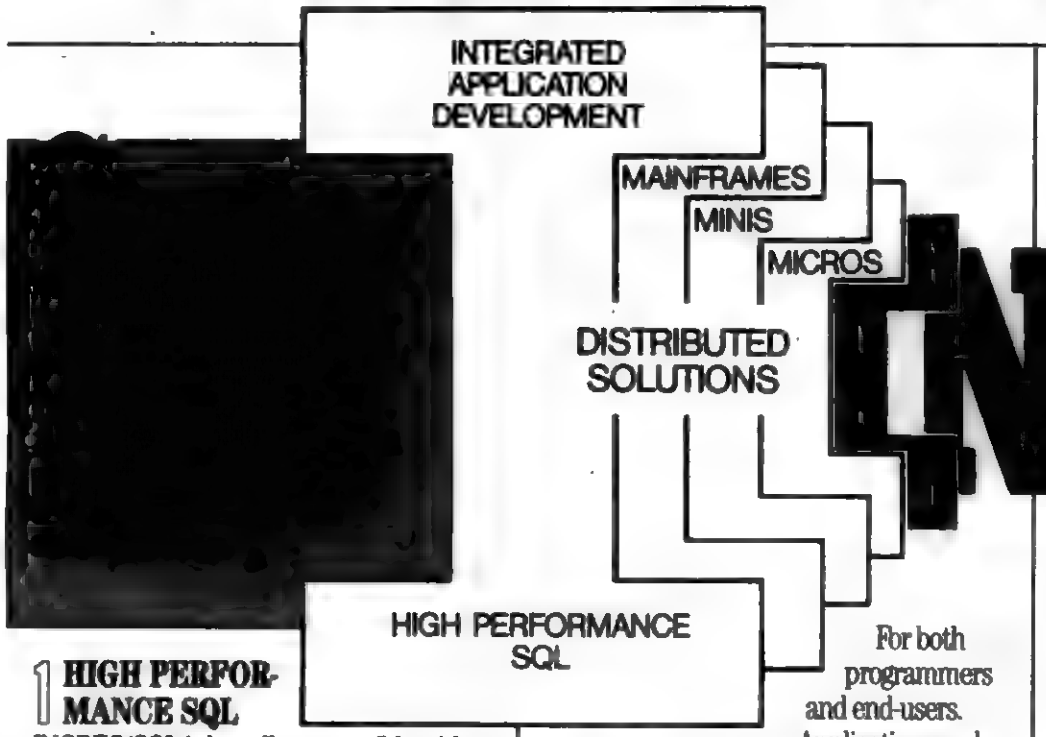
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HARD TALK
Donna Raimondi

Taking chances with new tapes

Could it be that the users who are replacing large iron oxide-based tape libraries with the newer chromium dioxide-based cartridge tapes are, one, poisoning their environments and, two, taking chances with the life span of their archives?

There are no chemical experts at *Computerworld*, but a letter from William Manly, a physicist who has examined and tested magnetic tapes since 1959, gives pause for thought.

"Because of the controversial nature of this letter, I would like to state that I am an independent consultant, and that I am writing this because it is my opinion. I am not in the employ of anyone in the magnetic iron oxide business, or anyone else who has a vested interest in iron oxides." So states the letter by Manly, who is now a consultant to the magnetic recording industry at HMI Consulting in Arlington, Texas.

The controversy Manly refers to in the letter and in a later phone conversation surrounds his assertions that the chromium dioxide used in IBM's 3480 and other vendors' cartridge tapes degrades in the presence of moisture and oxygen to chromium hexavelent compounds that are highly poisonous. In addition, Manly says that nobody knows the life span of chromium dioxide-coated tapes but that the material has a fairly short half-life and probably should not be used for archival storage.

"I'm spitting against the wind coming from a downdraft of millions of advertising and sales dollars, but it

See CHANCES page 39

Raimondi is a Computerworld senior writer.

Nine-track subsystem bows

Storage Technology offers CDC Cyber compatible

By Donna Raimondi

LOUISVILLE, Colo. — Storage Technology Corp. (STC) has unveiled a nine-track tape subsystem for Control Data Corp.'s Cyber mainframe systems.

The move is a new strategy for STC, which formerly marketed only IBM plug-compatible products, said Ron Dost of product marketing at STC.

"We are taking our existing technology into new markets and leveraging the support systems we already have in place," said Dost. "It is possible we will do this in the future with other vendors also," he said. The new system is a version of STC's existing 4600 IBM-compatible tape subsystem with hardware and microcode enhancements to allow for CDC compatibility, he added.

The 4700 Tape Subsystem is said to use 20% less space than its CDC counterparts, the CDC 669 and 679 series subsystems. The 4700 can be attached to multiple CDC and IBM mainframes simultaneously for shared access and storage capability, Dost said.

The unit is a 125 or 200 in./sec. nine-track tape subsystem designed for use with CDC Cyber 700 and 800 series mainframes and is compatible with IBM 360, 370, 4300, 3030, 3090 and 3090 series mainframes. It can sustain a data transfer rate of up to 1.25M byte/sec.

The system emulates the CDC 7021 tape subsystem and requires no hardware modifications to the CDC mainframe. No software modifications are needed with CDC's operating systems NOS 2.1 through 2.4, NOS-BE and NOS-VE. "Any very old systems running different versions of the operating system may require minor adjustments," Dost said.

The 4700 can connect to the selector channel of the IBM 360 and the block multiplex of the 370, 4300 and 3000 processor series. It also attaches to the data streaming channels of the 4300 and 3000 series.

The tape subsystem consists of three

See HMI page 38

TI printers integrate text, graphics

By James Connolly

TEMPLE, Texas — Incorporating what it terms "second-generation laser print engines" with proprietary controllers, Texas Instruments, Inc. has introduced its Omnilaser Series 2000 family of page printers for shared graphics and word processing environments.

Two of the three Omnilaser products use Adobe Systems, Inc.'s Postscript page description language, which TI officials said allows flexibility to integrate text and graphics. According to TI, the three Omnilaser printers use Ricoh Corp. engines that provide improved paper handling, higher duty cycles and the ability to print more copies in their lives than the previous generation of laser printers.

The printers using Postscript are the Omnilaser 2115 shared resource printer and the Omnilaser 2108 workstation printer. They are intended for graphics-intensive applications such as in-house publishing, computer-aided design and engineering and forms generation.

The 2115 prints 15 page/min. and includes the Postscript controller, built around a 32-bit Motorola, Inc. 68000 microprocessor. It features 3M bytes of random-access memory (RAM), has a maximum duty cycle of 25,000 page/mo (compared with 3,000 page/mo for earlier products) and has a machine life of 1.5 million prints. It also provides 300- by 300-dot resolution, according to TI.

The Omnilaser 2108 uses a 68000-based controller but only provides 2M bytes of RAM and 8 page/min printing. It has a 10,000 page/mo duty cycle and a 600,000-print machine life.

The third printer, the Omnilaser 2015, uses the same 15 page/min engine as the 2115 and includes 512K bytes of RAM.

See TI page 38

INSIDE

Bar code systems make slow, steady inroads in corporations/**38**

NEW THIS WEEK

- Interface Systems offers seven-color IBM-compatible printer
- For more on this and other new products, see pp. 115-128.

INSTANT ANALYSIS

"The reason we have so much confusion in the whole area of departmental processing is primarily because IBM doesn't want to distribute their general-purpose processing off of the mainframes."

— Tim Tyler, Mountain View, Calif.-based consultant

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TOWER SYSTEMS INTERNATIONAL

Unsure of applications, firms slowly but surely belly up to the bar code

By Rosemary Hamilton

NEW YORK — Although some industry surveys suggest that the bar code systems market will grow at a rate of 50% through 1990, one research firm said the industry will grow at a much slower rate — approximately 20% a year — because of general unfamiliarity with the systems.

Bar coding systems, which generated $600 million to $700 million in sales last year, according to a recent study by the market research firm Find/SVP, are usually associated with supermarket cash registers.

While automatically coding the prices of groceries is the most visible use of bar code systems, the technology has been used in other areas for many years and is also being applied to new areas at a slow but steady rate. Eastern Airlines, for instance, has been using bar code systems for baggage handling since 1973, according to the research report.

Other applications include automatic billing, inventory managment and control and document processing. The study found widespread use in the health care industry for identification purposes.

This has resulted in the founding of an organization called the Health Industry Bar Code Council, according to the study. The council works along with other organizations to promote standardization of the symbols used for bar coding.

The study also found that the top three U.S. automobile makers developed a combined total of 200 different uses for bar coding in production processes, including parts identification and shipping destinations.

A more novel use involves the runners of the New York Marathon, who are bar coded before the race. At preregistration, a bar code identification is established for each runner, who then must match that identification when registering at the starting line before being permitted to run the race. That bar code is then applied to the runner's bib. When the runner crosses the finish line, a scanner reads the runner's ID and assigns a finishing time to that runner.

Nine-track subsystem out

From page 37

devices — a control unit, either a 125 or a 200 in./sec. tape drive and a channel interface to provide communications translation functions between CDC technology and the Federal Information Processing Standard-compatible technology. Up to seven drives can be attached to one control unit.

The 4700 A70 200 in./sec. controller/drive unit costs $47,500, and the 4700 B70 drive unit costs $21,000. The 125 in./sec. models, the 4700 A50 and B50, cost $45,700 and $19,200, respectively.

TI printers for text, graphics

From page 37

TI officials said the Omnilaser printers have industry-standard emulations. Standard interfaces include parallel and RS-232 serial interfaces.

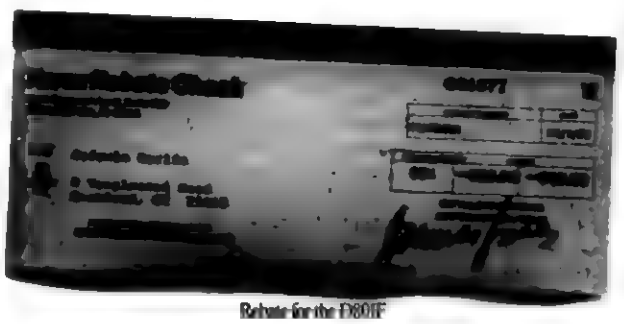
The 2015 will be available from TI resellers in July at a suggested list price of $5,995. The 2115 costs $7,995, and the 2108 costs $5,995. They will be available during the fourth quarter of this year.

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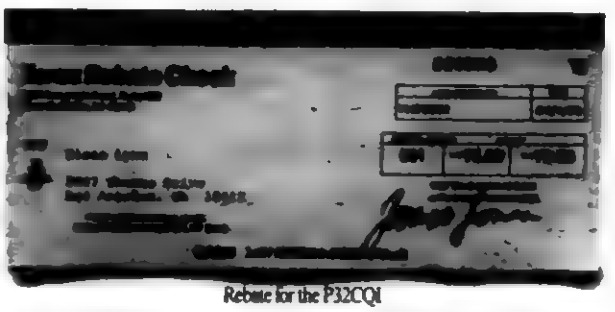
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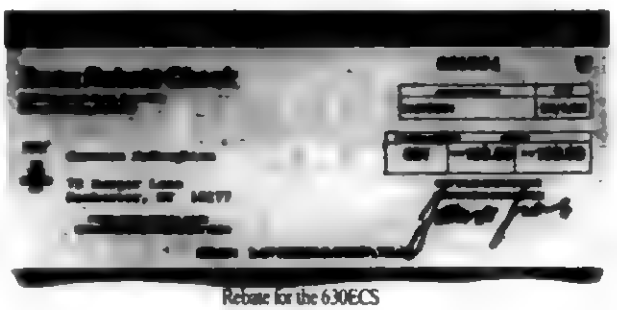
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Chances with new tapes

From page 37

seems to me that someone should speak up before the deed is completely done," Manly says in regard to the wholesale replacement of older tape libaries with the new cartridge systems.

As an employee of Ampex Corp. in the early '60s, Manly was part of a technical team that examined and reported negatively on a chromium dioxide material's potential use in magnetic tapes.

The team found that the material had only a slight advantage in intrinsic magnetization over two other commonly used tape coatings and that the price was several dollars a pound versus less than a dollar a pound for iron oxides, Manly says.

Tape companies that examined the Du Pont Co.-created material were almost unanimous in rejecting chromium dioxide at that time, Manly says.

Ideal for audio tapes

Subsequently, engineers discovered that the material, although not appropriate for long-term data storage, was ideal for instrumentation and audio tapes, according to Manly. Word of the substance's success got back to Du Pont, which started to get takers on its license offer.

Manly's letter goes into minute details of chemical compositions and decompositions and magnetizing properties. The bottom line is that tape makers that use the chromium oxide material for coating tapes have to add so much doping to minimize the poisonous nature of the material that they reduce the life of the substance.

Manly theorizes that about the time the experimenting with dopants occurred — about 10 years ago — IBM made its decision to use chromium dioxide for its cartridge tapes.

It was too late

He maintains that by the time IBM released the 3480 in 1984, IBM's technical people should have decided to go with iron oxides but that it was too late.

So where does that leave the industry? "It leaves the computer industry implementing their bulk archival data storage with a chemically and magnetically unstable material which degrades to highly poisonous compounds," Manly suggests.

The problem is not big right now, Manly says. But three to five years down the road, he predicts, cartridge-tape users will start to experience inexplicable errors.

'Loses magnetization'

"The tape won't look like it is degrading, but the material will be losing the strength of its magnetization," Manly says. Binders used to contain the poisonous deterioration should protect the computer room from any health hazards, unless the tape is shredded.

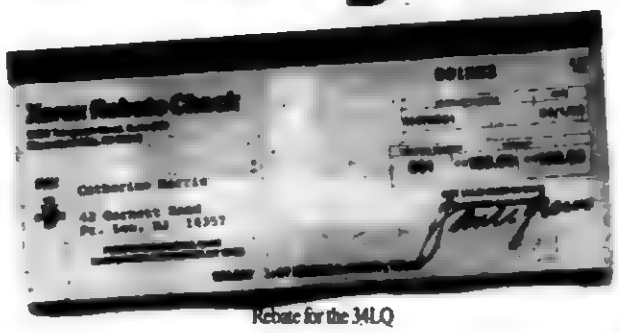
"However, if the user wants to discard the tape, he will either have to do so illegally or pay a lot to dispose of the toxic waste in a government-approved fashion," Manly adds.

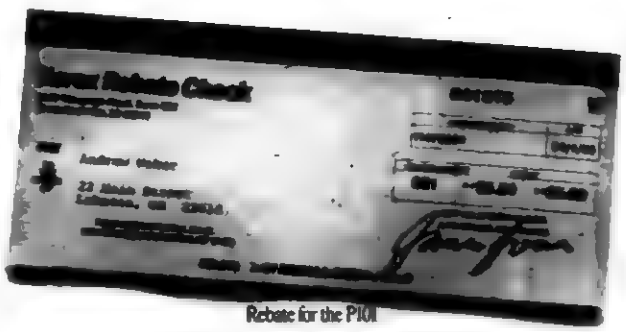
Manly is not saying there is no place in any industry for chromium dioxide-based tape. But he is saying that some investigation needs to be done to ascertain the tape's safety and longevity for data storage.

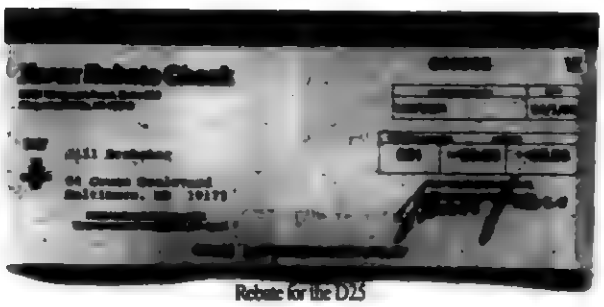
"The remedy for this whole mess is simple. Ask for iron oxide-based tapes with equivalent performance when you are intending archival storage. The technology is there, and your favorite tape company can make it for you and will, if the demand is evident," he advises.

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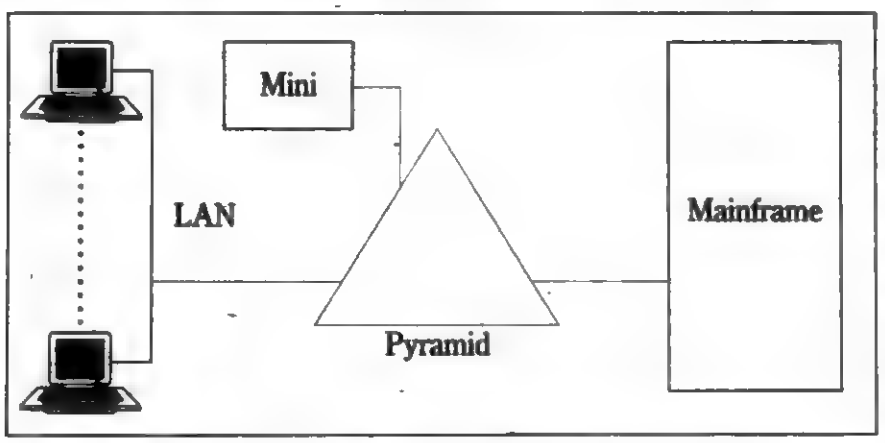
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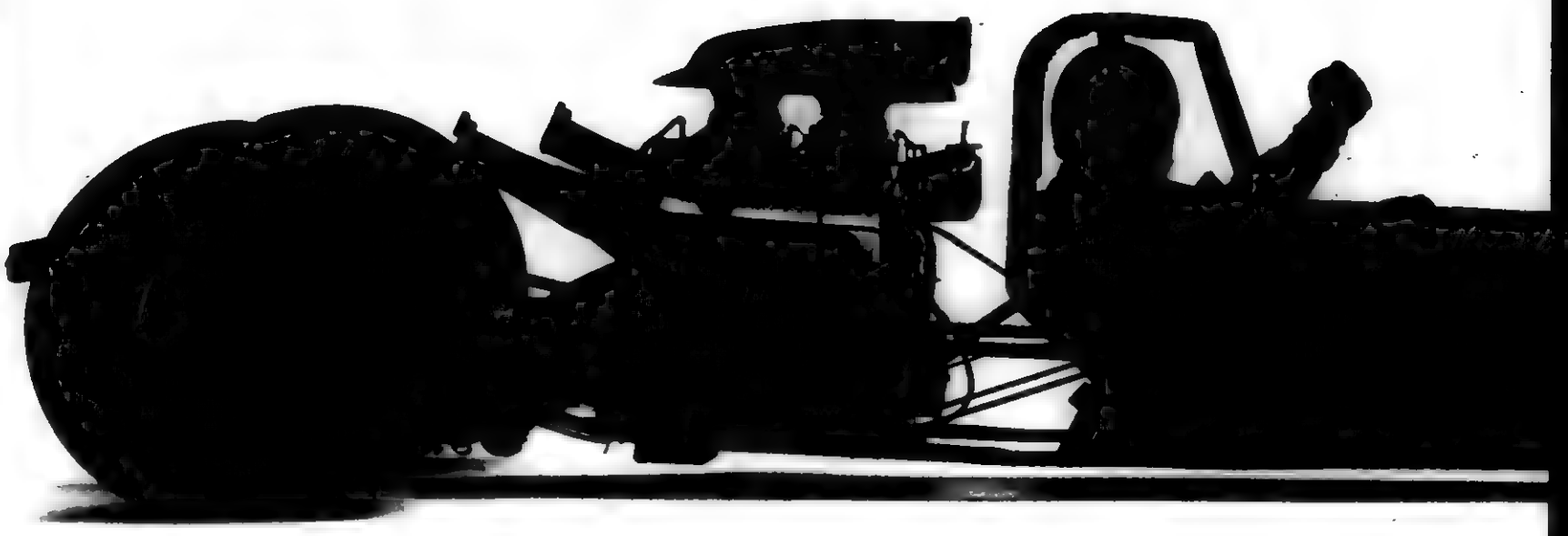
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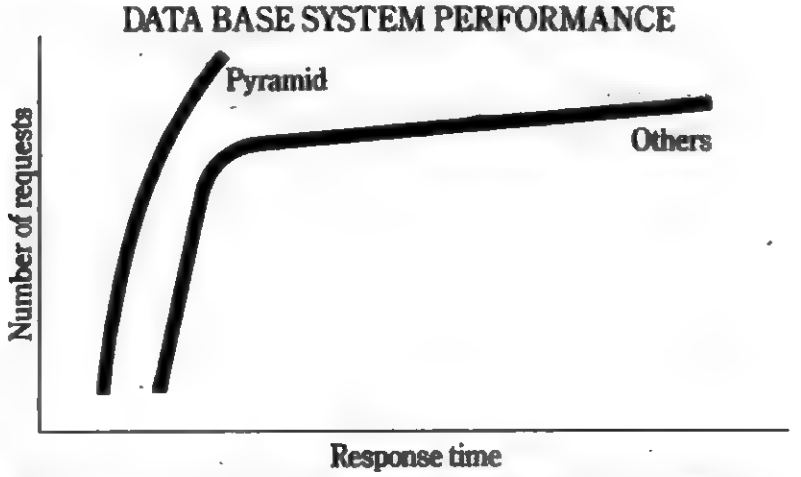
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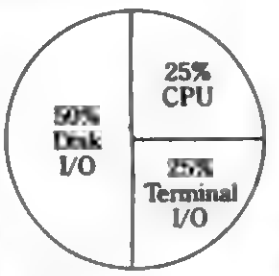
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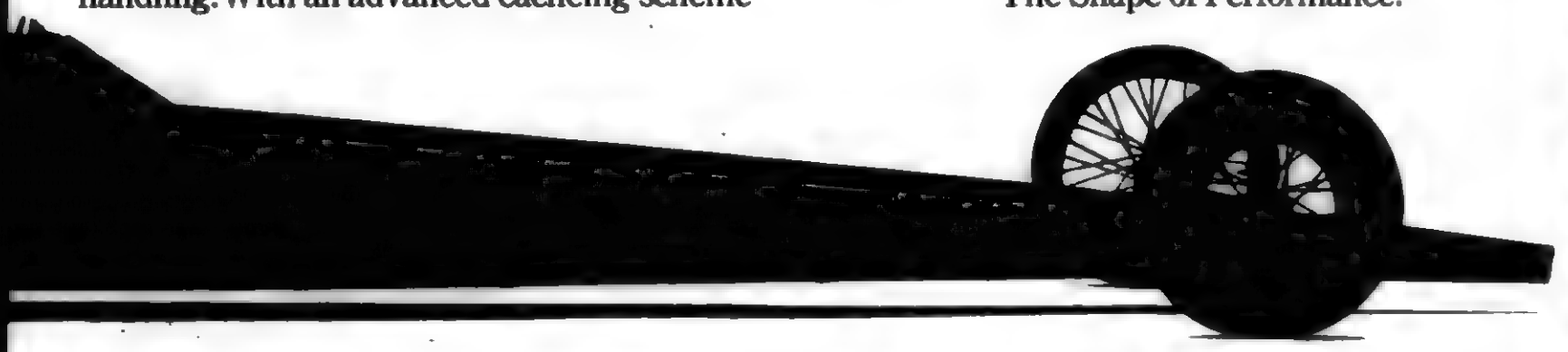
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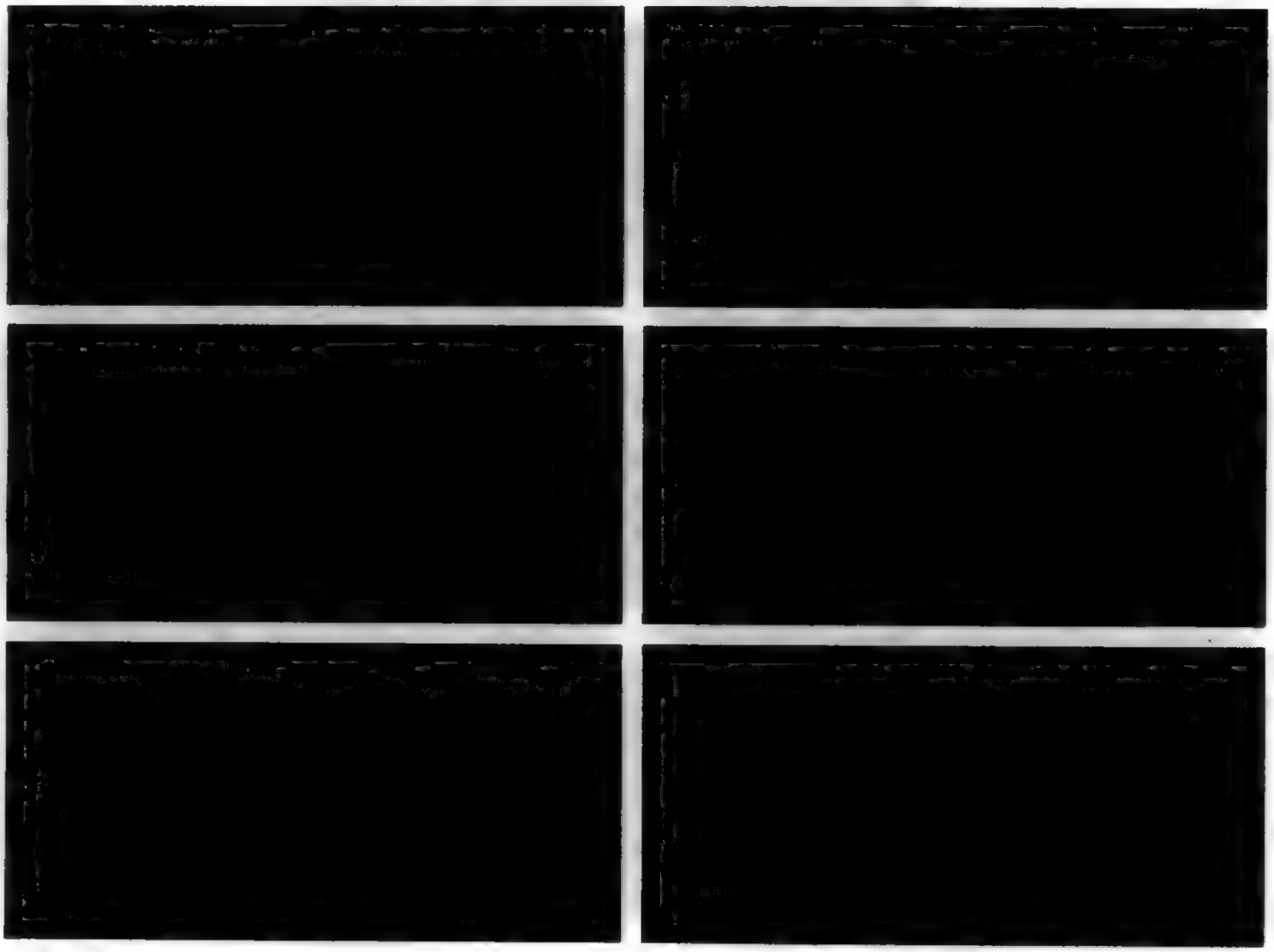
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Users rate their mainframe vendors

Survey Item									
No. of User Responses	17	186	9	64	708	21	178	88	31
Average Life of System (months)	[illegible]	[illegible]	[illegible]	42.18	30.41	27.47	[illegible]	43.89	[illegible]
Acquisition Method (%)									
Purchase	47.06	61.83	77.78	[illegible]	[illegible]	42.86	71.91	44.32	[illegible]
Rental or Lease from Manufacturer	[illegible]	17.74	22.22	12.50	11.16	19.04	14.04	[illegible]	6.45
Lease from Third Party	29.41	20.43	0.00	25.00	41.24	[illegible]	14.04	23.86	[illegible]
System Ratings (4.0-1.0)									
Ease of Operation	3.47	[illegible]	3.22	3.44	3.27	3.67	3.51	3.13	3.32
Reliability of Mainframe	3.66	[illegible]	3.67	3.50	[illegible]	4.00	3.43	3.51	[illegible]
Reliability of Peripherals	[illegible]	[illegible]	3.44	[illegible]	3.63	3.71	3.32	3.21	2.94
Manufacturer's Maintenance Service									
Responsiveness	3.71	3.47	[illegible]	3.42	[illegible]	3.81	3.34	3.40	3.37
Effectiveness	3.53	3.23	[illegible]	3.17	[illegible]	3.81	[illegible]	3.21	3.20
Manufacturer s Technical Support									
Troubleshooting	3.00	2.92	3.50	2.97	3.30	3.67	2.78	2.83	3.13
Education	3.12	2.76	[illegible]	2.81	3.13	2.81	2.98	[illegible]	3.03
Documentation	3.24	2.54	3.50	2.67	[illegible]	3.10	2.77	2.41	2.94
Manufacturer s Software									
Operating System	3.10	3.78	[illegible]	3.41	3.25	3.09	[illegible]	3.24	3.31
Compilers & Assemblers	[illegible]	3.46	3.56	3.39	3.27	3.09	3.08	3.26	3.31
Applications Programs	[illegible]	2.75	3.25	2.49	2.75	3.18	[illegible]	2.63	[illegible]
Ease of Programming	2.91	3.49	3.11	3.21	2.91	3.06	2.96	2.90	3.10
Ease of Conversion	[illegible]	3.34	3.13	3.08	2.76	3.00	3.10	2.46	3.07
Overall Satisfaction	3.00	3.42	3.33	3.24	3.14	[illegible]	3.08	[illegible]	3.20
Additional Ratings (4.0-1.0)									
Timeliness of Hardware Installation	3.82	3.39	3.78	3.48	[illegible]	4.00	[illegible]	[illegible]	[illegible]
Timeliness of Software Installation	[illegible]	3.33	3.89	[illegible]	3.35	3.33	[illegible]	[illegible]	[illegible]
Ease of Expansion	3.53	3.54	[illegible]	3.44	[illegible]	3.75	[illegible]	3.41	[illegible]
Compatibility of Hardware Carried Over from Other Systems	3.53	3.27	[illegible]	2.98	3.25	3.71	[illegible]	2.57	2.90
Compatibility of Programs/Data Carried Over from Other Systems	3.31	3.31	3.25	3.14	3.16	3.76	[illegible]	2.47	[illegible]
Power/Energy Efficiency	3.18	3.30	3.13	3.15	[illegible]	3.24	[illegible]	[illegible]	[illegible]
Productivity Aids Help Keep Programming Costs Low	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2.40	[illegible]	2.56	[illegible]
Software Support Delivered by Vendor	3.13	2.69	3.13	2.81	[illegible]	3.06	[illegible]	2.65	[illegible]
Keeping Up with & Implementing Vendor Changes to Hardware/Software (Very Easy=4.0, Very Difficult=1.0)	[illegible]	3.27	2.75	3.14	[illegible]	3.10	[illegible]	2.73	[illegible]
Did the system do what you expected it to do? (%)									
Yes	94.12	[illegible]	100.00	98.44	[illegible]	100.00	[illegible]	[illegible]	[illegible]
No	[illegible]	1.61	0.00	1.56	[illegible]	0.00	[illegible]	[illegible]	0.00
Undecided	0.00	4.84	[illegible]	[illegible]	[illegible]	0.00	[illegible]	5.68	[illegible]
Would you recommend system to another user? (%)									
Yes	94.12	[illegible]	[illegible]	[illegible]	[illegible]	100.00	[illegible]	84.09	[illegible]
No	[illegible]	3.23	[illegible]	3.13	[illegible]	0.00	[illegible]	6.82	[illegible]
Undecided	[illegible]	6.45	[illegible]	[illegible]	[illegible]	0.00	[illegible]	6.82	[illegible]

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> ***Datapro noted that no systems met Datapro's criteria for special merit, which the IBM 4381 and 3083 earned a year ago.***

overall scores slip the most from 1985 were Amdahl Corp., with a score of 3.00, and National Advanced Systems Corp. (NAS), with a score of 3.08. Their scores were down 0.22 and 0.42, respectively.

One pattern that Datapro officials were unable to explain was that Amdahl and NAS posted relatively high scores in many of the 23 categories, including ease of operation, reliability and support areas. However, when users scored those two vendors on the "overall satisfaction" question, the scores inexplicably slipped.

One Amdahl user noted that Amdahl has been "very responsive" to his needs. That user, who asked not to be identified, said of Amdahl's low score, "It's surprising. We have been very happy with them. We had some of the first 5860s of the line, and although we had a few bumps in the early going, those settled right down. Right now, we exceed 99.5% availability on each machine."

More responses, 708, came from IBM users than from any other vendor's customers. Those users gave overall satisfaction ratings averaging 3.14, with individual systems ratings ranging from 3.11 for the 4361 to 3.20 for the 3090.

Most of the vendors recorded lower scores in software-related categories than in hardware categories, particularly in the applications programs area. Datapro officials noted that the software results were comparable to previous scores.

Datapro also noted that no systems met Datapro's criteria for special merit, which the IBM 4381 and 3083 earned a year ago. That special mention is reserved for systems rated by at least 20 users and earning an overall satisfaction rating of 3.20 and no ratings of less than 2.80.

However, this year, more systems earned 3.50 ratings in individual categories than last year. Whereas only five systems mentioned by 20 or more users scored over 3.50 in mainframe reliability last year, nine systems made that mark this year. Similar gains were recorded in areas such as ease of operation, peripherals reliability, operating system and maintenance.

When asked whether their systems did what was expected of them and whether the users would recommend their systems to other users, 95% of all respondents, down one percentage point from 1985, said their system did what was expected, and 92%, the same percentage as last year, said they would recommend their systems to others.

> ***Burroughs Corp. scored the highest overall satisfaction numbers with an average of 3.42, based on 186 responses.***
>
> ***The two vendors that saw their overall scores slip the most from 1985 were Amdahl Corp. and National Advanced Systems Corp.***

Survey finds CPU satisfaction up

From page 1

with more than 31% of users reporting more than 10G bytes of storage, which was an 11-point jump over 1984.

Users judged their systems in 23 subjective categories, rating their computers on a scale of one to four, with four being the best score.

Burroughs scored the highest overall satisfaction numbers with an average of 3.42, based on 186 responses. That 3.42 figure was up slightly from the 1985 Burroughs score. Only seven of those 186 responses came from users of Burroughs' V300 series, but those seven gave that series some of the survey's best scores, including a 3.86 overall satisfaction rating. Most of the responding Burroughs users rated Burroughs' B series of mainframes.

One Burroughs user was not surprised by the V series results. "We are very, very pleased with our V machines in terms of throughput. The performance of the V machines as opposed to Burroughs' B machines represents a 100% increase in throughput. Also, the transition to the V machine was easy because it uses the same operating system," said Peggy Price, director of hospital information systems for Mount Sinai Medical Center in Miami.

Another vendor that posted consistently higher scores than in 1985 was Honeywell, Inc. Honeywell scored an overall satisfaction rating of 3.24, up from 3.15 in 1985. Control Data Corp., which was omitted from the 1985 report because too few users participated in the survey, received nine responses for an overall satisfaction score of 3.33.

The two vendors that saw their

Users rate their mainframes

Survey Item								
No. of User Responses	17	10	14	7	82	45	28	9
Average Life of System (months)	29.50	17.22	18.67	13.00	52.10	35.25	43.26	42.88
Acquisition Method (%)								
Purchase	47.06	20.00	50.00	57.14	70.73	57.78	64.28	77.78
Rental or Lease from Manufacturer	23.53	40.00	7.14	28.57	19.51	11.11	17.86	22.22
Lease from Third Party	29.41	40.00	42.86	14.29	9.76	31.11	17.86	0.00
System Ratings (4.0-1.0)								
Ease of Operation	3.47	3.30	3.64	4.00	3.66	3.76	3.71	3.22
Reliability of Mainframe	3.65	3.30	3.71	3.86	3.43	3.58	3.46	3.67
Reliability of Peripherals	3.50	3.20	3.07	3.57	3.02	3.29	2.82	3.44
Manufacturer's Maintenance Service								
Responsiveness	3.71	3.20	3.50	3.86	3.41	3.49	3.61	3.89
Effectiveness	3.53	3.10	3.36	3.83	3.12	3.30	3.32	3.67
Manufacturer's Technical Support								
Troubleshooting	3.59	2.80	2.93	3.00	2.87	3.07	2.86	3.50
Education	3.12	2.70	2.93	2.57	2.69	2.84	2.61	3.25
Documentation	3.24	2.20	2.64	2.43	2.53	2.68	2.43	3.50
Manufacturer's Software								
Operating System	3.10	3.56	3.93	3.86	3.74	3.78	3.86	3.22
Compilers & Assemblers	2.88	3.44	3.57	3.57	3.40	3.51	3.50	3.56
Applications Programs	2.86	2.43	2.54	3.00	2.86	2.78	2.86	3.25
Ease of Programming	2.91	3.33	3.57	3.71	3.51	3.41	3.50	3.11
Ease of Conversion	2.60	3.11	3.08	4.00	3.41	3.17	3.43	3.13
Overall Satisfaction	3.00	3.22	3.43	3.86	3.38	3.42	3.46	3.33
Additional Ratings (4.0-1.0)								
Timeliness of Hardware Installation	3.82	3.22	3.71	4.00	3.23	3.47	3.46	3.75
Timeliness of Software Installation	3.20	2.89	3.43	3.57	3.32	3.31	3.38	3.50
Ease of Expansion	3.53	3.67	3.64	4.00	3.52	3.49	3.48	3.38
Compatibility of Hardware Carried Over from Other Systems	3.53	3.44	3.38	3.57	3.37	2.95	3.27	3.50
Compatibility of Programs/Data Carried Over from Other Systems	3.31	3.00	3.36	3.43	3.38	3.23	3.29	3.25
Power/Energy Efficiency	3.18	3.56	3.57	3.86	3.30	3.17	3.14	3.13
Productivity Aids Help Keep Programming Costs Low	2.78	2.89	3.07	3.14	2.84	2.88	2.82	2.88
Software Support Delivered by Vendor	3.13	2.33	2.79	2.57	2.69	2.80	2.84	3.13
Keeping Up with & Implementing Vendor Changes to Hardware/Software (Very Easy 4.0 Very Difficult 1.0)	3.24	3.00	3.29	3.71	3.32	3.27	3.14	2.75
Did the system do what you expected it to do? (%)								
Yes	94.12	90.00	100.00	100.00	93.90	91.11	92.86	100.00
No	5.88	0.00	0.00	0.00	0.00	4.44	3.57	0.00
Undecided	0.00	10.00	0.00	0.00	6.10	4.44	3.57	0.00
Would you recommend system to another user? (%)								
Yes	94.12	100.00	100.00	100.00	87.80	88.89	85.71	88.89
No	5.88	0.00	0.00	0.00	0.00	6.67	10.71	0.00
Undecided	0.00	0.00	0.00	0.00	10.98	4.44	3.57	11.11

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30	34	120	219	55	289	25	21	176	26	57	5	31
36.38	47.61	29.20	25.95	46.02	32.85	15.79	27.47	50.85	56.50	42.14	13.40	58.52
70.00	55.88	64.17	38.81	43.84	47.40	44.00	42.86	71.91	30.77	49.12	60.00	67.74
6.67	17.65	10.00	17.35	14.54	7.27	0.00	19.04	14.04	34.62	29.82	20.00	6.45
23.33	26.47	23.33	43.84	41.82	45.33	56.00	38.10	14.04	30.77	21.05	20.00	25.81
3.53	3.36	3.19	3.28	3.20	3.29	3.40	3.67	3.31	3.15	3.12	3.00	3.32
3.60	3.41	3.74	3.83	3.72	3.80	3.84	4.00	3.43	3.50	3.61	3.50	3.45
3.33	3.26	3.48	3.52	3.52	3.55	3.68	3.71	3.32	3.04	3.28	3.50	2.84
3.50	3.35	3.47	3.50	3.45	3.48	3.52	3.81	3.34	3.36	3.20	3.80	3.37
3.27	3.09	3.48	3.57	3.42	3.50	3.63	3.81	3.20	3.21	3.18	3.40	3.20
2.93	3.00	3.07	3.24	3.13	3.22	3.40	3.67	2.78	2.84	2.77	3.40	3.13
2.80	2.82	2.85	3.16	3.09	3.21	3.24	2.81	2.98	2.52	2.64	3.20	3.00
2.73	2.62	2.78	3.04	3.04	3.02	3.16	3.10	2.77	2.42	2.39	2.60	2.84
3.47	3.36	3.11	3.23	3.29	3.31	3.36	3.09	3.28	3.12	3.29	3.40	3.31
3.50	3.28	3.20	3.30	3.31	3.26	3.32	3.09	3.08	3.08	3.36	3.20	3.31
2.48	2.52	2.71	2.76	2.86	2.73	2.83	3.18	2.55	2.22	2.78	3.25	2.80
3.27	3.16	2.89	2.89	3.06	2.87	2.80	3.08	2.86	2.96	3.04	2.60	3.10
3.21	2.97	2.70	2.79	2.90	2.71	2.72	3.00	3.10	2.56	2.40	2.40	3.07
3.30	3.19	3.11	3.12	3.18	3.15	3.20	3.08	3.08	3.08	3.06	3.00	3.20
3.57	3.41	3.48	3.69	3.53	3.72	3.80	4.00	3.30	3.28	3.25	3.60	3.53
3.43	3.32	3.18	3.28	3.39	3.23	3.32	3.33	3.10	3.00	3.11	3.40	3.28
3.40	3.47	3.17	3.31	3.49	3.33	3.64	3.75	3.52	3.24	3.47	3.60	3.04
3.07	2.91	2.91	3.43	3.13	3.25	3.60	3.71	3.28	2.72	2.80	2.60	2.90
3.23	3.06	2.94	3.29	3.08	3.15	3.48	3.76	3.32	2.58	2.41	2.60	3.03
3.27	3.03	3.19	3.36	2.98	3.10	3.48	3.24	2.87	2.79	2.93	3.25	2.36
2.79	2.62	2.98	2.61	2.82	2.54	2.72	2.40	2.63	2.48	2.80	2.50	2.48
2.87	2.76	2.86	2.89	2.82	2.95	3.12	3.05	2.44	2.80	2.84	3.00	2.89
3.23	3.06	2.83	2.81	2.99	2.82	3.00	3.10	3.11	2.68	2.70	3.40	3.00
00.00	97.06	98.06	95.43	98.38	97.23	96.80	100.00	94.94	80.77	89.47	80.00	96.77
0.00	2.94	1.67	1.37	1.62	0.35	0.00	0.00	1.69	7.69	5.26	0.00	0.00
0.00	0.00	1.67	2.74	1.62	1.73	4.00	0.00	3.37	7.69	3.51	20.00	0.00
00.00	82.35	93.33	96.35	98.38	95.50	96.00	100.00	94.83	80.77	87.72	60.00	83.87
0.00	5.88	1.67	0.46	1.62	1.04	0.00	0.00	5.08	11.54	5.26	0.00	12.90
10.00	11.76	5.00	2.74	1.62	2.77	4.00	0.00	3.05	3.85	7.02	20.00	0.00

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NCC Preview

Edited by Becky Batcha



ILLUSTRATION BY KEN CONDON

Connectivity, strategic DP top user concerns on eve of NCC

National Computer Conference: June 16 to 19

By CLINTON WILDER

One of the best ways to get a handle on hot issues in the data processing community is to check the credentials of the keynote speaker at the National Computer Conference.

In 1984, when IBM was flying high on its success of transplanting the microcomputer revolution into the corporate MIS world, Big Blue's president, John F. Akers, addressed the gathering in Las Vegas.

In 1985, when a serious vendor slump exacerbated concerns about the ability of U.S. computer firms to compete with Japan, Bobby R. Inman took the NCC podium at Chicago's McCormick Place. Inman heads the leading-edge Microelectronic and Computer Technology Corp. research consortium.

And in 1986, for the first time in many years, NCC officials have chosen the head of a user company, AMR Corp. Chairman Robert Crandall as the keynoter — with good reason.

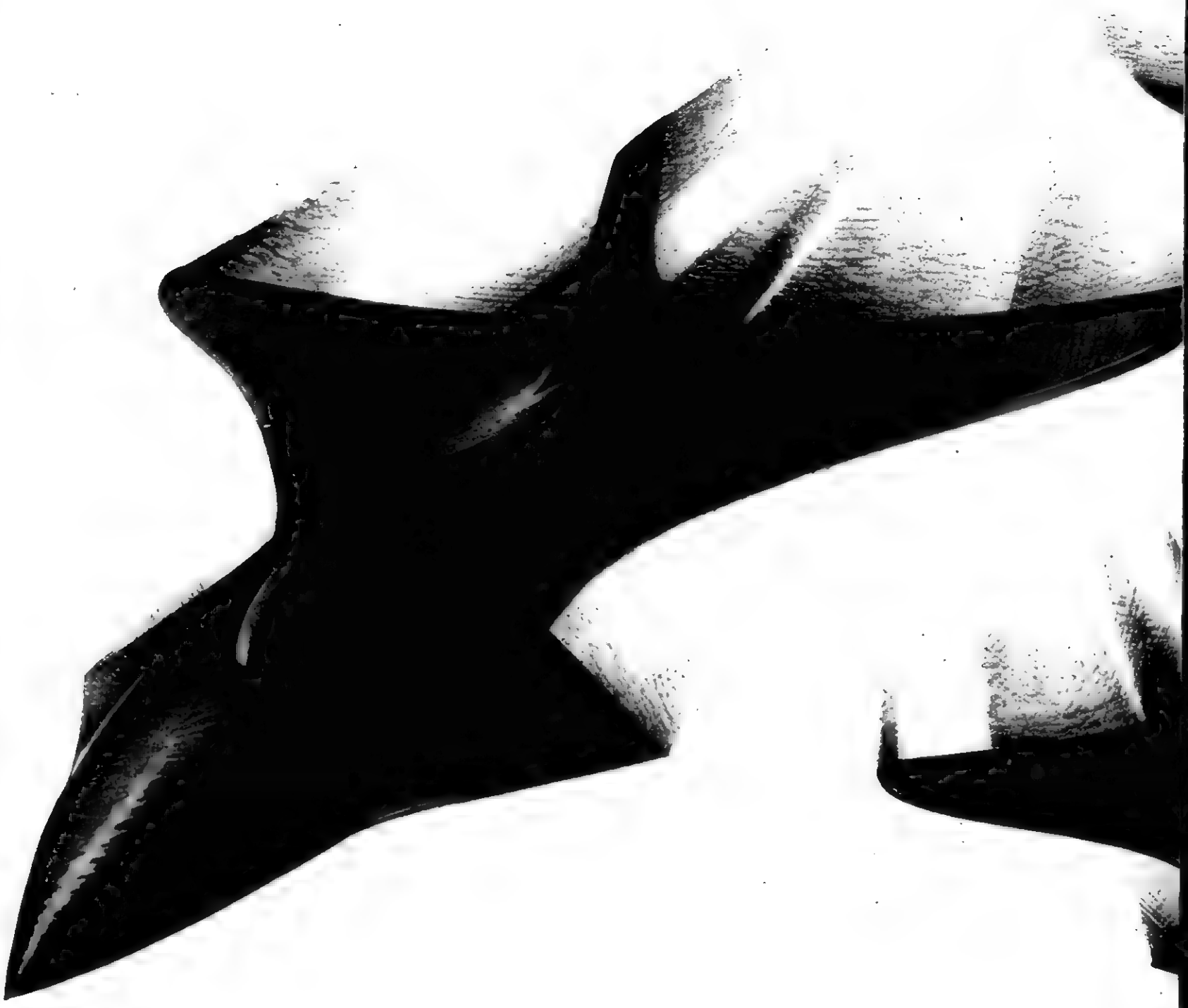
AMR's American Airlines, with its SABRE automated airline reservation system (see story page 54), is perhaps the best example of a trend at the forefront of the nation's MIS departments: DP for profit.

Across the U.S., in huge IBM 3090-based operations and small shops running minicomputers, the distinctions between user and vendor are becoming increasingly blurred. The strongest evidence of the transition of the U.S. economy from being manufacturing-based to information-based comes from the large computer users themselves: A recent Arthur Andersen & Co. survey of information executives in Fortune 1,000 companies found that

Wilder is Computerworld*'s senior editor, computer industry. CW correspondents James A. Martin, Alan Alper, Jeffry Beeler and Peggy Watt contributed to this story.*

> ***Not every user will arrive at NCC '86 seeking a sophisticated network, but virtually every user wants reassurance that his systems will be able to talk to each other.***

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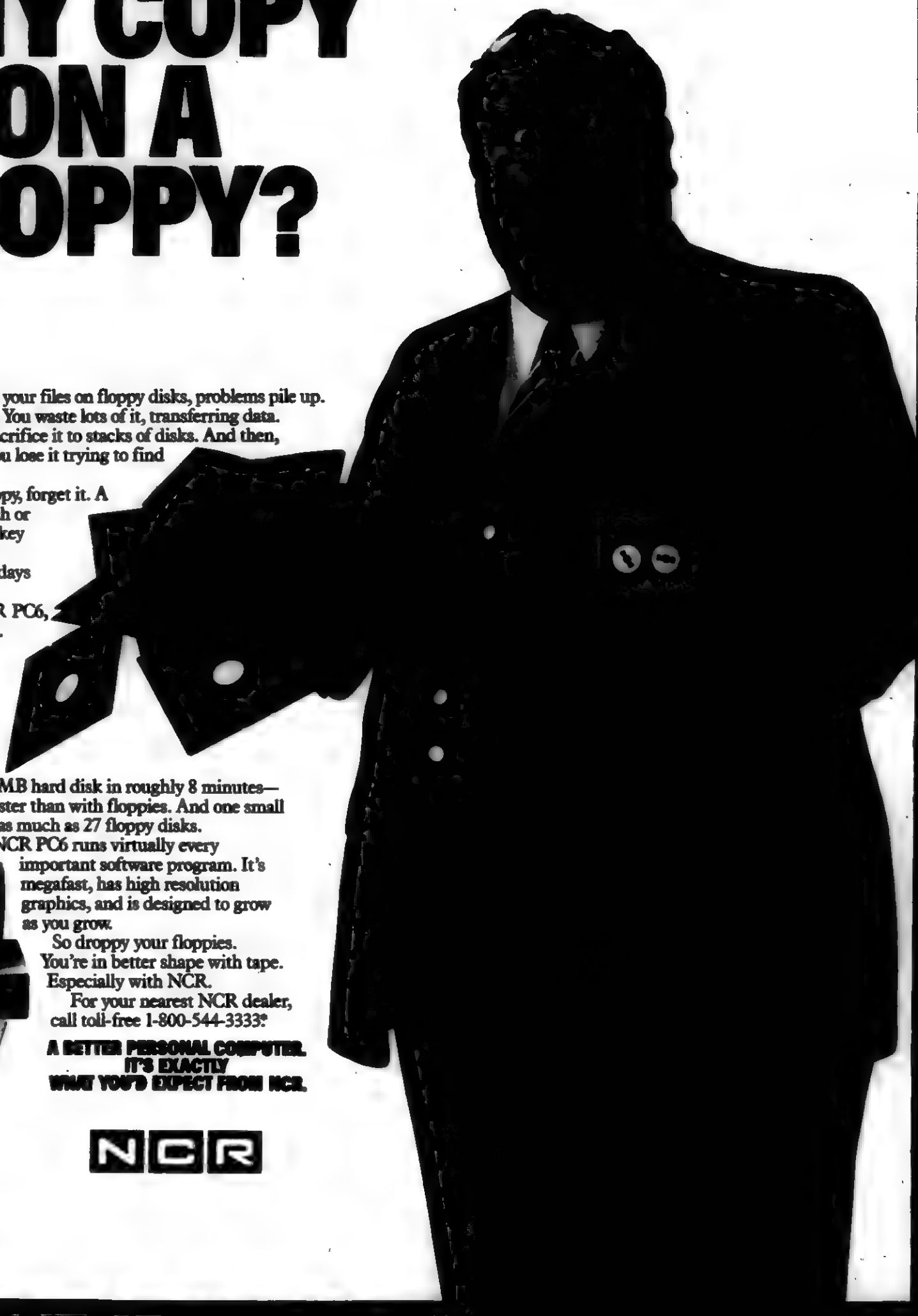
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Connectivity, strategy top user concerns

Continued from page 49

the No. 1 MIS issue is the use of information for competitive advantage.

"That is what is driving the hot technologies of communications, artificial intelligence, software engineering and computer-integrated manufacturing," says Melvyn E. Bergstein, Arthur Andersen's managing director of technology practices. "For many large users, the problem is understanding the concept of information for competitive advantage but not knowing how to implement it."

American Airlines' SABRE system and American Hospital Supply Corp.'s (AHS) customer site terminals linking hospitals to the AHS data base are two of the most commonly cited examples, but many other firms are quietly planning what could be a stampede into the information business.

One company currently making the transition to information vendor is Agway, Inc. in Syracuse, N.Y., a $4 billion manufacturer and distributor of livestock feed and other farm products. Agway plans to add a bundled microcomputer and farm management software package to its product line; leveraging its strong presence in a large vertical market.

"We feel we've always been offering information products within the company," says Dennis LaHood, Agway's corporate director of MIS. "Each development team is allocated to a specific user group, so we always looked at them as accounts. We don't see that being any different in the external marketplace."

From feed grains to financial services, companies are beginning to study new uses of DP technology — with dramatic implications for MIS executives.

"The MIS director today has to become a strategist," says David Kaytes, an information technology management consultant with Booz Allen & Hamilton, Inc. "He has to understand the function of the company's business and bring his talents, the application of technology, to the table." The corporate stature of MIS still varies widely, however, and Kaytes points out that more than 50% of his client companies do not house their MIS departments under the same roof as their corporate headquarters.

To make matters even tougher, the push for the competitive use of information technology has come at a time when decreased capital spending is the order of the day in many U.S. industries. Consequently, many MIS departments are being asked to do more with less.

Getting more bang for the DP buck has led to many of the root causes of the 1985-1986 computer industry slump: delaying hardware purchases and taking longer to evaluate communications and compatibility issues, while trying to do more with software already in place.

"Programmer productivity tools like Cobol generators have finally taken hold," says Thomas Lawton, editor of the "Computer Services Report," a software and DP services newsletter in Belmont, Mass. "When the budget screws get tightened down and you're not upgrading, you have more time and incentive to look at those kinds of things."

That pause, which seemed to begin in early 1985, touched off the deepest and most fundamental downturn in the history of large systems vendors. The biggest industry news at NCC '85 did not come from the floor of McCormick Place, but from financial departments in Armonk, N.Y., Minneapolis and so on, where a series of dismal quarterly reports delivered a timely picture of the state of the industry.

Eleven months later, the slump has proven to be a tough one for many companies — including IBM — to shake off. Combined first-quarter 1986 profits of 11 leading hardware vendors advanced just 5%, a lackluster performance for any industry, but especially disappointing in the formerly high-flying high-tech world.

Breakneck earnings growth, although still occurring at firms such as Digital Equipment Corp., Stratus Computer, Inc., Compaq Computer Corp. and Apple Computer, Inc., may prove to be an anachronism for many computer companies. And the maturation of both the hardware and software and services industries has spurred a restructuring in which almost no potential partnership is out of the question.

The motivation for Burroughs Corp.'s recent takeover of Sperry Corp. dramatically demonstrated that many firms no longer want to go it alone. For example, Applied Data Research, Inc., a technology-driven software house, forsook its independence for the substantial corporate muscle and capital of Ameritech, a former Bell operating company.

"These pairings indicate other things to come in the next few years," says Robert J. Conrads, vice-president of mergers and acquisitions at Kidder Peabody & Co. "We've passed through a stage of spawning of new technologies — next we'll see a new wave of large companies to really execute them."

In the next few years, vendors will prosper by providing true solutions to the connectivity dilemmas facing virtually all users — particularly those trying to deliver information in the marketplace. Just about all the hot issues involving the processing and distribution of data come down to the same thing: networking.

"There is a lack of software that will drive both the PC and the mainframe in file transfer applications, and there don't seem to be any standards in that area," says Kenneth R. Johnson, MIS director for Dr. Pepper Co. His complaint is a common one.

The establishment of industrywide communications standards may prove to be a utopian concept, but vendors are at least paying more lip service to the goal. Dozens of vendor companies, including IBM and a handful of user firms, have joined the Corporation for Open Systems, a nonprofit consortium formed earlier this year to promote common protocols and connections for multivendor environments.

Whether it is realistic to expect competing vendors to develop common standards is debatable, but it is clear that lack of compatibility is one fundamental cause for the industry's financial malaise. Not every user will arrive at NCC seeking a sophisticated, value-added network for using corporate data as a competitive weapon, but virtually every user wants reassurance that his systems will be able to talk to each other.

"As long as the old protocols continue to be supported, we don't particularly care about linking all our hardware," says John Cook, vice-president of computer operations at Central Bank in Concord, Calif. "But as new equipment comes out, we need the assurance of a clear-cut growth path." ■

THE STATE OF THE INDUSTRY: FIVE BROAD TRENDS TO KEEP IN MIND AS NCC UNFOLDS



Connectivity. Right now, most of technology's hot topics center around one concept: networking. Almost every NCC attendee will be looking for some assurance that the systems he buys will be able to talk to each other.



Strategic DP. Companies expect their DP operations to implement strategic applications that will improve corporate earnings. Increasingly, they are also asking DP to create information products and services that can be sold outside the company.



Making ends meet. Even as the MIS department's corporate role grows, its budget may be shrinking, thanks to a trend toward decreased capital spending in American industry. Programmer productivity tools and other aids that let companies forestall hardware purchases are gaining attention.



The industry slump. With the combined first-quarter 1986 profits of 11 leading hardware vendors advancing just 5%, the breakneck earnings growth may prove to be a thing of the past for many computer companies.



Mergers and acquisitions. With the hardware and software industries reaching maturity, a great deal of restructuring is going on. Actions like Burroughs' recent takeover of Sperry will become more and more prevalent.

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NCC IN A NUTSHELL

DATES: Monday, June 16 to Thursday, June 19

LOCATION: Las Vegas Convention Center and Hilton Hotel, Las Vegas

TIMES: • Keynote speech takes place Monday at 9:30 a.m. in the Hilton Ballroom.

• Exhibits are open from 10 a.m. to 6 p.m. Monday, Tuesday and Wednesday and from 10 a.m. to 4 p.m. Thursday.

• Technical sessions begin Monday at 1:30 p.m. and continue until 5 p.m. Thursday.

• Professional development seminars begin Sunday at 1 p.m. and continue until 4:30 p.m. Thursday.

SPONSORS: American Federation of Information Processing Societies, Association for Computing Machinery, Data Processing Management Association, IEEE Computer Society, Society for Computer Simulation

FOR MORE INFORMATION: Call AFIPS at (800) NCC-1986; in Virginia, call (703) 620-8955.

Interview

American's Crandall proves DP's profit potential

Robert Crandall — chairman, president and chief executive officer of American Airlines and its parent company, AMR Corp. — guided the development of SABRE (the Semi-Automated Business and Research Environment), a classic in the strategic use of information systems.

SABRE is a worldwide travel information system based in Tulsa, Okla. According to American's count, the system handled 45% of all airline reservations made in the U.S. last year as well as 20% of all reservations for car rentals and 10% for hotel rooms.

AMR employs 2,400 data processing employees. Its DP shop runs two IBM 9083s, two IBM 3090s (specially configured versions of the IBM 3083 and 3090) and an Amdahl Corp. 470V/8.

Crandall says it was his "great good fortune" to be exposed to the business possibilities of DP early in his career as manager of computer programming at Hallmark Cards, Inc. and head of data processing at Trans World Airlines.

He sees more possibilities right now, which is why he recently rehired Max Hopper, the man who developed SABRE and built a reputation for innovation at American. Hopper had left the airline for a short stint at Bank of America but reclaimed a post at American — senior vice-president of information systems — seven months ago.

Crandall won the Gartner Group, Inc.'s Excellence in Technology award for 1985 and will be the keynote speaker at next week's National Computer Conference in Las Vegas. He spoke recently with Computerworld Features Director George Harrar at American's headquarters in Dallas.

Can you envision a healthy, profitable American Airlines without SABRE?

American as it sits today could not be healthy and profitable without the inputs and activities of SABRE. Both the profitability of the external system and the functionality of the internal system make a contribution to American which is irreplaceable — today.

But Southwest Airlines, a very successful operation, does not have it. America West does not have it. Continental Airlines has a reservations system but nothing near the equivalent of SABRE. So you could certainly have a different kind of American Airlines without SABRE which might very well be profitable and healthy.

The examples you mentioned are airlines, while AMR is becoming a diversified company. Do you see American if not evolving away from being a passenger-carrying airline at least moving somewhere along the line from a passenger-carrying airline to a provider of information services?

It would be inaccurate to think of it as "evolving away" from something. AMR is going to become a substantially more diversified company.

AMR is likely to be a company whose revenues for the foreseeable future will primarily derive from carrying passengers and freight, but with a dollar volume of revenues and profitability associated with other activities — principally data processing and communications.

You will use SABRE to take you into different markets, such as insurance or retailing?

That's conceivable, although our highest priority is the application of the technologies we're good at to the business we know best. Whether there are applications to which we can bring those skills outside the airline business, I'm not sure.

Our initial readings of the marketplace are that we're likely to have a pretty full plate in the aviation business for some time to come.



ILLUSTRATION BY BRUCE GILFOY

American Airlines' Crandall

AMR Corp.'s data processing business is going to make a substantial contribution to the corporation's profits, on the order of $100 million dollars in 1986 — pretax.

What is Max Hopper's mandate?

What we've said to Max is that we want to be a more important participant in the data processing and communications marketplace with a primary focus in commercial aviation and a secondary focus in any other industry where we have proprietary capabilities that will allow us to earn higher than average rates of return. And we've said we've got the dollars to fund those efforts.

How much money is available to him?

As much as he needs.

Can you specify a dollar amount?

Figures just don't mean anything. We're certainly prepared to spend half a billion dollars; we're prepared to spend a billion dollars in terms of capital investment if the returns are there. That is not to say we will.

The SABRE system took a number of years to show a return.

SABRE did, but we knew that marketplace very well. We had two motivations — first to generate an independent stream of earnings and second to protect the stream of earnings that we hoped would come from the airline.

AMR's first-quarter earnings were $4.2 million. How much of that came from DP services or SABRE?

Oh, 600%.

That figure confuses me a little, but I get your point.

What I'm telling you is that the airline lost a substantial amount of money in the first quarter. The data processing operation made a substantial profit.

That relationship is abnormal because the first quarter is traditionally a bad period for the airline business. Max's business is less seasonal.

The point is that the data processing business is going to make a substantial contribution to the corporation's profits, on the order of $100 million dollars in 1986 — pretax.

Companies like Security Pacific Corp., McDonnell Douglas Corp. and Boeing Co. have spun off their DP services.

Not with any notable success, I might point out.

Security Pacific Automation Co. is apparently making a little profit, but you're right.

There is no inherent good that comes from that. One of the reasons those spin-offs don't work terribly well is that the spun-off entity is still primarily a data processing arm of the original host. Max and his organization would be primarily a data processing arm of American Airlines.

So you're out there as a separate business, and now instead of being perceived to be part of the team, you're sending invoices back and forth, and there are arguments about whether Max's services are too high priced.

We may set SABRE up as an independent entity, but it would be because of various internal reasons and because of competitive reasons, not because we think necessarily that it is a wise thing to do to get at the marketplace.

FACTS AND FIGURES: AMERICAN AIRLINES' SABRE SYSTEM

Miles of data circuits: 700,000
Peak message capacity: 1,200/sec.
Fares in data base: 13.5 million
Rate of fare changes: 35,000/day
Number of terminal devices: 75,000

Do you have any problem internally at American convincing others who aren't as sold as you are on the value of information systems?

The people in top management are familiar with the technologies and are committed to the notion that we cannot remain the traditional airline. They are persuaded that sensible and aggressive use of these techniques is a good way to go.

If we don't reduce our labor cost, we're not going to be in business. The only way to reduce the percentage of the revenue dollar devoted to labor is somehow to do the job in a way that is less labor intensive. The only answer I know is the application of technology. We are driven there both by conviction and necessity.

Max and his guys spend a lot of time figuring how we can most efficiently staff the airplanes, where we can most efficiently put crew bases — a variety of things which have allowed us to make consistent progress toward wasting less manpower.

At what stage is the worldwide communications network you are building?

We have established locations for 14 nodal sites, something like a Bell central office. We have four or five of those currently installed; the others are going forward in various states of construction. It will have a tremendous amount of growth capability.

There is excess capacity being built in to handle whatever business you might decide to get into?

It's growth capability rather than excess capacity. We have grown very fast in the past and expect to grow very rapidly in the future.

Grow within American or the data processing arm specifically?

Both. The airline itself will grow very rapidly — we just took delivery of our 300th airplane, and we'll be operating 500 airplanes in five years.

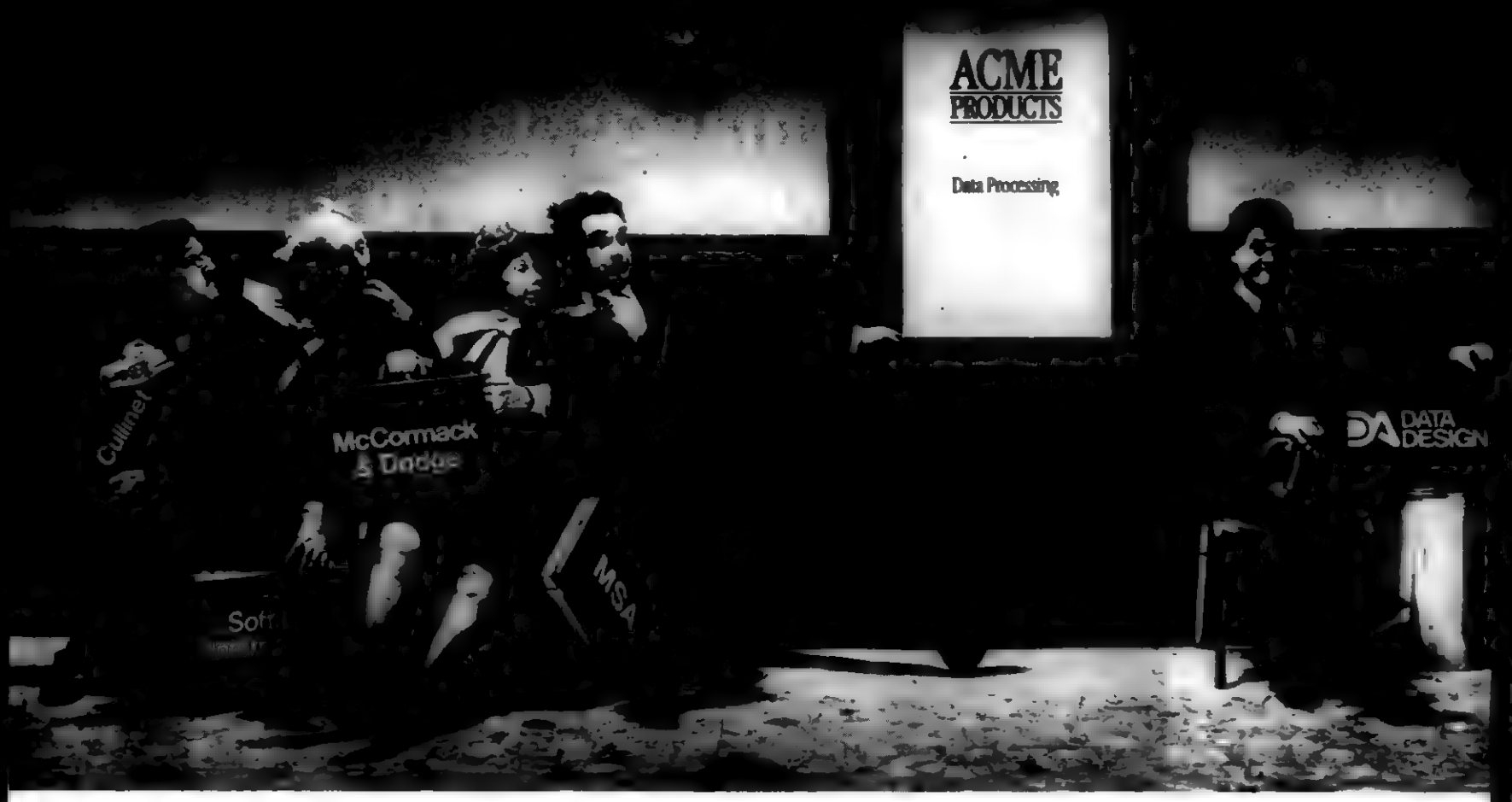
During that same time, data processing will grow several ways, such as the number of functions it handles within the airline.

As you grow and diversify, you run into different competitors. Who do you foresee competing against in three to five years?

I suppose you can envision a cir-

Continued on page 86

Why are other software vendors suddenly afraid of Data Design?



We think there are a number of reasons. Perhaps it's because Data Design is increasingly recognized as one of the finest applications software companies in the world. It's a realization that has come not just to our clients, but to our competitors as well. Mainframe financial software packages from Data Design are consistently rated the best in nationally-recognized independent software surveys—year after year.

Maybe they're afraid of our people. Data Design's employees share an unparalleled commitment to product quality and service. Their high level of data processing and accounting skills is well known—40 percent have graduate degrees in business management. We have also enjoyed a less than five percent employee turn-over rate for over a decade (while the industry average is over 30). So our customers can be confident that the people who develop their systems will remain with the company—ready to provide the support that is consistently rated the highest in the industry.

It could be the increasing realization among companies that vendor size and a familiar name do not guarantee happiness. Especially when software comes from "single source" or "all-things-to-all-people" vendors. They are unable to produce the type of superior product available from a firm that specializes in a specific application area. A firm like Data Design.

Perhaps it's the fact that 68 percent of our customers who previously purchased other vendors' systems decided to switch to Data Design.

Or it might be because we give potential customers a *complete* customer list, to allow them to survey any of our systems' users. If you want to see real fear, ask another vendor to do the same. Incidentally, our customer list includes Alcoa, Gerber, Pillsbury, Sherwin-Williams, Merrill Lynch, Bankers' Trust, Bristol-Myers, Federal Express, Litton, Lloyd's Bank, The New York Times Company, Owens-Corning, Royal Business Machines, Warner-Lambert and hundreds of other FORTUNE 1000 companies.

Maybe what's giving them sweaty palms is the fact that we are a model of financial stability and growth in an industry that's nervously watching revenues and profits decline. Who knows?

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Chronicle of NCCs past reveals an industry in motion

By STAN GIBSON

When the forerunner of the National Computer Conference surfaced in the early 1950s, there were only a handful of computers in the world, and some knowledgeable people at that time expressed the belief that only a handful would ever be needed or built.

Now that there are millions of computers, a problem no one could have foreseen in computing's early days — connecting them with one another — has become the foremost issue.

Each year, NCC has taken the pulse of the industry at the heart of what has been called the second industrial revolution.

Although the NCC as we know it dates from 1973, the conference originated in 1951 as the twice-a-year Spring and Fall Joint Computer Conference. Normally, one show took place in an Eastern city, the other in a Western city. The show was cosponsored by several electronics trade groups that joined together in 1961 to form the American Federation of Information Processing Societies (AFIPS).

In the 1950s, the show offered attendees a glimpse of an inchoate and complex technology; in the 1960s, it spotlighted the reign of the mainframe; in the 1970s, minicomputers surged to the forefront; and in the 1980s, micros and networking are vying for center stage.

In the wake of ENIAC's birth during the U.S.' World War II efforts, room-size computers emerged as a force in the worlds of business and government. The 1951 conference was dedicated to examining these computers and their significance. "At that time, it was the major way to disseminate knowledge. There were no journals," says Paul Armer of On-Line Business Systems of San Francisco, a regular attendee at the early shows.

Armer tells the story of Cuthbert Hurd, an IBM executive who was involved in his company's effort to introduce the IBM 701 during the 1950s. IBM's principal competition then came from Remington Rand Corp.'s 1103. Upon checking into his hotel to attend the conference, the IBM executive was ironically given room 1103. He requested another.

Willis Ware of the Rand Corp. in Santa Monica, Calif., served as chairman of the 1958 show held at the Ambassador Hotel in Los Angeles. He recalls the hotel provided sufficient space for all the attendees, the exhibits and the meetings. The biggest difference between the early conferences and today's? Size, says Ware, who compared the early shows' several hundred attendees with the 84,751 people at last year's show.

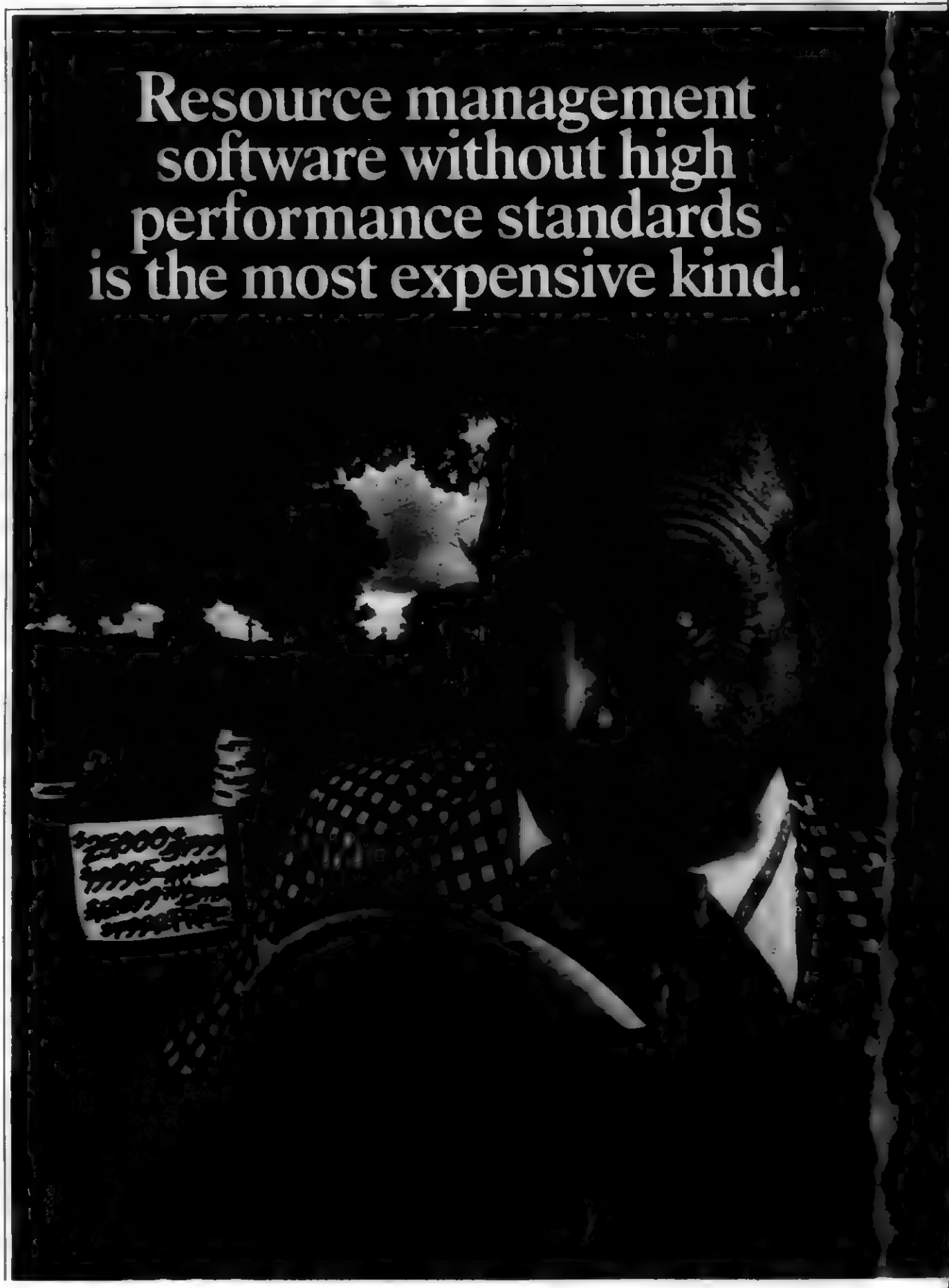
By the early 1960s, the conference drew 2,000 to 3,000 people, according to Richard I. Tanaka, president of the Fullerton, Calif.-based Systonetics, Inc., who was program chairman for the 1962 spring show and general chairman of the 1964 fall show, both held in San Francisco. Tanaka also attended shows held in Detroit, Atlantic City, Philadelphia, Washington, D.C. and Boston — locations not readily associated with NCC today.

He recalls that in 1964, space at the conference was given over to General Motors Corp. for a demonstration of a rudimentary computer-aided design system.

At the 1970 fall show in Atlantic City, Tanaka says, an exhibition of avant-garde computer art was shut down because of excessive nudity. A newspaper account of the incident blasted the show's managers as philistines.

Jerry Koory of Rand has

Resource management software without high performance standards is the most expensive kind.



Gibson is a Computerworld senior writer.

worked on every show since 1963. "I wish we had better ability to predict the effect of the economy on conference attendance," he says. The 1969 spring show in Las Vegas was huge, but a cyclical turn in the economy deflated attendance at the 1970 spring show in Houston. "We have the same cycle now" Koory adds, recalling last year's no-shows.

Over the years, the shows have mirrored the state of the country in other ways. The 1969 Las Vegas conference was marked by demonstrations by a group called Computer People for Peace, Koory recalls.

In 1973, AFIPS changed the show's name to the National Computer Conference, and the twice-yearly exhibitions became one. That year, the conference was held from June 4-8 in the New York Coliseum, where 184 exhibitors demonstrated their products.

Running parallel with the U.S. government's antitrust case against IBM that began in 1969, Sen. Philip D. Hart (D-Mich.), in his 1973 keynote address, said the computer industry must restructure itself or face government regulation. IBM's trial would not get under way until 1975.

In 1974 in Chicago, computer/government issues were again of major interest. Vice-President Gerald Ford warned in his keynote address that computers raised issues of privacy that would not be easily solved. By that time, another privacy issue, the Watergate break-in, had boiled over, and Ford was only weeks away from becoming president.

The 1976 conference returned to the Coliseum in New York. The show's highlight was Sperry Rand Corp.'s Univac 90/70 mainframe with 542K bytes of random-access memory (RAM) that could be upgraded to 4.1M bytes of RAM.

The 1977 NCC in Dallas was the first show to recognize the existence of personal computers, and that reportedly happened only because the chairman of that year's show was Portia Isaacson, an early microcomputer enthusiast. Although micro exhibits were on display that year, AFIPS squirreled them away in the convention center's basement.

The 51,000 spectators who attended NCC a year later in Anaheim, Calif., saw the micro's momentum increase, as the names of a number of micro companies, including Commodore Business Machines, Inc., Tandy Corp., North Star Computers, Inc. and Apple Computer, Inc., attracted notice. But PC companies were isolated in their own exhibit area in the Disneyland Hotel's Convention Center.

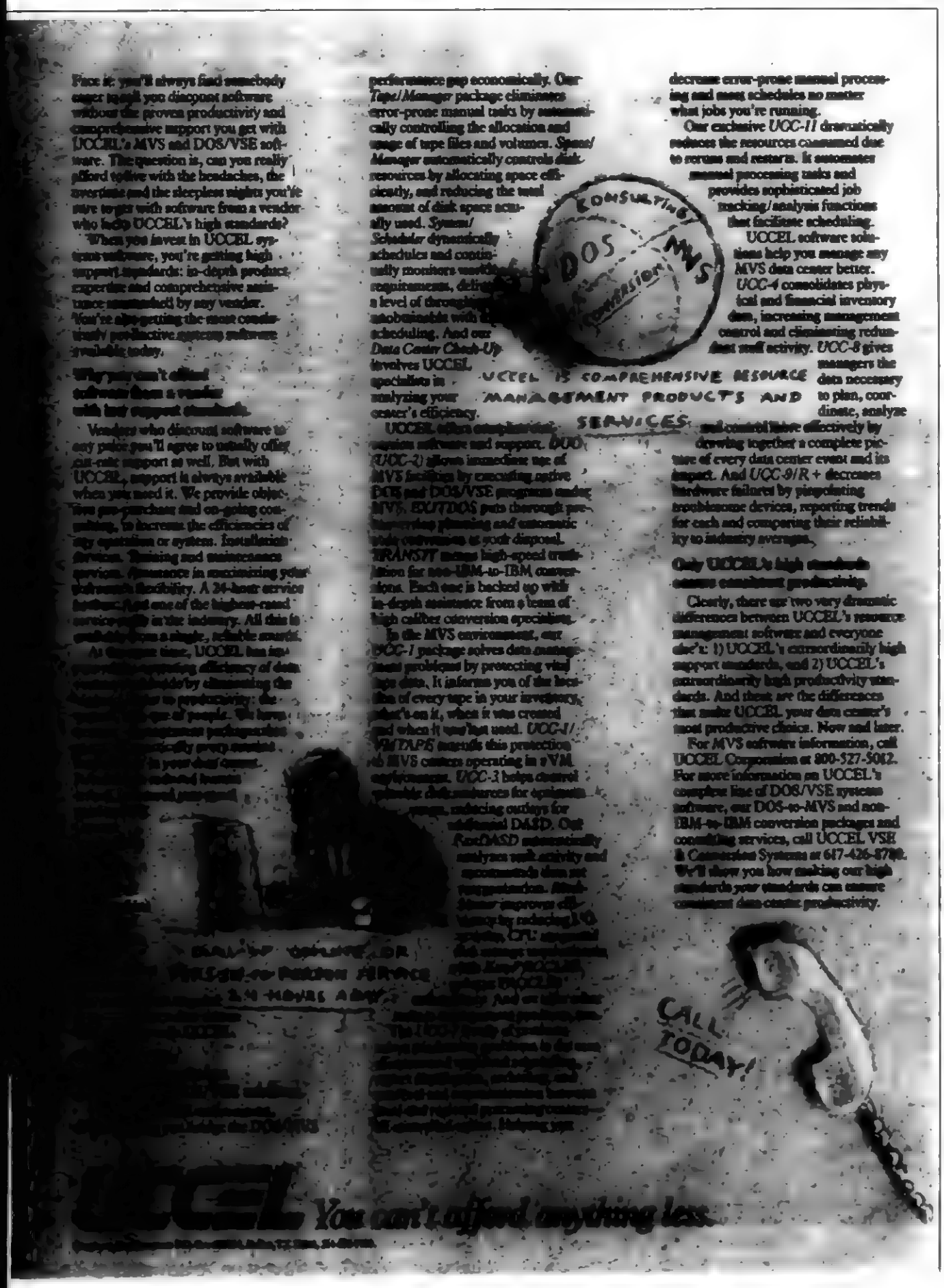
In 1980, the show again took place in Anaheim, and personal computers were still segregated. Apple brought forth its Apple III, and Atari Corp. introduced its Models 400 and 800. The micro software industry had begun to emerge in force.

In 1981, the micro display merged with the other exhibits as more than 525 vendors thronged to Chicago's McCormick Place. Commented then-president of Osborne Computer Corp. Adam Osborne, "They have moved the microcomputer from being a personal computer — a weird subsection of the industry in the basement — up into the mainstream of the industry."

In the four shows that have taken place since, economic factors — first a national recession, then the computer industry slump — have all but stolen the show from technical advances.

Perhaps the most notable aspect of last year's show was the number of companies that chose not to attend, due to what is now considered the worst slump in the history of the computer industry. Apple, Wang Laboratories, Inc., Digital Equipment Corp., Tandem Computers, Inc. and Compaq Computer Corp. were among the 50 vendors that sat out the exhibition.

Perhaps reflecting the difficulty NCC has in living up to the feverish excitement that pervaded some of the more recent shows, AFIPS officials indicate that the show is seeking to return to its original function as a forum at which computer professionals can gather to meet and become better informed, rather than as a spectacle dedicated solely to the dazzle of new products. ■



Continued from page 54

cumstance where we would compete with all of the nation's banks. I'm not sure we will be — it depends on what business we go into and who else elects to come into our business.

What you're seeing in the marketplace is really remarkable. There are all kinds of people out there selling little systems that do specialized things with airline reservations and ticketing.

All of a sudden we're competitors with 3M Corp.; J. C. Penney Co. has decided it has some proprietary capabilities and has set a course of going into the data processing/communications area. I would expect we would be a J. C. Penney competitor. American Express Co. is a very large vendor to us, a very large customer of ours and, in all probability and increasingly in the years ahead, a competitor.

Is there a personal computer in your office?

No, but there are several in the outside offices.

Do you use one at home?

No. I frankly think that the application of PCs to most home tasks is ostentatious and kind of stupid. I don't do enough things repetitively so that I can justify the I/O time. Most people, unless they play with them, don't get the return out of personal computers in personal use that they can in business.

> ***'I frankly think that the application of PCs to most home tasks is ostentatious and kind of stupid. Most people don't get the return out of personal computers in personal use that they do in business.'***
>
> — Robert Crandall, AMR Corp.

The so-called "office of the future" is going to happen. When you get down to the nitty-gritty, you find that although the personal computer is a nifty tool, people spend an awful lot of time running the printer. I don't know when we'll get the technology so we can use it literally in lieu of paper, but I have no doubts that will come. And there are graphics abilities which the systems just don't have yet.

Speech recognition and synthesis is another tricky technology to implement.

But coming. Max has been doing a lot of work educating me in optical scanning and reading devices.

For what use within American?

Optics could be very powerful for us in the handling of baggage and packages. You can't put a boarding pass down a slot and have it read today. But that technology is coming too, maybe in three to five years.

Robotics is enormously powerful. If you can put adequate optics together with robotics, a lot of the work we do here in handling of packages and baggages is obviously going to be robotized.

Max keeps track of all this?

He has two or three people whose full-time occupations are tracking those developments so when they get to the point where we think they are beginning to develop applications orientations, we can be there.

Max and his people have the charge of saying what's happening in software and hardware and competitive applications that we ought to be thinking of that we do not have today. His people get an appreciation of the business problem.

Today we've got a security threat to the world's commercial aviation industry. The only way we can handle the problem of matching which passenger and which bag are on the airplane is with a systems approach. Today we use preprinted bag tags. What we want to do is put on the baggage identifying label some kind of readable image that allows us to match that bag and its progress through the system and your progress so that we always know that the bag and you are on the same plane.

Similarly, we're looking at bag rooms as they may be 10 years from now. We have to have machinery to which we can talk. "OK, here's Joe's bag, now put this somewhere where you can get it back when we tell you, and we'll tell you when Joe gets on the airplane."

Talking to an automated vehicle?

When Joe gets on the airplane, maybe by inserting his smart card, the machine will say, "OK, Joe is on the airplane. Get the bag, put it in a particular container, tell me what container you've put it in so that if Joe gets off you can go and get it back off before the plane takes off." Those things take very sophisticated technologies. Try to put them out there to interface with the real world, where you're handling very large numbers of bags and people.

And you have the labor costs.

No matter how much you spend on labor, you simply can't do the job fast enough. That's the great challenge — you have to process more and more people and you have to do it in a civilized and humane way. ■

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Market-specific meets luring participants from big shows

Broad-based shows cited as ineffective

By MICHAEL SULLIVAN-TRAINOR

In an attempt to account for the recent cancellations of Comdex/Winter and the Office Automation Conference (OAC) — among others — and to rationalize the decline in many remaining trade shows' popularity, some observers cite the general computer industry slump.

But the slump is not the only cause — or even the main cause — of the turmoil. According to many sources, broadly defined shows like the National Computer Conference are simply not effective in today's evolving markets.

Three specific trends lie behind the big shows' troubles:

- Major vendors — including AT&T, Burroughs Corp., Cullinet Software, Inc., Data General Corp., Digital Equipment Corp. and Wang Laboratories, Inc. — have reexamined their marketing strategies. In many cases, they have bypassed major national shows for smaller, market-specific productions.
- Users' areas of interest are changing, leaving behind general concepts such as office automation and replacing them with specific technologies like voice/data integration, micro-mainframe links, digital private branch exchanges and local-area networks.
- The proliferation of computer trade shows over the last few years has forced vendors to choose among options. Exhibitors simply cannot afford to staff a booth at every show that might pertain to them.

"The everything-for-everybody shows don't work anymore," says Shelley Adelson, principal of the Interface Group, Inc., which sponsors the Comdex shows. "You can't give something to everybody."

Many observers agree that promoters must target their shows carefully — at either a market segment or a hot technology — if they expect to prosper.

The OAC was canceled in March after the technology on which it focused fell out of favor. The show's sponsor, the American Federation of Information Processing Societies (AFIPS), continues to sponsor NCC and the NCC Telecommunications Show. "It seems that office automation is no longer an easily definable term," explains AFIPS spokeswoman Katherine Stormont.

Craig Zamzow, a manager who supervises trade shows for DEC's office and information systems group, puts it another way. "Shows that have canceled, like OAC, Intech and Syntopicon, lost their focus with the attendees, and the attendance went down," he says.

In contrast, shows like the Interface Group's Interface, the International Communications Association's ICA and CW Communications, Inc.'s Communication Networks are growing because they are targeting the hot technologies involved in networking and telecommunications.

In addition, promoters are finding that vertical market shows are suffering less than general ones.

Vendors who exhibit at shows give one reason for their growing attraction to targeted shows and declining enthusiasm for general ones: Targeted shows produce better sales leads.

"In the past, we tried to attend as many large shows as possible," says Mike Mattozzi, manager of marketing services for Cullinet. "We've reevaluated that." According to Mattozzi, Cullinet finds its best leads at small, highly focused, regional shows. "You see the same number of qualified prospects come through your booth at these smaller shows as you would at the big ones," he says.

NCC, in particular, is feeling the effects of vendors' disenchantment. A comment from Charles Lanier, trade show coordinator for communications products vendor Digital Communications Associates, Inc., helps explain why: "We dropped out of the National Computer Conference this year because it is a very broad-based show that pulls in attendees from a wide range of areas," Lanier says. "It's not well defined."

General shows also suffer from their sheer size. In this regard, they are victims of their own success, having grown too large to be effective. Size can be detrimental for vendors who are trying to compete for the attention of qualified prospects.

DEC, for example, felt that NCC's enormity worked against the vendors' efforts. "We dropped out of NCC because it's a large show where, even though you're a major vendor, you can get lost in it," Zamzow says.

To ensure that it reaches qualified prospects, DEC has turned to producing its own trade shows. The vendor attracted more than 20,000 attendees to Boston in February for its third annual Decworld.

In light of the facts, NCC's recent loss of exhibitors — from 700 in 1984 to 550 in 1985, with even fewer expected this year — may be a blessing in disguise. Ed Chapman, who manages AT&T's national exhibit planning, thinks so. "The best thing that can ever happen to the NCC is that it's getting smaller," he says. ■

Sullivan-Trainor is a Computerworld senior writer.

AFIPS thrives on broad appeal, feels NCC can do the same

By JEFFRY BEELER

In an industry awash with professional associations representing nearly every conceivable special interest, the American Federation of Information Processing Societies (AFIPS) stands apart.

Unlike many other organizations, which cater mainly to vendors, AFIPS champions the cause of the information systems professionals who are the consumers of computing products and services.

This user orientation distinguishes AFIPS from classic trade groups like the Computer and Business Equipment Manufacturers Association and ADAPSO, which mainly serve the needs of hardware and software producers, respectively.

AFIPS is by no means the only industry organization that sees computing professionals as its chief constituency. But as cosponsor of the annual National Computer Conference, it almost certainly ranks as the most prominent such society — and the largest.

Currently celebrating its 25th anniversary, the group is an umbrella organization for 11 information processing-oriented professional associations, which collectively represent more than 250,000 members, according to John Gilbert, AFIPS conferences director.

Probably the most visible of the constituent societies are the Association for Computing Machinery, the Data Processing Management Association, the IEEE Computer Society and the Society for Computer Simulation — all NCC cosponsors.

In addition to these, AFIPS embraces seven other professional groups:

- The American Society of Information Science.
- The American Statistical Association.
- The Association for Computational Linguistics.
- The Association of Education Data Systems.
- The Instrument Society of America.
- The Society of Industrial and Applied Mathematics.
- The Society for Information Display.

Formed in 1961 to represent the U.S. in the International Federation of Information Processing, AFIPS seeks to promote the welfare of both the computing profession as a whole and the individuals who work within the profession.

Toward that end, the association undertakes a number of continuing user education projects, the largest and best known of which is the annual National Computer Conference.

Although the event will never be "all things to all people," AFIPS does aim to ensure that NCC's exhibitor roster and conference programs appeal to as broad a spectrum of computing professionals as possible, Gilbert says. By maintaining a general, horizontal format, the event "creates economies of scale that give users a once-a-year snapshot of where the industry is now and where it's headed," Gilbert maintains.

"Users can find out what's happening in the industry and learn what they need much more efficiently by going to NCC than by reading every trade publication and visiting lots of vendors individually," he adds.

In addition to helping AFIPS fulfill its mission of advancing the state of the art in information systems, NCC constitutes the federation's single largest source of revenue.

All surpluses from the show are put back into the 11 member organizations, each of which then uses the funds to finance its own activities.

As a nonprofit organization, AFIPS does not disclose its NCC financial results, according to Gilbert.

The primary responsibility for producing the show each year rests with AFIPS' Conferences Department, which is one of the six operating groups into which the professional association is divided.

The other five departments include the Communications Department, the Government Activities Department, the Press Department, the Finance Department and the Executive Directions Department.

Even though NCC remains the centerpiece of AFIPS' yearly schedule, the federation is working hard to expand the roles of several of its other departments besides the Conferences Department. The Government Activities Department, for example, has been charged with the task of keeping the 11 constituent societies abreast of the latest technology-related developments inside Congress, according to Gilbert. ■

Beeler is a Computerworld West Coast correspondent.

CORRECTIONS

The Disaster Recovery Planning service directory entry for Compusource (Product Spotlight, May 12, page 86) was inaccurate. Corrected information follows. Address: 110 MacKenan Drive, Cary N.C. 27511. Facilities provided: Hot and cold site storage. Total subscribers per center: 50 currently, 100 maximum. Additional services available: Consulting.

■

The last paragraph of "The high end: Performance, sophistication" (Executive Report, May 26, page 59) should have read as follows:

High-resolution scanners and scanning systems at the 1,000 by 1,000 dot/in. level are available from Imagitex, Inc. ($25,000 to $170,000), ECRM ($50,000) and Eikonix Corp. ($35,000). Typesetters range from the mid-range Linotron 202/300 ($35,000 to $45,000), Compugraphic 8600 ($60,000) and Autologic, Inc. offerings ($60,000 to $150,000) to the high-end Information International Co. and Hell Graphics Systems, Inc. lines ($150,000 to $250,000).

TECHNICAL SESSIONS

MONDAY

"From Programming to Software Engineering"

DAY: Monday

TIME: 1:30 p.m. to 3 p.m.

PLACE: Pavilion 2

CHAIR: Jean Paul Jacob, IBM Almaden Research Center

Panelists will discuss whether programmers can live up to companies' desire for high-quality software that meets specifications and gets delivered on time and within cost.

■

"Building a $350,000,000 Computer Company"

DAY: Monday

TIME: 1:30 p.m. to 3 p.m.

PLACE: Pavilion 10

CHAIR: John Singleton, Security Pacific Automation Co.

Singleton will discuss two concepts — the strategic planning pyramid and management by results — that help MIS directors understand and improve their organizational roles.

■

"Can Software Ever Meet Legislated Warranties?"

DAY: Monday

TIME: 1:30 p.m. to 3 p.m.

PLACE: Pavilion 1

CHAIR: Ed Bride, *Software News*

Panelists will argue whether software warranties can be legislated and whether it is economically practical.

■

"Justifying Investments in End-User Computing"

DAY: Monday

TIME: 1:30 p.m. to 3 p.m.

PLACE: Pavilion 11

CHAIR: N. Dean Meyer, Dean Meyer & Associates

Speakers will present case studies of end-user computing and will present guidelines for measuring payback.

■

"Contributions of AI to Education"

DAY: Monday

TIME: 1:30 p.m. to 3 p.m.

PLACE: Ballroom G

CHAIR: Wayne Harvey, Stanford Research Institute

Speakers will explain how artificial intelligence can improve computers as learning tools. They will survey the use of theorem provers and symbolic computation programs.

■

"Integrated Services Digital Network"

DAY: Monday

TIME: 1:30 p.m. to 3 p.m.

PLACE: Pavilion 4

CHAIR: Philip Beidelman, Western Telecommunications Consulting

This session will help managers understand ISDN.

■

"Local-Area Networks"

DAY: Monday

TIME: 1:30 p.m. to 3 p.m.

PLACE: Ballroom F

CHAIR: J. Edward Snyder, TRW, Inc.

The panelists will discuss basic local-area net design concepts and demonstrate how their companies' products apply to day-to-day situations.

■

"Ergonomics and the Automated Office"

DAY: Monday

TIME: 1:30 p.m. to 3 p.m.

PLACE: Ballroom E

CHAIR: Robert Wilson, Hamilton-Sorter

Panelists will offer information about ergonomically designed work environments, emphasizing national trends.

■

"Multivendor Environment — the Users' Perspective"

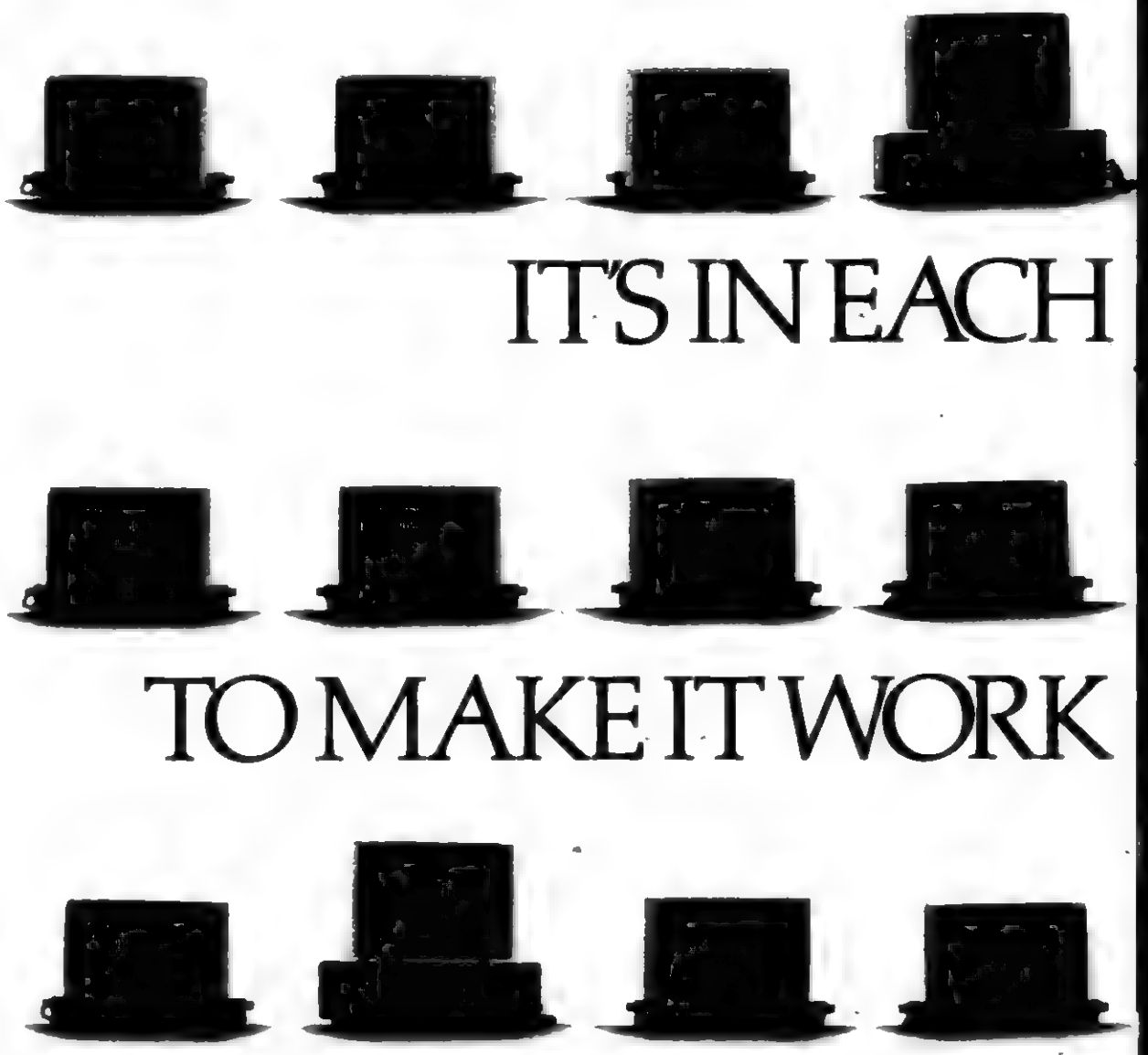
DAY: Monday

TIME: 1:30 p.m. to 3 p.m.

PLACE: Pavilion 5

CHAIR: Richard Price, Peabody Holding Co.

Panelists will discuss their corporations' experiences with multiple vendors.



NCC Preview

"Telecommunications in the Information Age"

DAY: Monday

TIME: 3:30 p.m. to 5 p.m.

PLACE: Pavilion 2

CHAIR: Richard T. Liebhaber, MCI Communications Corp.

Liebhaber will discuss how companies can use advanced digital transmission and switching technology to promote and support efficiency.

■

"Models, Methods and Tools for Software Development"

DAY: Monday

TIME: 3:30 p.m. to 5 p.m.

PLACE: Pavilion 10

CHAIR: C. V. Ramamoorthy, University of California at Berkeley

The speakers will emphasize the need for formalism, methodology and quantitative measurement in software development and maintenance.

■

"Computer-Supported Decision Making in the Real Estate Industry"

DAY: Monday

TIME: 3:30 p.m. to 5 p.m.

PLACE: Ballroom E

CHAIR: Marc Swenson, Homart Development Co.

Panelists will discuss how to use computer-based decision support tools to manage investment risk, optimize income and manage investment portfolios.

■

"The 4-4-4 Challenge: Implications of Superworkstations for Information Systems Management"

DAY: Monday

TIME: 3:30 p.m. to 5 p.m.

PLACE: Pavilion 10

CHAIR: Brian Blackmarr, Brian Blackmarr and Associates

Workstations that operate at 4 million instructions per second, store 400M bytes of data and cost less than $4,000 lie just over the horizon. This session explores how they will affect the future of MIS by challenging the economics of mainframe computing.

■

"Issues with Large-Scale Implementations"

DAY: Monday

TIME: 3:30 p.m. to 5 p.m.

PLACE: Pavilion 11

CHAIR: Michael Heschel, Baxter Travenol Labs, Inc.

Large-scale computer systems are difficult to implement, but they can have high payoffs for users. The speakers will discuss their companies' own projects to provide practical guidance for others.

■

"Service Issues"

DAY: Monday

TIME: 3:30 p.m. to 5 p.m.

PLACE: Ballroom D

CHAIR: Paul Vilandre, Convergent Technologies, Inc.

Speakers will discuss the service issues that are critical to the continued operation of computer systems.

■

"The Marriage of Expert Systems and Simulation"

DAY: Monday

TIME: 3:30 p.m. to 5 p.m.

PLACE: Pavilion 1

CHAIR: Norman R. Nielsen, SRI International, Inc.

Panelists will explain how knowledge-based programming tools will come to play a role in the evolution of computer-based simulation. They will argue that today's tools can be expanded to address system modeling problems for industry.

■

"Role of the Information Systems Manager as a Change Agent"

DAY: Monday

TIME: 3:30 p.m. to 5 p.m.

PLACE: Ballroom F

CHAIR: Allen Smith, Atlantic Richfield Co.

Smith will discuss the changing role of MIS and will suggest practical ways to change the mission and the methods.

■

"New Direction in Printer Technology — The Age of Electronic Imaging"

DAY: Monday

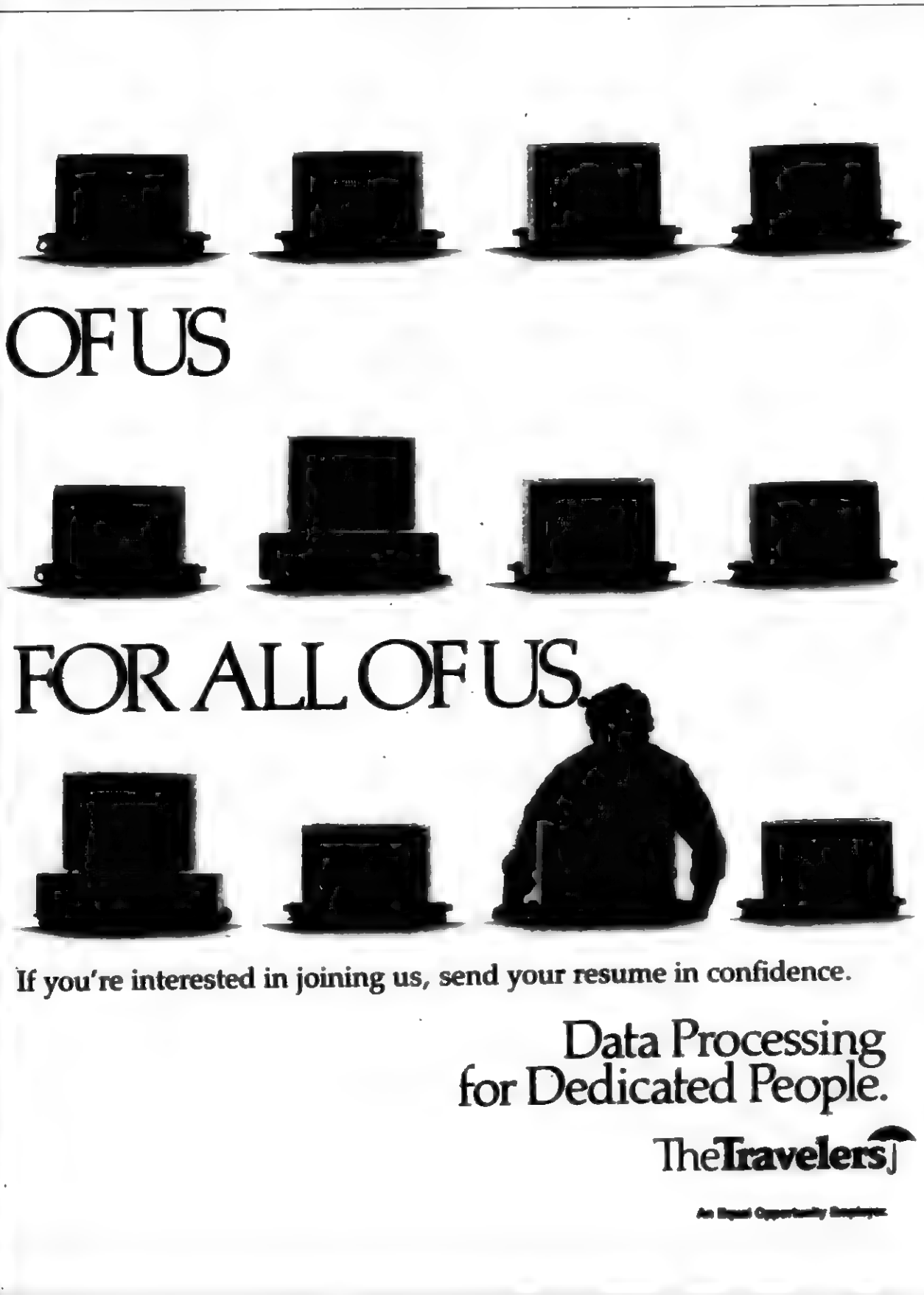
TIME: 3:30 p.m. to 5 p.m.

PLACE: Pavilion 5

CHAIR: Charles Pesko, C. A. Pesko Associates, Inc.

Pesko will explore trends in the development of printers that are changing hard-copy business communications.

■



TECHNICAL SESSIONS

TUESDAY

"Changing Career Paths for IS Professionals and Managers"

DAY: Tuesday

TIME: 8:30 a.m. to 10 a.m.

PLACE: Ballroom G

CHAIR: Kathy Richards, Fireman's Fund Insurance Co.

A career development counselor will engage MIS managers in a dialogue about making the most of current career options.

■

"Contemporary Applications of Speech Technology"

DAY: Tuesday

TIME: 8:30 a.m. to 10 a.m.

PLACE: Pavilion 11

CHAIR: Stanley Goldstein, Media Dimensions

Panelists will discuss applications of voice I/O in office and factory automation and other applications.

■

"Understanding Parallelism and Its Use in Supercomputers"

DAY: Tuesday

TIME: 8:30 a.m. to 10 a.m.

PLACE: Pavilion 5

CHAIR: Paul Schneck , Supercomputing Research Center

Speakers will explain the technical aspects of parallelism and will explore the technology's implications for users of supercomputers.

■

"Do We Have Pacemakers in Software? Cobol? Unix? Ada?"

DAY: Tuesday

TIME: 8:30 a.m. to 10 a.m.

PLACE: Pavilion 4

CHAIR: Jean E. Sammet, IBM

Speakers will explain why Cobol, Unix and Ada hold particular promise.

■

"International Networking"

DAY: Tuesday

TIME: 8:30 a.m. to 10 a.m.

PLACE: Pavilion 10

CHAIR: William C. Braseull Tandem Computers, Inc.

Braseull will describe the state of the art in international networks and will orchestrate a live demonstration.

■

"Are User Applications Programmers Becoming Obsolete?"

DAY: Tuesday

TIME: 8:30 a.m. to 10 a.m.

PLACE: Pavilion 1

CHAIR: Tom Rush, Coopers & Lybrand

Panelists will discuss whether fourth-generation languages and applications packages eliminate end users' needs for applications programmers.

■

"Expert Systems: Mainframe or Microcomputer?"

DAY: Tuesday

TIME: 8:30 a.m. to 10 a.m.

PLACE: Pavilion 2

CHAIR: Robert Anderson, Rand Corp.

Panelists will explore the use of expert systems in mainframe, minicomputer and microcomputer environments. They will focus on the question of whether microcomputer expert systems are valid business tools.

■

Continued on page 67



WHEN IT COMES TO BUILDING WIDE-AREA NETWORKS, THERE'S NO SUBSTITUTE FOR EXPERIENCE.

While any number of companies can offer to sell you a private wide-area network, one company can offer you 25 years of computer and communications experience along with it. BBN Communications.

Experience that includes designing and building the world's first packet-switching network for the U.S. government back in 1969. Since then, it has evolved into the world's largest wide-area network, the Defense Data Network, connecting over 30,000 users throughout the world.

But the U.S. Government isn't the only customer with tough networking problems that BBN has helped to solve. Numerous major corporations, among them Wang, Weyerhaeuser, and MasterCard, not to mention European giants like England's National Westminster Bank and Italy's largest corporation, ENI, have also found the answers they were looking for from us. Each came to BBN with a unique networking problem—from integrated voice/data transmission to electronic mail to credit authorization—and each came away with a unique networking solution.

If you're going to make a major commitment to a wide-area network vendor, only three things count. Experience, experience, and experience. In wide-area networking only one company delivers it all.

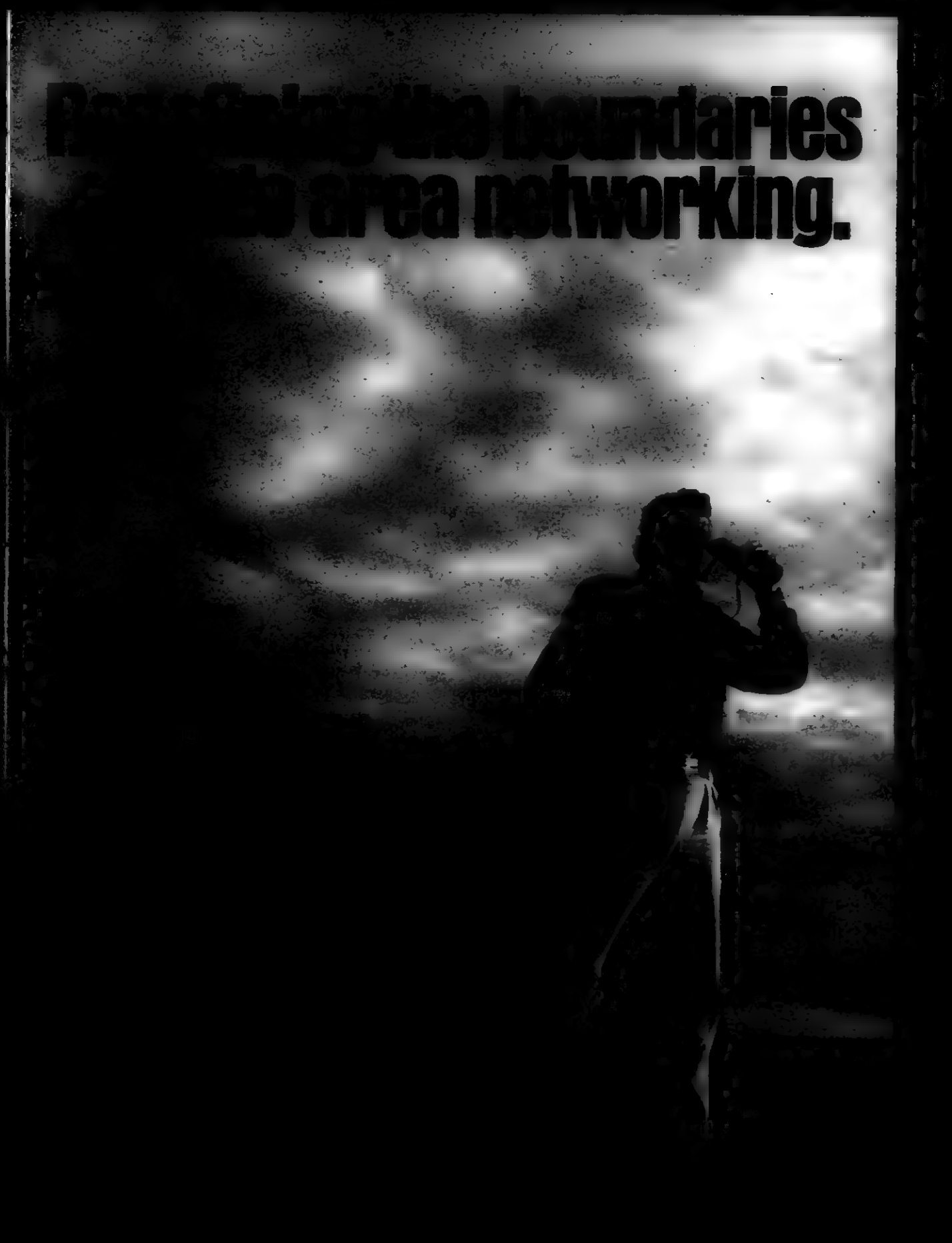
SHOULDN'T YOU BE TALKING TO BBN?

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...boundaries.

...the benefits of business ...clearly see just as many potential ...especially when it comes to your ...communications network.

Adding network locations across town or across the country means having to pull together more types of equipment. While added transmission lines can mean out-of-this-world monthly bills.

You need viable options.
That's why you need Codex.

How to get where you're going.

For just about any type of network problem, we have the solution. Because Codex offers the most complete range of networking products available. In fact, we've just introduced a whole new set of high-end multiplexers and gateways that let you custom-tailor a network to go farther than ever before, in terms of traffic volume, performance and growth.

The Codex 6200 Series Digital Transmission Multiplexers, for example, let you take advantage of the large bandwidth capacity of digital facilities at ...falling tariffs at the same time. One product allows you to combine voice and data in a single network using T-1 circuits. The other offers expanded network configuration flexibility and the highest price/performance in its class.

Another option is the Codex 6700 Series Network Processors. They're our next generation of statistical multiplexers that provide the most sophisticated automatic routing and rerouting features around. Plus offer improved throughput efficiency and extensive mixed protocol support to integrate a variety of applications in a single private network. There's even one model that provides access to popular packet switched networks.

Then there are the Codex SNA Gateways. They allow you to integrate async and bisync devices in an SNA network, and distribute IBM's Communications Network Management capabilities throughout.

Altogether, it's a range of new networking solutions that employs the latest, most advanced microprocessor technology. To maximize line efficiency, improve throughput, optimize system availability and reduce network costs. And allow you to custom-tailor your communications network, again and again, to get the best possible performance. Today and in the future.

In short, Codex high-end multiplexers and gateways are products that can help your business get where it's going.

It grows on you.

What makes this new group of Codex products so special are their individual capabilities, like extensive SDLC/HDLC and BSC protocol support for widespread equipment compatibility.

Support for high speed digital circuits, at T-1 and 56 kbps/64 kbps speeds. Automatic bandwidth allocation and adaptive data compression to maximize line efficiency. Selectable transmission rates for added flexibility. Switching capabilities and access to X.25 public networks. And protocol intervention to minimize delays associated with long-distance, satellite transmissions.

NEW NETWORK SOLUTIONS FROM CODEX

T-1 Multiplexer with enhanced voice and data capabilities
Digital Transmission Multiplexer for medium speed applications
Data Service and Channel Service Units for DDS use
Networking Multiplexers for high throughput, mixed protocol environments
Gateways that provide connections to IBM SNA and X.25 networks

Collectively, they share system features that will keep your network running strong for a long time to come. Including software-based configurability, centralized control, automatic redundancy, modularity and transparent operation. All the elements you need to join multiple networks together to form one cohesive, high-performance solution.

It doesn't end there.

Not only does Codex offer the widest range of vendor-independent networking products—including over 200 different modems, network management systems, and local area networks—we are the networking specialist most preferred among datacomm and data processing managers alike. With award-winning technical service, expert application engineering and unmatched product quality. Which is why 90% of the FORTUNE 100 have placed their confidence in Codex.

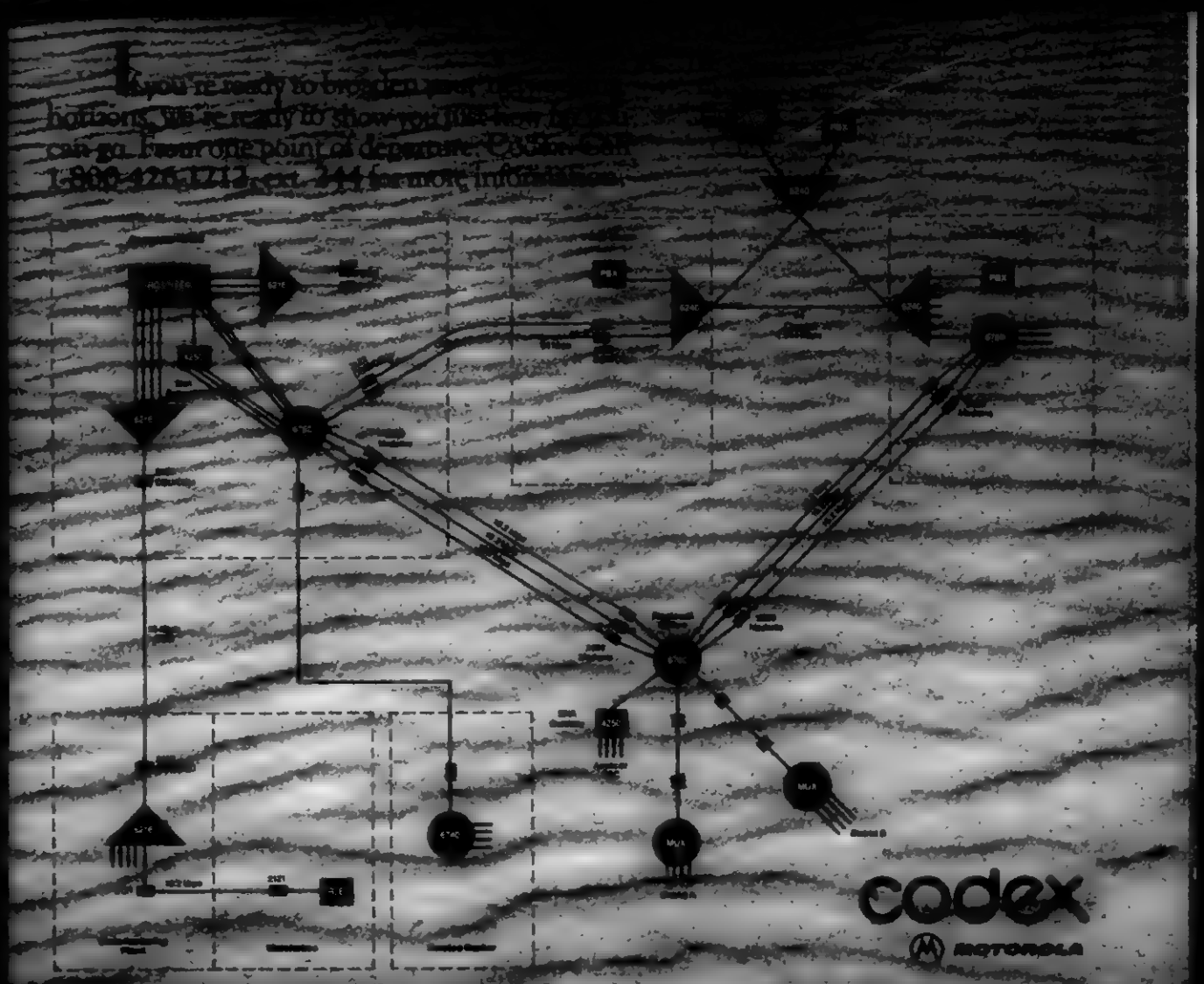
So if you're at a point where you should explore wide area networking a little further, explore Codex.

Because to our way of thinking, how far your network takes you should be as far as you decide you want to go.

For more information, call us at 1-800-426-1212, ext. 244. Or write Codex Corporation, 20 Cabot Blvd., Dept. 707-44, Mansfield, MA 02048.

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Codex 6760 Distributed Communications Processor

□ Delivers 40,000 characters per second of synchronous, bisynchronous and SDLC/HDLC throughput with selective data compression. □ Accepts 256 simultaneous calls for large-scale communications. □ Transmits at aggregate link rates up to T4 kbps. □ Supports four groupband trunks

□ Provides

DUE TO A LACK OF PHOTOGRAPHIC CONTRAST BETWEEN TEXT AND BACKGROUND, THIS PAGE DID NOT REPRODUCE WELL.

Continued from page 62

"Electronic Publishing, With or Without Paper"

DAY: Tuesday

TIME: 8:30 a.m. to 10 a.m.

PLACE: Ballroom E

CHAIR: Contance Greaser, Rand Corp.

In a series of case studies, panelists will discuss the use of electronic equipment to produce traditional paper publications and on-line data bases.

■

"Change is Routine for Information Systems"

DAY: Tuesday

TIME: 8:30 a.m. to 10 a.m.

PLACE: Ballroom F

CHAIR: Kathy Bnttain White, University of North Carolina

Speakers will describe how various organizations implement the MIS function and will suggest strategies for using technology as a strategic tool.

■

"Fourth-Generation Languages and Application Generators"

DAY: Tuesday

TIME: 10:30 a.m. to noon

PLACE: Pavilion 2

CHAIR: A. Winsor Brown, Douglas Aircraft Co.

Speakers will define fourth-generation languages, applications generators and other programming tools and will illustrate the productivity gains they enable. The session will also examine programming tools' effects on local-area networks.

■

"Departmental Computing: Panacea or Solution?"

DAY: Tuesday

TIME: 10:30 a.m. to noon

PLACE: Pavilion 4

CHAIR: George Colony, Forrester Research, Inc.

Colony and his panelists will try to determine whether departmental computing is merely a concept that helps minicomputer vendors sell equipment or truly a new direction.

■

"Image Processing Technology"

DAY: Tuesday

TIME: 10:30 a.m. to noon

PLACE: Pavilion 5

CHAIR: Jack Walsh, Integrated Strategies, Inc.

This session will review the evolution of various optical-disk technologies and explain their practical uses.

■

"An AI Approach to Document Preparation"

DAY: Tuesday

TIME: 10:30 a.m. to noon

PLACE: Pavilion 10

CHAIR: Martha Evens, Illinois Institute of Technology

Speakers will describe systems that use artificial intelligence techniques to analyze the grammar or meaning of text.

■

"Networking: A Management Overview"

DAY: Tuesday

TIME: 10:30 a.m. to noon

PLACE: Pavilion 11

CHAIR: Joseph Clark, Joseph Clark and Co.

Panelists will attempt to sort out the meanings of the terms "networking," "telecommunications" and "data communications." They will also discuss some of networking's implications.

■

"Do Current Software Protection and Pricing Practices Constitute a Rape of Users?"

DAY: Tuesday

TIME: 10:30 a.m. to noon

PLACE: Pavilion 1

CHAIR: Larry Welke, International Computer Programs

Speakers will explain how the tremendous variance between variable costs and selling price may be the root of users' desire to copy programs illegally.

■

"Inventing the Future: Competitive Advantage"

DAY: Tuesday

TIME: 10:30 a.m. to noon

PLACE: Ballroom F

CHAIR: M. Victor Janulaitis, Positive Support Review

Speakers will explain how specific companies are using automation to gain competitive advantage.

Continued on next page

"I can't, I'm wearing magnetic underwear."

—Computer backup excuse #685

Doing computer backup really gets under people's skin.

They'll do anything to get out of doing it, because backing up is so utterly boring.

But not doing it can definitely be a matter of getting your education at the college of hard knocks.

We're reminded of the PhD candidate in biology who did hunger research for his doctoral thesis without backing it up.

He had data from a year's worth of injecting and weighing rats stored on the disk. The computer crashed, the rat data was erased from memory, and he had it to do all over.

Back to the rat race.

So do your backup. Floppies if you don't have much memory. Or, if you have 5 to 10 Mbytes or over, on data cartridge – a 3M developed technology whose time has come.

For example, the space-saving 3M DC 2000 data cartridge holds 40 Mbytes of information. You'd need 80 floppies to store that much. And it can fit in your breast pocket.

To read more true-to-life "horror stories" of people who didn't back up, ask your computer products dealer for our leaflet "Horror Stories."

And you can forget about the polarity of your skivvies.



When you run out of excuses.™

TECHNICAL SESSIONS

TUESDAY
(continued from previous page)

"Vendor Service and Support: What's Important?"

DAY: Tuesday

TIME: 10:30 a.m. to noon

PLACE: Ballroom D

CHAIR: Alexia Martin, Seybold Office Computing Group

Speakers will explore controversial service issues and address users' alternatives to vendor support.

■

"Who Really Is the Boss?"

DAY: Tuesday

TIME: 1:30 p.m. to 3 p.m.

PLACE: Pavilion 2

CHAIR: Paul Dali, Regis McKenna, Inc.

Dali will discuss MIS executives' responsibilities to future innovation.

■

"Can Software Help Software Development? The Case for Expert Systems"

DAY: Tuesday

TIME: 1:30 p.m. to 3 p.m.

PLACE: Pavilion 10

CHAIR: Barbara Brown, IBM's Almaden Research Center

Speakers will debate whether programmers' knowledge can be captured in expert systems.

■

"Network Management"

DAY: Tuesday

TIME: 1:30 p.m. to 3 p.m.

PLACE: Pavilion 5

CHAIR: Robert Linebarger, Brigham Young University

Speakers will explain the basic tools and issues of network management.

■

"Cabling Systems and Micro-Mainframe Communications"

DAY: Tuesday

TIME: 1:30 p.m. to 3 p.m.

PLACE: Pavilion 4

CHAIR: Sidney Harris, Georgia State University

Speakers will review American Express' cabling strategy and look at software-based communications alternatives.

■

"The Future of CAD/CAM Productivity"

DAY: Tuesday

TIME: 1:30 p.m. to 3 p.m.

PLACE: Pavilion 11

CHAIR: Joseph Harrington, Arthur D. Little, Inc.

Speakers will explain specific methods for implementing computer-aided design and manufacturing.

■

"Chief Information Officer: Success or Failure?"

DAY: Tuesday

TIME: 1:30 p.m. to 3 p.m.

PLACE: Ballroom F

CHAIR: Nancy Markle, Arthur Young

Speakers will gauge the corporate information officer's role in business.

■

"Positive Experiences with Software Metrics"

DAY: Tuesday

TIME: 1:30 p.m. to 3 p.m.

PLACE: Pavilion 1

CHAIR: Michael Evangelist, Microelectronics and Computer Technology Corp.

Speakers will discuss portability, reliability and other qualities that have been proposed as appropriate measures of software.

■

"News from Research Programs in End-User Computing"

DAY: Tuesday

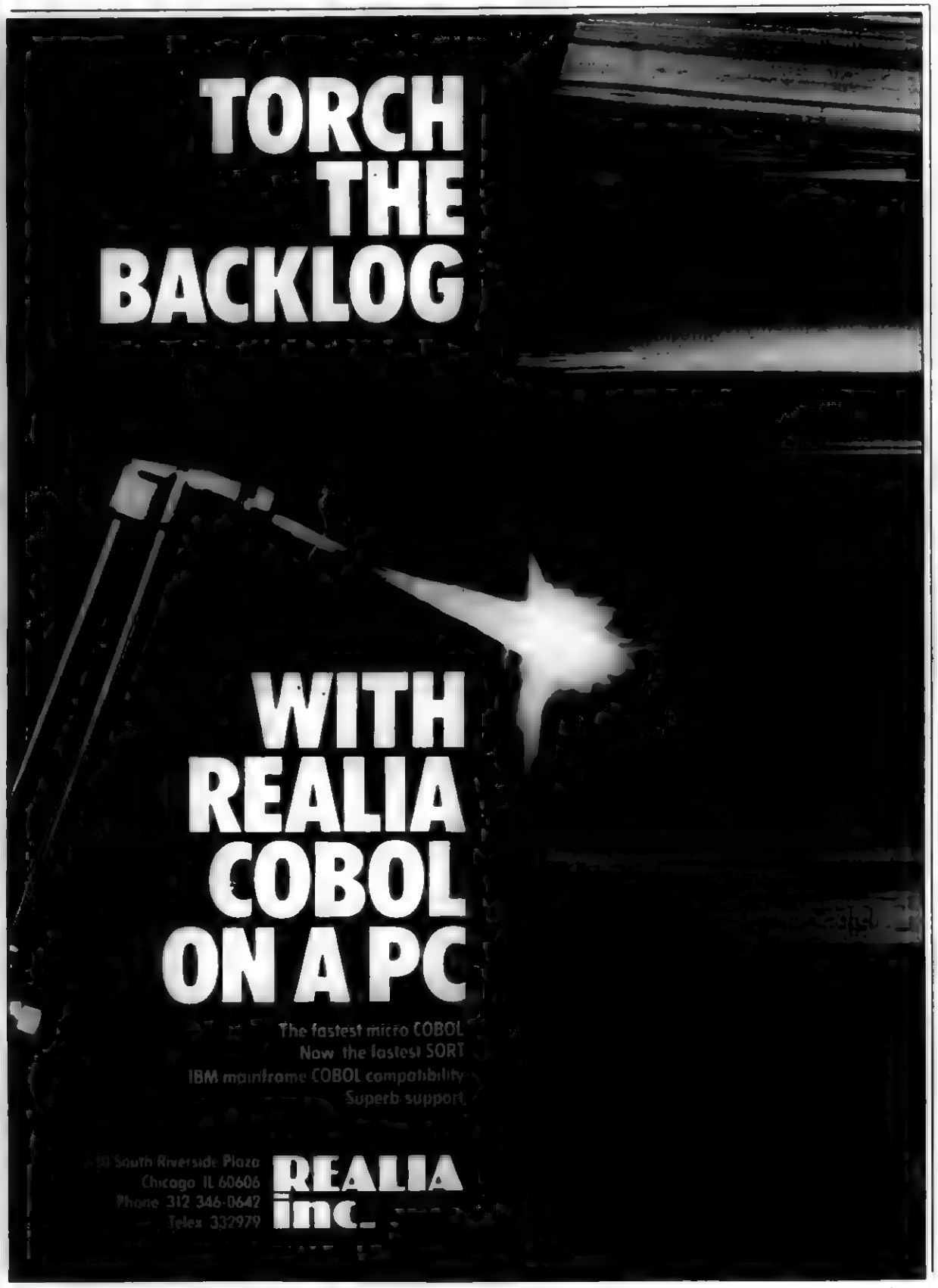
TIME: 1:30 p.m. to 3 p.m.

PLACE: Ballroom E

CHAIR: Tora Bikson, Rand Corp.

Panelists will analyze the results of three research projects that explored issues of end-user computing.

■



NCC Preview

"Personal Computers to Office Automation: Building a System"

DAY: Tuesday

TIME: 3:30 p.m. to 5:00 p.m.

PLACE: Pavilion 2

CHAIR: Amy Wohl, Wohl Associates

Wohl will argue that the office of the future is being built from the bottom up as hundreds and thousands of personal computers get connected to existing OA systems.

■

"Deregulation and Automation — The Financial Industry"

DAY: Tuesday

TIME: 3:30 p.m. to 5:00 p.m.

PLACE: Ballroom F

CHAIR: John Parady, Consultant

Panelists will explore where deregulation and competition are leading the financial industry and will discuss computers and networks as strategic tools.

■

"Will New Architectures Save the Minicomputer Industry?"

DAY: Tuesday

TIME: 3:30 p.m. to 5:00 p.m.

PLACE: Pavilion 10

CHAIR: Craig Symons, Gartner Securities Corp.

Speakers will try to clarify the advantages and disadvantages of parallel processing and reduced instruction set computing architectures.

■

"Software Development Management: The Challenge"

DAY: Tuesday

TIME: 3:30 p.m. to 5:00 p.m.

PLACE: Pavilion 4

CHAIR: Peter Freeman, University of California at Irvine

Panelists will discuss both broad issues and specific techniques for managing software development.

■

"AI Microcomputer Applications in CAD/CAM"

DAY: Tuesday

TIME: 3:30 p.m. to 5:00 p.m.

PLACE: Pavilion 5

CHAIR: L. William Salmon, Saltek Services

Speakers will discuss current applications of artificial intelligence in computer-aided design and manufacturing.

■

"Case Studies"

DAY: Tuesday

TIME: 3:30-5:00 p.m.

PLACE: Pavilion 11

CHAIR: Gordon Lew, American Airlines

Panelists will discuss several user companies' successful networks as a means of evaluating the progress of communications technology.

■

"Lifecycle Data Bases for Buildings"

DAY: Tuesday

TIME: 3:30 p.m. to 5:00 p.m.

PLACE: Ballroom F

CHAIR: Curtis C. Pounds, McDonnell Douglas Architectural, Engineering & Construction Systems Co.

Panelists will look at the benefits of integrating data throughout the life of a facility — from design through maintenance.

■

"Semiconductor Directions in Connectivity"

DAY: Tuesday

TIME: 3:30 p.m. to 5:00 p.m.

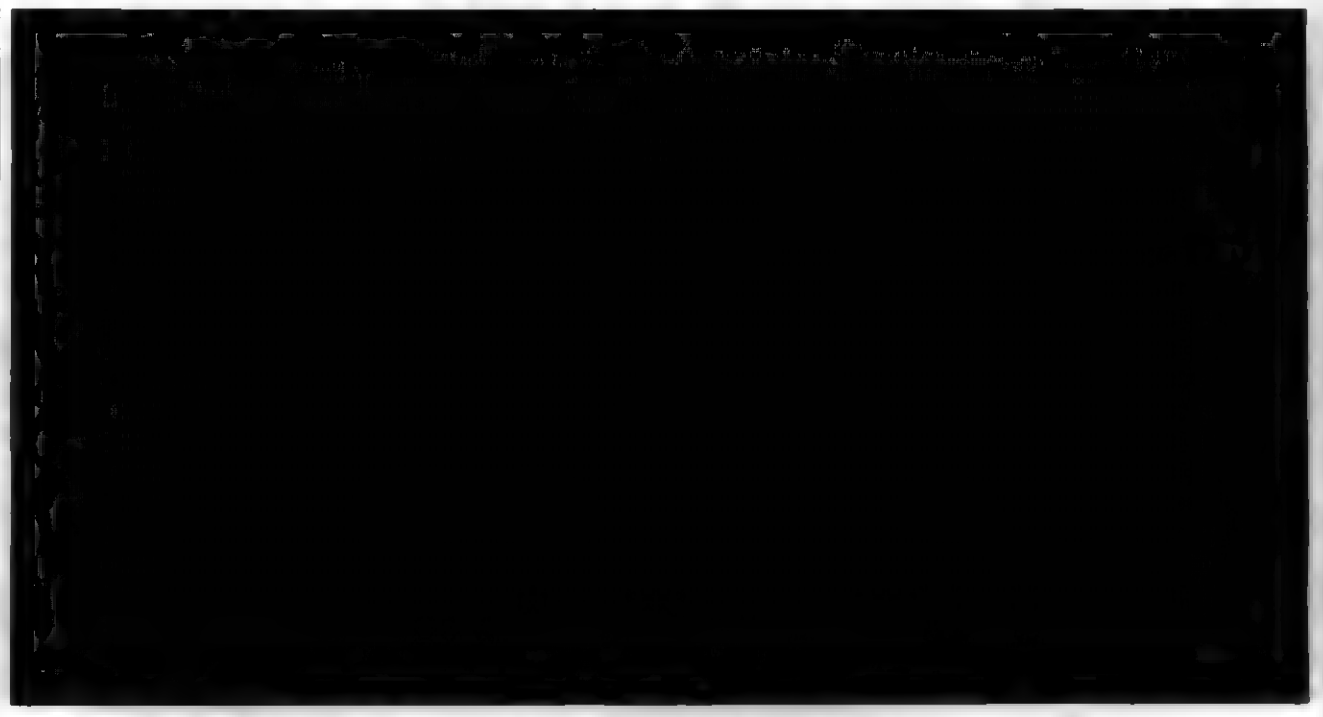
PLACE: Ballroom G

CHAIR: Bobbie Fox, Intel Corp.

Fox will lead a roundtable discussion of trends in very large-scale integration implementation as they apply to office users' connectivity needs.

■

Continued on next page



UNTIL NOW, COMBINING SYNC AND ASYNC NETWORKS HAS BEEN A PRETTY AWKWARD AFFAIR.

CASE's DCX Multiplexers blend your sync and async traffic into one datastream without spilling a drop.

Now it's easy to pipe sync and async data down the same leased lines. And make room for more traffic in the process.

With CASE DCX Multiplexers.

The DCX system eliminates the need for outboard protocol converters, extra wiring, separate power supplies and other makeshift "solutions" that can make a plumber's nightmare of your data network.

With DCX multiplexers, you can pipe DEC peripherals into an IBM network. Exchange data between an IBM host and an HP system in another country. Mix async and SNA/SDLC or bisync traffic without polluting your data or slowing your flow. You can even use your 3270 sync terminal to access an async host.

With *integral protocol conversion*, DCX pumps your sync traffic through a *32-port gateway* that doesn't tie up a single comm line. Among other things, this feature allows inexpensive async terminals, including printers, to act like synchronous terminals for your IBM host.

With *poll-elimination*, DCX cuts out the polling messages that clog up leased lines on IBM networks. This reduces the volume of sync traffic by up to 80%. Which makes room for all kinds of pure and unpolluted data – including async traffic like interactive graphics, CAD imagery and additional control units. All without degradation to IBM or non-IBM users.

In fact, DCX benefits read like a DP/MIS wish list: dynamic port selection, easy access to X.25 packet switched networks and outside IBM hosts, simple file transfer, security. Even network management.

With DCX, your network is completely *future-proof*. Because the DCX design is so flexible and open-ended it can grow and change just as fast as you do.

Your network can start with a simple 4-line point-to-point mux – and evolve to include everything from LANs to international data networks.

One CASE customer has grown a DCX network that links more than 28,000 terminals to more than 100 computers in more than 50 countries. And that's only half the potential capacity of the DCX system.

If you're ready to pump more different kinds of data down fewer pipes with less pollution, call CASE toll-free at 800-824-4000, extension 326.

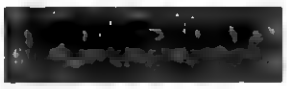
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TECHNICAL SESSIONS



"Uncertainty in Intelligent Systems"

DAY: Wednesday

TIME: 8:30 a.m. to 10 a.m.

PLACE: Pavilion 2

CHAIR: Ronald Yager, Iona College

Speakers will discuss current, ad hoc approaches to managing uncertainty in expert systems and will propose an alternative approach.

■

"Can/Should Data Processing Control PC and Information Center Architecture and Usage?"

DAY: Wednesday

TIME: 8:30 a.m. to 10 a.m.

PLACE: Pavilion 1

CHAIR: Paul Rosenthal, Coopers & Lybrand

Speakers will discuss whether DP should control end-user computing.

■

"Emerging Storage Technologies and Architectures — Judging Real Availability for Future Systems"

DAY: Wednesday

TIME: 8:30 a.m. to 10 a.m.

PLACE: Pavilion 5

CHAIR: James Moore, Dataquest, Inc.

Moore and a panel of speakers will review trends in storage devices and look at the future of high-capacity, high-performance disk subsystems; optical disk systems; and emerging architectures.

■

"Conferencing"

DAY: Wednesday

TIME: 8:30 a.m. to 10 a.m.

PLACE: Pavilion 10

CHAIR: Thomas House, University of Southern California

Speakers will present various types of electronic conferencing and give examples of situations in which each type of conferencing makes sense.

■

"Managing the Training Function"

DAY: Wednesday

TIME: 8:30 a.m. to 10 a.m.

PLACE: Ballroom E

CHAIR: Charles Hoemer, Information Technology Consulting

Speakers will explain how managers can get the most out of the money they spend for training.

■

"Graphics Workstation Technology Trends"

DAY: Wednesday

TIME: 8:30 a.m. to 10 a.m.

PLACE: Pavilion 11

CHAIR: Carl Machover, Machover Associates

Speakers will examine the many products that can be considered graphics workstations.

■

"Finally, Shoes for the Cobbler's Children"

DAY: Wednesday

TIME: 8:30 a.m. to 10 a.m.

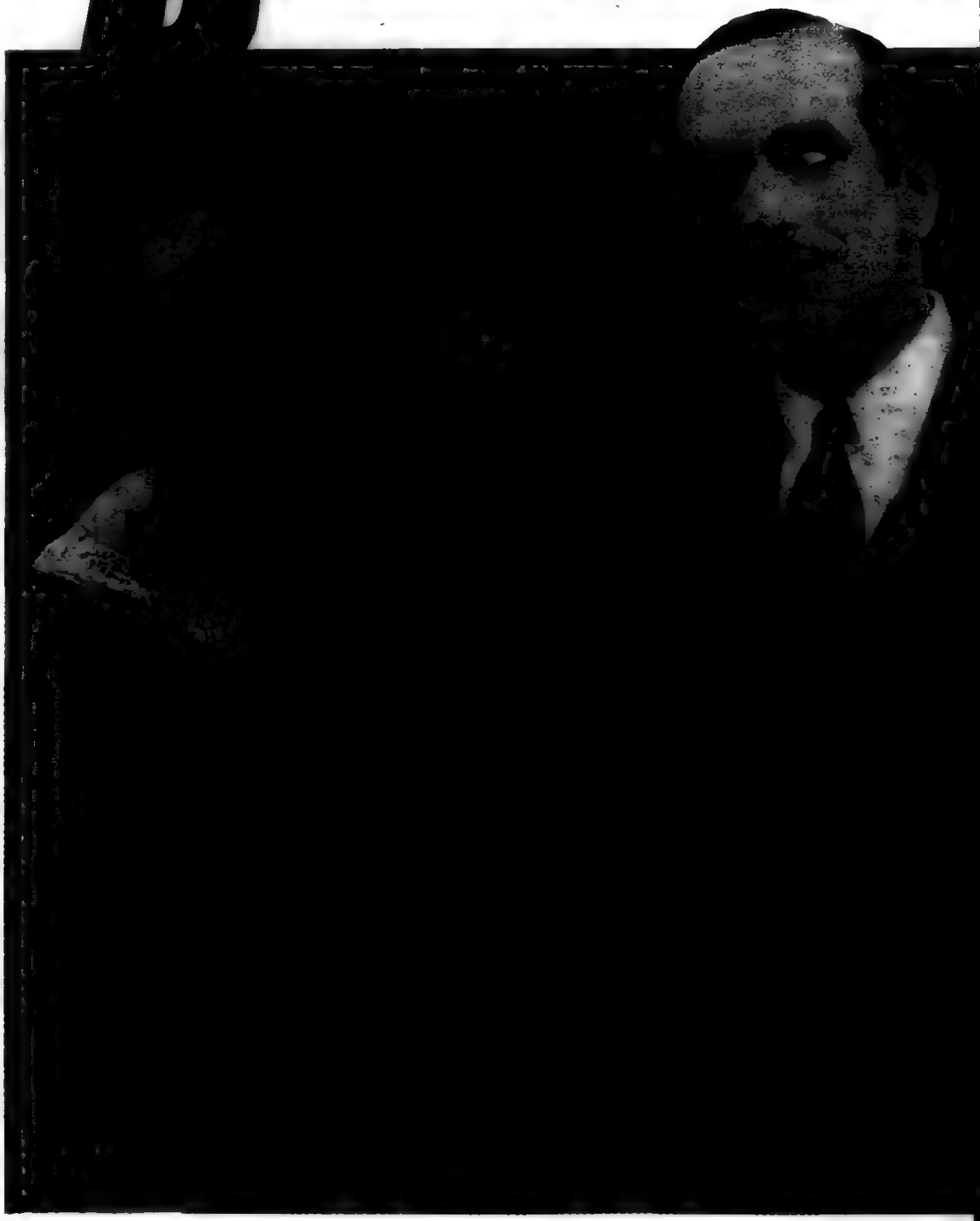
PLACE: Ballroom F

CHAIR: Richard Carpenter, Intech

Speakers in this session will present a framework for an analyst's workbench — a collection of sophisticated programming tools.

■

Remember When the Fi



NCC Preview

"Decision Support Systems — Myth or Reality?"

DAY: Wednesday

TIME: 8:30 a.m. to 10 a.m.

PLACE: Ballroom G

CHAIR: Oscar Bilodeau, Humphreys & Associates

Speakers will distinguish decision support tools from production data bases.

■

"Views and Perspectives of the Future of Data Bases and Graphics"

DAY: Wednesday

TIME: 8:30 a.m. to 10 a.m.

PLACE: Pavilion 4

CHAIR: Gerald Marrone, Citicorp

Speakers will argue that without the integration of data bases and graphics, end-user computing will not fulfill its goals.

"Are you Keeping Pace with the Future?"

DAY: Wednesday

TIME: 10:30 a.m. to noon

PLACE: Pavilion 2

CHAIR: Paul Dali, Regis McKenna, Inc.

Speakers will explore leading-edge technologies.

■

"Optical Disks and Large Document Image Systems"

DAY: Wednesday

TIME: 10:30 a.m. to noon

PLACE: Pavilion 10

CHAIR: Mike Alsup, Arthur Andersen & Co.

Speakers will explore the state of the art in large-document image management.

■

"Software Maintenance: Observing the Professionals"

DAY: Wednesday

TIME: 10:30 a.m. to noon

PLACE: Pavilion 1

CHAIR: Nicholas Zvegintzov, "Software Maintenance News"

Speakers will discuss what managers can learn by observing the methods of software professionals.

■

"Information Center Case Study — Measuring Success"

DAY: Wednesday

TIME: 10:30 a.m. to noon

PLACE: Ballroom E

CHAIR: Jerome Thode, Deloitte Haskins & Sells

Panelists will discuss whether information centers make users more productive.

■

"Electronic Mail"

DAY: Wednesday

TIME: 10:30 a.m. to noon

PLACE: Pavilion 4

CHAIR: Richard Gunther, Ontyme Systems, McDonnell Douglas Information Systems Group

Speakers will attempt to define some standard parameters for E-mail and will review several commercially available systems.

■

"Computer Politics and Policies"

DAY: Wednesday

TIME: 10:30 a.m. to noon

PLACE: Ballroom F

CHAIR: John Gosden, The Equitable

Panelists will discuss some of the issues that innovations in technology have raised and our political system has failed to address.

■

"How Much Computer for the Analytical Job?"

DAY: Wednesday

TIME: 10:30 a.m. to noon

PLACE: Pavilion 11

CHAIR: John Mazzola, McDonnell Douglas Information Systems Group

Panelists will examine how much power users need for analytical processing.

■

Continued on page 80

rst Talkie Left Us Speechless.



Photo courtesy of The Silver Screen.

The year was 1927 and New York's chilly October was about to get a blast of Hollywood heat. *The Jazz Singer* sizzled and left us wide-eyed watching the magic of Al Jolson.

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SCHEDULE AT A GLANCE

Monday, June 16

Exhibit Hours 10 a.m. to 6 p.m.

Program Track	9:30 a.m.	1:30 p.m. to 3 p.m.	3:30 p.m. to 5 p.m.
Artificial Intelligence		**Contributions of AI to Education** Wayne Harvey *Stanford Research Institute (SRI)* *Ballroom G*	**The Marriage of Expert Systems and Simulation** Norman R. Nielsen *SRI International, Inc.* *Pavilion 1*
Case Studies		**Building A $350,000,000 Computer Company*** John Singleton *Security Pacific Automation Co.* *Pavilion 10*	**Issues with Large-Scale Implementations** Michael Heschel *Baxter Travenol Labs, Inc.* *Pavilion 11*
Controversy		**Can Software Ever Meet Legitimate Warranties?** Ed Brice ***Software News*** *Pavilion 1*	
Cost Analysis			
Educational and Societal Issues	**Keynote Address** Robert L. Crandall Chairman *AMR Corp.* *(parent company of American Airlines)* *Hilton Ballroom*	**Ergonomics and the Automated Office** Robert Wilson *Hamilton-Sorter Co.* *Ballroom E*	
End-User Computing		**Justifying Investments in End-User Computing** N. Dean Meyer *Dean Meyer and Associates* *Pavilion 11*	**The 4-4-4 Challenge: Implications of Supermicrostations for Information Systems Management** Brian Blackman *Brian Blackman and Associates* *Pavilion 4*
Engineering			
Hardware		**Multivendor Environment — the Users' Perspective** Richard Price *Peabody Holding Co.* *Pavilion 3*	**Service Issues** *Ballroom G* **New Direction in Printer Technology — The Age of Electronic Imaging** *Pavilion 5*
Management			**Role of the Information Systems Manager as a Change Agent** Allen Smith *Atlantic Richfield Co.* *Ballroom F*
Marketing Communications		**Pushing the Limits of Creativity in Marketing** Kenneth Bahn *Virginia Polytechnic Institute and State University* *Ballroom D*	**Financial Management in Agencies** Susan A. Thomas *Franson & Associates, Inc.* *Ballroom D*
Networking		**Integrated Services Digital Network** *Pavilion 4* *Local-Area Networks* *Ballroom F*	**Telecommunications in the Information Age*** Richard T. Liebhaber *MCI Communications Corp.* *Pavilion 2*
Software		**From Programming to Software Engineering*** Jean Paul Jacob *IBM Almaden Research Center* *Pavilion 2*	**Models, Methods and Tools for Software Development*** C. V. Ramamoorthy *University of California at Berkeley* *Pavilion 10*
Trends			**Computer-Supported Decision Making in the Real Estate Industry** Mark Swenson *Homart Development Co.* *Ballroom E*

* Featured session

CW chart compiled by Laura Fredericksen

Information provided by the American Federation of Information Processing Societies

Tuesday, June 17

Exhibit Hours 10 a.m. to 6 p.m.

Program Track	8:30 a.m. to 10 a.m.	10:30 a.m. to Noon	1:30 p.m. to 3 p.m.	3:30 p.m. to 5 p.m.
Artificial Intelligence	**Expert Systems: Mainframe or Microcomputer?** Robert Anderson *Rand Corp. Institute for Research on Interactive Systems* *Pavilion 2*	**An AI Approach to Document Preparation** Martha Evens *Illinois Institute of Technology* *Pavilion 10*		**AI Microcomputer Applications in CAD/CAM** [illegible] Salmon *Saltek Services* *Pavilion 5*
Case Studies	**Electronic Publishing, With or Without Paper** Constance Greaser *Rand Corp.* *Ballroom E*		**Chief Information Officer — Success or Failure** Nancy Marvin *Arthur Young* *Ballroom F*	
Controversy	**Are User Applications Programmers Becoming Obsolete?** Tom Rush *Coopers & Lybrand* *Pavilion 1*	**Do Current Software Protection and Pricing Practices Constitute a Rape of Users?** Larry A. Welke *International Computer Programs, Inc.* *Pavilion 1*		**Are VDTs Injurious to Your Health?** Bonnie Johnson *Aetna Life & Casualty Co.* *Pavilion 1*
Cost Analysis				
Educational and Societal Issues		**Educational Telecommunications** Judith Jones Hubert *National Commission on Industrial Innovation* *Ballroom E*		
End-User Computing	**Changing Career Paths for IS Professionals and Managers** Kathy Richards *Fireman's Fund Insurance Co.* *Ballroom G*	**Vendor Service and Support — What's Important?** Alexia Martin *Seybold Office Computing Group* *Ballroom D*	**News from Research Programs in End-User Computing** Tora K. Bikson *Rand Corp.* *Ballroom E*	**Personal Computers to Office Automation: Building a System*** Amy Wohl *Wohl Associates* *Pavilion 2*
Engineering			**The Future of CAD/CAM Productivity** Joseph Harrington *CIM Group, Arthur D. Little, Inc.* *Pavilion 11*	**Lifecycle Data Bases for Buildings** Curtis C. Pounds *McDonnell Douglas Architectural, Engineering & Construction Systems Co.* *Ballroom F*
Hardware	**Contemporary Applications of Speech Technology** *Pavilion 11* **Understanding Parallelism and its Use in Supercomputers** *Pavilion 5*	**Image Processing Technology** *Pavilion 5* **Departmental Computing: Panacea or Solution?** *Pavilion 4*	**Smart Facilities in Support of Smart Systems** Michael Bell *Harbinger Group* *Ballroom G*	**Will New Architectures Save the Minicomputer Industry?** *Pavilion 10* **Semiconductor Directions in Connectivity** *Ballroom G*
Management	**Change is Routine for Information Systems** Kathy Brittain White *University of North Carolina* *Ballroom F*	**Inventing the Future — Competitive Advantage** M. Victor Janulaitis *"Positive Support Review"* *Ballroom F*	**Who Really Is Out Front?*** Paul Dali *Right Brokerage, Inc.* *Pavilion 2*	
Marketing Communications	**Videotex** Ronald Solberg *Continental Illinois Corp.* *Ballroom D*	**Direct Marketing: Targeting Customers Through the Use of Specialized Data Bases** Paul Warren *Magnatex International Ltd.* *Ballroom G*		
Networking	**International Networking** William C. Brasuell *Tandem Computers, Inc.* *Pavilion 10*	**A Management Overview** Joseph Clark *Joseph Clark and Co.* *Pavilion 11*	**Cabling Systems and Micro/Mainframe Communications** *Pavilion 4* **Network Management** *Pavilion 5*	**Case Studies** Gordon Lew *American Airlines* *Pavilion 11*
Software	**Do We Have Pacemakers in Software? CobolT UnixT Ada?** Jean E. Sammet *IBM* *Pavilion 4*	**Fourth-Generation Languages and Application Generators** A. Winsor Brown *Douglas Aircraft Co.* *Pavilion 2*	**Can Software Help Software Development? The Case for Expert Systems** *Pavilion 10* **Positive Experiences with Software Metrics** *Pavilion 1*	**Software Development Management: The Challenge** Peter Freeman *University of California at Irvine* *Pavilion 4*
Trends				**Deregulation and Automation — The Financial Industry** John E. Perady *Consultant* *Ballroom F*

* Featured session

CW event executed by Lawe Publishers

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SCHEDULE AT A GLANCE

Wednesday, June 18

Exhibit Hours 10 a.m. to 6 p.m.

Program Track	8:30 a.m. to 10 a.m.	10:30 a.m. to Noon	1:30 p.m. to 3 p.m.	3:30 p.m. to 5 p.m.
Artificial Intelligence	**Uncertainty in Intelligent Systems*** Ronald Yager *Machine Intelligence Institute, Iona College* *Pavilion 2*		**Programming Languages for Artificial Intelligence** Sheldon Boilen *IBM, Cambridge Scientific Center* *Pavilion 5*	
Case Studies		**Information Center Case Study — Measuring Success** Jerome P. Thode *Deloitte Haskins & Sells* *Ballroom E*		
Controversy	**Can/Should Data Processing Control PC and Information Center Architecture and Usage?** Paul Rosenthal *Coopers & Lybrand* *Pavilion 1*		**Does Our Formal Education System Meet the Needs of Computer Professionals and Their Employers?** John Schleich *University of Nevada* *Pavilion 1*	**Is Transborder Data Control a Privacy or a Political Isolationism Issue?** Terry Curtis *California State University, Chico* *Pavilion 1*
Cost Analysis	**Decision Support Systems — Myth or Reality?** Oscar Bilodeau *Humphreys and Associates* *Ballroom G*	**Are VPs and PCs Compatible?** George Rock *Teledyne, Inc.* *Ballroom G*		**'Bean Counter' or Financial Data Compiler and Interpreter?** Dick Goven *Rockwell International Corp.* *Ballroom E*
Educational and Societal Issues		**Administrative and Instructional Use of Computers in Education** Herbert Witt *Dept. of Health and Human Services* *Ballroom D*		**How Goes the Computer Revolution?*** Norman Livergood *University of San Francisco* *Pavilion 2*
End-User Computing	**Managing the Training Function** Charles Hoerner *Information Technology Consulting* *Ballroom E*	**Optical Disks and Large Document Image Systems** Michael Alsup *Arthur Andersen & Co.* *Pavilion 10*	**Future Trends in End-User Interface** Jim Bair *Advance Technologies, Hewlett-Packard Co.* *Ballroom G*	**End-User Access: Transactions and Information** *Ballroom D* **What MIS Managers Don't Understand About the Office** *Ballroom F*
Engineering	**Graphics/Workstation Technology Trends** Carl Machover *Machover Associates* *Pavilion 11*	**How Much Computer for the Analytical Job?** John Machnik *McDonnell Douglas Information Systems Group* *Pavilion 11*		
Hardware	**Emerging Storage Technologies and Architectures — Judging Real Availability for Future Systems** James Moore *Dataquest, Inc.* *Pavilion 5*	**Are You Keeping Pace with the Future?*** Paul Dali *Regis McKenna, Inc.* *Pavilion 2*	**Transaction Processing — Trends and Directions** Lawrence Timmins *Gartner Group, Inc.* *Pavilion 10*	**Planning Hardware Configurations for Maximizing System Performance in an Office Information Systems Environment** Robert McDowell *Arthur Young* *Pavilion 11*
Management	**Finally, Shoes for the Cobbler's Children** Richard Carpenter *Intech* *Ballroom F*		**How Washington Regulates the Information Age** Howard L. Funk *Technical Resource Program, IBM* *Ballroom F*	
Marketing Communications				
Networking	**Conferencing** Thomas Reuter *University of Southern California* *Pavilion 10*	**Electronic Mail** Richard Switzer *Ontyme Systems, McDonnell Douglas Information Systems Group* *Pavilion 4*	**Long-Distance Alternatives** Gwynda Myers *The IIA Group* *Pavilion 4*	**Networking Software** Chris Hughes *Intel Corp.* *Pavilion 10*
Software	**Views and Perspectives of the Future of Data Bases and Graphics** Gerald Marrone *Cincorp.* *Pavilion 4*	**Software Maintenance — Observing the Profession** *Pavilion 1* **Let's Talk About Friendliness, Usability, Windows, Icons, etc.** *Pavilion 5*	**Can We Manufacture Software? How? Why?** Norihisa Suzuki *IBM* *Pavilion 11*	**Software Testing: The Bugbusters Grow Up!** E. F. Miller *Software Research, Inc.* *Pavilion 4*
Trends	**Trends in Contract Services** Philippe Dreyfus *Cap Gemini Society, Paris* *Ballroom D*	**Computer Politics and Policies** John Gosden *The Equitable* *Ballroom F*	**An Expert Predicts the Future*** Alan Feller *All Data Graphics/Isaco* *Pavilion 2*	

* Featured session

CW event compiled by Laura Fredrickson

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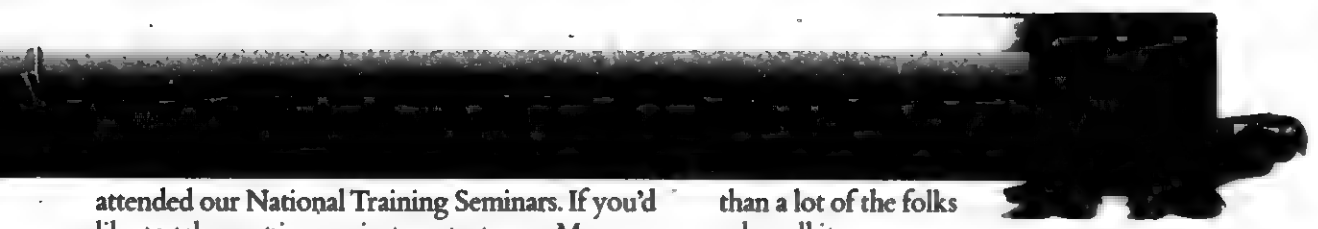
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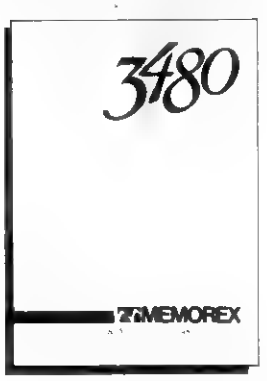
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NCC Preview

Thursday, June 19 Exhibit Hours 10 a.m. to 4 p.m.

Time	Research and Development		Small Business
8:30 a.m.	**8:30 to 9:15** **Identification, Authentication and Privacy in Digital Communications** B.O. Brien *RSA Data Security, Inc.* *Hilton Ballroom*	**8:30 to 9:15** **Reasoning About Knowledge — An Overview** J. Halpern *IBM Research Center* *Hilton Ballroom*	**8:30 to 10** **Before the Purchase Process:** **How to Know You're Ready for Automation** Ron Mansfield *Mansfield and Associates* *Hilton Ballroom*
9	**9:15 to 10** **Applying Software Reliability Models to Decision Support** C. Chang *University of Illinois at Chicago* *Hilton Ballroom*	**9:15 to 10** **Updates in Relational Data Bases** B. C. Desai *Concordia University, Canada* *Hilton Ballroom*	
10	**10 to 10:45** **SPQL: Software Product Quality Level** M. Ohba *Japan Science Institute, IBM Japan* *Hilton Ballroom*	**10 to 10:45** **Non-Chronological Sequential Simulation** D. Kumar *University of Texas at Austin* *Hilton Ballroom*	**10 to 10:30** **Break**
11	**10:45 to 1:30** **Extending the Capabilities of Word Processing Software** H. Berghel *University of Nebraska* *Hilton Ballroom*	**10:45 to 11:30** **Detecting Loop Structure in Assembly Code** L. Cleveland *Japan Science Institute, IBM Japan* *Hilton Ballroom*	**10:30 to noon** **During the Purchase Process:** **How to Streamline Your Computer Purchase** Theresa Meyers *Quarterdeck Office Systems, Inc.* *Hilton Ballroom*
Noon	**11:30 to 12:15** **Project Source File Management Under the Unix Operating System** A. Filipski *Motorola Microcomputers* *Hilton Ballroom*	**11:30 to 12:15** **Generation of Minimum Test Sets for Detection and Location of Multiple Faults in Fanout-Free Combinational Circuits** H. K. Su *North Carolina State University and IBM Research, Triangle Park* *Hilton Ballroom*	**Noon to 1:30** **Break**
	12:15 to 1 **Break**		
1 p.m.	**1 to 1:45** **Graphic-Theoretic Bounds for On-Line Checks in Multiple Processor Systems** P. Banerjee *Coordinated Science Laboratory of the University of Illinois* *Hilton Ballroom*	**1 to 1:45** **Fault Tolerance and Diagnosability of a Class of Binomial Interconnection Networks** A. Ghafoor *Syracuse University* *Hilton Ballroom*	**1:30 to 3** **After the Purchase Process:** **How to Make Your Computer Work for Your Business** Wayne Wagner *Businessland, Inc.* *Hilton Ballroom*
2	**1:45 to 2:30** **How to Convert Informal Ideas to Formal Ideas in Software Engineering** T. Nartker *University of Nevada* *Hilton Ballroom*	**1:45 to 2:30** **Parallel Probabilistic Computing** J. Hershey *IBM* *Hilton Ballroom*	**3 to 3:30** **Break**
3 4 5			**3:30 to 5** **Current Users of Small Business Computers: Inside Information from First-Time Users** Stanley Siegel *University of California at Los Angeles Law School* *Hilton Ballroom*



TECHNICAL SESSIONS

WEDNESDAY

"Are VPs and PCs Compatible?"

DAY: Wednesday

TIME: 10:30 a.m. to noon

PLACE: Ballroom G

CHAIR: George Rock, Teledyne, Inc.

Speakers will discuss the information manager's role in helping top managers define their data needs.

■

"Let's Talk about Friendliness, Usability, Windows, Icons, etc."

DAY: Wednesday

TIME: 10:30 a.m. to noon

PLACE: Pavilion 5

CHAIR: William Bracker Jr., Technology Research Associates

Speakers will address various aspects of user interfaces.

■

"An Expert Predicts the Future"

DAY: Wednesday

TIME: 1:30 p.m. to 3 p.m.

PLACE: Pavilion 2

CHAIR: Alan Paller, AUI Data Graphics/Issco

Paller will provide an overview of computer graphics.

■

"Does our Formal Education System Meet the Needs of Computer Professionals and Their Employers?"

DAY: Wednesday

TIME: 1:30 p.m. to 3 p.m.

PLACE: Pavilion 1

CHAIR: John Schleich, University of Nevada

Speakers will examine why computer science graduates get treated as trainees.

■

"Transaction Processing — Trends and Directions"

DAY: Wednesday

TIME: 1:30 p.m. to 3 p.m.

PLACE: Pavilion 10

CHAIR: Lawrence Timmins, Gartner Group, Inc.

Panelists will identify strategic solutions for transaction processing problems.

■

"Long-Distance Alternatives"

DAY: Wednesday

TIME: 1:30 p.m. to 3 p.m.

PLACE: Pavilion 4

CHAIR: Gwynda Myers, The JIA Group

Representatives from various long-distance carriers will discuss how to choose among carriers.

■

"Future Trends in End-User Interface"

DAY: Wednesday

TIME: 1:30 p.m. to 3 p.m.

PLACE: Ballroom G

CHAIR: Jim Bair, Hewlett-Packard Co.

Speakers will explore the interface projects that research labs are sponsoring.

■

"Programming Languages for Artificial Intelligence"

DAY: Wednesday

TIME: 1:30 p.m. to 3 p.m.

PLACE: Pavilion 5

CHAIR: Sheldon Berkin, IBM, Cambridge Scientific Center

Speakers will explain the progress being made in artificial intelligence languages.

Continued on page 82

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SCAN/COBOL takes the effort out of program documentation. Nothing's more important to document than source code, but nothing gets done less.

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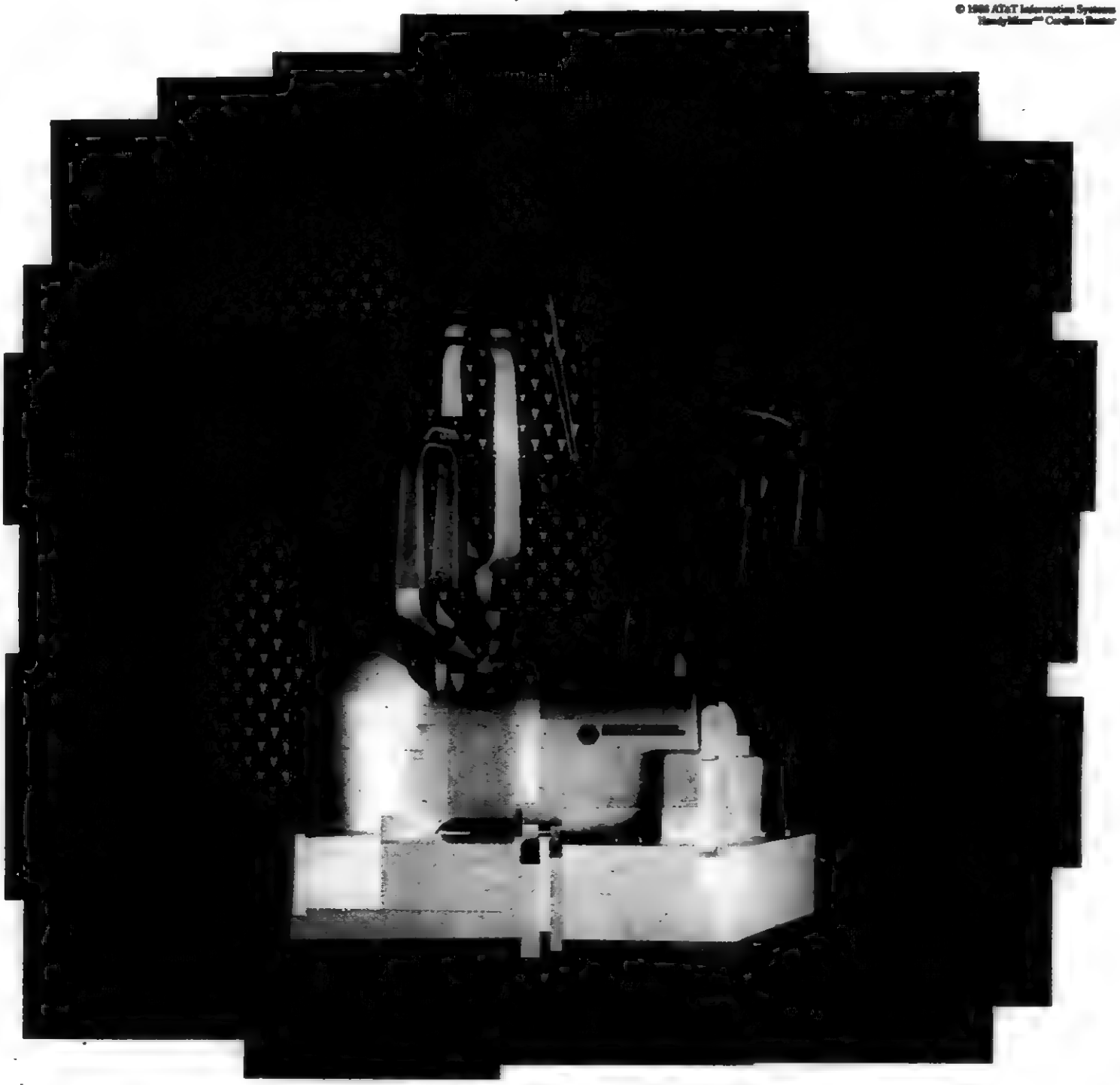
No matter how many changes you make, SCAN/COBOL keeps all your source level documentation up-to-the-minute. Whether it's your own COBOL program or a vendor's, SCAN/COBOL gives you the critical information you need—whenever you need it—in clear, easy-to-follow form.

And SCAN/COBOL guarantees that all your source code gets documented in exactly the same way. Programmers will become productive sooner, develop reliable programs faster, and maintain them easier.

SCAN/COBOL does what no other analysis tool can. It simulates the execution of every cleanly compiled program. SCAN/COBOL saves hours and hours of testing and computer time by giving you critical information that shows how your program will run. It highlights poorly structured code in simple, concise graphs; pinpoints the illegal use of keywords; and reveals hidden bugs and maintenance booby-traps— all before the program runs.

Group Operations, Inc.
1110 Vermont Avenue NW
Washington, DC 20005
Offices in Atlanta, Boston, Chicago, Dallas, Los Angeles and New York. Find out how SCAN/COBOL improves programmer productivity, EDP auditing and program documentation.
Call Cheryl Maloney today at (202) 887-5420

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Handyhiker™ Cordless Heater



How AT&T Is Helping Black & Decker Get From The Drafting Table To The Kitchen Table.

WE MAKE THE PIECES FIT.

BLACK & DECKER* has always made quality tools that can help you build a kitchen. Now they're making quality tools that can help you cook in one. And AT&T is providing the tools to help them do it faster.

With international voice communications built around AT&T System 85s, Black & Decker will greatly reduce the time it takes to make a new idea into a new product—and to get that product to markets in fifty different countries.

Our AUDIX† voice mail system and global electronic mail will overcome the problem of communicating across time zones. So messages can be delivered anywhere in the world, any time, day or night.

And AT&T systems can work with voice and data products made by other manufacturers, and also grow and change to meet future needs.

To find out why AT&T is the right choice to help you meet your current and long-term business goals, call 1 800 247-1212.

AT&T
The right choice.

*Registered Trademark of The Black & Decker Corporation
**Trademark of The Black & Decker Corporation
†Audio Information Exchange

TECHNICAL SESSIONS

WEDNESDAY

(continued from page 80)

"Can We Manufacture Software? How? Why?"

DAY: Wednesday

TIME: 1:30 p.m. to 3 p.m.

PLACE: Pavilion 11

CHAIR: Nonhisa Suzuki, IBM

Speakers will discuss the "software factory" concept, which has been implemented in Japan.

■

"How Goes the Computer Revolution?"

DAY: Wednesday

TIME: 3:30 p.m. to 5 p.m.

PLACE: Pavilion 2

CHAIR: Norman Livergood, University of San Francisco

Speakers will debate whether we are masters or victims of information.

■

"End-User Access: Transactions and Information"

DAY: Wednesday

TIME: 3:30 p.m. to 5 p.m.

PLACE: Ballroom D

CHAIR: T. Andrew Finn, AT&T Communications

Panelists will examine videotex, online transaction processing and online data bases.

"Planning Hardware Configurations for Maximizing System Performance in an Office Information Systems Environment"

DAY: Wednesday

TIME: 3:30 p.m. to 5 p.m.

PLACE: Pavilion 11

CHAIR: Robert McDowell, Arthur Young

Speakers will discuss techniques that improve system performance in environments that support heavy end-user computing.

■

"Networking Software"

DAY: Wednesday

TIME: 3:30 p.m. to 5 p.m.

PLACE: Pavilion 10

CHAIR: Chris Hughes, Intel Corp.

Speakers will explain the different types of networking software.

■

"Is Transborder Data Control a Privacy or Political Isolationism Issue?"

DAY: Wednesday

TIME: 3:30 p.m. to 5 p.m.

PLACE: Pavilion 1

CHAIR: Terry Curtis, California State University

Speakers will examine European nations' justification for erecting barriers to transborder data flow.

■

"Software Testing: The Bugbusters Grow Up!"

DAY: Wednesday

TIME: 3:30 p.m. to 5 p.m.

PLACE: Pavilion 4

CHAIR: E. F. Miller, Software Research, Inc.

Participants will debate whether programmers can predict the general behavior of a program through selective testing in events where exhaustive testing is impossible.

■

"What MIS Managers Don't Understand About the Office"

DAY: Wednesday

TIME: 3:30 p.m. to 5 p.m.

PLACE: Ballroom F

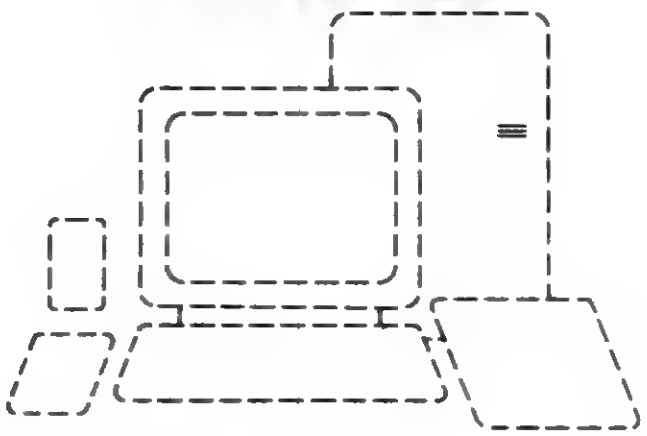
CHAIR: Linda O'Keefe, Dataquest, Inc.

Speakers will discuss how some good DP management practices can have undesirable effects on office automation.

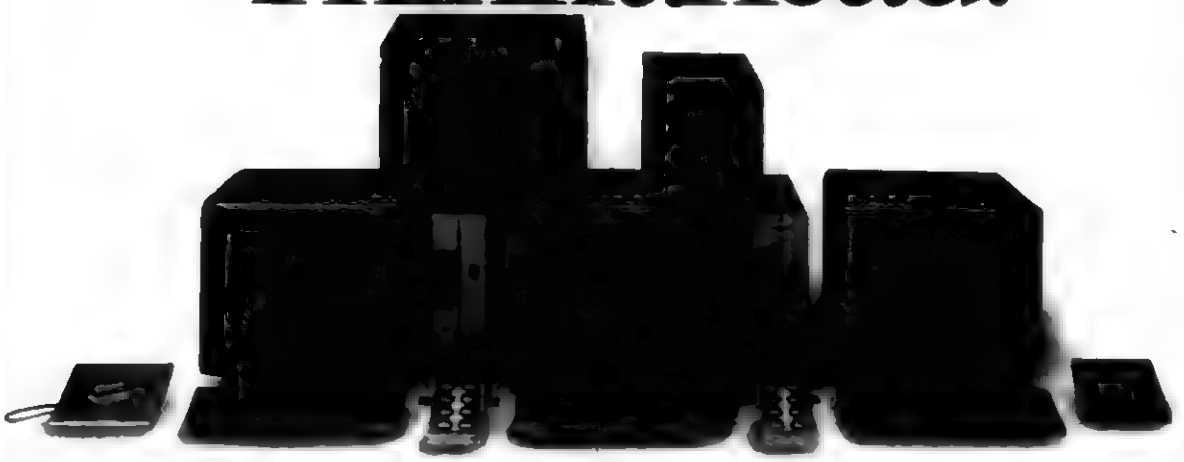
THURSDAY

Thursday's sessions will be split into two categories: research and development, with 14 half-hour presentations; and small business, with four 1½-hour presentations. See chart page 79 for details.

Think.



Thinkahead.



At Spectragraphics, we've always had a company philosophy of not just thinking, but thinking ahead. It's something to strive for. And it does more than just sound nice in our corporate brochure.

It pays off.

For example, last year we introduced the DesignSet 1080,™ a graphics terminal that's compatible with the IBM 3080.

As good as it was at the time, the most important feature of the DS 1080 was its potential. A designed-in potential for growth with easy field upgrades. So every DS 1080, this year's or last's, can have all the most up-to-date features we have to offer. With complete compatibility and maintainability. Which gives our model a future without planned obsolescence.

Unfortunately, that wasn't an option given to customers of companies who merely think. Customers who are now working with out-of-date models that aren't even a year old.

In addition to the foresight we have in designing products, Spectragraphics has the track record, stability and service to back them up. Because we know that those things help just as much in making your system run smoothly.

So, all that being said, the decision is up to you.

You can think.

Or you can think ahead. With Spectragraphics.

SPECTRAGRAPHICS
Where your ideas take shape.

Spectragraphics Corp., 10260 Sorrento Valley Rd.
San Diego, CA (619) 450-0611.

Designset 1080 is a trademark of Spectragraphics Corporation.

Digital has it now.



The best way to bring all your users together. Today.

As computer systems multiply, so do the problems of sharing information among the people who use them.

Each system has its own operating software. Its own way of representing data. And its own way of communicating this data to the outside world. And as systems change to keep up with technological advances, the more users must struggle just to keep up.

But one computer company can bring all your users together. No matter how many vendors you're using.

At Digital, the ability to network computers is the cornerstone of our entire computing strategy. No wonder, then, that a Digital network can communicate with IBM mainframes and personal computers better than IBM can. Your users can exchange memos, mail, and documents directly. With no slowdowns from having to go through an intermediate computer.

And because *we've* planned for change, we can help *you* plan for it, too. You can upgrade to the latest, most cost-effective technology simply by plugging in new equipment. Without bringing down the network you already have. Without disrupting your entire organization.

Perhaps that's why our customers have made our Ethernet networks the most widely installed in the world -- with over a half million users. For more than a decade, Digital's networks have been connecting the front office, the factory floor, the engineering center and the MIS department. And today, they're bringing entire companies together on a complete range of VAX™ desktop, departmental and large-scale computers.

Let us show you a Digital network in action at a company near you. Or at one of our 22 Applications Centers for Technology. Just call your local Digital sales office. And we'll show you how one company can bring all your computers together. Today.

digital™

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EXHIBITORS' BOOTHS

Adacom Corp.

BOOTH: B-3409, B-3411

REPRESENTATIVES: Moti Gura, president; Mike Holliger, sales manager; Mike Motta, technical services manager.

FEATURED PRODUCTS: Adacom will exhibit its 3270 local distribution network, Adalink transmission devices, Adastation workstation, Shadow printer adapter and Adaprint printer adapter.

■

AFIPS Press

BOOTH: A-1057

REPRESENTATIVES: Chris Hoetzel, director; Olive Shilland, fulfillment and administration.

FEATURED PRODUCTS: AFIPS Press will exhibit statistical reports, educational materials, proceedings of special seminars and a quarterly journal.

■

Alloy Computer Products, Inc.

BOOTH: B-3310, B-3312

REPRESENTATIVES: Nigel Spicer, senior vice-president for sales and marketing; Robert Otten, OEM sales manager.

FEATURED PRODUCTS: Alloy will exhibit its APT-120, APT-60 and APT-40 ¼-in. streaming cartridge tape drives and its PC Slave/16 multiuser board.

■

Alpha Data, Inc.

BOOTH: A-1411

REPRESENTATIVES: Sonny Flink, director of marketing.

FEATURED PRODUCTS: Alpha Data will introduce the Atlas 520, a 520M-byte Winchester-type disk drive, which is said to offer quick access to 2.25M bytes of information.

■

Amco Engineering Co.

BOOTH: C-4066, C-4068, C-4070

REPRESENTATIVES: Floyd Johnson, sales manager.

FEATURED PRODUCTS: Amco will display a series of vertical, color consoles.

■

Listings are based on vendors' responses to a Computerworld questionnaire. Editorial assistant Laura Fredrickson contributed to the reporting and compilation of this material.

Amencable, Inc.

BOOTH: C-3845, C-3874

REPRESENTATIVES: Dave Dent, president; Greg Tripp, vice-president; Paul Christian, Mary Howe and Mark Pearson, sales representatives.

FEATURED PRODUCTS: Amencable will exhibit polyvinyl chloride and plenum cable assemblies; coaxial and twinaxial cable; RS-232, RS-499 and RS-422 ports; and local-area networks.

■

Analog & Digital Peripherals, Inc.

BOOTH: C-3457

REPRESENTATIVES: Mary Jane Keeney, sales administrator; Jerry Davis, engineering support manager.

FEATURED PRODUCTS: ADPI will introduce an IBM Personal Computer-compatible, RS-232, 5¼-in. floppy disk system, a cartridge storage device and a compact cassette drive.

Anchor Automation, Inc.

BOOTH: C-3444

REPRESENTATIVES: Jerome Hussong, director of consumer sales; George Eisler, president.

FEATURED PRODUCTS: Anchor will exhibit its Volksmodem line of modems and its

IBM ASCII terminals:

The case in black and white.

Introducing a somewhat more colorful member of the family.

Meet the IBM 3164 ASCII Color Display Station.

It gives you eight foreground and eight background colors. On a 14" screen.

And because of its 8 x 16 character matrix, the 3164 gives you clear, crisp characters in color.

But is color any reason to buy IBM's 3164? It is, according to studies that indicate the use of color increases productivity, decreases errors and promotes user satisfaction.

Color, of course, is far from the sole reason for choosing the 3164. To appreciate the others, you should get to know the rest of our ASCII family.

Emulation. Another side of the family.

Our ASCII terminals are designed to fit into existing systems. Even if the systems aren't ours.

Emulation Capability	
3161	IBM 3101 Model 881 ADDS Viewpoint* Hazeltine 1500* Lear Siegler ADM-3A* Lear Siegler ADM-5* TeleVideo 910*
3163	IBM 3101 Model 881 DEC VT 52* DEC VT 100* TeleVideo 950*
3164	IBM 3101 Model 881

For example, our basic ASCII Display Station, the IBM 3161, emulates up to six terminals. And the advanced-function 3163 emulates a number of higher level ASCII data streams.

Features	3161	3163	3164
Screen size	12"	12"	14"
Lines x characters	25x80	25x80	25x80
Character matrix	8x16	8x16	8x16
Double-sized characters	No	Yes	Yes
Line drawing characters	24	24	24
Vertical scroll	Jump	Jump/ Smooth	Jump/ Smooth
Definable function keys	24	24	24
Windowing	No	Yes	Yes
Partitioning	Horiz.	Vert./ Horiz.	Vert./ Horiz.
Characters in buffer	1920	7680	7680

What's more, every one of our ASCII terminals can operate in its own function-rich native mode.

Our family is flexible.

Our unique plug-in cartridges allow for considerable flexibility in your operation. For example, simply by switching cartridges you can shift a terminal from one data stream to another.

And, in many countries cartridges are also available that go beyond emulation to let you operate your ASCII terminals in several foreign languages. Appropriate foreign language keyboards are also offered.

Enhanced ergonomics. Another family trait.

All our ASCII terminal keyboards have 102 keys. But that's not all they have in common. Every keyboard also has a low profile, gentle contour and typewriter touch.

And our keyboards have programmable function and editing keys so they can be custom-tailored to fit your application needs. The 3163 and 3164 models also have redefinable and recappable keys.

Superior ergonomic design isn't confined to the keyboard, however. All three displays tilt and swivel for maximum user satisfaction. And, of course, by making the display easy to read, we made it easier on the eyes. In addition to the 8 x 16 character matrix, we gave it an advanced non-glare etched screen, cursors, and character and field attributes like blink, reverse video, underscoring and dual intensity.

High standards. Competitive prices.

Quantity discounts are offered, too. And financing is available through the IBM Credit Corporation. Best of all, each terminal comes with the quality, service and support you'd expect from IBM.

Contact your IBM marketing representative, or call 1 800 IBM-2468, Ext. KC/90, for the IBM Authorized Distributor nearest you. And we'll present more evidence in the case for IBM's ASCII terminals.

It may be all you need to color your view.

*ADDS Viewpoint is a trademark of Applied Digital Data Systems, Inc.; Hazeltine 1500 is a trademark of Hazeltine Corp.; Lear Siegler ADM-3A/ADM-5 are trademarks of Lear Siegler, Inc.; TeleVideo 910/950 are trademarks of TeleVideo Systems, Inc.; DEC VT 52/VT 100 are trademarks of Digital Equipment Corporation.

NCC Preview

Signalman line of communications products.

■

Anixter Brothers, Inc.

BOOTH: B-3706

REPRESENTATIVES: William Moeller, Mike Armstrong and Frank Mitchell, product managers.

FEATURED PRODUCTS: Anixter will demonstrate its Cost Efficient Operation material management system and its voice and data transmission products and accessories.

■

Anvil Cases, Inc.

BOOTH: C-4142

REPRESENTATIVES: Sylvia Sepulveda, Rob Menary, Dan Hakala and Jim Patterson, district sales managers.

FEATURED PRODUCTS: Anvil will display its line of heavy-duty shipping and storage cases and containers for computer hardware, including cases and containers for military applications.

■

Applied Data Communications, Inc.

BOOTH: C-3352, C-3354

REPRESENTATIVES: Pat Kane, president; Ben Smith, duplication division manager; Bill Williamson, technical division manager.

FEATURED PRODUCTS: Applied Data will feature support products, including duplication systems for 5¼-in. diskettes and a system that burnishes and places diskettes in jackets.

■

Association for Computing Machinery

BOOTH: A-1312, A-1314, A-1316

REPRESENTATIVES: Lillian Israel, membership promotion manager; Diana Moore, membership and subscription processing supervisor.

FEATURED PRODUCTS: ACM will feature its journals (including its monthly *Communications of the ACM*), special interest group newsletters and current conference proceedings.

■

AT&T

BOOTH: A-1034

REPRESENTATIVES: Not available.

FEATURED PRODUCTS: AT&T will exhibit its full line of data processing and communications products, including Unix System V Release 3, Simultask, Starlan and the Unix PC.

■

BDT Products, Inc.

BOOTH: B-3406

REPRESENTATIVES: Lawrence S. Hebb Jr., president; Penelope Lantry, executive vice-president; Richard Given, vice-president of sales.

FEATURED PRODUCTS: BDT will exhibit its Laserfeeder and Multifeeder sheet feeders for use with laser printers, its Flipper extended-output collator and its line of sheet feeders for dot matrix and daisywheel printers.

■

Bell & Howell Co., COM Division

BOOTH: C-3967

REPRESENTATIVES: Gary Moskovitz, president; Richard Banks, marketing manager.

FEATURED PRODUCTS: Bell & Howell will exhibit its COM Print 6000, a compact, in-line computer output microfilm print and duplication system.

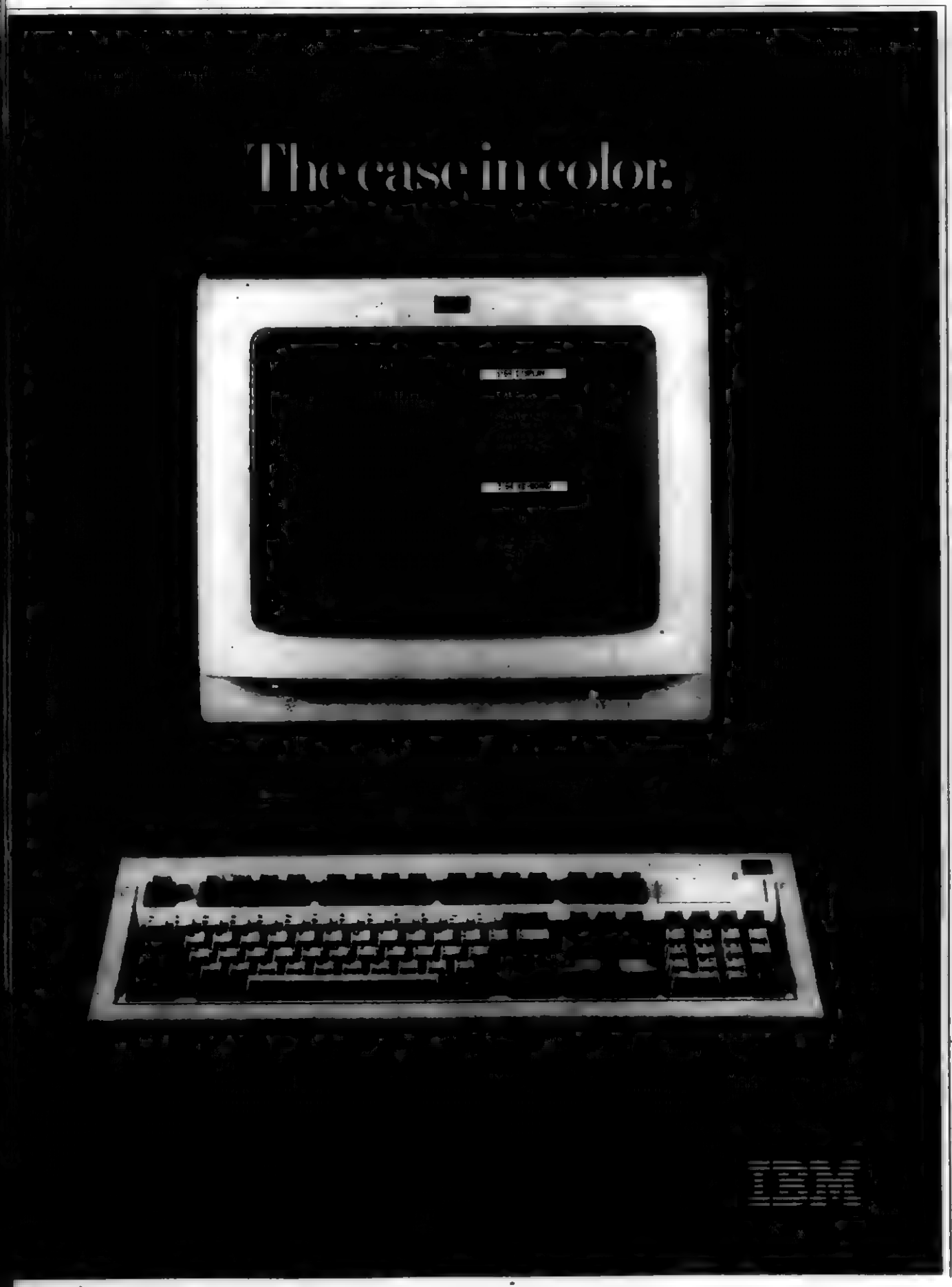
■

Bridge Communications, Inc.

BOOTH: C-3824

REPRESENTATIVES: William Carrico, president and chief executive officer; Judith Estrin, executive vice-president.

Continued on page 86



Announcing
Computerworld's
MICRO DIRECT SHOPPER
SEE PAGE 140

We just turned Honeywell, IBM and Wang into ONE.

Introducing Honeywell's Office Network Exchange.

Good news for companies with millions tied up in computers and communications.

Honeywell has just announced a new capability that will change the way your company looks at computers and communications.

The Office Network Exchange. ONE.

ONE is an information-sharing architecture, a unique combination of hardware and software products that now help to make information stored in your IBM, Wang and Honeywell Systems mutually accessible.

But ONE provides much more than just access. With ONE you not only transfer data, you can manipulate it as needed.

From a single workstation, ONE lets you integrate office processing, data processing, and communications, with decision support tools. Now departments can transfer, share, and combine information from dissimilar data bases. Without extra steps or costly duplications of effort.

ONE just made obsolescence obsolete.

By establishing communications among incompatible systems, the significant investment you've made in mainframes, minicomputers, communications systems—even personal computers—is protected, even enhanced. And future growth is simplified.

ONE helps managers manage more effectively.

Office Network Exchange helps managers manage by providing faster, more efficient access to multiple departmental data bases. With ONE, information can be shared from system to system, department to department. Throughout the company. Around the world.

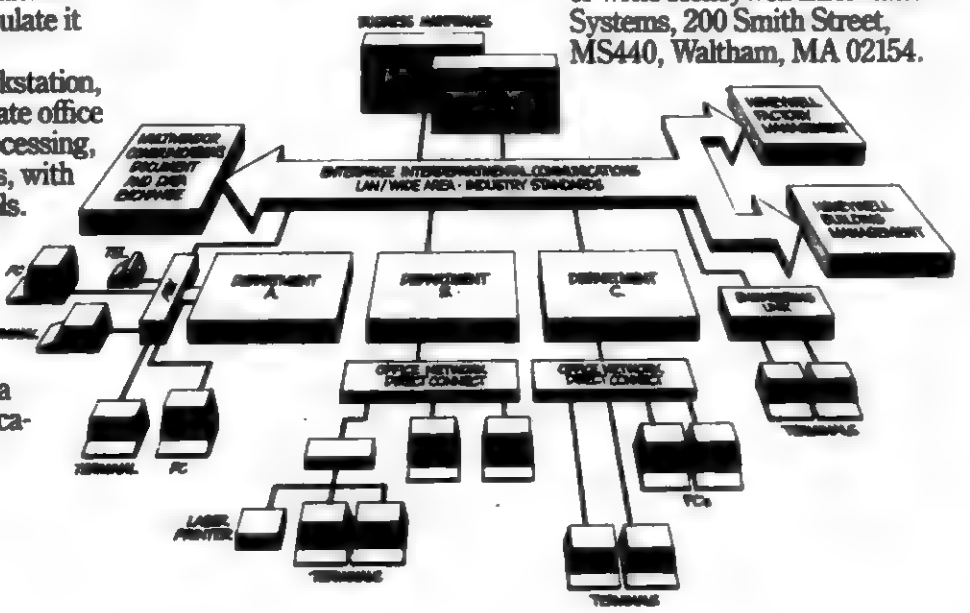
ONE is a major step toward total systems integration.

Right now, Office Network Exchange links a variety of systems from IBM, Wang, and Honeywell. Plus communications systems from AT&T.

Soon it will include other computer vendors such as Digital Equipment Corporation and Hewlett Packard.

So if you have computers from more than one computer company, Honeywell is the company that can help make them work together. And the company that will help integrate your computers, communications and controls into ONE.

To find out more information, call 1-800-328-5111, ext. 2783 or write Honeywell Information Systems, 200 Smith Street, MS440, Waltham, MA 02154.



Together, we can find the answers.

Honeywell

EXHIBITORS' BOOTHS

Continued from page 85

FEATURED PRODUCTS: Bridge will exhibit its CS/1-3270, a local-area network server; its Lanswitch/1 local-area network data switch; and its GS/300 internetwork gateway.

■

Britton-Lee, Inc.

BOOTH: B-3332

REPRESENTATIVES: David Britton, president; Peter Story, vice-president of marketing.

FEATURED PRODUCTS: Britton-Lee will announce an enhancement to its RS300 series relational data base systems.

■

Bull Peripherals Corp.

BOOTH: C-3508

REPRESENTATIVES: Farid Neema, president; Dean Merndenhall, director of sales.

FEATURED PRODUCTS: Bull will exhibit its MP6090, a magnetic page printer that prints 90 page/min.

■

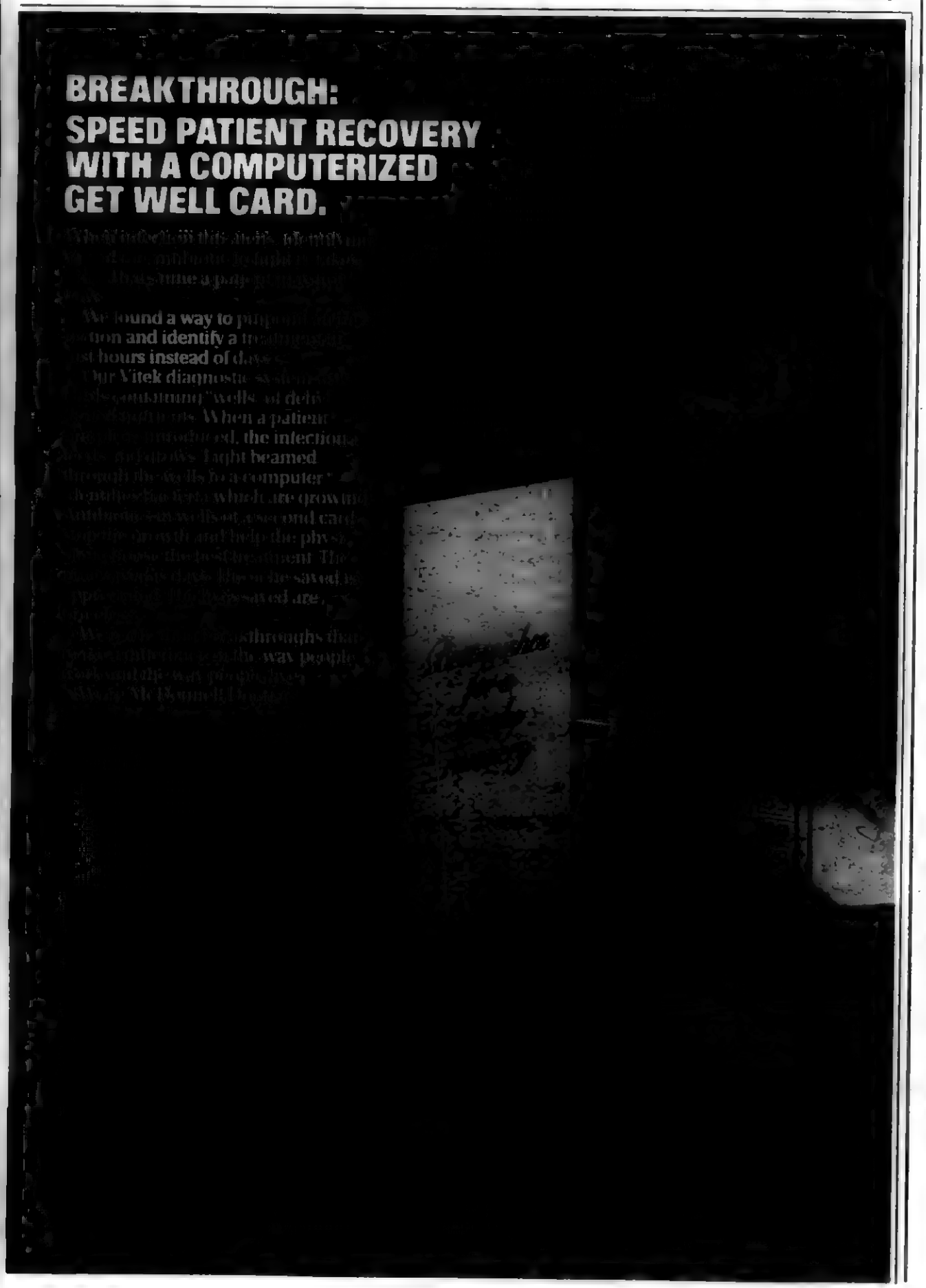
Cambar Business Systems, Inc.

BOOTH: B-3936, B-3938

REPRESENTATIVES: Roger Davis, president; Larry Register, western regional manager.

FEATURED PRODUCTS: Cambar will exhibit its Control customer order processing and inventory management software for wholesale distributors and manufacturers.

■



Canon U.S.A., Inc.

BOOTH: B-4006

REPRESENTATIVES: M. Tamai and M. Yoshikawa, general managers.

FEATURED PRODUCTS: Canon will introduce the A-200 II series of personal computers and will exhibit laser printers, disk drives and components and a bubble-jet printer.

■

Capitol Circuits Corp., Printer Products Division

BOOTH: B-3338

REPRESENTATIVES: Josh Zuckert, director of sales and marketing; Brian Starr, applications engineer.

FEATURED PRODUCTS: The Printer Products Division will exhibit its S-600 and S-610 slip printers, its Series 900 printer mechanism and a point-of-sale terminal.

■

CESN Publications, Inc.

BOOTH: C-3653

REPRESENTATIVES: Brook Taliaferro, editor; Harold H. Short Jr., vice-president of marketing.

FEATURED PRODUCTS: CESN will exhibit *Computer/Electronics Service News* and *Computer/Electronics Service Guide.*

■

Charles River Data Systems, Inc.

BOOTH: A-1120

REPRESENTATIVES: Richard Shapiro, president; Joseph D'Angelo, executive vice-president and chief operating officer; Daniel Capone, vice-president of sales and marketing.

FEATURED PRODUCTS: Charles River Data Systems will introduce a Motorola, Inc. 68020 option for its VME Universe family and a low-end addition to the family and will demonstrate all Universe models.

■

Continued on page 90

Introducing NonStop VLX.™

Tandem technology sets the new standard for large applications in on-line transaction processing.

More transactions per second at a lower cost per transaction than any system in the world.

THE CIRCUITRY'S FAST.

We designed the system in our own laboratory, right down to our own unique VLSI chips. The result is more circuitry in less space. With fewer components than our next largest system, the VLX delivers twice the performance and three times the reliability.

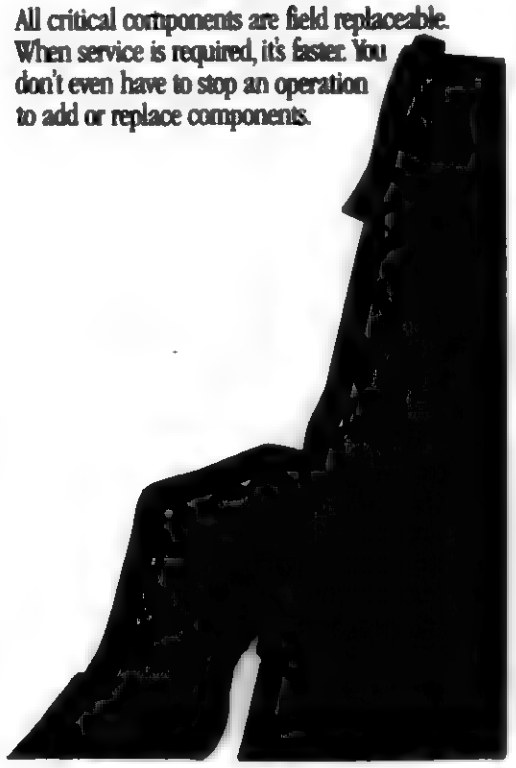


PROCESSORS WITH LARGE APPETITES.

The VLX processors move transactions in 32-bit chunks. They reach into main memory in 64-bit chunks. Because this happens in parallel, more work gets done in less time at a lower cost per transaction.

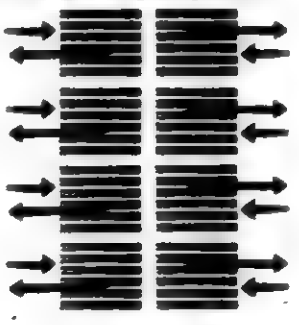
THE SERVICE IS EASY.

All critical components are field replaceable. When service is required, it's faster. You don't even have to stop an operation to add or replace components.



THE DATA EXPRESSWAY.

In a conventional database, I/O requests must be handled sequentially. This creates queues that slow response time. In the VLX system, there are multiple paths to multiple disks. Data enters and leaves the database simultaneously. No time is wasted, and all disk space gets used.

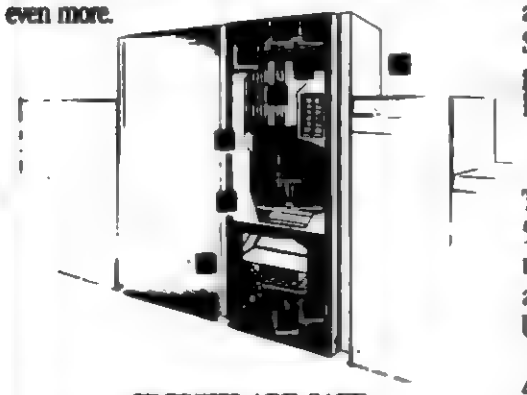


DIAGNOSTICS FROM A DISTANCE.

An integrated microprocessor allows us to monitor the system environment from anywhere in the world. We can even run stress tests remotely. If a failure does occur, the VLX has the capability to automatically dial out to remote centers anywhere in our worldwide network.

THE SYSTEM KNOWS THE SYMPTOMS.

Expert systems software, using fault analysis, directs the problem diagnosis systematically. It also allows us to analyze it and shorten service time even more.



SECRETS ARE SAFE.

We offer software that will protect the security of your data whether it's in the VLX, in another Tandem system or in transmission.

NO GROWING PAINS.

To add power, just add processors. You can grow from a base four-processor system to 16. From there, you can expand in whatever increments you choose, all the way to 255 systems. You never buy more than you need, and you'll never have to rewrite a line of applications code.



NO-FAULT INSURANCE.

Tandem systems achieve fault-tolerance with a unique, parallel processing architecture. There are no idle back-up components. Instead, multiple components share the workload. If one goes down, the others pick up the slack, and application processing is uninterrupted.

HERE TODAY. HERE TOMORROW.

The VLX is compatible with any Tandem system and with all major communications standards—SNA, X.25, MAP and O.S.I. And by acting as a gateway to other vendors' systems, the VLX can link them and enhance their value as well.

WE HAVE EXCELLENT REFERENCES.

Tandem systems are already at work for Fortune 500 companies in banking, telecommunications, manufacturing, transportation, retailing and energy, as well as several branches of the U.S. Government.

To find out what we can do for you, call 800-482-6336 or write to us. Corporate Headquarters: Tandem Computers, Incorporated, 19191 Vallco Parkway, Loc. 4-31, Cupertino, CA 95014

TANDEMCOMPUTERS

EXHIBITORS' BOOTHS

Continued from page 88

Cincom Systems, Inc.

BOOTH: C-3848

REPRESENTATIVES: Dick Kleinberg, regional sales manager for Western U.S., Mike Reagan, trade show director.

FEATURED PRODUCTS: Cincom will exhibit its Supra relational data base management system for IBM mainframes, its Ultra Interactive Data Base System for Digital Equipment Corp. VAX machines and its Mantis fourth-generation development system. The firm will also show its manufacturing, financial, network management and micro-mainframe link software.

■

Computer Science Press, Inc.

BOOTH: A-1114

REPRESENTATIVES: Elizabeth Mergner, assistant to the president and acquisitions editor.

FEATURED PRODUCTS: Computer Science Press will exhibit a variety of books, including *Local-Area and Multiple-Access Networks.*

■

Computer Technology Group

BOOTH: C-4133, C-4135

REPRESENTATIVES: John DeAno, president; Robert Hinchev, executive vice-president.

FEATURED PRODUCTS: Computer Technology will feature its instructor-led and video training courses.

■

Cullinet Software, Inc.

BOOTH: B-3926

REPRESENTATIVES: Vic Morris, senior international vice-president; Susan Zellmann-Rohrer, director of marketing.

FEATURED PRODUCTS: Cullinet will exhibit its IDMS/R relational data base management system and its manufacturing, financial, human resources, banking and information center software. The firm will also feature its Goldengate and Infogate microcomputer packages.

■

CW Communications, Inc.

BOOTH: A-1456

REPRESENTATIVES: Don Fagan, *Computerworld* publisher; Frank Cutitta, managing director of international marketing services.

FEATURED PRODUCTS: CWCI will exhibit four of its publications: *Computerworld, Computerworld Focus, Micro Marketworld* and *Network World.* The firm will also feature its international marketing services.

■

Cyber Digital, Inc.

BOOTH: C-3753, C-3755

REPRESENTATIVES: Jerry Iris, director of office automation sales.

FEATURED PRODUCTS: Cyber Digital will display its MSX networking switch and a line of products that offer data communications and integrated, simultaneous voice/data communications via standard phone cable.

■

Data Access Corp.

BOOTH: C-3344

REPRESENTATIVES: Charles Casanave, vice-president of marketing; Cory Casanave, vice-president of product development.

FEATURED PRODUCTS: Data Access will announce a version of its Dataflex application development product for Digital Equipment Corp. VAX MVS environments.

■

Data Clean Corp.

BOOTH: C-3410

REPRESENTATIVES: Phil Bertino, executive vice-president, Western region.

FEATURED PRODUCTS: Data Clean will feature its computer room cleaning, site preparation and disaster recovery services and products.

■

Data Exchange Corp.

BOOTH: C-4227

REPRESENTATIVES: Sheldon Malchicoff, president; John Rafter, executive vice-president; Dave Van Demoortel, vice-president of sales and marketing.

FEATURED PRODUCTS: Data Exchange will feature its system refurbishment services and its repair services for printed-circuit boards and electromechanical subassemblies.

■

Continued on page 92

Now playing on the Forte Network:



Forte PJ™ The soft-loaded 3278/79 emulator for PCs. A powerful core product with IBM® compatible file transfer support. You can add mainframe graphics, 3270PC and more features as you need them.



Forte 3270PC™ A smarter desk on a disk. The power of IBM's 3270 PC with a simple software upgrade of the Forte PJ. You can "hot key" between host and mainframe windows, and do up to four concurrent file transfers.



ForteNet™ CMS-TSO host software with menu-driven transfers of binary and text files in either direction. Considered one of the industry's fastest software packages.



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A major graphics series, rated APA. 3270PC enhancements. Twinax. LAN Gateways. All part of the Forte network. All attuned to IBM's office systems strategy. For full information, call toll-free.

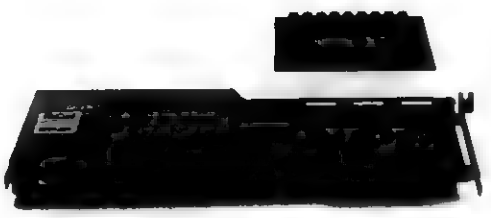
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EXHIBITORS' BOOTHS

Continued from page 90

Data Processing Management Association

BOOTH: A-1324, A-1326

REPRESENTATIVES: Janet L. Milakis, director of membership.

FEATURED PRODUCTS: The DPMA will exhibit membership promotion material and educational program information. It will also display its publications.

■

Datapro Research Corp.

BOOTH: A-1244

REPRESENTATIVES: Richard Burke, vice-president for sales; Bobbi Alpert, regional manager

FEATURED PRODUCTS: Datapro will offer attendees a free research report, "User Ratings of Local-Area Networks," and will exhibit its "Datapro Reports on Communications."

■

Digi-Data Corp.

BOOTH: C-3746, C-3748

REPRESENTATIVES: Jim Benfer, assistant to the president; Dave Holland, managing director.

FEATURED PRODUCTS: Digi-Data will exhibit its Series 2000 ½-in. streaming tape drives.

■

Digital Products, Inc.

BOOTH: A-1535

REPRESENTATIVES: Cornelius Peterson, president; Rich Kasinski, national sales manager.

FEATURED PRODUCTS: Digital Products will exhibit its Netcommander sub-local-area networks and its Printdirector printer sharing devices.

■

Distributed Logic Corp.

BOOTH: A-1847

REPRESENTATIVES: Dennis Edwards, vice-president for sales; Bill Waler, Western regional sales manager; George Kopach, Eastern regional sales manager.

FEATURED PRODUCTS: Dilog will display Digital Equipment Corp.-compatible disk, tape and communications controllers.

■

Distributed Processing Technology

BOOTH: B-4027, B-4028

REPRESENTATIVES: Steve Goldman, president; Steve Holler, director of marketing

FEATURED PRODUCTS: Distributed Processing will exhibit its PM3010 series caching disk controllers.

■

Dotronix, Inc.

BOOTH: C-3456

REPRESENTATIVES: Bill Sadler, president; Steve Sims, national accounts manager.

FEATURED PRODUCTS: Dotronix will exhibit 3-in. to 23-in. CRT displays, a liquid crystal shutter display, multimode and multifrequency monitors and high-resolution monitors.

■

Dranetz Technologies, Inc.

BOOTH: A-1104, A-1105

REPRESENTATIVES: David Fuhrman, vice-president and general manager for computer products.

FEATURED PRODUCTS: Dranetz will introduce the Dran-Scan I multipoint power line monitoring system, which combines an IBM Personal Computer, a Dranetz Series 710 data communications multiplexer, up to 64 power line disturbance remote monitor units and a software package.

■

Eastman Kodak Co.

BOOTH: C-3936

REPRESENTATIVES: Michael Maxwell, manager of computer-assisted retrieval products; James McKay, manager of computer imaging products.

FEATURED PRODUCTS: Kodak will exhibit products from its business imaging systems division, its copy products division, its mass memory division and its subsidiary, Verbatim Corp. Featured will be Kodak's recently announced PC KAR-1500, a computer-assisted retrieval system.

■

Edpac Corp.

BOOTH: A-1116, A-1214, A-1215, A-1216

REPRESENTATIVES: George Brown, president and chief executive officer; John Ambrose, chairman.

INTELLIGEN

It takes more than a PC to make a 3270 network work.

Telex understands the individual needs of managing information. That's why we've introduced the Intelligent System Series.™

The new Telex 1260/1280 Intelligent Workstations have been developed especially for 3270 users. Powerful, highly configurable workstations that adapt to your organization's personal needs. From high-end microcomputer performance to on-line host interaction, the Intelligent System Series is designed for flexibility, engineered for power.

The Telex 1260 is the low cost choice for users seeking IBM XT compatibility and AT performance. Telex's 1280 runs up to 30% faster than the AT and supports both AT hardware and software. Together the 1260/1280 offer a wide selection of memory, storage, peripheral and expansion options to provide for today's needs as well as tomorrow's growth. And they both support a choice of 3278 or AT style keyboards.

Telex is "the" single source for 3270 intelligence, performance and flexibility. From terminals and workstations to software and peripherals, Telex provides complete customer support. And we back every product with over 2000 Telex dedicated service and support people worldwide.

For more information, contact our Marketing Communications Department, 6422 East 41st Street, Tulsa, OK 74135. 1-800-331-2623 (In Oklahoma call 918-628-3113).



Telex 1260/1280 Intelligent Workstations

IBM AT and IBM XT are trademarks of International Business Machines.
Telex is a registered trademark of Telex Corporation.

FEATURED PRODUCTS: Edpac will exhibit its Tech 80 and Minitech 90 computer room air-conditioning systems.

■

Elsevier Science Publishing Co.

BOOTH: A-1658, A-1659

REPRESENTATIVES: Alan Comeretto, acquisitions editor; Ken Adams, marketing coordinator.

FEATURED PRODUCTS: Elsevier will exhibit *Cuadra/Elsevier: Directory of Online Databases, The Software Catalog* and other computer science books and journals.

■

Emergency Power Engineering, Inc.

BOOTH: C-3648

REPRESENTATIVES: Brad Little, director of marketing.

FEATURED PRODUCTS: Emergency Power will exhibit its entire line of electrical products.

■

Emulex Corp.

BOOTH: C-3770

REPRESENTATIVES: Bob Coupland, marketing and communications manager.

FEATURED PRODUCTS: Emulex will exhibit its IP7000 disk controller for Digital Equipment Corp. VAX users, its MD series of disk controllers and other storage products, including the UC14 host adapter and the ATS Kit, which provides the IBM Personal Computer AT with disk storage.

■

Epson America, Inc.

BOOTH: A-1144

REPRESENTATIVES: Peter Bergman and Dennis Cox, group product managers.

FEATURED PRODUCTS: Epson will exhibit a series of personal computers, portable computers, dot matrix printers and ink-jet printers. The firm will also show one plotter, the HI-80.

■

Equitable Life Leasing Corp.

BOOTH: B-3413

REPRESENTATIVES: Bill Taylor and Nelson Strickland, executive vice-presidents.

FEATURED PRODUCTS: Equitable will feature its operating leases and national vendor programs.

■

Exide Electronics

BOOTH: B-3331

REPRESENTATIVES: Connie Gentry, manager of marketing communications.

FEATURED PRODUCTS: Exide will introduce its Series 6000 line of uninterruptible power supplies.

■

Fenwal, Inc.

BOOTH: C-3801, C-3803, C-3805

REPRESENTATIVES: Marv Charney, regional manager; Bill MacDonald, sales engineer.

FEATURED PRODUCTS: Fenwal will introduce Vesda, a safety device that is designed to detect smoke and burning synthetic materials before conventional smoke detectors can. The detector is an air sampling-type detector with three sensivity levels.

■

Fike Fire Suppression Systems

BOOTH: C-4120, C-4122

REPRESENTATIVES: Bill Eckholm, division manager; Bob Gibbs, national sales manager.

FEATURED PRODUCTS: Fike will exhibit a line of fire suppression equipment.

■

Flexible Computer Corp.

BOOTH: B-3612

REPRESENTATIVES: Nicholas Matelan, president and chief executive officer.

FEATURED PRODUCTS: Flexible will exhibit its Series 3000 Flex/32 Multicomputer, a parallel computer with 40 computer modules. It will also show its Series 1200 Flex/32 Multicomputer, which will be linked to the Series 3000 via Ethernet, and its C2C, a real-time computer module based on Motorola, Inc.'s 68020.

■

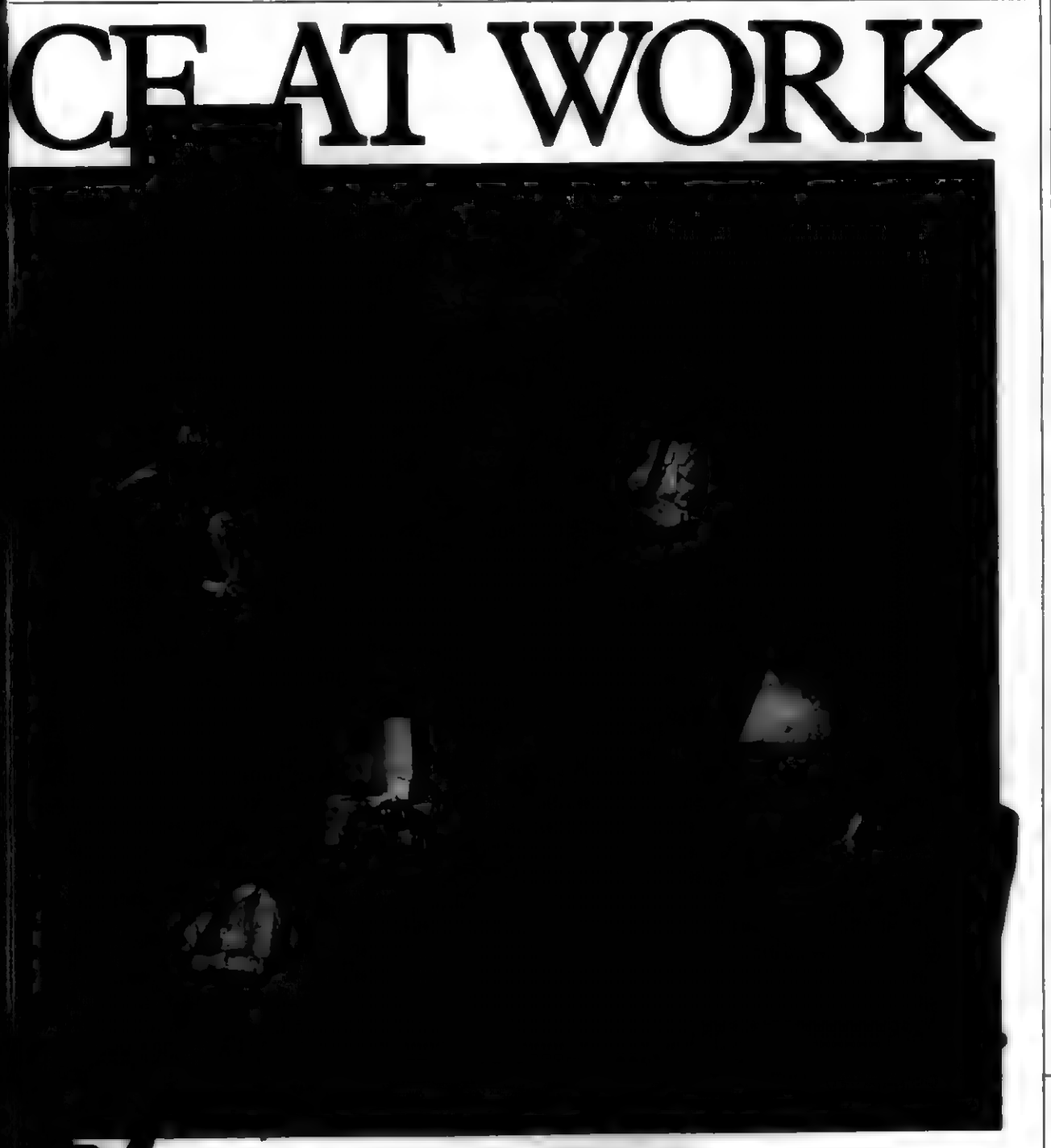
Fujitsu America, Inc.

BOOTH: C-3630

REPRESENTATIVES: Mitsuo Tada, executive vice-president; Donald Moffet, president.

FEATURED PRODUCTS: Fujitsu will exhibit printers, disk drives, computer systems and office automation equipment, including modems and facsimile machines.

Continued on next page



The #1
3270 Alternative
TELEX
TELEX COMPUTER PRODUCTS, INC.

Announcing
Computerworld's
MICRO DIRECT SHOPPER
SEE PAGE 139

EXHIBITORS' BOOTHS

Continued from previous page

Gemidex, SDS

BOOTH: B-3937

REPRESENTATIVES: W. B. Hoffman, president; Michael Jenkins, programming technician; Dianne Skidmore, technical support.

FEATURED PRODUCTS: Gemidex will exhibit its Gemidex PC data entry software with file transfer, which allows up to 35,000 keystroke/hour.

■

General Robotics Corp.

BOOTH: B-3326

REPRESENTATIVES: Carl Pick, chairman; Barbara Pick, executive vice-president.

FEATURED PRODUCTS: General Robotics will exhibit the Python/32B, a 32-bit supermicro that offers up to 16M bytes of memory and suports up to 64 users.

■

Gimix, Inc.

BOOTH: B-4235, B-4236

REPRESENTATIVES: Robert Phillips, president; Richard Don, vice-president.

FEATURED PRODUCTS: Gimix will exhibit Motorola, Inc. 68020-based, single-board computers and 68020 development systems.

■

Graham Magnetics, Inc.

BOOTH: A-1660, A-1661

REPRESENTATIVES: Herb Schantz, vice-president of marketing; Art Field, vice-president of sales; Ray Waver, product manager.

FEATURED PRODUCTS: Graham will exhibit the Epoch MTC tape cartridge, the Media Management Program Controller, the Inspector IV MDC tape evaluator, Ultimag and Epoch 480 magnetic tape.

■

Grid Systems Corp.

BOOTH: C-3636

REPRESENTATIVES: Sam Wiegand, president and chief executive officer; Alan Lefkof, vice-president of marketing, Bruce Walter, sales vice-president.

FEATURED PRODUCTS: Grid will exhibit its Gridcase line of laptops and its software products. The firm will also announce price reductions.

■

GTE Spacenet Corp.

BOOTH: C-3973

REPRESENTATIVES: Ivan Riley, vice-president of marketing; Michael Caffarel, director of industrial accounts marketing; Anthony Romano, director of field marketing.

FEATURED PRODUCTS: GTE Spacenet will introduce three satellite-based Skystar network data services: Skystar Multipoint, Skystar Point-to-Point and Skystar Interactive Network.

■

Hattori Corporation of America, Hattori Seiko Computer Peripherals Division

BOOTH: B-3325

REPRESENTATIVES: Marshall Shaw, general manager and national sales manager.

FEATURED PRODUCTS: Hattori Seiko will exhibit the MP-1300AI impact dot matrix printer, which features a speed of 300 char./sec.

■

Hitachi Ltd.

BOOTH: C-4012

REPRESENTATIVES: Kenzo Isomopo, senior advertising specialist.

FEATURED PRODUCTS: Hitachi will exhibit computer peripherals, disk drives, tape drives and an optical disk drive. It will also show color display, bubble memory and compact disk read-only memory products.

■

Honeywell, Inc.'s Information Systems division

BOOTH: C-3930

REPRESENTATIVES: Bill Wray, executive vice-president of Information Systems; Gene Manno, group vice-president; Dave Cleary, vice-president and general manager.

FEATURED PRODUCTS: Honeywell will introduce the DPS 6 Plus family of minicomputers and the Office Network Exchange information-sharing architecture.

■

Honeywell, Inc. Micro Switch division

BOOTH: C-3462

REPRESENTATIVES: Mark Tiddeens, marketing director for keyboards;

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For your FREE copy of our 16" x 20" MADE FOR EACH OTHER poster, please tear out this ad and send it to us along with your name and address. Mail to: Topaz, Inc. 9350 Topaz Way, San Diego, CA 92123-1164.

Duwayne Pople, product manager for keyboards.

FEATURED PRODUCTS: Micro Switch will exhibit IBM Personal Computer-compatible keyboards, Digital Equipment Corp.-compatible keyboards and solid-state sensors.

■

IBM

BOOTH: B-3738, B-3306

REPRESENTATIVES: Not available.

FEATURED PRODUCTS: IBM's exhibit will focus on nine broad topics: computer-integrated manufacturing; personal computers; departmental systems; advanced technology; telecommunications; printers; large systems; IBM alternate channels; and text, image and graphics.

■

IMSL, Inc.

BOOTH: B-3815, B-3817

REPRESENTATIVES: Chuck Johnson, chairman of the board; Bill Potratz, manager of promotions; Pete Palmer, sales manager.

FEATURED PRODUCTS: IMSL will exhibit its IMSL/Library, Sfun/Library, Math/PC-Library and Stat/PC-Library. It will also show a series of Protran problem-solving environments.

■

Information Processing, Inc.

BOOTH: A-1002

REPRESENTATIVES: Diane Weinzierl, account manager; Don Tyra, president.

FEATURED PRODUCTS: Information Processing will exhibit PC-Blis, a multiuser operating system and Cobol compiler for the IBM Personal Computer XT and AT and compatibles. The firm will also display Blis/Cobol, a multiuser operating system and Cobol compiler.

■

Informer Computer Terminals, Inc.

BOOTH: B-4206

REPRESENTATIVES: Lars Persson, president; Thomas Sadowski, vice-president of marketing and sales; Peter Weill, vice-president of international operations.

FEATURED PRODUCTS: Informer will introduce the Model 208, a portable color workstation; the Model 211, a module for micro-mainframe connection; the Model 281, a protocol converter; and the System 300, a twin-axial controller coupled with a portable workstation to emulate the IBM 5251.

■

Infotron Systems Corp.

BOOTH: A-1220

REPRESENTATIVES: Jim Hahn, president and chief executive officer; Bob Bauer, vice-president of marketing and development; Steve Stuart, vice-president of sales.

FEATURED PRODUCTS: Infotron will exhibit the Integrated Network Manager, which is designed to provide single-point control of both T1 backbone networks and Infotron's 990 access network.

Institute of Electrical and Electronics Engineers, Inc.

BOOTH: C-3246, C-3248, C-3250, C-3252

REPRESENTATIVES: Cathy Ferrere, marketing manager; Joan Izzo and Louise Esposito, marketing assistants.

FEATURED PRODUCTS: The IEEE will exhibit transactions from its 33 member societies and publications from the IEEE Press. It will also feature membership service information and an on-line data base system.

■

Interlink Computer Sciences, Inc.

BOOTH: C-3407

REPRESENTATIVES: Susan Chiliemi, marketing communications manager; James Pementel, press secretary; Stephen Bowden, Western regional sales manager.

FEATURED PRODUCTS: Interlink will exhibit the VM/Decnet gateway, the MVS/Decnet gateway and the 3711S gateway, a series of products that feature bidirectional file transfer, data translation and terminal emulation.

■

International Data Corp.

BOOTH: C-3952, C-3954, C-3956, C-3958

REPRESENTATIVES: Joseph Levy, senior vice-president; Peter Rowell, president; Nina Ricci, director of marketing.

FEATURED PRODUCTS: IDC's booth will feature its market analysis and consulting services for the information processing industry.

■

International Planning Information, Inc.

BOOTH: B-3417

REPRESENTATIVES: Murray Disman, president; Daniel Sik, vice-president.

FEATURED PRODUCTS: International Planning will exhibit market research and planning reports.

Continued on next page

LOCAL DATA
MAP TO
IBM CONNECTIVITY

It's Easy to Solve IBM Connectivity Problems With Local Data Protocol Converters

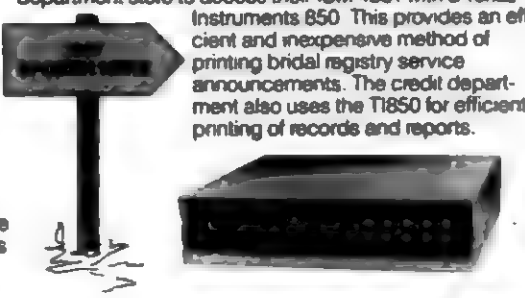


Get immediate host access from an async PC, CRT or printer with DataLynx/3274 or 5251. Use it instead of a cluster controller for economical, secure local and remote connectivity.

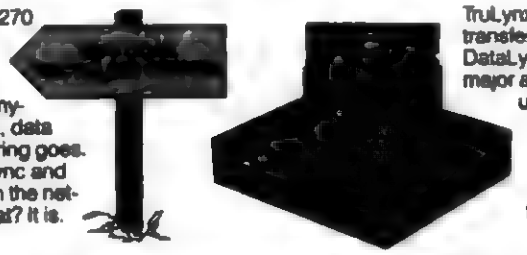
A Fresno (CA) hospital uses DataLynx to bring nine DEC VT-100 terminals on line with a BSC host 200 miles away at Blue Cross offices in Los Angeles.

The hospital transfers confidential patient and medicare data to Blue Cross using inexpensive async modems. Administrative productivity is increased through better patient account control and cash flow problems are solved with faster insurance compensation payments.

InterLynx/3287 attaches virtually any low cost ASCII printer anyplace you can plug in a 3287, allowing a major department store to access their IBM 4381 with a Texas Instruments 850. This provides an efficient and inexpensive method of printing bridal registry service announcements. The credit department also uses the TI850 for efficient printing of records and reports.



Convert your 3270 coax devices to RS-232 today. Then place your coax terminals anywhere your PABX, data switch or LAN wiring goes. Mix or match Async and Coax terminals in the network. Sound great? It is.



TruLynx PC software provides fast easy file transfer to IBM host programs through DataLynx Protocol Converters. In one major application company executives update financial planning databases from PC's at home and in the office. In another application source code for large mainframe application programs is transferred to and from PC's for demonstration, test and editing.

Local Data offers two excellent System 34, 36, 38 connectivity products. DataLynx/5251 provides exceptional dialup async access with X.25 and ETU file transfer support.

InterLynx/5251 connects to the host at the twinax port, eliminating the costly communications adapter. Users access the host by way of asynchronous modems or local RS-232C connections.

InterLynx/5251 moves data at 38.4Kb and supports print rates to 5200 cps. DataLynx/5251 recognizes up to 32 LUs, dual sync hosts and supports data at 19.2Kb and 9600 baud.

Customers of a restaurant supply house in Denver dial an IBM/36 host through a DataLynx/5251, check inventory levels, current pricing and perform their own order entry.

This is especially helpful to ski area concession operators who prepare large quantity orders during off hours, cutting delivery time to their mountain locations.

The supplier gives better sevice, maintains improved inventory and passes savings on to his customers. The customer has better inventory control, schedules deliveries to suit his needs, and maintains easy communications with his supplier.

Do business with a company that gives you outstanding service and support, a company with an installed base of more than 17,500 units worldwide.

Since 1977, Local Data has been a profitable manufacturer of quality products backed by a twelve month guarantee and an experienced technical support team.

Now! Convert any Async minicomputer or PC into a dependable remote job entry station with DataLynx/3780.

One customer in Hawaii using Prime and Microdata computers for account receivable and payroll data entry, accesses a payroll/service bureau IBM 4300 host with DataLynx/3780

LOCAL DATA

Get the full connectivity story. Call 213/320-7126. Canada 613/748-9751. UK (0753) 76537.

EXHIBITORS' BOOTHS

Continued from previous page

Jensen Tools, Inc.

BOOTH: A-1061

REPRESENTATIVES: Tom Fenzel, sales manager.

FEATURED PRODUCTS: Jensen will exhibit telecommunications, maintenance and repair kits.

■

Juki Office Machine Corp.

BOOTH: B-3317

REPRESENTATIVES: T. Hagiwara, printer division vice-president; Sal Sastito, national sales manager.

FEATURED PRODUCTS: Juki will exhibit daisywheel and dot matrix printers.

■

Kimtron Corp.

BOOTH: A-1750

REPRESENTATIVES: John Kim, president; Charles Kaplan, Eastern regional sales manager.

FEATURED PRODUCTS: Kimtron will show four data terminals, a local-area network and three workstations.

■

Leading Edge Products, Inc.

BOOTH: B-3620

REPRESENTATIVES: Not available.

FEATURED PRODUCTS: Leading Edge will exhibit a standard and fixed-disk version of its Model D personal computer and a selection of software.

■

Lear Siegler, Inc., Data Products division

BOOTH: C-3538

REPRESENTATIVES: Richard Knoblock, president; Jim Weeks, marketing product specialist.

FEATURED PRODUCTS: Lear Siegler will introduce alphanumeric and color graphics VDTs.

■

Lee Data Corp.

BOOTH: C-4016, C-4018

REPRESENTATIVES: Not available

FEATURED PRODUCTS: Lee Data will exhibit network and local processing products for IBM 3270 and Personal Computer environments.

■

Litton Computer Services

BOOTH: C-3550

REPRESENTATIVES: Les Fondiler, vice-president and general manager; Robert Huston, vice-president.

FEATURED PRODUCTS: Litton will feature the Litton Data Network, the Litton Image Design Center and a range of remote computing services.

■

M/A-Com Cable Home Communications

BOOTH: C-3401, C-3403

REPRESENTATIVES: Joe Teague, vice-president for sales and marketing; Nita Hunsucker, customer service manager.

FEATURED PRODUCTS: M/A-Com will exhibit electronic wire and cable for computers, local-area networks and data communications.

■

McGraw-Hill Information Systems Co.

BOOTH: B-3418

REPRESENTATIVES: Gary Beach, advertising sales manager; George Werner, publisher.

FEATURED PRODUCTS: McGraw-Hill will exhibit its *Data Communications* magazine, buyers' guide and buyers' cards.

■

Megadata Corp./TSD Display Products

BOOTH: A-1121

REPRESENTATIVES: Ari Bachana, president; Dick Adams, Steve Sloan, director of sales for TSD.

FEATURED PRODUCTS: Megadata will exhibit its Models 7, 6 and 4 Unix processors, its 8188 family of intelligent terminals, a series of touch-screen digitizers and an intelligent multiplexer.

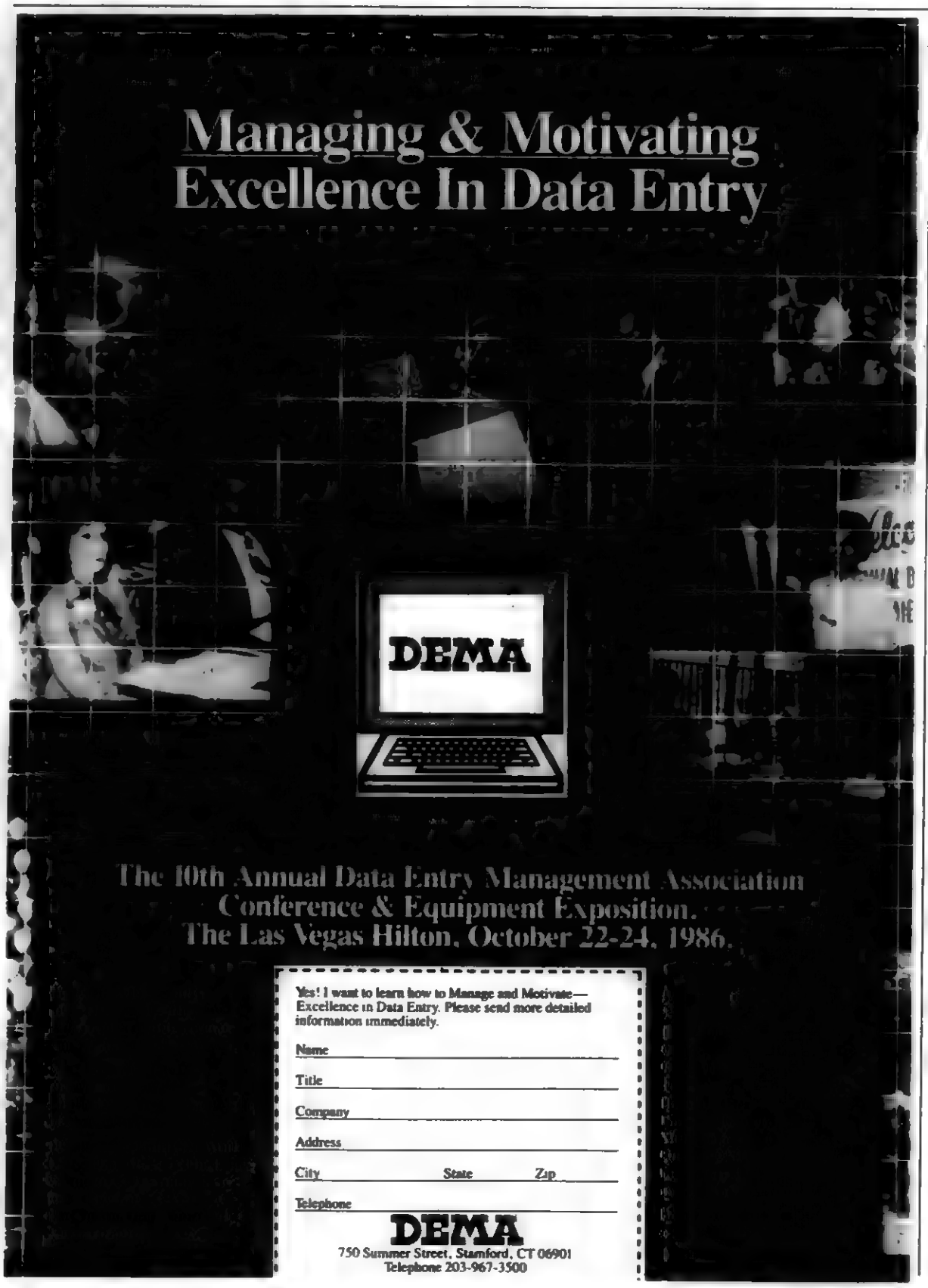
■

Memorex Media Products Group, Industrial Products Division

BOOTH: A-1153

REPRESENTATIVES: Mark Klein, vice-president of sales and marketing; Tom Roberts, national sales manager.

FEATURED PRODUCTS: Memorex will exhibit the Memorex 34809 Tough-shell Cartridge and accessories.



NCC Preview

Microlytics, Inc.

BOOTH: A-1207

REPRESENTATIVES: Michael Weiner, president.

FEATURED PRODUCTS: Microlytics will demonstrate its Word Finder electronic thesaurus software and Type Right, a real-time spelling checker.

■

Micron Industries Corp.

BOOTH: C-4131

REPRESENTATIVES: Frank Bussa, product manager; Donald Wehrenberg, vice-president of marketing.

FEATURED PRODUCTS: Micron will exhibit its power conditioners.

■

Micro Technology, Inc.

BOOTH: A-1112, A-1113

REPRESENTATIVES: Dan Sullivan, vice-president for marketing and sales; Richard Hicksted, president.

FEATURED PRODUCTS: Micro Technology will display Q-bus-compatible disk, floppy and tape controllers for Digital Equipment Corp. machines.

■

The MIT Press

BOOTH: C-3314

REPRESENTATIVES: Frank Satlow, executive editor; Cathy Maretz, sales representative.

FEATURED PRODUCTS: The MIT Press will display professional, technical and trade books and journals.

■

Modern Office Technology

BOOTH: A-1213

REPRESENTATIVES: Daryl James, West Coast district manager; Lura K. Romei, editor.

FEATURED PRODUCTS: Copies of various issues of *Modern Office Technology* magazine will be available.

■

Modular Power Corp.

BOOTH: B-3316, B-3318

REPRESENTATIVES: John Waterman, president; David Hoffman, vice-president of development; Tony Matouk, vice-president of manufacturing.

FEATURED PRODUCTS: Modular Power will introduce Upstar, an uninterruptible power system.

■

Motorola Semiconductor Products, Inc.

BOOTH: A-1256

REPRESENTATIVES: Craig Skeppstrom, Al Mouton and Rich Potyka, marketing managers.

FEATURED PRODUCTS: Motorola Semiconductor will exhibit its telecommunications and linear products and its display and terminal systems.

■

Multi-Tech Systems, Inc.

BOOTH: B-3337

REPRESENTATIVES: Thomas Helmerman, marketing director; Pete Hanlon and Jan Hubbard, managers for national accounts.

FEATURED PRODUCTS: Multi-Tech Systems will display its line of modems and its Multimux statistical multiplexers.

■

National Semiconductor Corp.

BOOTH: A-1534

REPRESENTATIVES: Jim Lucas, marketing communications manager.

FEATURED PRODUCTS: National Semi will exhibit its Series 32000 32-bit microprocessor family and associated software and will introduce Unix System V, Release 3.0 software.

■

NEC Information Systems, Inc.

BOOTH: B-3916

REPRESENTATIVES: Frank Girard, vice-president of systems sales and marketing.

FEATURED PRODUCTS: NEC will introduce a Unix-based minicomputer that supports up to 32 workstations and will also demonstrate its Pinwriter dot matrix printers and Spinwriter letter-quality printers.

■

Nestar Systems, Inc.

BOOTH: A-1008

REPRESENTATIVES: Charles Hart, president; Harry Saal, vice-president of research and development.

FEATURED PRODUCTS: Nestar will exhibit its Plan local-area network line, which includes the Plan 2000 file and print server; the Plan 5000 file server and the Plan 3000B net.

■

Network Systems Corp.

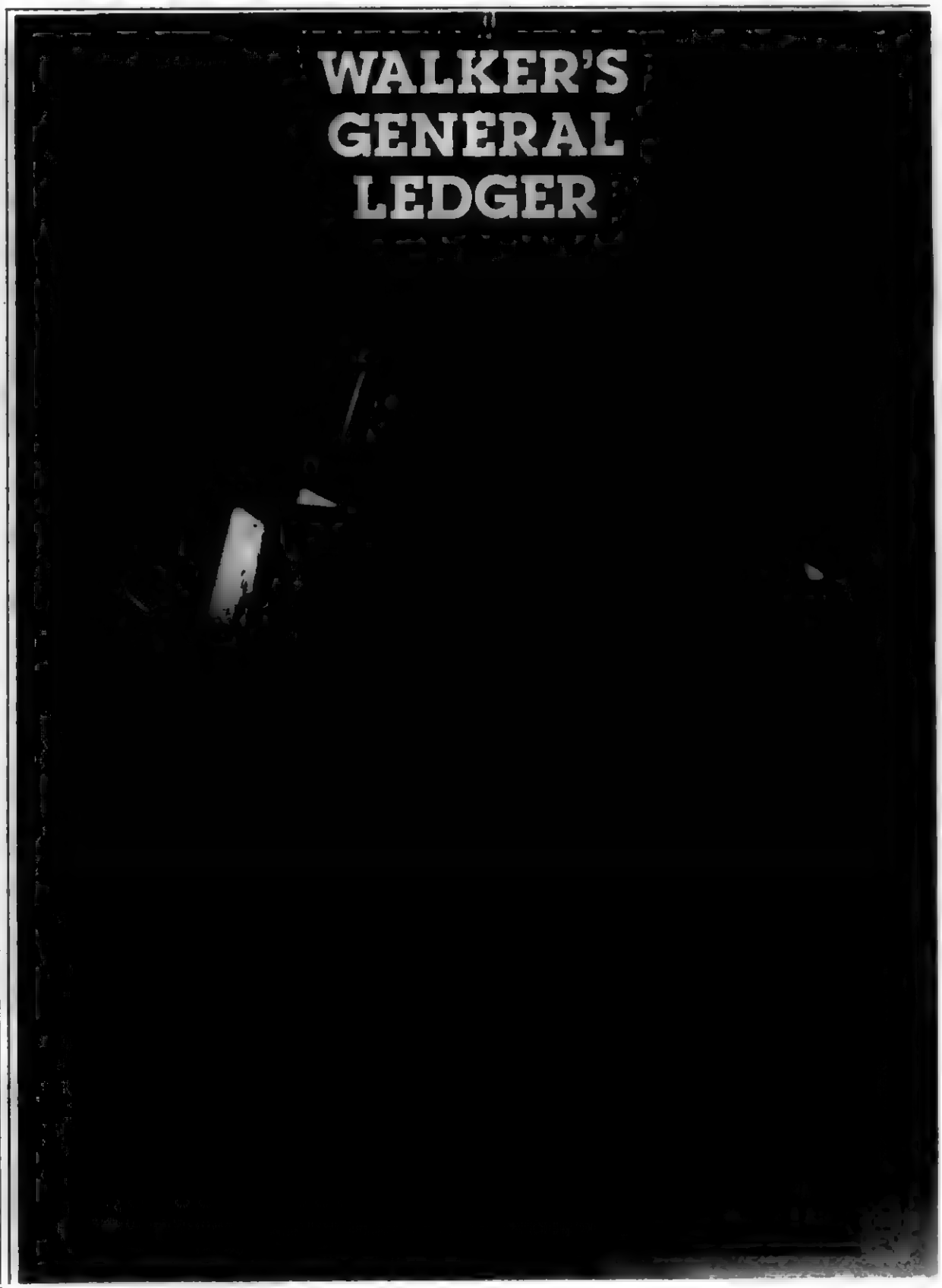
BOOTH: A-1652

REPRESENTATIVES: Robert Burns, vice-president of planning; Mahlon Moore, vice-president of marketing.

FEATURED PRODUCTS: Network Systems will exhibit its Hyperchannel A and Hyperchannel B local-area network products and its Hyperbus terminal network.

■

Continued on next page



EXHIBITORS' BOOTHS

Continued from previous page

Nichimen America, Inc.

BOOTH: C-3376

REPRESENTATIVES: K. Obata, manager of electronics.

FEATURED PRODUCTS: Nichimen America will exhibit its switching power supplies and a cross-flow fan.

■

Nixdorf Computer Corp.

BOOTH: A-1234

REPRESENTATIVES: Michael Anderson, president; James Addlesberger, vice-president of sales and marketing.

FEATURED PRODUCTS: Nixdorf will introduce two general business systems: the 8870 Model 75 and 8870 Model 25. It will also announce a micro color terminal: the 8810/35.

■

Nortronics Co.

BOOTH: A-1006

REPRESENTATIVES: Mike Drees, director of engineering; Tom Pozinski, product sales manager.

FEATURED PRODUCTS: Nortronics will exhibit magnetic tape heads and magnetic card heads.

■

Office Automation Systems, Inc.

BOOTH: C-4060

REPRESENTATIVES: Jan Kirk, president; Robert Freeman, cofounder; John Whalen, senior vice-president of sales.

FEATURED PRODUCTS: Office Automation will display its Laserpro line of laser printers and a forms generation package, among other products.

■

Optotech, Inc.

BOOTH: C-3972

REPRESENTATIVES: Phil Shires, president; Nelson Yew, chairman of the board; Di Chen, executive vice-president and chief technical officer; .

FEATURED PRODUCTS: Optotech will exhibit its Model 5984 optical disk drive and its line of controller cards for the IBM Personal Computer, Personal Computer XT, AT and compatibles.

■

Oracle Corp.

BOOTH: C-3915

REPRESENTATIVES: Gary Gibson, corporate vice-president; Tom Siebel, director of strategic accounts.

FEATURED PRODUCTS: Oracle will announce Version V of its Oracle relational data base management system and productivity tools.

■

Panasonic Industrial Co., Computer Products Division

BOOTH: B-3538

REPRESENTATIVES: Frank Yaman-aka, general manager; Dick Walker, assistant general manager.

FEATURED PRODUCTS: Panasonic's Computer Products Division will exhibit its full product line, including its Business Partner personal computers, monitors and printers.

■

Para Systems, Inc.

BOOTH: A-1434

REPRESENTATIVES: Jim Keffer, president; Bruce Brown and Les Robertson, sales managers.

FEATURED PRODUCTS: Para will exhibit its Minuteman uninterruptible power supplies for minicomputers and micros.

■

Peed Publishing, Inc.

BOOTH: A-1820

REPRESENTATIVES: Kimberly Mitchell-Kriz, sales representative.

FEATURED PRODUCTS: Peed will exhibit *The Processor*, a publication for dealers, brokers and end users.

■

Philips Peripherals, Inc.

BOOTH: C-3616

REPRESENTATIVES: Theo Loevenich, general manager.

FEATURED PRODUCTS: Philips Peripherals will exhibit the GP 480L, a dot matrix printer.

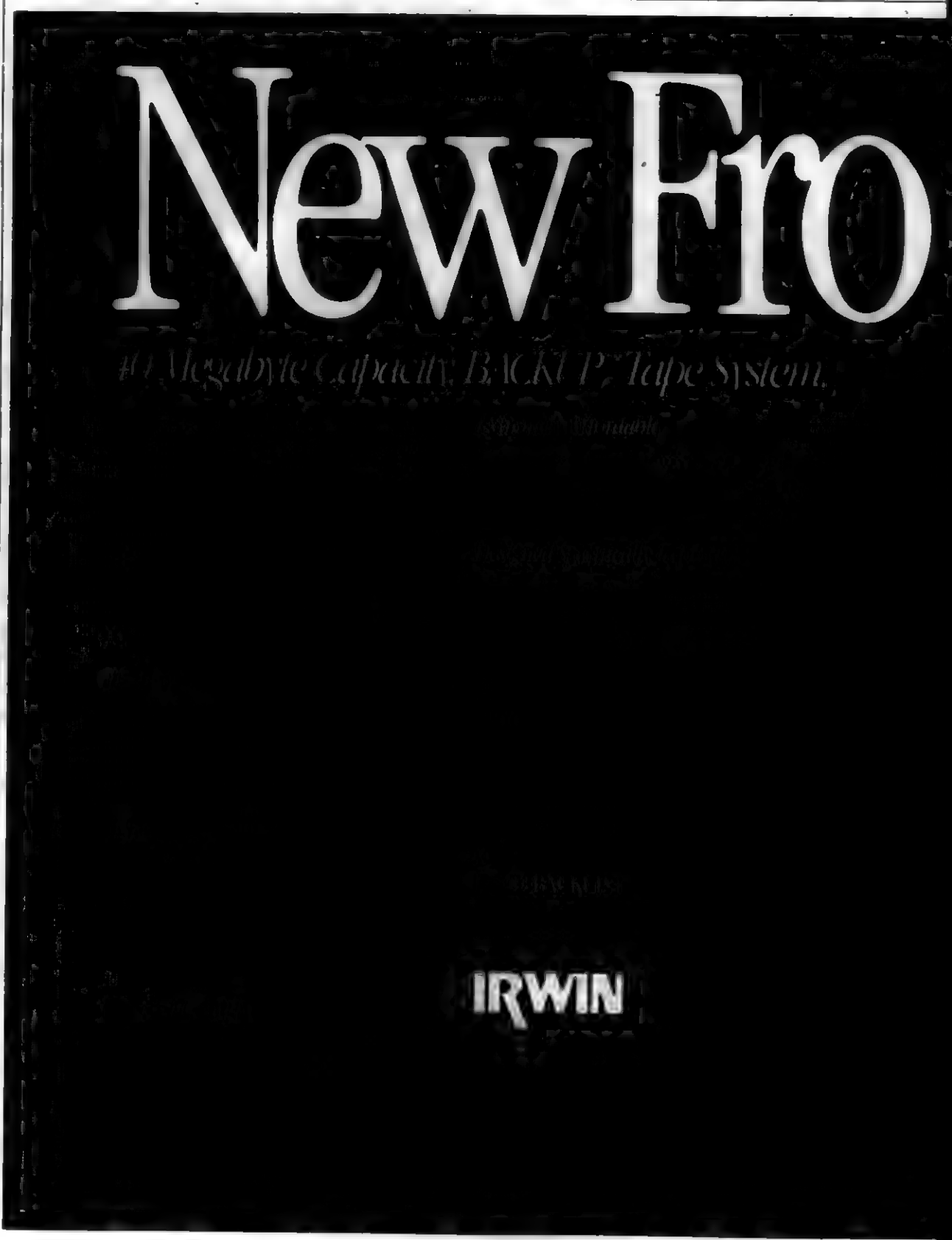
■

Philips Subsystems & Peripherals, Inc.

BOOTH: C-3616

REPRESENTATIVES: Robert Moes, director of marketing; Robert Van Eijk, marketing manager.

FEATURED PRODUCTS: Philips Subsystems & Peripherals will demon-



NCC Preview

strate compact disk read-only memory devices.

■

Pictel Corp.

BOOTH: A-1421

REPRESENTATIVES: Brian Hinman, cofounder and technical vice-president; Randall Smith, vice-president of marketing and sales.

FEATURED PRODUCTS: Pictel will demonstrate the Pictel videophone system, which operates over dial-up lines and lets callers talk face-to-face.

■

Plesman Publications

BOOTH: C-3554

REPRESENTATIVES: Gord Campbell, editor; Jim Rostron and James Markis, sales representatives.

FEATURED PRODUCTS: Plesman will exhibit *Computing Canada*, a publication for the data processing industry.

■

Printronix, Inc.

BOOTH: A-1054

REPRESENTATIVES: Jack Andersen, senior vice-president for domestic marketing; Joe Maroida, vice-president for OEM sales; Ken Mathews, vice-president for district sales.

FEATURED PRODUCTS: Printronix will introduce laser printers and matrix line printers. It will also show its line of band printers.

■

QMS, Inc.

BOOTH: C-3870

REPRESENTATIVES: Tom Tanko and Kim Marshall, product managers; Paul Reeves, national dealer sales manager.

FEATURED PRODUCTS: QMS will exhibit its Kiss, Smartwriter, PS, Lasergrafix, Concept and Laser Connection series of laser printers.

■

Quadratron Systems, Inc.

BOOTH: C-3904

REPRESENTATIVES: Karl Klessig, chairman; John Theiss, president.

FEATURED PRODUCTS: Quadratron will display versions of its Q-Office+ software in French, German, Spanish and Italian. The firm will also display a bit-mapped version of its Q-One word processing software.

■

Relational Technology, Inc.

BOOTH: B-3950

REPRESENTATIVES: Peter Tierney, vice-president of marketing.

FEATURED PRODUCTS: Relational Technology will exhibit its Ingres relational data base management system, Ingres/PC Link micro-mainframe connection and Vigraph visual graphics editor.

■

Research, Inc., Teleray Division

BOOTH: A-1655, A-1656, A-1657

REPRESENTATIVES: Ed Abramson, president of Research, Inc.; Tuck Renshaw, Teleray Division vice-president; John Beland, engineering manager; Steve Schaefgen, sales manager.

FEATURED PRODUCTS: Teleray will exhibit a line of ANSI-standard, multiprotocol terminals that communicate, in menu-selectable operating modes, with two or more host computers.

■

Ricoh Corp.

BOOTH: B-4238

REPRESENTATIVES: Yukihiro Wada, president of Ricoh Systems, Inc.; Peter Mork, vice-president of Ricoh Corp..

FEATURED PRODUCTS: Ricoh will exhibit the LP4080R, a table-top, 8 page/min laser printer, and the RP3400Q, a compact serial impact printer.

■

Continued on next page

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EXHIBITORS' BOOTHS

Continued from previous page

SAB Nife, Inc.

BOOTH: C-3559, C-3561

REPRESENTATIVES: Alan Feo, national sales manager for Nifepower; Mike Groh, vice-president of Nife Powertronics; Des Faria, technical director.

FEATURED PRODUCTS: SAB Nife will exhibit its Nifepower 800 uninterruptible power supply and other power products.

■

Sampo Corporation of America

BOOTH: C-3659, C-3661, C-3663

REPRESENTATIVES: Jung Ko, executive vice-president; George Korzeniewski, vice-president.

FEATURED PRODUCTS: Sampo will display a variety of display monitors, CRT terminals, liquid crystal shutter display monitors and thermal transfer printers.

■

Science Applications International Corp.

BOOTH: B-4036

REPRESENTATIVES: Randy Dockter, nuclear instrumentation division computer systems manager

FEATURED PRODUCTS: Science Applications will exhibit Dapper, a command-driven data manipulation analysis and plotting program for the IBM Personal Computer and compatibles.

■

Second Source Computers, Inc.

BOOTH: C-4054

REPRESENTATIVES: Frank Jacobson, president; Dean Gaston, director of customer service

FEATURED PRODUCTS: SSCI will exhibit its SSCI-800 minicomputer and will announce the SSCI-3200, which supports up to 16M bytes of error-checking and correcting memory.

■

Seikosha Co., U.S.A. Office

BOOTH: B-3325

REPRESENTATIVES: Tad Terao, general manager; Phillip Strong, manager of national OEM sales coordination.

FEATURED PRODUCTS: Seikosha will exhibit the MP-1300, a dot matrix printer that features a snap-in color printing kit.

■

The Society for Computer Simulation

BOOTH: A-1334

REPRESENTATIVES: Charles Pratt, executive director.

FEATURED PRODUCTS: The society will exhibit recently published books on artificial intelligence.

■

Society for Information Display

BOOTH: A-1724

REPRESENTATIVES: Larry Tannas, treasurer; Bettye Burdett, national office manager.

FEATURED PRODUCTS: SID will exhibit copies of technical papers and digests.

■

Solidstate Controls, Inc.

BOOTH: C-3305

REPRESENTATIVES: Richard F. Cassidy, president; Norman O'Leary, Darwin Delans and Richard Holden, sales managers.

FEATURED PRODUCTS: Solidstate will exhibit its Powerbase 1000, Powerbase 4000, Powerbase 5000, Silencer and Powerguard products.

■

Sorbus, Inc.

BOOTH: C-4236

REPRESENTATIVES: John Valentino, senior vice-president for development and support

FEATURED PRODUCTS: Sorbus will feature its computer maintenance services for IBM mainframes, MAI/Basic Four Information Systems, Inc. minicomputers and IBM Personal Computers.

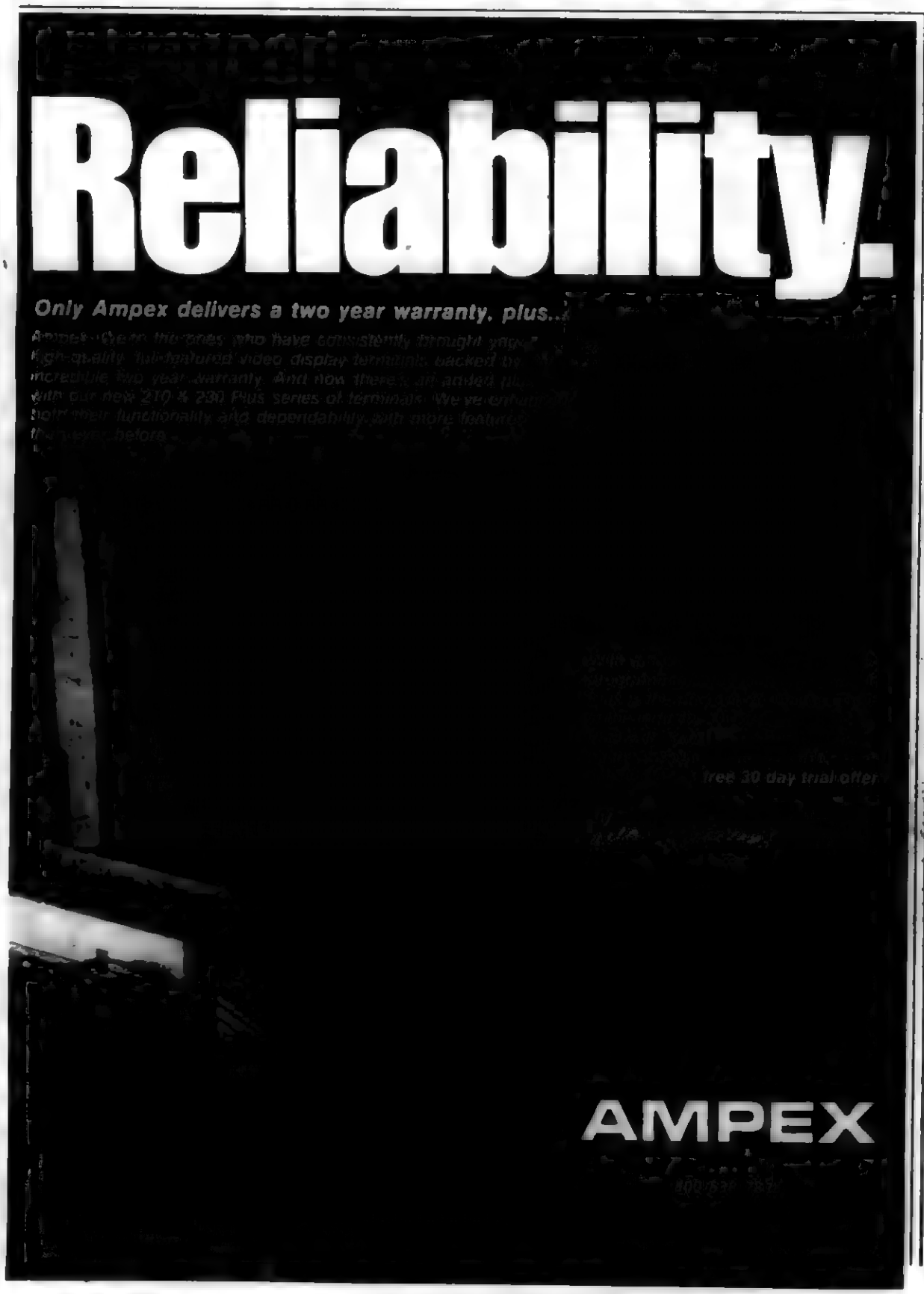
■

Sord Computer of America, Inc.

BOOTH: B-4035, B-4039

REPRESENTATIVES: Takayoshi Shiina, president; Hitoshi Kubota, marketing vice-president.

FEATURED PRODUCTS: Sord will exhibit the M68OUX, a VME System V machine; the M68MX, a Motorola, Inc. 68000-based desktop unit; and the IS-11C, a laptop portable with Digital Equipment Corp. VT100 emulation.



NCC Preview

Sperry Corp.

BOOTH: B-3520

REPRESENTATIVES: Frank Della, Mapper marketing director.

FEATURED PRODUCTS: Sperry will demonstrate its Mapper fourth-generation software systems, which target vertical applications areas.

■

Storage Technology Corp.

BOOTH: C-3608

REPRESENTATIVES: Steve Jerritts, president and chief operating officer; Frank Gunn, division vice-president of OEM operations.

FEATURED PRODUCTS: STC will exhibit its 2925 tape accelerator, 5000 series impact printer, 6100 printer, 8380E disk and 4670 tape system.

■

Switchcraft, Inc.

BOOTH: C-3763, C-3765

REPRESENTATIVES: Ron Schultz, manager of marketing development; Jim Cerwin, manager of data communications.

FEATURED PRODUCTS: Switchcraft will exhibit a variety of interconnect cable assemblies and other power accessories.

Symbolics, Inc.

BOOTH: C-4003, C-4005, C-4007

REPRESENTATIVES: Ralph Seibert, software specialist; Gary Bolan and Tom Wagen, regional sales managers.

FEATURED PRODUCTS: Symbolics will exhibit its 3600 series computers. The firm will also exhibit its Symbolics color software.

■

Syquest Technology

BOOTH: C-3816

REPRESENTATIVES: Syed Iftikar, president; Anil Nigam, vice-president of engineering.

FEATURED PRODUCTS: Syquest will exhibit its SQ551, a 5¼-in., half-height intelligent disk drive for IBM Personal Computers and compatibles. The firm will also show its SQ1500 family of hard-disk subsystems.

■

Sytek, Inc.

BOOTH: A-1156

REPRESENTATIVES: Stuart McFaul, public relations manager; Nancy Locke, manager of marketing communications.

FEATURED PRODUCTS: Sytek will exhibit three local-area networks: the System 2000, the System 6000 and the System 3000/7000.

Tab Books, Inc.

BOOTH: B-4029

REPRESENTATIVES: Larry S. Hager, vice-president; Ron Powers, acquisitions editor.

FEATURED PRODUCTS: Tab Books will exhibit a variety of trade and professional reference books.

■

Tei Electronics, Inc.

BOOTH: C-3809, C-3811

REPRESENTATIVES: John Gunter, president; David Gray, Mountain Region vice-president.

FEATURED PRODUCTS: Tei Electronics will exhibit its telephone call accounting and management systems.

■

Teledyne Big Beam

BOOTH: C-3408

REPRESENTATIVES: William Beam, president; Nick Shah, director of marketing.

FEATURED PRODUCTS: Teledyne will exhibit power-conditioning equipment and other power accessories.

■

3M Corp.

BOOTH: B-4226

REPRESENTATIVES: Frank Price, sales manager; Claudia Belisle, convention coordinator.

FEATURED PRODUCTS: 3M will exhibit a variety of magnetic media and optical recording products.

■

Toshiba America, Inc., Information Systems Division

BOOTH: A-1555

REPRESENTATIVES: John Rehfeld, vice-president and general manager; Phil Vertin, vice-president of national sales.

FEATURED PRODUCTS: The firm will exhibit its T3100 portable personal computer and an enhanced version of its T1100 portable. The firm will also display its 3-in-One dot matrix printers and its floppy disk drives.

■

U.S. Committee for the 10th World Computer Congress: International Federation for Information Processing

BOOTH: A-1521

REPRESENTATIVES: Robert Spieker, chairman of the U.S. Committee for IFIP; K. Ando, worldwide president.

FEATURED PRODUCTS: The committee will distribute copies of the final program for IFIP '86, which is being held Sept. 1-5 in Dublin.

Continued on next page

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		Specialty Furnishings	$ 500 00	$ 851 00	170.20
		Upholstered Office Furn	$1000 00	$ 982.20	98.22
2 Merge data from up to 10 files	TOTAL	FOR PATRICIA JACKSON	$2300.00	$3483.74	149.29
	85	JOHN BRIGHT			
		Specialty Furnishings	$ 500 00	$1251 00	250 20
		Georgian Home Line	$1500 00	$2532 20	169 01
		Executive Furnishings	$ 800.00	$1216.35	152.04
3 Can run as summary or detail report at same time.		Upholstered Office Furn	$1000.00	$ 916.25	91.62
		Colonial Home Line	$1500.00	$ 0.00	0.00
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EXHIBITORS' BOOTHS

Continued from previous page

Venturcom, Inc.

BOOTH: C-3830

REPRESENTATIVES: Myron Zimmerman, president; James Graham, vice-president and director of marketing; Meryl Charnow, director of sales.

FEATURED PRODUCTS: Venturcom will exhibit its Prelude information management system. The firm will also feature its Venix System V Version 2 operating system.

■

Videx, Inc.

BOOTH: C-3447, C-3449

REPRESENTATIVES: Paul Davis, president; Jack Trowbridge, research and development manager; Jim Dawson, software development manager.

FEATURED PRODUCTS: Videx will exhibit Timewand, a credit card-size, programmable bar code reader; Smart Recharger, a programmable communications device for translating protocols; and Mailcenter, communications software for Apple Computer, Inc.'s Appletalk network.

■

Visual Technology, Inc.

BOOTH: A-1107

REPRESENTATIVES: Clifford Zimmer, president; John Bruni, vice-president of marketing; Frank Wesolowski, vice-president of sales.

FEATURED PRODUCTS: Visual Technology will exhibit the Visual 220, 230, 240, 241 and 1000, a series of video display terminals.

■

Votan Co.

BOOTH: C-4218

REPRESENTATIVES: James Rogaus, president; Robert Russo, vice-president of sales and marketing; Jim Cook, director of product marketing.

FEATURED PRODUCTS: Votan will announce the Votan voice mail system. The firm will also exhibit the Votan Voice Card, an IBM Personal Computer plug-in card; the VTR 6060, an RS-232 voice terminal; and the VTR 3270, a 3270 voice terminal.

■

Xepix, Inc.

BOOTH: C-3637

REPRESENTATIVES: Edward Neylan, president; Ernie Rioux, vice-president of marketing and sales; Ray Ahern, national accounts manager.

FEATURED PRODUCTS: Xepix will introduce the Gator S and the Gator L, two 32-bit Motorola, Inc. 68020-based supermicros that support high-resolution, bit-mapped graphics. It will also show other members of its Gator line.

■

Xylogics, Inc.

BOOTH: C-3837, C-3839

REPRESENTATIVES: Bruce Bergman, president; Kindra Alaimo, manager of sales and marketing support; Kevin Gonor, vice-president of sales.

FEATURED PRODUCTS: Xylogics will feature its recently announced Xylogics 712, a disk controller for VME-bus-based systems.

■

Zenith Data Systems Corp.

BOOTH: B-3510

REPRESENTATIVES: Bob Dilworth, president; John Frank, vice-president of marketing; Art Lambert, vice-president of sales.

FEATURED PRODUCTS: Zenith will exhibit its Z-171 laptop, its Z-200 and Z-158 desktop machines and its Z-148 personal computers. The firm will also show a variety of monitors and its Xenix operating system.

■

Zetaco, Inc.

BOOTH: C-3544

REPRESENTATIVES: Bob McGowan and Bob Lafferty, sales representatives; Gary Becker, technical representative.

FEATURED PRODUCTS: Zetaco will exhibit a series of Data General Corp.-compatible interfaces and subsystems, including the LRS-10 optical disk subsystem, the ARZ-1 disk controller, the DPS-1 dual-processor switch and the STA-1 tape interface adaptor.

■

Zoltech Corp.

BOOTH: C-3767, C-3769

REPRESENTATIVES: Les LaZar, president; Dave Friedman and Betty Kayton, vice-presidents; Michele Blair, sales manager.

FEATURED PRODUCTS: Zoltech will exhibit a line of VME and Q-bus systems, including the VV-11 series and the VQ-11 chassis.

■

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Advertising and Sales Promotion Manager
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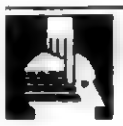
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MANAGEMENT



TAKING CHARGE
Alan Brill

Preparing for the DP audit

Mention the words "it's annual audit time" to most data processing managers, and you'll see an immediate, often full-blown anxiety attack. They have been traumatized by the last five annual audits they've gone through and are sure the next 10 will be equally painful.

You hear managers talking at conferences, consoling each other. "Yes," one tells the other, "our auditors gave us a horrible, vengeful, negative report. Never would have suspected that they had such an axe to grind. Came clear out of the blue. First I heard of it was when the boss got a copy of the report that went to the board!"

You've heard the same things. Maybe said them. And it's an absolute shame. Auditing does not have to be a painful process or a useless one. And there shouldn't be any surprises.

Almost every DP shop is audited by one or more organizations. The company's own internal auditors frequently review data processing work — so do independent accounting firms. Audits conducted by government agencies are also a fact of life, particularly for the public sector DP manager or the manager in a highly regulated industry. In fact, many DP organizations have internal review or quality assurance functions built into them.

So as DP managers, we're audited in one way or another all the time. It is my contention that the way the DP portions of the audits are conducted causes the problems.

See PREPARING page 104

Brill is director of Computer Security Services for the New York City Department of Investigation.

Offshore data entry pays off

Satellite communications speed turnaround time

By David A. Ludlum

American Airlines expected the productivity of workers at a data entry facility to fall 30% when it moved the operation from Oklahoma to Barbados last year to take advantage of lower wages. Instead, productivity improved, and American has set up a subsidiary, Caribbean Data Services, Inc., through which it now sells the facility's services to other companies.

American's experience helps illustrate the recent rapid growth in offshore data entry operations. While the shops were first set up in the 1960s, their number has mushroomed in recent years with the availability of sophisticated satellite communications, which speed up the turnaround time.

"The office doesn't have to be next door any more," says Norman Bodek, president of the Data Entry Management Association, who estimates that, after a spurt of growth last year, there are about 75 offshore data entry shops. About a third are owned by American companies, he says.

While many in the industry expect optical scanners to eventually take over data entry work, some organizations have recently abandoned scanners, and Bodek does not expect them to be in wide use for 15 years.

Until then, offshore entry could grow rapidly and have a significant effect on clerical employment in the U.S., according to a report by the U.S Congress' Office of Technology Assessment (OTA).

American-owned offshore facilities have been set up by both internal corporate data processing departments and independent service bureaus. The Caribbean is the most popular location — there are at least 20 facilities in Barbados and Jamaica — but shops have also been established in Ireland, Singapore and the People's Republic of China, among other locations.

The shops work with a variety of data,

See OFFSHORE page 112

Nonverbal communication: DP management taken at face value

By Jeffry Beeler

Many data processing supervisors moving into higher management jobs lack skills for handling fellow workers, among these being a knack for nonverbal communication, according to several industry sources.

"Many DP managers come from a technical background where a lot of their tasks are often relatively cut and dried," says Richard Goldenberg, chief of MIS at Martin Marietta Corp. in Long Beach, Calif. "So when they finally get into management, they frequently haven't had a chance to develop skills at handling people and in some ways are unprepared for their new jobs."

A somewhat tougher stance is taken by Loretta Malandro, founder of Malandro Communication, Inc., a Tempe, Ariz.-based consulting firm. As a career development counselor for executives in Fortune 500 corporations, Malandro has dealt extensively with information systems.

While there are exceptions, she says, "by and large, the people who run computer organizations inside large companies are unresponsive, expressionless, static and extremely self-controlled. As a result, other people find them hard to read and are often uncomfortable in their presence."

At a recent NCR Corp. users group meeting, Malandro cited fresh clinical studies that suggest the power of nonverbal communication to reveal a speaker's thought and to influence a listener. Contrary to popular opinion, words convey only a paltry 7% of the total information that two typical people exchange during everyday discourse, she said.

See MANAGEMENT page 113

Bonuses, other staff incentives require careful handling

Dinners, faster response times among options

By Donna Raimondi

In any MIS organization, there are employees who put in a day's work, and there are employees who excel. Rewarding the programmer or analyst who does his utmost for the company can be a tricky piece of politics. If handled without finesse, a reward system can lead to damaged egos in the MIS shop, MIS managers say.

"There is a danger in giving incentives for special accomplishments," says Darrell Waite, vice-president of information services at Ramada Inns, Inc. in Phoenix. Waite's managers give family dinner vouchers to employees who perform special accomplishments, and the company has experimented with other rewards.

Some of the programs have worked, but "some people who don't get a chance to be in on it feel bad," Waite says.

Some workers may never be in a position to win performance awards unless there is some kind of hero-making crisis that they solve, says a vice-president of a Bell operating company, who asked not to be named. For example, software maintenance people who work very hard solving tough problems all the time are not as visible as program developers who create new solutions. Such workers might feel left out and could become resentful, so it is important to pay them very well for the work they do, he says.

If the regional Bell company reaches its performance objectives for a given year, it puts aside a pool of incentive money, the vice-president says. Significant team awards — from 5% to 10% of each team member's salary — are given out for especially good work. "We hold back 20% of this pool for special individual merit awards that can be given for outstanding performance on a particular project or for sustained outstanding performance," he says. Smaller rewards take the form of weekend trips and football or baseball tickets.

The Bell vice-president is one who does not think rewards have to damage the egos of nonrecipients. In fact, Bell makes the major awards in public, formal presentations. "Awards can provide something to shoot for. Some people like to receive their awards privately, but we don't do that. We want them public." Bell's MIS turnover rate is 3%, which is about half the industry average, he says.

At Alpo Petfoods, Inc. of Allentown, Pa., outstanding performance is rewarded with promotions and career advancements, says Terry L. Heeter, director of MIS. There is no corporate policy on rewards, and Alpo has never considered any kind of incentive plan. But the company tries to address needs of its programmers and analysts in other ways, he says. "The most important incentive to keep good people is a good work

See BONUSES page 104

INSIDE

Managers on the Move: New chief at Security Pacific Automation/**105**

Calendar: conferences, shows, seminars/**106**

INSTANT ANALYSIS

"I'm at peace. I think it's important for a person to know when it's time to come and time to go."

— Frank Borman announcing his resignation as chairman and chief executive of Eastern Airlines

Preparing for the DP audit

From page 103

I spent more than seven years with a Big Eight accounting firm and conducted a lot of the data processing portions of the annual audits of major corporations. And I undoubtedly caused a lot of problems for my clients and for myself through ineffective or inefficient DP/auditor relationships.

Now as a DP manager with that background, I've been on both sides of the fence. Here are some frequently heard questions about the audit process as well as ways you can prepare, eliminate suprises and work more effectively with the audit team.

Our company's fiscal year ends Dec. 31. What are the auditors doing here in the summer?

While that's the year-end date, the audit is a very long and complex process. Some of the first questions that auditors ask are, "How good are the company's internal controls? Can we rely on the computerized records for our work, or will we have to work around the computer?"

To find out, the DP area is one of the first stops that auditors make. If there are problems found, the auditors will likely increase the amount of testing of the company's records for accuracy. (Such testing can be time-consuming and expensive. Good internal accounting controls in your systems pay themselves back very quickly).

The DP phase of the audit should be at about the same time each year, so you should be able to plan for it. Get the schedule early in the year from your internal audit manager or whomever is liaison to the auditors in your organization.

Why the endless interviews? Can't we get a list of the information that the auditors need and just provide it to them?

You can. In most cases, if you schedule an early meeting with the audit team manager, he will probably provide you with a set of questionnaires to be used to document your general DP environment, organization and internal controls and to provide information on your major applications.

Fill them out and forward them to the auditors. They will then schedule a visit to verify, ask questions and review one or more applications in detail. This process helps you by assuring you that the answers are correct and complete and by reducing the number of expensive auditor-hours spent on semiclerical tasks.

The auditors seem to keep barging in on everyone. How can I maintain some degree of control?

The audit process is an interactive one, but it need not disrupt your operations. Again, the secret to success is an opening meeting in which you and the audit team agree on ground rules. To the extent that they know (from your completed questionnaires) who they want to see, you can schedule meetings at mutually convenient times.

When they need to see others, it is not unreasonable to ask that they coordinate scheduling through you or someone you designate. But don't use the agreement to try to slow down or sidetrack the auditors. They have the right, given by the board of directors, to see whatever and whomever they have to.

Who is in charge of the audit? Who do I complain to if there's a problem?

For interal audits, see your firm's internal audit director. For external audits, I would still start with the internal audit manager. But the person you eventually have to meet is the outside firm executive in charge of the audit, generally a manager, principal or partner in the firm. That's the person with the power to handle disputes. When you experience a problem with an audit staff member, you help yourself and your company by bringing it to management's attention quickly.

Bonuses, other staff incentives

From page 103

environment. The staff needs proper tools to work with, management understanding of their needs and available opportunities for advancement," he adds.

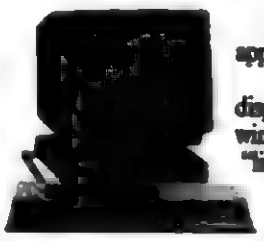
Ramada's Waite agrees. His employees work on IBM's Airline Control Program. "These are valuable people. They are in high demand, and they are highly paid, so money is not that much of an incentive. They are more interested in how they are treated. The way we keep them is to treat them like they are extremely important to us."

One of the many seemingly minor conditions that can help keep good people interested in their jobs is fast response time on the computer system, says Ralph Hayhurst, vice-president of MIS at Hobart Corp. of Troy, Ohio. The 60 programmers in Hobart's IBM installation work in project teams. There are no awards or certificates to praise good work outside of the yearly salary remuneration that tries to place the programmers and analysts in the proper salary range for the work they do.

Rewards at Hobart take the form of a pleasant, professional work environment, interesting jobs as part of project teams and frequent reviews that spur proper training where employees need it most, Hayhurst says. "The best reward is recognition that the team is assigned to a good project and they have some visibility in the company for what they do."



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MANAGEMENT

MANAGERS ON THE MOVE

John P. Singleton has been named executive vice-president of Security Pacific Corp. of Los Angeles and chairman and chief executive officer of Security Pacific Automation Co. He succeeds **DuWayne J. Peterson Jr.**, who left Security Pacific last month to join Merrill Lynch & Co. as executive vice-president for operations systems and telecommunications, a newly created position.

Singleton was previously executive vice-president of Security Pacific National Bank and president of Security Pacific Automation.

Before joining Security Pacific in 1982, he was executive vice-president for operations and data processing organizations at Maryland National Bank.



John Singleton

■

Robin Martin, who has held technical and managerial positions at IBM since 1961, has been appointed as a vice-president for end-user computing services at Carter Hawley Hale Information Services of Anaheim, Calif. Martin, 47, will be responsible for the company's end-user computing and information management areas.

Since 1979, he has been an IBM branch market support manager working with the retail, media and petroleum industries. He began his career in information systems in 1955 with Douglas Aircraft Co.



Robin Martin

■

Martin Marietta Data Systems of Greenbelt, Md., has appointed two vice-presidents to its software division. **Donald R. Shaw** will be vice-president and general manager of the information technology division, heading the commercial software division in Princeton, N.J. **Arthur G. Mitchell** will be vice-president in charge of worldwide commercial software sales. He will be reporting to Shaw.

■

Paul E. Neal has been appointed vice-president of information services for Indianapolis Life Insurance Co. Neal's responsibilities include long-range planning and organizational development of information services operations as well as management of the department.

■

Alois J. Strnad has been named vice-president of management information systems at Tandem Computers, Inc. of Cupertino, Calif. Strnad, 49, assumes overall responsibility for the company's management information systems.

■

Dennis J. LaHood has been named director of management information



Dennis LaHood

services at Agway, Inc. of Syracuse, N.Y., an insurer and distributor of farm supplies and petroleum products. He has been the company's director of systems and development services.

■

Danners, Inc., an operator of discount stores based in Indianapolis, has named **Stephen E. Ogle** to the position of director of data processing and **Rebecca Clark** to information center supervisor.

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CALENDAR

WEEK OF JUNE 15

JUNE 15-20, LONG BEACH, CALIF. — **1986 Government Management Information Sciences Conference.** Contact: Tom Lang, Assistant Chairman, Data Processing Department, 9150 E. Imperial Highway, Downey, Calif. 90242.

JUNE 16-18, UNIVERSAL CITY, CALIF. — **Synergy '86, Conference on Functional Interfacing for Computer-Integrated Manufacturing.** Contact: Cheri Willetts, Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

JUNE 16-19, LAS VEGAS — **The 1986 National Computer Conference.** Contact: National Computer Conference, 1899 Preston White Drive, Reston, Va. 22091.

JUNE 16-20, CAMBRIDGE, MASS. — **Managing Information Technology: New Responsibilities in a Changing Environment.** Contact: Center for Information Systems Research, Sloan School of Management, MIT, E40-193, 77 Massachusetts Ave., Cambridge, Mass. 02139.

JUNE 17-18, PLYMOUTH, MICH. — **Robotic End Effectors: Design and Applications Seminar.** Contact: Mary Dombrowski, Special Programs Division, Robotics International of the Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

JUNE 17-19, ATLANTIC CITY — **Plas-Tech '86.** Contact: Delia Associates, P.O. Box 338, Delia Marketing Communications Center, Whitehouse, N.J. 08888.

JUNE 18-20, TOKYO — **Marketing Opportunities Seminar.** Contact: Agnes M. Pavel, Program Director, U.S. Telecommunications Suppliers Association, Suite 1618, 333 N. Michigan Ave., Chicago, Ill. 60601.

WEEK OF JUNE 22

JUNE 22-27, PHILADELPHIA — **Management Information Systems for Strategic Advantage.** Contact: The Registrar, Office of Executive Education, 200 Vance Hall, The Wharton School of the University of Pennsylvania, Philadelphia, Pa. 19104.

JUNE 23-24, NEW YORK — **Applying Information Technology for Competitive Advantage.** Contact: Frank Lesh, Information Management Perspective, Inc., Suite 208, 5 Elm Row, New Brunswick, N.J. 08901.

JUNE 23-25, ALBUQUERQUE, N.M. — **Integrated Fiber-Optic Technology Training.** Contact: Linda Castle, Optoelectronic System Consultants, P.O. Box 35525, Albuquerque, N.M. 87176.

JUNE 23-25, MIAMI — **Electronic Data Processing Auditors Association 14th Annual International Conference.** Contact: EDPAA, P.O. Box 88180, Carol Stream, Ill. 60188.

JUNE 23-26, BOSTON — **ATE East '86.** Contact: Registrar, Morgan-Grampian Expositions Group, 1050 Commonwealth Ave., Boston, Mass. 02215.

JUNE 23-27, AMSTERDAM — **Fourth Annual European Fiber-Optic Communications and Local-Area Networks Exposition.** Contact: Cheryl MacDonald, Information Gatekeepers, 214 Harvard Ave., Boston, Mass. 02134.

JUNE 23-27, CAMBRIDGE, MASS. — **Managerial Planning for the Security and Privacy of Contemporary Computer and Telecommunications Systems.** Contact: Prof. Gary Marx, Department of Urban Studies and Planning, MIT, 77 Massachusetts Ave., Cambridge, Mass. 02139.

JUNE 23-27, CHICAGO — **A/E/C Systems '86: The Computer and Management Show for the Design and Construction Industry.** Contact: Conference Director, A/E/C Systems '86, P.O. Box 11318, Newington, Conn. 06111.

JUNE 24-26, CHICAGO — **Structured Techniques Association III/ Structured Techniques in the Eighties: Practice and Prospects.** Contact: Mary Anne Gabriel, Heller Financial Corp., 105 W. Adams St., Chicago, Ill. 60603.

JUNE 24-27, CHICAGO — **Autocad Expo '86.** Contact: William Ryan, Autocad Expo '86, Autodesk, Inc., 2320 Marinship Way, Sausalito, Calif. 94965.

JUNE 25, CHICAGO — **International Facility Management Association's Computer Applications for Facility Management.** Contact: IFMA, Suite 1410, 11 Greenway Plaza, Houston, Texas 77046.

JUNE 25-26, COATESVILLE, PA. — **Chester County Expo '86: CAD/CAM Conference from Micro to Mini.** Contact: Lee Smith, Central Chester County Vocational Technical School, 1635 E. Lincoln Highway, Coatesville, Pa. 19320.

WEEK OF JUNE 29

JULY 2-3, LAS VEGAS — **Full Meeting of the Design Automation Standards Subcommittee.** Contact: Ron Waxman, Design Automation Standards Subcommitee Co-Chairman, IBM FSD, 9500 Godwin Drive, Manassas, Va. 22110.

WEEK OF JULY 6

JULY 8-11, COLUMBIA, MD. — **The Technical Manager in a Changing Environment.** Contact: Continuing Education Institute, Suite 102, 21250 Califa St., Woodland Hills, Calif. 91367.

See CALENDAR page 112

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CALENDAR from page 106

JULY 9-11, NEW YORK — **The Fourth Annual PC Expo.** Contact: PC Expo, P.O. Box 1026, Englewood Cliffs, N.J. 07632.

WEEK OF JULY 13

JULY 13-18, CHICAGO — **Guide 65.** Contact: Guide International Corp., 111 E. Wacker Drive, Chicago, Ill. 60601.

WEEK OF JULY 20

JULY 23-25, BOSTON — **Microtrends '86, Education: Redirecting the Revolution.** Contact: Bobbi Hunt, International Communications Industries Association, 3150 Spring St., Fairfax, Va. 22031.

WEEK OF JULY 27

JULY 27-31, ANAHEIM, CALIF. — **Third Annual Information Center Conference & Exposition.** Contact: Information Center Conference & Exposition, Weingarten Publications, Inc., 38 Chauncy St., Boston, Mass. 02111.

JULY 28-30, RENO, NEV. — **1986 Summer Computer Simulation Conference.** Contact: The Society for Computer Simulation, P.O. Box 17900, San Diego, Calif. 92117.

WEEK OF AUG. 3

AUGUST 4-8, ANN ARBOR, MICH. — **Contemporary Data Communication Networks: Planning, Management and Computer-Based Design.** Contact: Engineering Summer Conferences, 300 Chrysler Center/N. Campus, Ann Arbor, Mich. 48109.

WEEK OF AUG. 10

AUGUST 11-14, SNOWMASS, COLO. — **AM/FM International Ninth Annual Conference.** Contact: AM/FM International, Suite 820, 8775 E. Orchard Road, Englewood, Colo. 80111.

WEEK OF AUG. 17

AUGUST 18-22, DALLAS — **Thirteenth Annual Conference on Computer Graphics and Interactive**

See CALENDAR page 113

Offshore data entry pays off

From page 103

including encyclopedias and other lengthy texts, businesss records, financial statements, statistics, order forms, ticket stubs and mailing lists. Hard copy is flown or sent by facsimile to the offshore site and returned either by air on tape or disk or electronically via satellite.

The one motive for moving data entry offshore has been lower wages, which the OTA found to range from one-fourth to one-fifteenth of those in the U.S., with lower wages in Asia than in the Caribbean and Ireland.

But companies considering the location of an offshore site look far beyond wage levels. With respect to the labor force alone, their key considerations include language, education and the work ethic.

Barbados retains a literacy rate of 95% — better than the U.S.' — as a legacy of the British educational system, according to Joseph Stroop, a spokesman for American Airlines.

Fewer job opportunities in the Caribbean means data entry workers there tend to be better educated than their American counterparts, Bodek said.

Coached on 'how to work'

Workers in Jamaica did have to be coached on "how to work — to be on time and work efficiently," said Lawrence Bresnahan, president of Advanced Automation Associates of Andover, Mass., which produces data bases in Jamaica. But, Bresnahan said, "they're well educated, and they want to learn. They train well."

However, another service bureau, General Information Services of Philadelphia, passed over the Caribbean due to what it sees as an unfavorable work ethic, according to company President Bernard Davis.

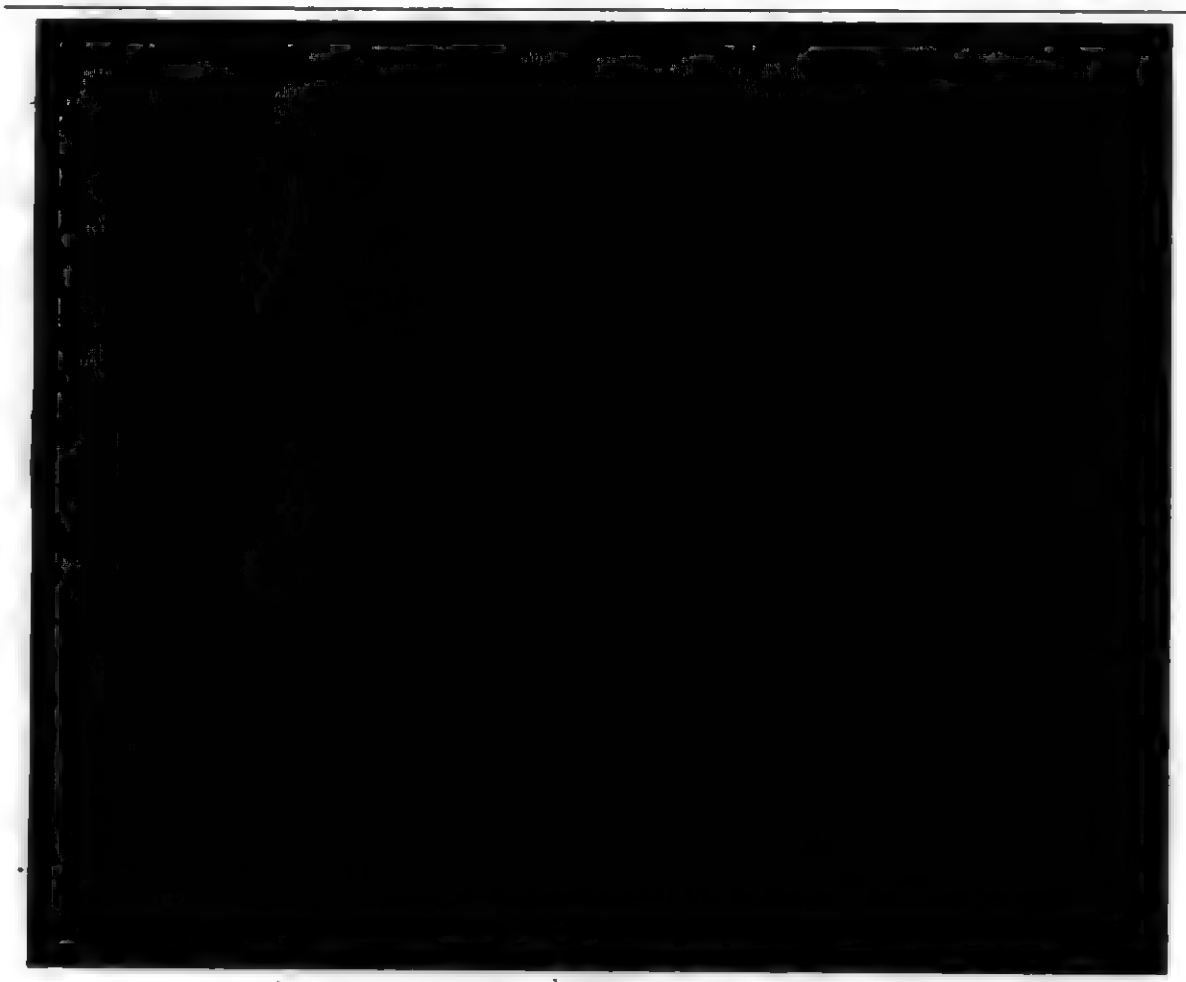
Initially, General Information Services set up its data entry operation in Madras, India. After some "very bad experiences" with communications and transportation problems, the firm moved its operation to Dublin, where wages are higher but the work ethic benefits from an "achievement-oriented" population and "horrible weather," Davis said.

Other criteria for selecting a site include political stability, proximity to the U.S., communications facilities and infrastructural factors such as power supplies.

Barbados boasts of its telecommunications system, which includes a satellite connection, digital systems, private lines and fiber-optic cable. Davis said he is happy with communications with Ireland, noting that like the Caribbean, Ireland has the advantage of regular airline service to the U.S.

Bresnahan does point out occasional one-day delays in getting documents through customs in Jamaica and warns of the need for an uninterruptible power supply.

Data security is another concern with offshore entry. While some offshore operators encrypt transmissions, there is some "sensitive data" that will never be sent abroad, Bodek said. Much of the overseas work is "retro" entry of data such as encyclopedias and, in one case, all the Congressional speeches of representatives and senators, he said.



HOW ONE COMPANY MANAGES TO WIN ITS BURGER WARS.

At headquarters of a leading regional fast food chain, executives were looking for a way to beef up accountability. That's when they called in the data processing department.

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Management at face value

From page 103

A much more reliable guide to a person's current mental and emotional state is the timbre and volume of their voice. They account for about 38% of the communication that takes place, for the most part unconsciously, during face-to-face meetings, Malandro says.

But the most potent carrier of a message is the impression an individual makes visually through cues like dress, eye contact, readiness to smile, posture and gestures. Appearance and behavior account for roughly 55% of the message, Malandro says.

"The decisions we make and the opinions we form about others are based primarily on perception," she says. The result can be an unwitting mixed message that coworkers find difficult to decipher.

A lack of ability at nonverbal communication can seriously damage an MIS chief's chances for future advancement, according to Dick Enslin, senior systems analyst with Baltimore-based Central Maryland Multiple List, Inc.

During a lengthy computing career that has included a stint as a DP chief at NCR, Enslin has observed ill effects of faulty nonverbal communication.

Some MIS managers, for example, take pains to express concern for their employees' welfare. But in the next breath, they negate those sentiments with a nonverbal faux pas that says the opposite, according to Enslin.

His experiences convinced him that a low aptitude for interpersonal relations frequently alienates information systems executives from their staffs, tarnishes their professional images and undercuts their effectiveness as managers. "Many MIS directors simply lack the necessary skills to be good leaders and properly motivate their employees," he says.

Failure to master nonverbal communication can also alienate systems executives from their bosses and thus prevent them from advancing.

One remedy might lie in improving undergraduate instruction. "Many schools have been quite successful in giving their students a solid grounding in technology," says Robert Richter, MIS manager at Evansville, Wis.-based Baker Manufacturing Co. "But their efforts to teach 'people skills' have generally been a lot less effective."

Information systems executives might also pattern themselves after people who communicate well nonverbally. Malandro says most successful individuals have at least three personal characteristics in common. "They match the rhythm of every person with whom they deal," she said. "They use a lot of encouragers, including smiles, head-nodding and words of encouragement." Finally, she said, they avoid "leaking," or turning their bodies to one side, rather than facing their conversation partners squarely.

CALENDAR from page 112

Techniques. Contact: SIGGRAPH '86, Conference Management, Smith, Bucklin & Associates, Inc., 111 E. Wacker Drive, Chicago, Ill. 60601.

AUGUST 19-21, PHILADELPHIA — **Second Annual Physical and Electronic Security Symposium and Exposition.** Contact: Michael C. Otten, Booz, Allen and Hamilton, Inc., 4330 East-West Highway, Bethesda, Md. 20814.

WEEK OF AUG. 24

AUGUST 26-28, SAN MATEO, CALIF. — **Interconnect '86.** Contact: Agnes M. Pavel, Program Director, U.S. Telecommunications Suppliers Association, Suite 1618, 333 N. Michigan Ave., Chicago, Ill. 60601.

WEEK OF AUG. 31

SEPTEMBER 1-5, DUBLIN — **International Federation for Information Processing Congress '86.** Contact: IFIP Congress '86, 44 Northumberland Road, Dublin 4, Ireland.

SEPTEMBER 2-5, CHICAGO — **Fourth Annual Office Automation Society International Conference.** Contact: Sue Pickard, OASI, Suite B, 15269 Mimosa Trail, Dumfries, Va. 22026.

SEPTEMBER 3-5, LOS ANGELES — **Telemarketing/West.** Contact: Doug Shreve, The Telemarketing Foundation, Inc., P.O. Box 829, Arnold, Md. 21012.

WEEK OF SEPT. 7

SEPTEMBER 8-10, PHILADELPHIA — NCC — **Telecommunications Conference.** Contact: NCC-Telecommunications, American Federation of Information Processing Societies, 1899 Preston White Drive, Reston, Va. 22091.

SEPTEMBER 8-18, MONTREAL — **43rd FID Conference and Congress.** Contact: Local Organizing Committee, FID 43rd Conference and Congress, C.P. 1144, Succursale Place Desjardins, Montreal, Quebec, Canada H5B 1B3.

SEPTEMBER 9-12, ANTWERP, BELGIUM — **Second European Simulation Congress.** Contact: The Society for Computer Simulation, c/o Ghislain C. Vansteenkiste, University of Ghent, Coupure Links 653, B-9000 Ghent, Belgium.

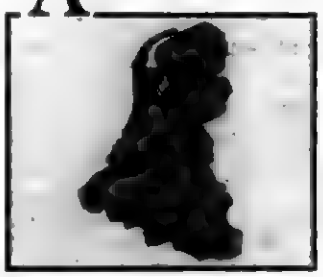
WEEK OF SEPT. 14

SEPTEMBER 18-19, MONTREAL — **Canadian Office Machine Dealers Association/Candex.** Contact: Roy Whitsed, Candex Conference, Inc., 47 Lakeshore Road E., Mississauga, Ont., Canada L5G 4L7.

WEEK OF SEPT. 21

SEPTEMBER 22-25, ORLANDO, FLA. — **Space Tech '86.** Contact: Society of Manufacturing Engineers Public Relations, Box 930, One SME Drive, Dearborn, Mich. 48121.

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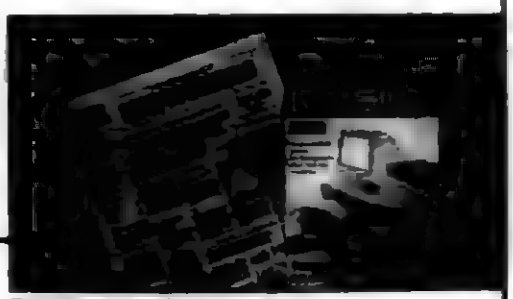
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NEW PRODUCTS

Software AG introduces net managers

Software AG of North America, Inc. of Reston, Va., has introduced two communications networking products: Com-Pose, an outline environment manager, and Net-Pass, a network parallel application session manager.

The Com-Pose system is the central communications manager for Software AG's Information Center, Development Center, Production Center, Office Automation and Communications system products. According to the vendor, users whose terminals are physically connected to CICS, TSO or CMS can logically connect to a Com-Pose system.

Com-Pose provides maintenance system support for existing applications. It is also said to provide Natural (the vendor's fourth-generation language), facilities, on-line printout spooling, interactive program development and maintenance, library and file management, commands and utilities for computer center control and job scheduling and management.

Com-Pose is operating system independent and provides interactive utility services for system programming functions supported by a menu-driven facility, the vendor said.

Com-Pose for IBM mainframes running MVS or DOS/VSE costs $45,000 or $35,000, respectively. The system will be available in July.

Net-Pass enables terminal users to manage several logical terminal sessions from the same IBM 3270-type terminal. Simultaneous Com-Plete or CICS sessions, different Com-Pletes or various teleprocessing monitors such as CICS, TSO, Roscoe or IMS can be maintained.

Net-Pass handling of these sessions is reportedly transparent to the user. Net-Pass acts as an intermediary between terminals and applications by performing services the applications do not perform, such as screen-to-hard-copy, screen-to-screen and data compression.

According to the vendor, Net-Pass can be customized to individual specifications.

Net-Pass for IBM mainframe systems running MVS/XA, OS/VS1 and DOS/VSE costs $25,000, $20,000 and $15,000, respectively. It will be available in October.

Interface unveils printer

Dot matrix tabletop offers graphics in seven colors

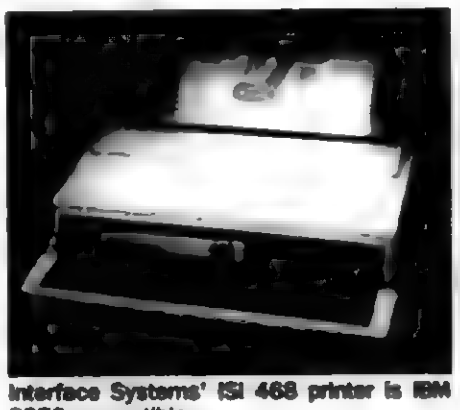
The ISI 468 IBM 3270-compatible printer, said to produce IBM Programmed Symbols graphics in up to seven colors, has bowed from Interface Systems, Inc. of Ann Arbor, Mich.

The ISI 468 is a tabletop dot matrix, plug-compatible replacement for IBM 3268 Model 2C and 3287 Model 2C printers. The seven colors offered are black, red, blue, green, turquoise, yellow and pink.

According to the vendor, the ISI 468 prints at 400 char./sec. in draft mode and 100 char./sec. in near-letter-quality mode. Character spacing for standard-size output can be 10, 12 or 16.67 char./in. Other features include bar coding, large-character label printing, a demand documents tear bar for reduced forms waste and a switch-selectable coaxial Centronics Data Computer Corp. parallel port for connection to IBM Personal Computers as well as 3270 systems.

The top-loading printer handles continuous-feed forms that are 3 in. to 15 in. wide with up to six parts. Individual sheets can be fed manually or loaded automatically through an optional sheet and envelope feeder.

The ISI 468 can be directly connected to an IBM 3274, 3276, 4300 or Personal Computer system. It offers standard coaxial



Interface Systems' ISI 468 printer is IBM 3270 compatible.

support for the Synchronous Data Link Control standard and Small Computer System interface. It also offers an extended print buffer for local copy support for the IBM 3179 and 3279 monochrome display stations and the 3279-3A and 3279-3B color display stations. When connected to IBM PCs, it emulates the IBM 5152 personal printer's text printing functions.

Color software, a color display or controller are not required to print in color, the vendor said. Users of monochrome displays can make full use of the printer's color output capabilities.

The ISI 468 seven-color printer is priced at $6,450. It is also available on a 24-month lease for $300/mo and a 36-month lease for $270/mo.

IBM expands its modem line

IBM recently expanded its line of modems with the introduction of several models. New models of the 5865, 5866 and 5868 modem series transmit at either 9.6K or 14.4K bit/sec. over four-wire, point-to-point links. The 14.4K bit/sec. 5866 and 5868 Model 62 use Trellis Coding error correction protocols.

All new models feature Communication Network Management (CNM) functions such as local and remote self-test and status reports. According to IBM, CNM only works in synchronous mode, in conjunction with Netview, IBM's new network management product for Systems Network Architecture (SNA) networks.

The 5865/66 Model 2 will be available in July. The 5865/66 Model 3 and 5868 Models 52 and 62 will ship in October.

The 5811/12 limited-distance modems, designed for short-haul communications, are lower priced and offer fewer functions than long-haul modems, IBM said. They support full-duplex synchronous or asynchronous data transmission at rates of up to 19.2K bit/sec. over four-wire circuits. The 5812 offers CNM functions.

The 5811 series modems offer the same capabilities of the 5812 series, with the exception of CNM. Both series are compatible with the IBM Cabling System. Prices for the 5811 begin at $1,100; the 5812 begins at $700. Both will be available in the first quarter of 1987.

Datatext, Dow Jones team up to provide business software

Mix CD-ROM, on-line access to financial data

Datatext, Inc. of Woburn, Mass., and Dow Jones & Co. have announced CD/Newsline, a business information product said to integrate Datatext's Corporate Database published on compact optical disks with menu-driven access to on-line news stories and stock quotes from Dow Jones News/Retrieval.

CD/Newsline uses an IBM Personal Computer, data base software, display, communications software, a modem and a compact-disk read-only memory (CD-ROM) and drive to provide numeric and textural information on all public companies traded on the New York, American, over-the-counter and regional stock exchanges.

Datatext's Corporate Database reportedly holds 250,000 pages of business information providing a history of corporate financial results from as far back as seven years. Data on 10,000 public companies, executives and nearly 100 industries is included. Information in the Dow Jones News/Retrieval service is available up-to-the-minute.

According to a Datatext spokesman, combining the two services can provide users with an overall financial picture of a company. Available information includes financial statements, annual reports, investment analyst reports, business literature and trade press abstracts, biographies of corporate offices and directors, current and historical stock price and trading data as well as current business and financial news developments.

The CD/Newsline software enables users to switch between the two sources of information, retrieving data from both. Also, it is said to automatically handle the logon and search routines necessary to access the information found on the Dow Jones News/Retrieval service.

Other features include formatting and report-generating capabilities and compatibility with other personal computer applications such as Lotus Development Corp.'s 1-2-3, Ashton-Tate's Multimate and Micropro International Corp.'s Wordstar. Data or text from CD/Newsline can be transferred to existing spreadsheets or word processing documents.

CD/Newsline is a subscription-based product. The basic configuration, including a subscription to one CD-ROM disk from the Corporate Database, is priced at $14,100 per year. Delivery is expected to begin in the fourth quarter of this year.

INSIDE

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SOFTWARE & SERVICES

Systems software

Radian Corp. has ported its **Rulemaster** software program for developing expert systems to the Digital Equipment Corp. Microvax workstation.

Rulemaster allows users to develop applications on the VAX under VMS and run them on the VAX, on Unix-based systems, PC-DOS- or MS-DOS-based systems or on custom-designed microprocessor-based systems. Features include interprocess communication and the ability to generate a compilable C-code representation of the expert system.

Rulemaster for single-user workstations costs $5,000. For multiuser systems it costs $17,500. The DOS version costs $995.

Radian Corp, P.O. Box 9948, 8501 Mo-Pac Blvd., Austin, Texas 78766.

■

Boston Systems Office, Inc. has introduced the **BSO/Assembler II** family, a relocatable assembler for the Motorola, Inc. 68020.

The assembler was designed for use on Digital Equipment Corp. VAX-based systems. It supports the Motorola specified instruction set with both mnemonics and instruction syntax.

The assembler supports all data storage directives, including real-number constants and 32-bit expressions.

BSO/Assembler is priced starting at $4,900.

Boston Systems Office, 128 Technology Center, Waltham, Mass. 02254.

■

Convex Computer Corp. has announced the **Math Advantage** software package to run on its C-1 supercomputer system.

The Convex Math Advantage is a software library of 176 engineering and scientific subroutines. The subroutines provide functions used in signal and seismic processing, mechanical design, simulation, image processing and general scientific computing.

Convex Math Advantage is priced at $10,000. Source code costs $15,000.

Convex Computer, 701 N. Plano Road, Richardson, Texas 75081.

Parity Computer Systems, Inc. has introduced **Tracs**, a software product designed for data acquisition, analysis and control on Digital Equipment Corp.'s VAX systems.

Tracs collects data from intelligent devices, on-line definition of collections of input channels, real-time monitoring of the data acquisition process and manipulation of polling parameters.

Tracs supports a concurrent multiuser environment. Features include real-time numerical or graphical display and analytical graphics.

A single CPU license starts at $5,000.

Parity Computer Systems, 10 E. Athens Ave., Ardmore, Pa. 19003.

Applications packages

Litton Industrial Automation Systems has announced the **Litton Conventional Warehouse Software System** (CWSS), an inventory and work order control software package for manual storage warehouses.

The menu-driven system is capable of storing and tracking different parts in quantities ranging up to 100,000. The software can bar code each incoming item.

CWSS is priced starting at $72,000 on the IBM Personal Computer AT. It also runs on the IBM Series 1 computers.

Litton, 5825 Oberlin Drive, San Diego, Calif. 92121.

CORRECTIONS

Able Computer's Able QDHU communication controller [CW, May 12, page 143] sells for $1,295.

Vocam Systems, Inc. [CW, April 14, page 105] is located in Bloomington, Minn.

Announcing TI's Second Satellite Symposium: A To Getting Started.



Series/1

NEW PRODUCTS/SOFTWARE & SERVICES

The **Informatics Legal Systems Division** of **Sterling Software** has announced **Prestige**, a series of seven prepackaged systems said to address the automation needs of mid-size law firms.

The packages were designed to run on Wang Laboratories, Inc. VS5 or VS6 minicomputers. The packages cover the applications of automated time and billing, bill editing, word processing and electronic mail.

The integrated packages are priced from $41,000 to $106,000 each.

Sterling Informatics, Legal Systems Division, 2111 E. Highland Ave., Phoenix, Ariz. 85016.

■

IBM has announced **CATIA Building Design**, an addition to the computer graphics-aided, three-dimensional interactive application system developed by Dessault Systems.

CATIA Building Design is an application for creating, modifying and managing structural elements and objects in a two-dimensional environment. It provides an integrated set of applications and a data base for structures, building design and facilities management featuring drafting, 2-D and 3-D wireframe design, surface modeling, solids modeling and shading.

Prices start at $400/mo for a single-user license.

IBM, 900 King St., Rye Brook, N.Y. 10573.

Utilities

Data Design Associates has announced **DD-EDI**, an add-on module for its mainframe Accounts Payable and Purchase Order Control System and DD-AIM translator program.

DD-EDI is an electronic data interchange system. It allows DD-AIM to handle electronic invoices in standard formats. Users can translate both the standard and nonstandard formats into Data Design's accounts payable format and validate outside- vendor control amounts prior to transmitting data to the accounts payable system.

DD-EDI is priced at $5,000.

Data Design Associates, 1279 Oakmead Pkwy., Sunnyvale, Calif. 94086.

■

Boston Systems Office, Inc. has announced **BSO/Debug**, a debugger designed for use on Digital Equipment Corp.'s Microvax II.

According to the vendor, BSO/Debug provides instantaneous program patch capability for developing programs for the Motorola, Inc. 68000, 68010 and 68020 family and the Intel Corp. 8086, 8186 and 8286 family. It allows software applications to be debugged before going to the hardware prototype.

BSO/Debug offers support for interrupts, I/Os, read-only memory and random-access memory segmentation and instruction timing.

BSO/Debug is priced from $5,000.

Boston Systems Office, 128 Technology Center, Waltham, Mass. 02254.

MICROS

Software applications packages

Hewlett-Packard Co. has announced the **HP 64228S emulator**, said to provide full-feature emulation and software support of the Intel Corp. 80286 microprocessor in the HP 64000 logic-development system.

The 64000 system is said to support both the real-address and protected virtual-address modes of 80286 operation with full emulation and development capabilities. The 64228S provides an environment for designing, testing and integrating hardware and software development.

Features reportedly include real-time execution up to 8 MHz with no wait states and up to 1M byte of emulation memory.

The HP 64228S costs $9,400.

Hewlett-Packard, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

Artificial Intelligence Step-By-Step Guide

For companies, laboratories, universities, or any organization investigating AI and the application of expert systems. A simple hookup brings it into your auditorium or conference room. On June 25, 1986

On November 13, 1985, more than 30,000 people participated in TI's first satellite symposium on AI—and 97.5% expressed interest in another one.

Announcing "Knowledge-Based Systems: A Step-By-Step Guide To Getting Started."

Symposium II is designed for managers and visionary technologists who may already be involved in AI or beginning to explore its potential. And, you need not have participated in the first symposium to benefit from this one.

Dr. Harry R. Tennant has devoted months of research surveying the work of world-class AI experts. Dr. Tennant will present the results of his investigation into the practical experiences of people directly involved in implementing knowledge-based systems.

Through on-screen interviews and interpretative commentary, Dr. Tennant will bring you much of the best advice and practical know-how that exists today.

In about five hours, you'll gain insights, perspective and step-by-step knowledge it might otherwise take months to acquire through ordinary study and trial-and-error experience.

By simply downlinking the satellite signal into your own facility, you can share this valuable learning experience with as many people as you like—*at no charge from TI!*

Learn from leading authorities and real-world experience.

You'll hear and see AI pioneers such as Dr. Edward A. Feigenbaum, noted AI author and educator from Stanford and past president of the American Association of Artificial Intelligence, and Dr. John D. McDermott, Founder and Vice President of Operations of the Carnegie Group, who turned an uncommon number of his expert systems research projects into successful applications.

You'll also hear from executives and innovators of some of the key software tools used for development of expert systems: Thomas P. Kehler, Chairman of the Board and Chief Executive Officer of Intellicorp. James C. Williams, Vice President of Technology of Inference Corporation.



Dr. Harry R. Tennant, Senior Member Technical Staff and manager of artificial intelligence research in TI's Computer Science Laboratory. Invented the concept of menu-based natural language understanding. Involved in knowledge representation systems, expert systems, logic programming, information management, and working LISP systems into the PC and other small computers. Author of "Natural Language Processing: An Introduction to an Emerging Technology." Selected as one of America's top scientists under the age of 40 by "Science Digest" magazine.

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Announcing Computerworld's MICRO BUYER'S SHOPPER

SEE PAGE 139

NEW PRODUCTS/MICROCOMPUTERS

USA/Unlimited Software Associates, Inc. has announced **Quick Quality Analysis** (QQA), software for estimating the effectiveness of quality control techniques.

QQA models quality control techniques including functional specification review, logic specification review, module logic inspections, code inspection, unit test, function test, subsystem test and system test.

It quantifies the costs of implementation, calculates potential savings and displays projected benefits, according to the vendor. "What-if" scenarios display varying returns on investments, project impacts and benefits.

QQA runs on the IBM family of Personal Computers. It costs $995.

USA/Unlimited Software Associates, 457 Coldstream Drive, Berwyn, Pa. 19312.

Standard Econometrics Corp. has released a **business forecasting system** for financial planners and market analysts.

The system is said to be driven with 15-month economic forecasts distributed by the vendor on diskettes with monthly updates and forecast revisions.

The menu-driven system operates on IBM PC-DOS 2.0 or higher. According to the vendor, the forecasting system enables clients to forecast sales, orders or revenue statistics by creating multiple regression models. Users of Lotus Development Corp.'s 1-2-3 can transfer data and forecasts to spreadsheets.

The system is priced at $150, and the Lotus data transfer program is priced at $25.

Standard Econometrics, P.O. Box 44026, Indianapolis, Ind. 46244.

The **Software Group** at **Pugh-Roberts Associates, Inc.** has announced **Professional Dynamo** (PD) and **Professional Dynamo Plus** (PD Plus), modeling environments for continuous simulation on personal computers and workstations.

The PD modeling environment includes a full-featured editor, an intelligent compiler, a simulator that allows users to change input values between runs, an automatic viewer that produces plots and tabular output and a documentor that converts models into a standard format and provides referencing tools.

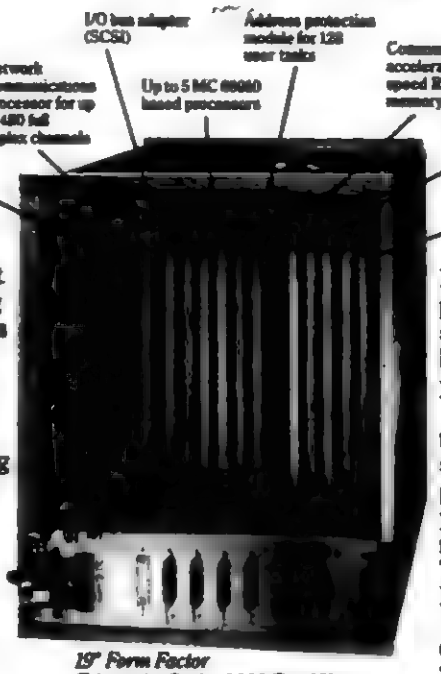
In addition, PD Plus contains a report generator, a model interface builder and a split-screen editor.

PD and PD Plus cost $495 and $1,996, respectively.

Pugh-Roberts Associates, Five Lee St., Cambridge, Mass. 02139.

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TELEMATICS

Software languages

Unipress Software, Inc. has ported the **Lattice C Cross compiler** to the AT&T Personal Computer 6300 Plus running under the Unix operating system.

The Lattice C Cross compiler is said to provide users with the ability to generate executable Microsoft Corp. MS-DOS code with the AT&T PC 6300 Plus multiuser Unix computer. It implements the full C language and library.

The Lattice C Cross compiler includes a linker, librarian, disassembler and floating-point support.

For the AT&T OC 6300 Plus, the Lattice C Cross compiler costs $795.

Unipress Software, 2025 Lincoln Highway, Edison, N.J. 08817.

Software utilities

Intel Corp. has announced **Ipat**, a performance analysis tool hosted on the IBM Personal Computer AT, XT and Intel development systems.

Ipat is said to monitor the performance and completeness of test cases for microprocessor-based software. It displays information in histograms and code coverage maps.

Ipat consists of a base unit and power supply plus a target interface and control software. It supports operation with Intel's Integrated In-Circuit Emulator for analysis of software based on Intel's 8086, 8088, 80186, 80188 and 80286 microprocessors.

Ipat costs $9,995.

Intel, W-3030, 3065 Bowers Ave., Santa Clara, Calif. 95051.

■

Rabar Systems International has announced **CTLlaser**, a memory-resident, menu-driven program for sending commands to the Hewlett-Packard Co. Laserjet printer.

The software enables the user to change orientation to portrait or landscape mode, change font, type style, pitch, point, page length, margin settings and more without exiting from the spreadsheet or word processing program currently in use.

CTLlaser runs on any IBM Personal Computer or compatible under Microsoft Corp. MS-DOS or IBM PC-DOS. It costs $65.

Rabar Systems, P.O. Box 306, Westport, Conn. 06881.

■

James River Group, Inc. has announced the **Business Toolbox Series**, 20 business utility programs said to run on Digital Research, Inc. CPM computers and Microsoft Corp. MS-DOS computers.

Some of the utilities were designed to interact with the modules of James River's Accounting for Micros small business system. Other utilities are stand-alone programs such as T-Man, a mailing list and notebook, and Loans, for calculating loan payments and printing a payment schedule.

Prices range from $40 to $95.

James River Group, 125 N. First St., Minneapolis, Minn. 55401.

■

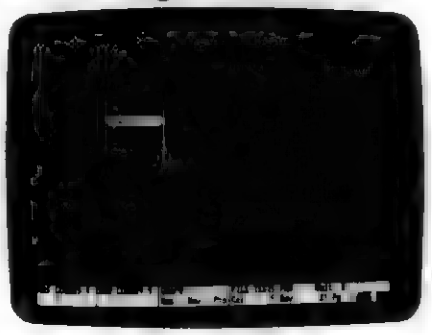
Logic Development Corp. has announced **QE**, an editor for programmers using QNE International's Q-Pro 4 fourth-generation applications de-

Continued on page 122

Now it costs even less to look good.

The Cordata Desktop Printshop™ has always been the best value in PC-compatible laser printers.

With speed and flexibility that the others can't match. Type fonts on diskette, not expensive cartridges. Data transfer up to 30 times faster than Hewlett-Packard's LaserJet+. Features implemented in software, for easy update. And Epson™ emulation, so it runs with most MS-DOS programs.



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A menu-driven forms design software program for rapid document creation, the industry-acclaimed Wordstar 2000™ word processing program, and 38 fonts on diskette are included with the Desktop Printshop, for the amazingly low price of $2995.

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TELEX 650-2696270; in Europe: Holland 032-18111



Talk is Cheap. It's Performance That Counts.

Today's system software buying decisions will affect your company for years to come.

Before you select a vendor, talk to people you can trust.

If you're about to invest in system software for your mainframe, here's some free advice that may surprise you:

Go slowly.

The decision you're making will be felt for years to come throughout your entire organization. So don't try to shortcut the selection process.

And in particular, don't make a decision without talking to people with first-hand experience—the users of the products in question.

Naturally, we believe that Software AG products offer the best solutions available to the problems you face. And we'd like to have an opportunity to convince you—not by competitive claims and counterclaims, but by demonstrated performance in real-world customer sites.

In the meantime, we'd like to offer a few thoughts on some factors that contribute to performance.

Needed: integrated, long-term, worldwide solutions.

If you've been involved in data processing for any length of time, you already know more than enough about the dangers of piecemeal "quick fixes". You don't have to be sold on the value of integrated tools that meet a full range of organizational needs through a common syntax and shared procedures.

But while many vendors preach integration, few practice it on the scale of Software AG. From our core products, ADABAS and NATURAL, we have created an entire universe of software products that simultaneously meet the needs of everyone from MIS professionals to end users with no programming experience.

We're also integrated in another way—geographically. As more and more organizations seek to coordinate resources and data on a worldwide basis, they need a caliber of support that is consistent worldwide. Software AG's reach is unique among independent software vendors—with products installed in 52 countries.

Fourth-generation technology: Who needs it? Who's got it?

A lot of vendors have expended a lot of hot air on the subject of fourth-generation languages. And we'd be the last to deny that a well-designed 4GL like NATURAL can be a phenomenal productivity tool—as much as 10 to 20 times more productive than COBOL, for instance.

But the language itself is only part of the story. Because in committing to a fourth generation system, you're really committing to an entire technology for meeting your organization's needs. You'd better be sure that technology includes everything you need—from DBMS, 4GL, and data dictionary to end-user computing tools, office systems, micro/mainframe links, and intersystem communication facilities. If it doesn't, you may be looking at only a partial solution.

In any case, don't evaluate a 4GL by itself. Evaluate it in relation to the other products that are required to satisfy your total information needs. Do they share a common architecture or syntax? Were they designed together, or are they simply marketed together? And most important of all, how do people like working with them?

We *know* how people like working with NATURAL. After all, it's the world's most widely installed, widely experienced fourth-generation language—used by over 75,000 programmers. If you're looking for insights into 4GL technology, you might start by talking with one of them.

Industry surveys repeatedly rate Software AG #1.

It's one thing for a vendor to be proud of its products. It's another for an entire industry to share in that high regard.

Yet that's just what's been happening with Software AG products. For several years, *Datapro* and *Datamation* have both published annual surveys of system software users. And Software AG has repeatedly come out on top by a variety of yardsticks. That's not rhetoric—that's performance.

Software AG: high-performance vendor to over 2000 customers.

Because system software is a long-term investment for most organizations, it inevitably carries with it a long-term relationship with the software vendor.

And for many years, we and our users have recognized the importance of that relationship. In fact, we have worked together to shape it in the interests of delivering the best possible product performance.

But while we're glad our users take the trouble to respond to surveys, we have no control over their comments.

Which makes it all the more gratifying to see the survey results. And all the more imperative that you hear what users have to say—before you buy.

Just give us a call today. Or send in the coupon. We'll be glad to put you in touch with Software AG users in situations comparable to yours, so you can find out for yourself what industry insiders have known all along:

Anyone can talk. But when it comes to performance, Software AG stands alone.

Call us at 1-800-336-3761.
(In Virginia and Canada, call 1-703-860-5050.)

I'm tired of talk.
Let me see some performance.

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Provide 24 Hour CICS Service

IBM gave dynamic file allocation to CICS ... but you need Netec's CAFC to make non-stop, round-the-clock CICS a reality. CAFC allows a single command to OPEN or CLOSE 5 or 50 files and to enable or disable the transactions. It allows CICS and your batch programs to automatically add, remove and share files.

Browse, Print and Archive CICS Dumps

The CICS Dump Display Facility offers a variety of access modes for transaction and formatted dumps. You may view or print any dump without disturbing CICS. You may selectively inhibit dump generation or archive the dumps for after-the-fact off-line analysis. CDDF automatically switches the dump data sets for you.

NETEC Netec International, Inc.
P.O. Box 18538 • Dallas, TX 75218
(214) 324-2848 • Telex 314419 TELECOM UD

NEW PRODUCTS/MICROCOMPUTERS

Continued from page 118

velopment system for microcomputers.

QE is said to be a tool for creating and maintaining programs written in Q-Pro 4 and can be used as a replacement for, or in conjunction with, the Q-Pro 4 editor.

QE allows full-screen concurrent editing. It features pop-up windows, insert and delete modes and merging of external program text and fields by row number.

QE costs $69.95.

Logic Development, 12 Garland Lane, Willingboro, N.J. 08046.

■

Pansophic Systems, Inc. has announced **Easytrieve Plus PC**, a version of its Easytrieve Plus information retrieval and data management system for IBM Personal Computers and compatibles.

The PC version features the same syntax as the mainframe version, allowing offloading of reporting to personal computers. Additional features include forms creation for data entry, a data base for storing data, an editor for entering and correcting jobs and Help windows.

The program reads Lotus Development Corp., .PRN and ASCII files.

Easytrieve Plus PC is available on a site-license basis. A 30-copy license costs $19,000.

Pansophic Systems, 709 Enterprise Drive, Oak Brook, Ill. 60521.

COMMUNICATIONS

Protocol converters

Pyramid Technology Corp. has announced Remote Job Entry (RJE)-Hasp communications capability for its **90 Series** and **Workcenter** product lines.

RJE-Hasp permits a Pyramid system to act as a communication gateway to IBM mainframes via the RJE-Hasp workstation protocol, according to the vendor.

Pyramid's implementation supports Hasp multileaving, seven input channels, seven printer output channels, seven punch-format output channels and operator console channels. These functions operate at speeds up to 56K bit/sec.

Adding RJE-Hasp capability requires Pyramid's General Purpose Synchronous Communications controller board, for $9,800, and the RJE-Hasp Program package, for $5,000.

Pyramid Technology, 1295 Charleston Road, Mountain View, Calif. 94043.

Software

Rolm Corp. has announced **Cypress Release 3**, enhanced software for its Cypress personal communications terminal.

Cypress Release 3 allows users to autodial telephone numbers or account codes from a host data application screen. It also features added terminal emulations such as Digital Equipment Corp. VT220 and Data General Corp. Dasher D210, according to the vendor.

Other features of Cypress Release 3 include an expanded data group line and password capabilities as well as improved access to public and private data bases.

Available in July, Release 3 is priced at $1,500.

Rolm, 4900 Old Ironsides Drive, Santa Clara, Calif. 95054.

Multiplexers/Modems

Data Race, Inc. has announced an upright tower model of its **Race** high-speed full-duplex modem.

The Race modem was designed for interactive applications over dial-up telephone lines by users of asynchronous ASCII terminals and personal computers.

According to the vendor, the Race tower offers an ergonomic display and a footprint only 2 in. by 12 in. Other features are said to include error-protected operation with throughput of over 1,000 char./sec. on dial-up lines.

The Race modem is priced at

Continued on page 127

Computerworld's New MICRO DIRECT SHOPPER.

An easy way for you to order micro products.

Now you can order microcomputer products directly from suppliers through Computerworld's new MICRO DIRECT SHOPPER.

Computerworld's display classified section now includes MICRO DIRECT SHOPPER, an all new section designed especially for companies that sell their micro products by mail or telephone orders.

This can mean a savings of money, time and energy in locating and acquiring the micro products that you need. MICRO DIRECT SHOPPER will appear preceeding the Buy-Sell-Swap section every week in Computerworld.

See page 139

COMPUTERWORLD
A PUBLICATION OF CW COMMUNICATIONS

HOW TO BE IN 6 PLACES AT ONCE.

Only a Falco 500 Multi-Host Terminal can open windows onto all these worlds-today.

No other product in its class delivers productivity like the Falco 500 Multi-Host Terminal.

1. THE ANSI WORLD OF DEC MINICOMPUTERS.



Because no one can match its high-performance specs. Which are—in a word—*spectacular.*

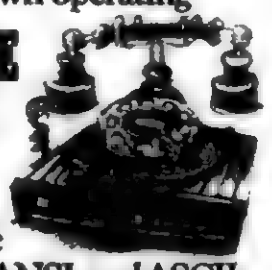
For openers, take the Falco 500's multi-host capabilities. They let you communicate with separate computers through two bidirectional ports—*concurrently.* Ports that can be configured automatically

2. THE UNIX WORLD.

as RS232C or RS422. So you can enter or retrieve data from any of the computer worlds shown here—plus hundreds of others. And switch between any of them with a single keystroke. *No other terminal today offers this kind of multi-host capability.* Period.

Then too, nobody does windows like the Falco 500. Nobody. It lets you create six windows on one screen—each one configured as a separate terminal. That means each one has its own operating

3. THE REMOTE TELECOM WORLD.



mode, compatible with virtually all ANSI *and* ASCII terminal protocols. Plus its own set of 64 programmable function key levels. And its own segment of dedicated display memory. Meanwhile, the competition's only got split screens. No contest there, either.

4. THE ELECTRONIC-MAIL WORLD.



Maybe you don't need to talk to this many applications from a single terminal—today.



But if you're getting ready to install multiple computers or replace single-function terminals—don't. Until you look at the Falco 500.

It's the only terminal that lets your operators be in six places at once—getting lots more work done. And the only one that doesn't mind if those places are ANSI- or ASCII-oriented; mainframe, mini or micro; or located in an office, factory or engineering lab. Plus the

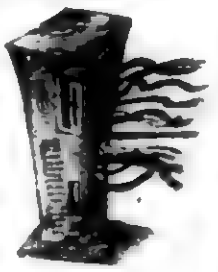
5. THE LOCAL AREA NETWORK WORLD.



adaptability of the Falco 500 means you no longer need several terminals doing just one thing at a time. Because it does six things on one terminal—half a dozen on another.

To start opening windows today on a more productive, multi-host world, contact your

6. THE ASCII WORLD OF SUPERMINIS AND MICROS.



Falco distributor.

For the one nearest you, contact Falco Data Products, 1294 Hammerwood Avenue, Sunnyvale, CA 94089; (408) 745-7123. Toll-free (800) 835-8765.

FALCO 500

THE SPECTACULAR PRODUCTIVITY MACHINE.



Introducing the most reliable DEC-compatible terminal ever built. The TeleVideo 9220.

"Why do we own thousands of TeleVideo® terminals? Because we can't afford thousands of problems."

Susan Kennedy is a product analyst at Leasametric, a company that rents, sells, and services DP equipment all over the country. Including thousands of terminals. And if reliability is important to the average user, it's critical to Leasametric. Because everything they offer not only has to stand up to the rigors of shipping, but the extra wear and tear that rental equipment always takes. And if a Leasametric machine breaks down, so does the cash flow it generates.

So before Leasametric approves one unit, they tear it apart piece by piece. And give it an evaluation that makes an MIT exam seem easy by comparison. We talked to Susan recently, and these are just a few of the things she said:

"Too many terminals just don't measure up... I've seen machines with questionable ergonomics... keyboards that flex in the middle when you type... even cheap little diodes that could drop off... all these factors combine to make a product you either want or don't want in your product line...

"But with TeleVideo, the whole product is well designed. They start with solid engineering, and follow through with every detail, down to the steel brace in the keyboard. Overall, they've built the same quality into the 9220 that's made all their other terminals last so long. Obviously, we want to make sure that, two years from now, our equipment will still be working for us. That's why we feel so good about TeleVideo."

9220 KEY FEATURES			
Super dark 14" amber screen (green optional)	✓	30 non-volatile programmable function keys	✓
Full VT 220 compatibility	✓	VT100-compatible keyboard	✓
DB25 connector for printer port	✓	Complete key click/tone control	✓
Tilt and swivel base	✓	Graphics model available	✓

Of course, Susan is talking about quality and reliability. When you check the features you get for the money, we look just as good. As you can see from the chart above, the 9220 gives you full VT 220 compatibility. A 14" amber screen. And the best thought-out ergonomics around. All for only $618.

The TeleVideo 9220. If you'd like more information, or the name of your nearest distributor, call 800-835-3228, Dept. 128. In the meantime, we'd like to leave you with a quote from Susan Kennedy, "Keeping customers happy is what my job is all about. And TeleVideo definitely makes my job a lot easier."

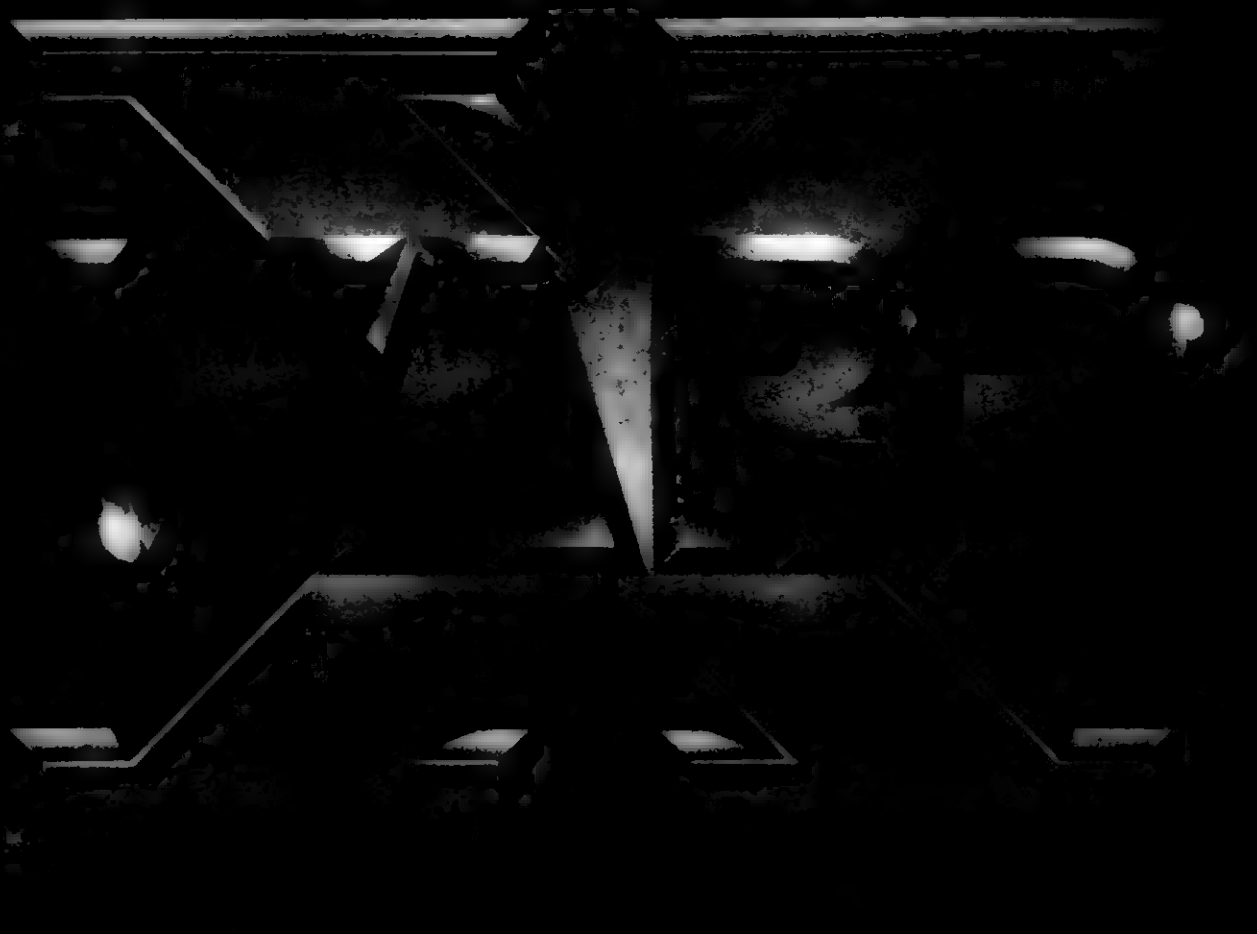
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INTRODUCING



Computer Corporation of America

A Crowntek Company

Continued from page 122

$1,495. With a second, statistically multiplexed, independent printer channel, it costs $1,695.

Data Race, 5839 Sebastian Place, San Antonio, Texas 78249.

Local-area networks

The Destek Group has announced a **local-area network configuration** for the AT&T 6300 series of microcomputers.

The configuration uses a media access protocol with a network bus speed of 2M bit/sec. According to the vendor, the Destek network continues to function even if one node on the network fails.

The product is said to be IBM Netbios compatible.

Individual node prices range from $500 to $700 depending on bus configuration, quantity and software.

The Destek Group, 830 E. Evelyn Ave., Sunnyvale, Calif. 94086.

Network services

Western Digital Corp.'s Enhanced Peripherals Division has announced the **Dialcard25**, a CCITT X.25 personal computer circuit board with GTE Telenet Communications Corp. PC X.25 software, for use on GTE's dial-up synchronous service.

Dialcard25 allows users of personal computers to utilize the X.25 dial service and communicate synchronously over the Telenet public data network.

Features include automatic end-to-end error detection and retransmission, rates up to 4.8K bit/sec. and the ability to perform multiple tasks simultaneously.

Dialcard25 is priced at $595.

Western Digital, 2445 McCabe Way, Irvine, Calif. 92714.

Test equipment

Datacomm Management Sciences, Inc. has introduced the **Network Service Manager** (NSM), a performance management system.

NSM can monitor up to 1,024 circuits simultaneously. It provides measurements for response time, bit-to-poll delay, processing time, primary and secondary text time, primary and secondary text counts, error counts, line utilization and line availability.

Other features include bidirectional application monitoring, real-time alarms and network segmentation. All protocols, such as 3270 Binary Synchronous Communications and IBM 3270 Synchronous Data Link Control/Systems Network Architecture, are applicable at speeds up to 19.2K bit/sec.

System prices range from $1,200 to $3,000 per circuit.

Datacomm Management Sciences, 25 Van Zant St., E. Norwalk, Conn. 06855.

■

Computer Systems Associates, Inc. has introduced the **Sea-1** static emulator/analyzer.

The Sea-1 is a test instrument said to plug into any microprocessor socket or system bus connector. The logical state of all lines is displayed by individual LEDs.

The Sea-1 is priced at $3,785.

Computer Systems Associates, 7564 Trade St., San Diego, Calif. 92121.

Communication Devices, Inc. has announced the **Leased Line Modem Error Reporting System**.

The Leased Line Modem Error Reporting System is said to continually monitor the signal quality and data carrier detect leads of up to 32 modems and report malfunctions to a printer.

Error messages contain information on the carrier, the circuit identification number, line destination, time and data as well as the type and duration of each error.

According to the vendor, the system is modem-vendor independent.

Leased Line Modem Error Reporting Systems are available in groups of eight lines.

Prices start at $1,500.

Communication Devices, 1 Forstmann Court, Botany Village, Clifton, N.J. 07011.

SYSTEMS & PERIPHERALS

Data storage

Plexus Computers, Inc. has announced an **expansion module** said to boost disk storage and tape backup speed for the company's Unix-based P/60 computer system.

In its minimum configuration, the expansion module includes either one 9-in. hard disk or the Group Coded Recording tape drive. The maximum configuration includes two 9-in. hard disks and the tape drive.

According to the vendor, the module allows on-line disk storage of the P/60 to be expanded up to 2G bytes. The tape drive can write 180M bytes on a standard 2,400-ft reel in fewer than 20 minutes, the vendor claimed.

The expansion module is priced from $29,000.

Plexus Computers, 3833 N. First St., San Jose, Calif. 95134.

■

Sigma Information Systems has announced the **SA-H155**, a 12¼-in.-high ruggedized industrial system enclosure with mounting for three removable media drives.

The SA-H155 includes a 480W switching power supply. Three 5¼-in. Winchester drives are located at the right front of the unit. It incorporates a 14-slot Q-bus backplane that can be used with either Digital Equipment Corp.'s LSI-11 series or Microvax systems.

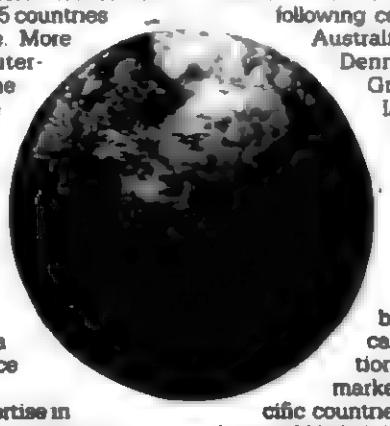
The SA-H155 is priced at $4,500.

Sigma, 3401 E. La Palma Ave., Anaheim, Calif. 92806.

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NEW PRODUCTS/SYSTEMS & PERIPHERALS

Terminals

Electro Standards Laboratory, Inc. has introduced the **Model 8029 RGB Video A/B/C Switch.**

The device is said to switch individual red, green and blue signals of the red-green-blue (RGB) coaxial video signal simultaneously. The user can switch three RGB computer outputs to one common video monitor or switch one computer output to three video monitors.

According to the vendor, all connections to the color monitors and color computers are made via connectors mounted on the rear panel.

The Model 8029 is priced at $249.

Electro Standards Laboratory, P.O. Box 9144, Providence, R.I. 02940.

■

Olympia U.S.A., Inc. has announced its **Olytext 20** screen-based typing system.

The Olytext 20 consists of a 12-in. tiltable screen and detachable keyboard. The system's CPU contains 128K bytes of internal memory, 64K bytes of random-access memory (RAM) and a 64K-byte RAM disk.

According to the vendor, characters are displayed on the screen and errors can be corrected on the screen or on paper.

With a single drive it costs $1,849; with a dual drive it costs $2,099.

Olympia U.S.A., Box 22, Somerville, N.J. 08876.

■

IBM has announced that its **3290 Information Panel Model T30** has been Tempest tested and accredited.

The 3290 Model T30 is a slim-profile display station said to display up to 9,920 characters. It provides a data/typewriter keyboard with an integrated numeric keypad, which is similar to the Model 230 keyboard but not customer modifiable.

The 3290 Information Panel Model T30 costs $9,300 including keyboard and 6-ft power cable. Annual minimum maintenance charges are $360.

IBM, 44 S. Broadway, White Plains, N.Y. 10601.

Printers/Plotters

Graftel, Inc. has announced that its **VP200** and **VP210** color video processors now support Tektronix, Inc.'s 4690 series of color ink-jet printers.

The processors provide 8- and 64-color capability, respectively. The 4692 and 4696 Tektronix printers utilize yellow, magenta, cyan and black inks and drop-on-demand technology. They provide print output at 154 dot/in. and 120 dot/in., respectively. Output can be on transparency, cut sheets or roll paper.

Graftel's video processors range in price from $1,495 to $3,495.

Graftel, 400 Executive Blvd., Elmsford, N.Y. 10523.

■

Olympia U.S.A., Inc. has introduced the **ESW 1000, ESW 2000** and **ESW 3000K** daisywheel printers.

The ESW 1000 was designed for use with personal computers. It prints 15 char./sec. and has a 2,000-char. buffer. The ESW 2000 is a wide-carriage daisywheel printer. It prints at 25 char./sec. and has a 2,000-char. buffer. The ESW 3000 has a print speed of 40 char./sec. It features a 4,000-char. buffer.

The ESW 1000, ESW 2000 and ESW 3000 cost $549, $799 and $1,699, respectively.

Olympia U.S.A., Box 22, Somerville, N.J. 08876.

Power supplies

Dranetz Technologies, Inc. has announced **Dran-Scan 1 Multipoint Power Line Monitoring System.**

Dran-Scan 1 combines an IBM Personal Computer, a Series 710 data communications multiplexer, up to 64 power-line disturbance remote monitor units (RMU) and a software package into an integrated system for monitoring power quality.

Each RMU measures and stores out-of-limit power-line sags, surges, high and low voltages and impulse transients.

The data communications multiplexer costs $2,650. The RMUs range from $1,950 to $2,950. The central processor costs $6,500.

Dranetz Technologies, P.O. Box 4019, Edison, N.J. 08818.

■

Electronic Specialists, Inc. has announced **computer power stabilizers.**

According to the vendor, the stabilizers are suitable for installations having erratic voltage and frequency. Crystal-controlled, 60-Hz, sine-wave power is said to be generated to power 250W and 500W loads. An internal battery provides continuous operation during generator changeover and other downtime situations.

A 250W stabilizer costs $1,095; a 500W stabilizer costs $1,495.

Electronic Specialists, 171 S. Main St., Natick, Mass. 01760.

PRICE REDUCTIONS

PC's Limited has announced a price reduction for the PC's Limited AT.

The AT includes the system unit with 1,024K bytes of memory on the motherboard, a 1.2M-byte floppy drive, a combined floppy and hard-disk controller card and an IBM Personal Computer AT-style keyboard, according to the vendor.

A 192W power supply, two serials and one parallel port, eight expansion slots and a clock calendar with battery backup are also included. The unit is keyboard switchable from 6 MHz to 8 MHz.

The PC's Limited AT is now priced at $1,495.

PC's Limited, Building 3, 1611 Headway Circle, Austin, Texas 78754.

CICS Users:

To increase uptime and control your file availability... Challenge DADS.

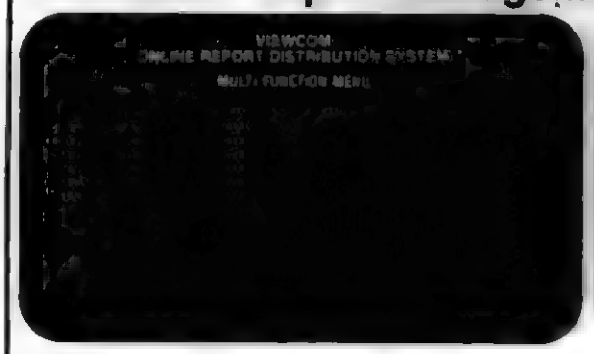
Greatly enhances CICS 1.7 allocation capability
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- Eliminates CICS downtime if files can't be allocated
- Supports all CICS startup options
- Requires no modifications to CICS
- Allocates/deallocates files by groups
- Automatically opens and closes files
- Automatically enables/disables transactions and programs
- Provides security exit and audit trail
- Automatic time-initiated allocation/deallocation
- Batch interface
- O/S core manager

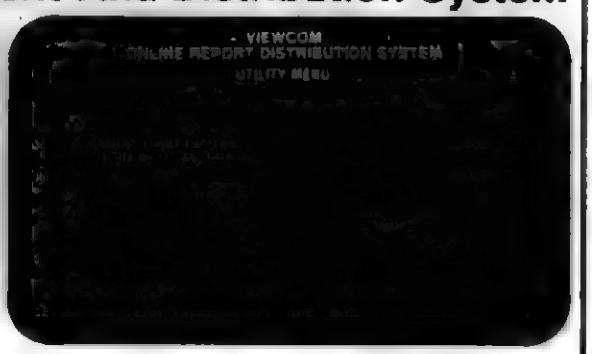
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Challenge us!

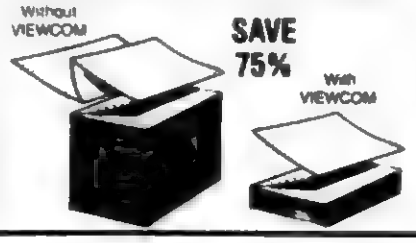
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In fact, Attachmate will buy *your* IRMA®. $800 for every IRMA you trade in for a new IBM®-compatible Attachmate 3-N-1™ Adapter.

And don't worry — the 3-N-1 is also compatible with IRMA! Hang on to your software. It'll never know the old warhorse is gone.

But unlike IRMA, Attachmate lets you keep your options open. The 3-N-1 also runs all those new IBM 3270 programs like host-based file transfer, Personal Services/PC™, VM Bond™, and more.

On top of that, as a 3-N-1 user you'll enjoy the most powerful IBM 3270-PC emulation program available. With features like multi-session windows, host printer emulation and IBM-compatible API.

Plus, the *hardware compatibility* of the 3-N-1 positions you to take advantage of all the new IBM 3270 software now being developed.

Here's the deal: for every IRMA board you replace with a 3-N-1, we'll give you $800 credit against the retail price of the 3-N-1. Your cost is just $395. It's that simple. But hurry, this offer ends ~~June 30~~, 1986.*

Find out more about how you can trade up to 3-N-1 compatibility. Call us.

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COMPUTER INDUSTRY

Section begins on page 164

Word Perfect raising profile without turning back on users

Popular software has low-key firm riding high

By Peggy Watt

OREM, Utah — As low-key Word Perfect Corp. aims for a higher corporate profile for its popular microcomputer word processing program, it is also trying to keep its small-town values. From its headquarters, just a few miles from its cofounders' alma mater, Brigham Young University, the company says it believes it accommodates its users to a degree that other, battle-worn veterans have abandoned.

Wordperfect software has never been copy-protected, which the company attributes simply to a quiet vote of faith in honesty. "It's an amazing thing about the American public," says cofounder and President Bruce Bastian. "If you force them to be honest, they won't have it."

But good intentions are only a start — building a higher profile means new promotional territory. Word Perfect, formerly Satellite Software International, took a big step recently with its first full-page advertisements in *The Wall Street Journal* and *USA Today*.

A higher profile is not just advisable, it is necessary, says Bob Lefkowits, vice-president of software research for Infocorp, a Cupertino, Calif., market research firm.

"Word Perfect has a hit product, and they're riding its trail," he says. "But a low-key approach will limit them in the long run. The name of the game in personal computer software is still marketing. There are only so many features you can add."

The company recognizes that benefit, even if it is still getting used to the methods of establishing a higher profile. "We do marketing because we have to get the news out," says W. E. Peterson, executive vice-president. "We introduce a product without too much fanfare, let it develop its following, listen to the people who use it and let it evolve."

> ***'Word Perfect has a hit product, and they're riding its trail. But a low-key approach will limit them in the long run.'***
>
> — Bob Lefkowits, Infocorp

Wordperfect corporate users include Upjohn Corp., which recently bought 2,000 copies, Ford Motor Co. and several aerospace companies and defense contractors. A deciding factor was the liberal site-licensing policy, MIS managers report.

Word Perfect's licensing plan is essentially a volume purchase agreement that allows users to upgrade their copies without returning diskettes, make their documentation and move copies among machines.

Word Perfect appears to be listening to its newest audience. It invited a dozen corporate MIS managers to an informal advisory board last January and asked for a wish list of features. Among the expected changes are easier document sharing with the addition of a standard format line; accommodation of graphics, like a spreadsheet graph; and several modes to allow users to cope with more advanced features as they become more proficient.

Word Perfect's responsiveness ensures a rosy future for its new ventures, says Jeff Tarter, analyst and editor of "Softletter," an industry newsletter based in Cambridge, Mass.

"They've really started to make some inroads," Tarter says. "Theirs is a classic case of how the market is product driven. They've worked very hard at enhancing the product and paying attention to what users want. Everybody pays lip service to that, but these guys really went out and did it."

The firm also showed its focus by recently changing its name from the ambiguous Satellite Software to the moniker of its premier product. "We tried for years and years to build some recognition," Peterson says. "But it was the product name that customers recognized, so the company switched." Also, employees were tired of fielding daily requests for satellite dish prices, adds Dan Lunt, vice-president of marketing.

The new name stresses commitment to word processing, despite the recent release of many adjunct products. "Our goal is not to become a Microsoft Corp.," Bastian says. "We are a word processing company, but we can react to other needs as well."

As the market changes, so does the competition, Word Perfect executives say. Though Multimate International Corp.'s Multimate, now owned by Ashton-Tate, has been the primary rival product, new competitors are surfacing.

Lunt names the IBM Displaywriter because of its cross-system use. Others mention Microsoft Word, because of that company's firm push into the corporate market. But Word Perfect officials say they're not worried about Wordstar from Micropro International Corp. "I think Multimate and Wordstar have peaked," Peterson says.

See WORD page 132

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Expecting strong quarter, Businessland calls off merger

Sought changes in acquisition terms

By Maura McEnaney

SAN JOSE, Calif. — In apparent pursuit of more favorable acquisition terms, computer retail chain Businessland, Inc. last week called off a proposed merger with MBI, Inc. of Rockville, Md.

Sources said the merger was halted after Businessland sought to change the terms of the acquisition in anticipation of strong fourth-quarter financial results.

Under the preliminary merger terms, sources said, Businessland planned to exchange 1¼ shares of stock for each share of MBI stock, a deal valued at about $75 million.

Speculatively, the restructured deal reduced the exchange to approximately 1¼ shares for each MBI share.

"I guess Businessland decided it should be more in their favor," said Paul Evans, an analyst at Warburg, Rowe & Pitman Akroyd, Inc. "My sense is that Businessland's current quarter is probably quite strong."

Announced in mid-April, the merger would have paired two of the country's largest computer store chains and added 36 stores and $118 million in sales to Businessland's holdings.

Businessland also announced in April plans to acquire the 36-store Amerisource chain in Kansas City.

News of the aborted merger reminded some analysts of the failed merger between 3Com Corp. and Convergent Technologies, Inc. [CW, March 31].

"It is the same thing, except it didn't happen the day before the shareholders' meeting," Evans said.

Word Perfect raising profile

From page 130

Word processing companies are battling in a large but limited market, says William Coggshall, executive vice-president of the market research firm Market Access International, Inc. of Mountain View, Calif.

"About two-thirds of the users have word processing programs, and I don't see that rising," Coggshall says. "I'd expect only average, modest growth for word processing."

Word Perfect executives, however, say they will keep growing by porting Wordperfect to new systems; a version for Digital Equipment Corp.'s Microvax is expected at Comdex/Fall '86.

In some ways, Word Perfect's six-year history is a typical startup-to-success story. Bastian joined his Brigham Young computer science professor, Alan Ashton, in months of feverish programming to design their flagship product. The original workroom was a closet, and the desk was a door laid across two IBM Personal Computer packaging cartons, Ashton recalls. During the code-writing, Ashton was still teaching full time.

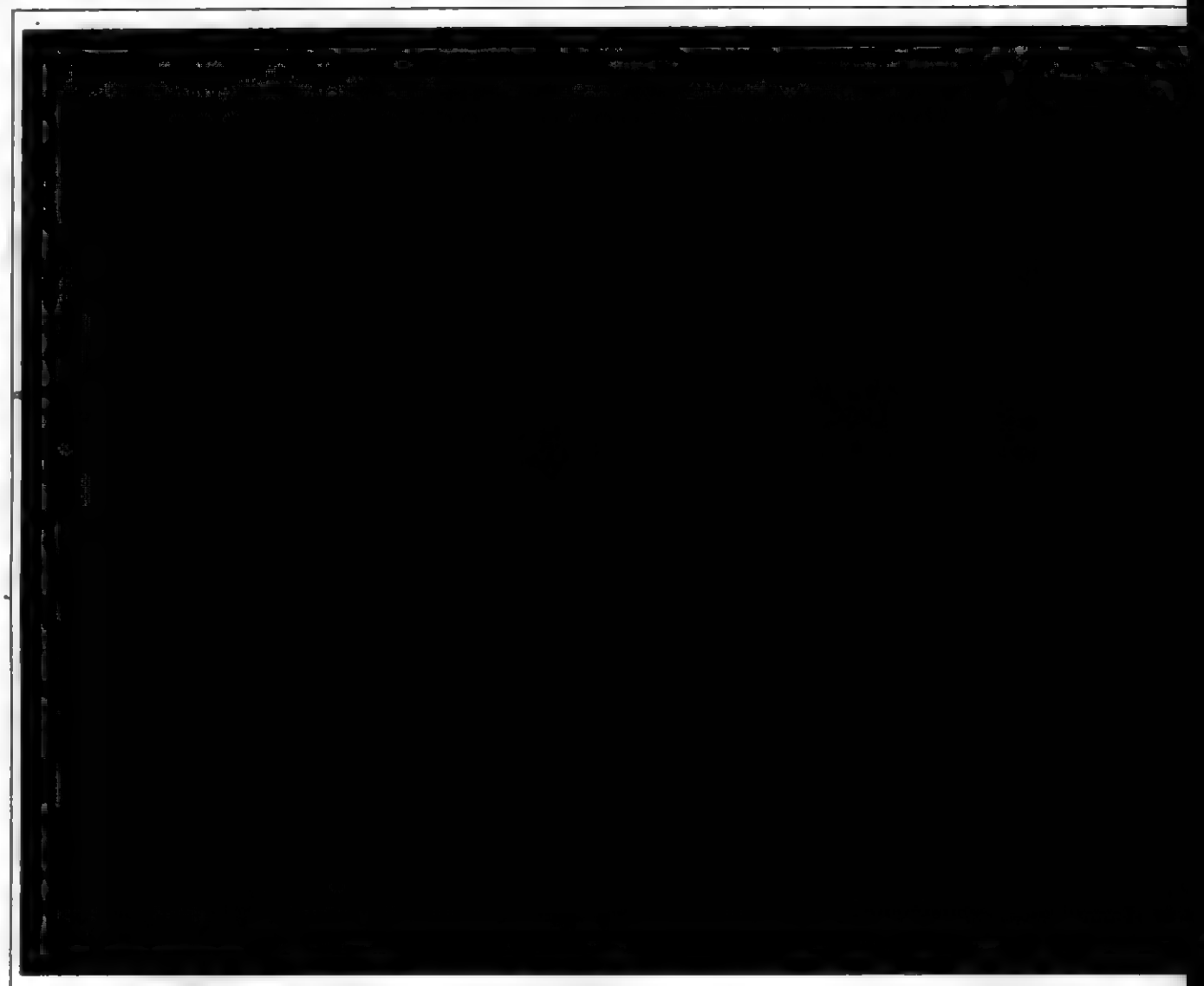
Word Perfect's work force has doubled yearly to its current level of 250, and all who joined when the company released its MS-DOS version in November 1982 are still there, Peterson says. Revenues have also doubled or more every year.

The company is still privately held and has no plans for a public stock offering. "We can't see the advantage in it," Lunt says.

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COMPUTER INDUSTRY

Sperry's Japan unit says takeover will not mean change

Says users won't be inconvenienced

By Takehisa Kondoh
Computerworld News Service

TOKYO — Nippon Univac Kaisha, Ltd. (NUK), partly owned by Sperry Corp., has reassured Japanese Sperry users that Burroughs Corp.'s takeover will not mean "the slightest change" in its products and services. Sperry, which owns 34.2% of NUK, agreed to be acquired by Burroughs May 27 for $4.44 billion.

NUK Chairman Teruo Sawachi said the "product lines of Sperry and Burroughs can coexist, and both firms' operating systems will remain intact."

Japanese Sperry users will not be inconvenienced, he said. Sawachi, however, would not say whether his firm will take specific steps to protect its Sperry customers.

Owned by three others

NUK, capitalized at $21.8 million, is also owned by Mitsui & Co., a trading house, and two Japanese mainframe makers, Mitsubishi Electric Corp. and Oki Electric Industry Co.

A large number of NUK's customers are in the securities industry, to which the firm supplies a range of Sperry hardware and software, including the 1100 mainframe series.

Yuji Ogino, director of International Data Corp. (IDC) Japan Ltd., said the takeover will speed the shift of Japanese Sperry users to competitors' equipment.

Rumors about the purchase, he said, "already deprived NUK of many mainframe users. The anxiety of the remaining users is now amplified."

'Healthy competition'

Meanwhile, some insiders in the Japanese computer industry, including Fujitsu Ltd. Managing Director Rinzo Iwai, hailed Burroughs' takeover and said that the combined organization was "a step to bring healthy competition to the worldwide computer market dominated by IBM."

> ***'Product lines of Sperry and Burroughs can coexist, and both firms' operating systems will remain intact.'***
>
> — Teruo Sawachi
> Nippon Univac Kaisha, Ltd.

IDC-Japan's Ogino and other Japanese computer experts doubt NUK will be merged into Burroughs' Japanese subsidiary, however. There are wide gaps in the strategies the two companies have for the Japanese market, according to Ogino and other Japanese computer experts.

Since establishing NUK in 1958, Sperry has used a multidirectional strategy in Japan, tying in with various vendors including Oki, Mitsubishi and Mitsui.

Most recently, Sperry proposed a technical and procurement agreement for semiconductors and disk storage systems with Hitachi Ltd.

Burroughs, meanwhile, has controlled its market presence in Japan only through Burroughs-Japan. "This difference of market strategy is too substantial for the two Japanese subsidiaries to mesh with each other easily," one industry analyst said.

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Can a shotgun wedding work?

From page 164

tions, pooled resources and combined research and development of Burroughs and its new wholly owned subsidiary, critical mass is only a means to an end. Only one group can answer the question, Will it work? It's the users.

In the large-scale mainframe MIS world, IBM is a factor in virtually every purchase decision made. Although the "no one ever got fired for buying IBM" mentality has thankfully dissipated somewhat, the fact remains that non-IBM vendors must provide customers with a solid reason not to buy IBM.

The MIS director may be bowled over by the price/performance of a Sperry or DEC or Tandem Computers, Inc. system, but he still has to convince more conservative higher-ups to stray from the Big Blue nest.

Right now, a lot of users don't see that solid reason in Burroughs-Sperry. Sperry users have said openly in the trade press that they're concerned about the future of Sperry architecture. If they don't like what

Computer industry section begins on page 164.

they hear, they may turn to IBM, which will be more than willing to lend a sympathetic ear and a 3080 leasing contract.

Burroughs-Sperry management has a lot of reassuring to do. Sperry must overcome its lukewarm reaction to the takeover and convince its users that product lines and migration paths will be preserved.

Sperry must do so in a better fashion than the indirect way it informed customers of the operating system license fees for third-party channel buyers that it instituted earlier this year. The firm is reportedly sending a letter to its largest customers explaining the takeover situation — a good sign. For Burroughs, the year-long effort for the computer merger deal of the century can't stop here. Blumenthal may be the conqueror, but his will be a Pyrrhic victory if users decide bigger is not better.

It may, of course, be at least 18 months before the jury of collective MIS purchase decisions returns its verdict on the merger. The management of this yet-to-be-named $10 billion vendor gave itself quite a challenge in three weeks of sometimes acrimonious takeover talks by building up skepticism among its users.

Overcoming that challenge may prove even harder than executing a successful tender offer.

■

Every stock market investor should be as fortunate as IBM. Big Blue decided to play the market recently, authorizing the buyback of up to $1.5 billion worth of its shares when they were trading at the sluggish level of $147.

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CBEMA: Trade bill news mixed

From page 164

Taiwan and West Germany.

CBEMA officials said the provision, sponsored by Rep. Richard A. Gephardt (D-Mo.), is protectionist and invites retaliation against U.S. exports.

On the other hand, Maxwell said, several other provisions would be beneficial to the industry, including the measure to open foreign markets to U.S. telecommunications products and services.

The Trade and International Economic Policy Reform Act of 1986, which awaits Senate action later this year before it becomes law, was designed to fight "unfair" foreign import practices. It was also designed to improve the climate for U.S. exports in hopes of reducing the U.S. trade deficit.

Trade deficit worsened

The U.S. trade deficit in telecommunications equipment worsened during the first quarter of 1986 by 30.3% to a deficit of $402 million, according to CBEMA's latest statistics. Exports declined 8.3% as imports increased by 13.3%.

"The increasing negative balance is far more a reflection of foreign trade barriers to U.S. telecommunications products than it is on the industry's competitiveness," commented Vico Henriques, who is CBEMA's president.

"It is no accident that telecommunications equipment trade with the Far East showed the greatest deficit," he continued.

"CBEMA and the U.S. industry will continue to insist upon open markets abroad in all of the upcoming trade negotiations," Henriques said in a statement.

First-quarter decrease

The latest trade figures for the computer and business equipment industry showed that sector's positive trade balance decreased by 7.9% in the first quarter of 1986 to $1.281 billion, CBEMA reported.

Exports declined by 9.5% and imports declined by 10.1%, reversing the pattern of import and export increases in 1985, Henriques said.

The computer industry has maintained a positive trade balance with all world regions except the Far East, CBEMA noted.

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Major Japanese vendors report first profit setbacks in years

Semiconductor slump, weak yen responsible

By Yasuko Yoshimi
and Takahisa Kaneda
Computerworld News Service

TOKYO — Several major Japanese electronics vendors recently issued annual financial reports showing the first setback in profits that those companies have experienced in years.

Only the computer manufacturing divisions of those firms were able to post positive revenue growth, the financial reports showed.

The cause of trouble for the Japanese electronics industry appears to be the increasing strength of the Japanese yen against the U.S. dollar and the continued recession in the worldwide semiconductor market.

Hitachi financials

Among those that issued weak financial statements for the 1985 fiscal year was Hitachi Ltd., Japan's largest electronics supplier. Hitachi suffered its first year-to-year decline in revenue in 10 years, while its profits dropped for the first time in 11 years.

At Toshiba Ltd. and Mitsubishi Electronics Corp., sales and profits eroded sharply. Toshiba's revenue recorded its first year-to-year drop in 20 years, while Mitsubishi suffered its first yearly sales setback in 10 years.

Hitachi and Toshiba reported year-to-year revenue declines of $165.7 million and $118.3 million, respectively, and each maintained those drops stemmed from foreign exchange fluctuations. Fujitsu Ltd. blamed the semiconductor recession for its more than 67% profit decline.

Some of the firms that issued overall weak fiscal reports, however, showed double-digit growth in computer sales. Industry leader Fujitsu became the first Japanese firm with annual computer system revenue of more than $6 billion. Fujitsu, NEC Corp. and IBM Japan, Japan's three largest computer firms, showed an average 19.8% systems sales growth over the previous year.

In other Japanese financial news, all six of Japan's largest semiconductor manufacturers have curtailed 1986 investment spending. The Japanese chip makers announced a 30% cut in aggregate investment, which this year will total $1.83 billion.

The six — NEC, Hitachi, Toshiba, Fujitsu, Matsushita Electronics Corp. and Mitsubishi — cut back their investments in 1985 by 38.3% to $2.6 billion.

Investment reductions

Semiconductor investment reductions were deepest at Mitsubishi, which plans a 43% cut to $194 million. NEC will spend $411 million, down 30%; Hitachi, $353 million, down 33.3%; Fujitsu, $200 million, down 29.2%; and Matsushita, $235 million, down 33.3%.

Toshiba, which leads the Japanese effort to develop the next generation of semiconductors, minimized its investment cuts to 16.7%, or $441 million.

Last December, Toshiba became the first Japanese chip vendor to enter volume production of 1M-bit dynamic random-access memory chips.

Despite the investment cuts, domestic chip-manufacturing observers foresee a sharp production recovery this year. They estimate production by the six vendors will grow by an average 17.2% to $12.37 billion.

Echoing this outlook, the Ministry of International Trade and Industry recently reported Japan's semiconductor productivity has turned the corner and posted 2.8% growth in March.

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See page 139

COMPUTERWORLD
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Convergent sees 2nd-quarter losses

SAN JOSE, Calif. — Two months after its failed merger with 3Com Corp., Convergent Technologies, Inc. is anticipating second-quarter losses because of declining OEM business with AT&T Information Systems.

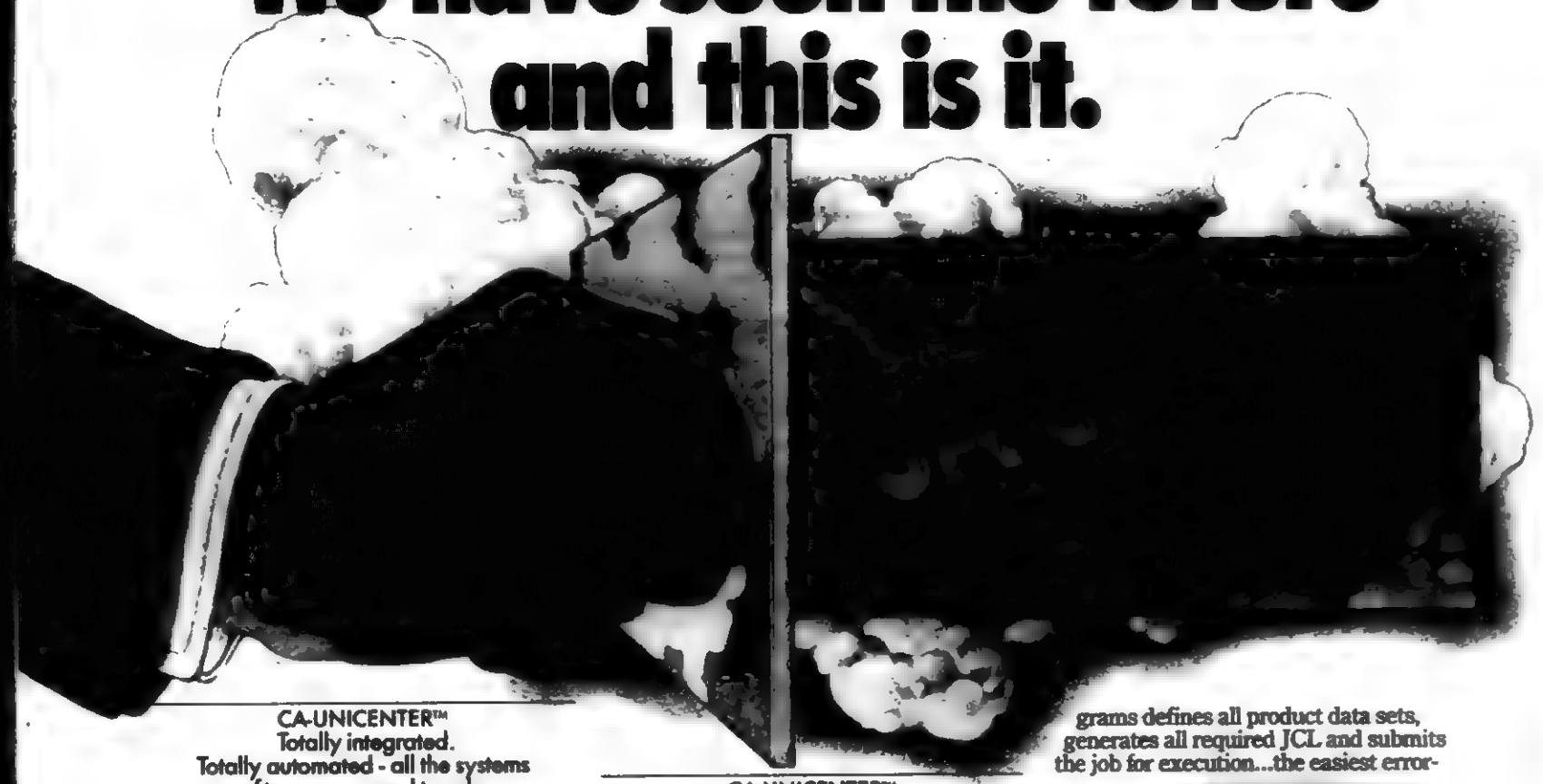
Convergent President Paul Ely told shareholders recently that shipments to AT&T dropped 30% in the quarter. The company expects sales of its Unix-based Personal Computer to AT&T will drop to no more than $30 million in the second half of the year, from about $60 million in the first and second quarters.

"Nobody is going to be making any money anytime soon," said Bruce Lupatkin of Hambrecht & Quist, Inc. in San Francisco. Analysts are also waiting to see what impact the merger of Burroughs Corp. and Sperry Corp. will have on Convergent's OEM business, since Burroughs is currently a large Convergent customer.

Ely told shareholders Convergent's large cash reserves will be used to acquire a number of companies producing turnkey systems in vertical markets. It is expected the first of those acquisitions will be Baron Data Systems. Convergent currently owns 40% of Baron Data, an Oakland, Calif., systems integrator in the legal and medical markets.

— Maura McEnaney

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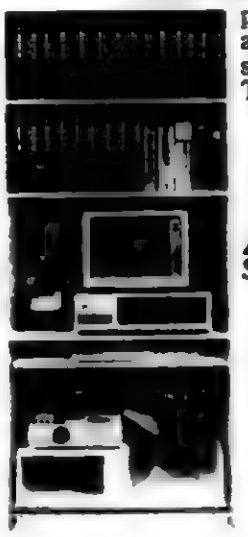
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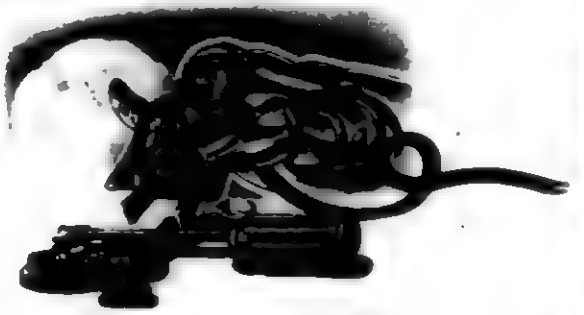


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Computer lessors enter hot telecommunications market

Comdisco finds strong digital PBX demand

By Alan Alper

In an attempt to counteract ebbing growth rates in the bread-and-butter mainframe and peripherals portions of their businesses, computer leasing firms are diversifying their portfolios by adding telecommunications products.

And with good reason.

According to the American Association of Equipment Lessors (AAEL), telecommunications is the fastest growing category in the leasing business. The AAEL estimated that leasing of telecommunications equipment, including telephone switches and voice/data private branch exchanges (PBX), grew from $3.4 billion in 1983, constituting 5.7% of the $61.2 billion business equipment leasing industry, to $8.8 billion in 1984, or 11% of the $80.8 billion total market.

Although figures for 1985 are not expected to be available until later this month, an AAEL spokeswoman said growth in the telecommunications leasing portion of the business continues apace. "The telecom area is continuing to grow, and leasing usually follows growing areas of the economy," she said, noting that preliminary 1985 estimates place the total leasing market at $94 billion.

The market for telecommunications is growing, she said, because of the deregulation that followed the breakup of AT&T in 1984. "It's opened up new markets and demand for new equipment," she added.

Charles Greco, vice-president of financial services at the market research and consulting firm International Data Corp. (IDC), said that since most computer lessors are closely tied to the fortunes of IBM, the industry leader's sluggish performance is dictating the current telecommunications embrace.

"Most of the lessors are IBM junkies," he suggested. "If IBM isn't shipping products, they have to diversify their portfolio in the event all hell breaks loose. Telecommunications products seem to be the most logical move."

One computer leasing company considered a pioneer in the telecommunications market is Comdisco, Inc. From a standing start two years ago, Comdisco expects to tally between $150 million and $200 million in telephone switches this year, up from $60 million last year, according to Bob Bardagy, senior marketing vice-president.

Bardagy said, given the convergence of computer and communications technology, the leasing of telecommunications gear is a natural extension of what Comdisco has done since it was founded in 1969.

"The guy who is making the decision on a PBX is usually close to the guy making the decision on the computer," Bardagy explained. "With it all being under the auspices of the MIS group, it has become easier for us to lease telecom equipment."

Digital PBXs

Comdisco did not participate in the telephone switch market until the advent of digital PBXs, Bardagy said, because such products better fit the firm's overall leasing strategy. With digital switches, there appears to be guaranteed remarketing value. "If people are moving from location A to B, they might not want to bring their digital PBX, so we'll lease them a new one and remarket the old one," Bardagy noted.

While large lessors such as Comdisco are embracing telecommunications products, many of the smaller companies are taking a cautious approach to the market. "They can't afford the overhead," IDC's Greco maintained.

Tom Martin, president of Computer Financial, Inc., said his leasing company is evaluating offering telecommunications products. "We're trying to understand the residual value before we get in," he said.

The problem, Martin stressed, is that there is not enough market research available to enable lessors to ascertain which vendor will persevere. "This is a new business, and it's . . . hard to say which vendors will be around in five years and which equipment will have residual value."

To alleviate the possibility of investing assets in equipment with little residual value, some lessors are pricing leases on a zero residual value basis, forcing lease prices to be artificially high, Martin noted.

Another negative factor affecting not just the leasing of telecommunications equipment but the entire leasing industry is the proposed tax reform bill currently winding its way through the U.S. Congress. As currently written, the tax overhaul bill would lower depreciation rates on equipment and repel investment tax credit, changes which most likely would impede investment in new equipment.

The AAEL spokeswoman said that despite the anticipated tax code changes, leasing will remain a popular way for companies to keep pace with technological change. "That's even more true in the telecommunications area where technology is changing rapidly," she said. "Leasing is a hedge against obsolescence."



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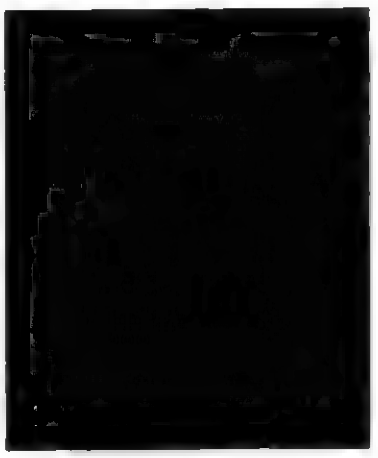
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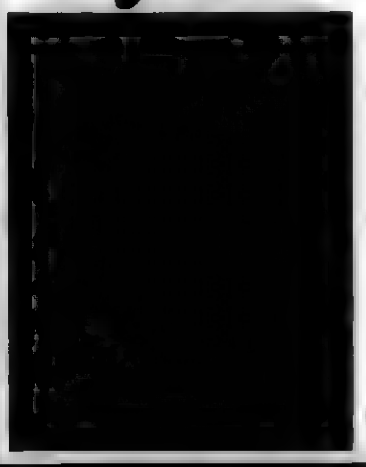
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Hey, got a friend? Don't know? Check your database! What? No database!? Have we got a deal for you (and your friend). Until June 30, Microrim will send you a *complete* second copy of Rbase 5000 free when you send in your warranty card and a copy of our sales invoice. So you can get together with your friend, split the cost for one and get two! Or, you can keep the extra copy at home, at a branch office, or down the hall. Rbase 5000 is easy to learn and operate, and has the custom reporting features most users need. Remember, the two for one offer is only good from April 15 till June 30.

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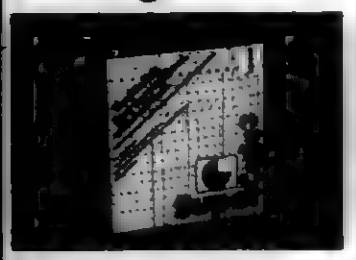
64K (200Ns)	$12 ea. set
64K (150Ns)	$15 ea. set
128k or 256k (150Ns)	$39 ea. set

Bernoulli Berserk!

We've got a problem. The prices we're able to offer on Bernoulli boxes are changing about 10 times faster than we can change this ad. Probably because the machines are selling about 10 times faster than anyone ever dreamed they would. The 20 Meg and 40 Meg versions feature two ½ height drives with removable cartridges. There's a 90 day warranty, and we're an authorized Bernoulli service center—turnaround on repairs is usually 24 hours. Here are our latest up-to-date-but probably obsolete by-now prices!

Bernoulli Box 40 Meg $2499
Additional 20 Meg Cartridge $89
Bernoulli Box 20 Meg $1999
Additional 10 Meg cartridges $51
Bernoulli Care Kit $79

Supercalc ifragilistic!



SuperCalc 3 is the kind of product that you'd be proud to bring home to your mother. Like Lotus 1-2-3 it offers spreadsheet, information management and presentation graphics. But it only needs 128k of RAM, and is not copy-protected. It also is compatible with the Hercules Monochrome Card, as well as the Enhanced Memory (EMS) and Enhanced Graphics (EGA) standards. And you get a free copy of Sideways, the program that lets your printer think horizontal is vertical.

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SixPakPlus Minus$!



AST is so wrapped up in Enhanced Memory and other arcane subjects that they've been letting the price slip on their original claim to fame—the AST SixPakPlus, one of the original and best multifunction cards. So if you're just starting in computing, or outfitting a second unit for home, now's a great time to buy this basic piece of hardware. You get a clock calendar, serial port, parallel port, up to 384k of memory, and copies of two classic unprotected programs—Sidekick 1.5 and DESQView. A genuine deal.

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SixPakPlus 384k (fully populated) $219

Herculean rebate!

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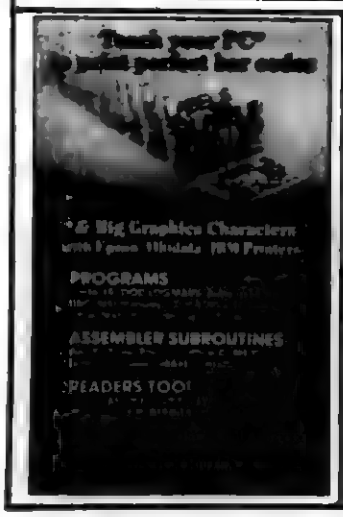
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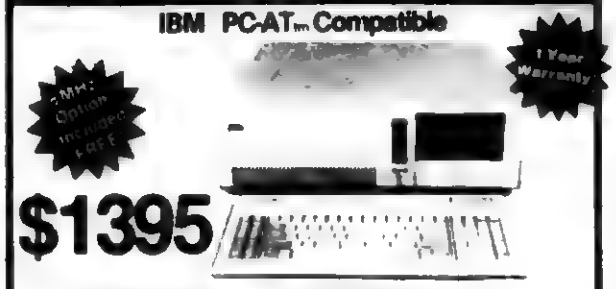
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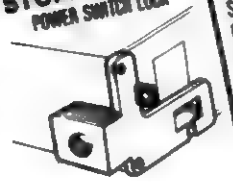
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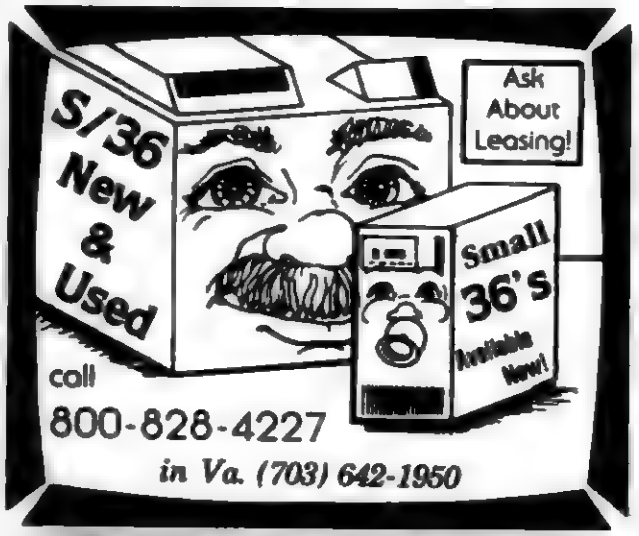
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- June 30 - **Integrated OA Systems**
- July 7 - **Data Security**
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- July 28 - **Management Training for DP Executives**
- August 11 - **Information Centers**
- August 18 - **On End-User Computing**
- September 1 - **The MAP Marketplace**
- September 8 - **Computer Leasing**
- September 22 - **Communications Standards**
- September 29 - **On-line Computing**

Product Spotlights

- June 23 - **Personal Comp. Graphics**
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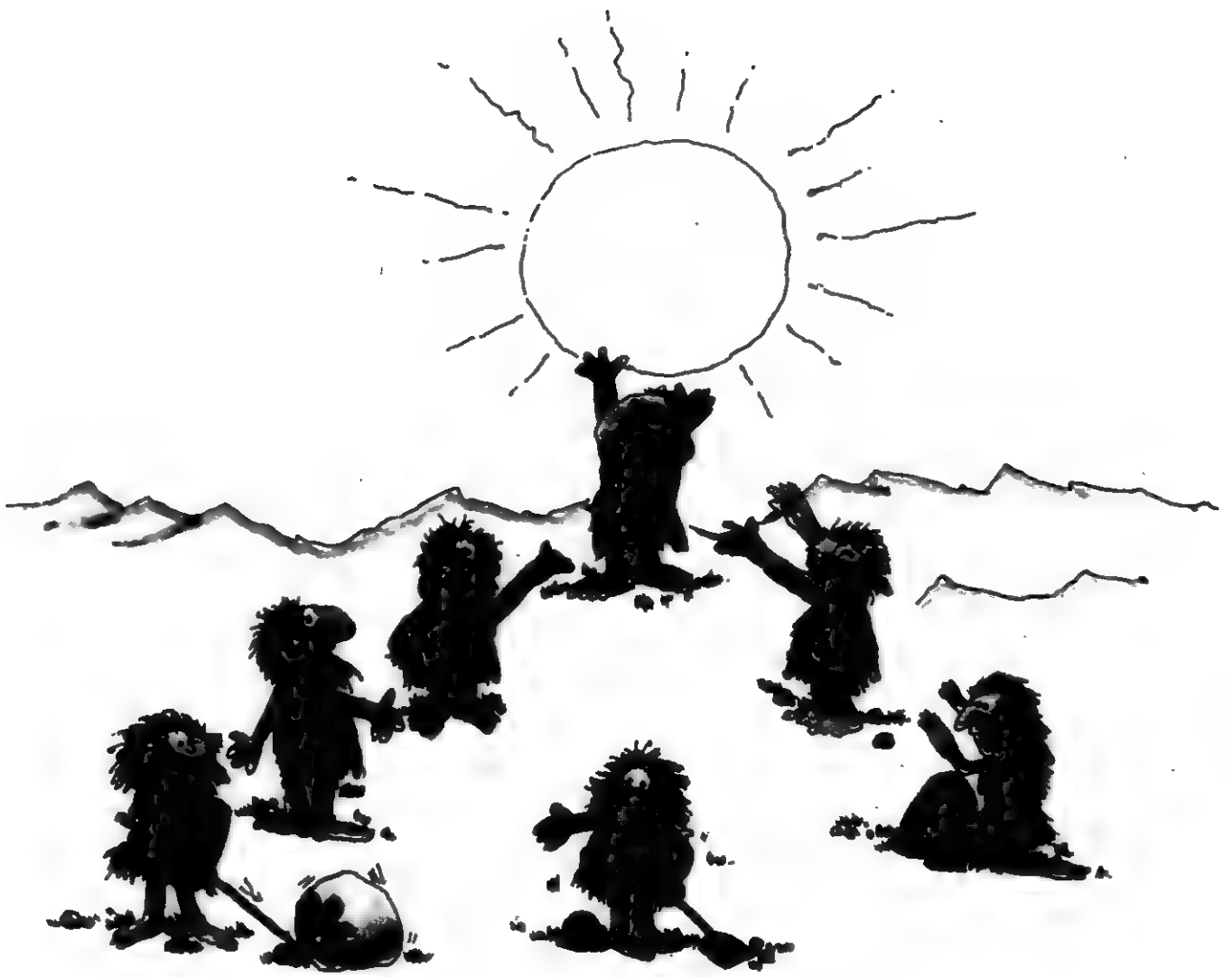
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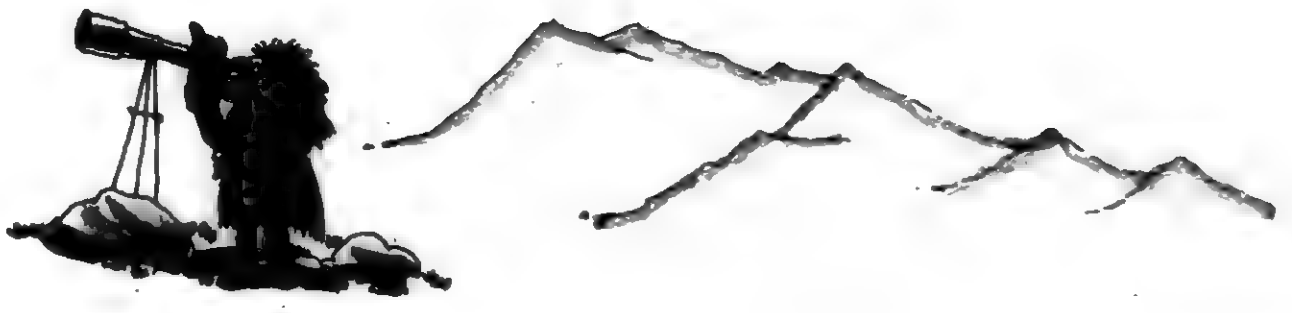
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Software Engineer — Microprocessor High Technology *(371-03)* Major high technology manufacturer located in suburban San Diego seeks Microprocessor Software Engineers with three years of real-time software design experience on Intel 8080, Z-80, or Motorola using Assembler, C, or PLM. BSEE or Computer Science degree a plus. To $45,000.

IMS and CICS Systems Programmer — Team Environment *(371-03)* Large San Diego based organization seeks professionals to assist in system upgrade utilizing multi-CPU's and a large network of terminals. The company is stable, yet progressive. To $45,000.

Analyst — Communications *(371-04)* Growing San Diego Government consulting firm needs people experienced in Secure Communications or Verification and Validation. To $45,000.

DEC VAX System Programmer *(371-07)* Northern San Diego software company Manage and tune their VMS system. Will interface with Applications Programmer and assist in training. To $45,000.

Programmer/Analyst — RPG III *(371-09)* One of San Diego's fastest growing companies is expanding their System 38 group. Will develop new on-line systems. To $35,000.

Real-Time Control Programmers *(371-10)* A San Diego firm has a multi-year project to create real-time control systems [illegible] nuclear energy facilities. Experience required with drivers/handlers, data acquisition, and control systems on 16-bit microcomputers using Assembler language. To $45,000.

Software Engineer — Vision Systems *(371-11)* Rapidly expanding San Diego firm is adding to their vision systems group. Person will develop machine vision inspection systems on DEC VAX and IBM PC's. To $50,000.

Software Engineer — ADA *(371-12)* Leading San Diego systems software development firm needs Programmers to support development of ADA language compiler and tools. To $35,000.

HP3000 Programmers *(361-02)* Rapidly expanding hi-tech firm seeks HP3000 Applications and Systems Programmers, preferably with manufacturing applications, to learn 4th generation development tools. Lots of opportunity to develop new systems and learn IBM mainframes. Southern California. To $38,000.

QA Analyst/Management Opportunity *(361-05)* Major division of international [illegible] located in Orange County seeks a QA Analyst with experience in systems development, EDP auditing. Move into management. High visibility position within a rapidly expanding firm. To $50,000.

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Senior Systems Analyst — IMS DB/DC Development *(361-07)* This top aerospace organization in Southern California offers an outstanding benefits package which includes Christmas week holiday. Work with on-line data base applications exclusively. Position requires manufacturing or financial applications experience in an IBM mainframe environment using IMS DB/DC. To $46,000.

IBM Programmer/Analyst — IDMS Training *(361-11)* Leading Orange County Fortune 500 company offers excellent training and a pleasant, modern working environment. Two years of OS COBOL experience required with exposure to on-line/data base applications. To $40,000.

Senior Business Systems Analyst *(361-12)* International corporation, with headquarters in Orange County seeks a Project Leader with IBM 30XX OS/MVS experience. Will recommend accounting software packages or design custom systems. IMS DB/DC preferred. To $47,000.

Hogan Specialists — All Levels *(351-01)* Progressive suburban Los Angeles financial institution seeks junior to senior level HOGAN specialists. IBM mainframe environment offers a variety of career opportunities. To $40,000.

Senior Data Base Analyst — IDMS Development *(351-02)* Opportunity to join state-of-the-art data center. Seek professional with three years data base analysis experience to provide applications. Suburban Los Angeles location. To $50,000.

Major System Development — Multiple Openings *(351-03)* Highly successful suburban Los Angeles based organization is undertaking major new system development projects. Programmer/Analyst openings in data base mainframe applications, system software, micro-computer product development. Project leader positions available. To $50,000.

CAD/CAM Programmer/Analyst *(351-13)* Southern California manufacturer seeks individual with CAD/CAM experience for a major new development. To $35,000.

Software Engineer *(351-16)* High technology software firm located in Los Angeles seeks Software Engineer with three years of compiler development experience in C/UNIX. BSEE or BSCS. To $50,000.

Programmer/Analysts — Major System Development *(351-18)* Multiple Openings. Successful suburban Los Angeles based organization is undertaking major new system development projects. New Programmer/Analyst openings in data base mainframe applications, system software, micro-computer product development and multiple project leader positions. To $50,000.

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Consultants — Big 8 Prestige *(351-20)* Los Angeles based practice of major Big-8 firm is committed to significant expansion. Excellent opportunities for senior-level professionals with background in manufacturing, financial or administrative systems. To $50,000.

FOCUS Programmer/Analyst *(351-21)* Southern California Fortune 500 company offers a highly visible position for a FOCUS Programmer Analyst to work in an information center environment. You will support various user groups and develop applications to meet their needs. To $38,000.

UNIX Systems Programmer *(351-23)* Santa Monica based employer engaged in development of hardware/software products, seeks experienced UNIX Internals Systems Programmer to support and enhance software. To $50,000.

Department Leader — MVS *(351-25)* Prominent financial services firm seeks a professional experienced in MVS systems programming. Will lead installation of MVS and provide technical leadership to department. Attractive new quarters near popular Southern California beach community. To $50,000.

NORTHERN CALIFORNIA

UNIX Systems Programmer *(341-01)* Major San Francisco Bay Area vendor is seeking UNIX Development Engineers. Requires kernal knowledge in Berkeley and AT&T UNIX for this highly visible position. To $55,000.

DoD Contracts Awarded — Silicon Valley *(341-02)* Positions available in Program Management, Satellite control, mission planning configuration management, digital signal processing and test and integration. Skills needed are ADA, JOVIAL/73, PASCAL or FORTRAN to be used in a state-of-the-art development environment. To $70,000.

Software Engineers — Project Leaders *(341-03)* Utilize your experience in Digital Signal Processing or high speed image processing to grow with this rapidly expanding supplier of multibus systems. Prefer VAX, UNIX, PASCAL and C. Any EW experience is a plus. San Francisco Bay Area location. To $50,000.

Software Engineer — Development *(341-04)* Join this prestigious, highly visible development team with a multi-[illegible] in-[illegible] oping their next generation of products. In-depth knowledge of IBM MVS operating systems and heavy Assembler experience sought. Silicon Valley. To $45,000.

Product Marketing Manager — Mini/Micro Computers *(341-08)* Prestigious nationwide computer vendor in San Jose is looking for an experienced professional to manage the integration of a product from engineering definition through product life cycle and marketing distribution. Experience in marketing a computer product is required. To $60,000.

Customer Support Systems Engineer *(341-09)* Dynamic young company located in the San Francisco Bay Area is looking for Systems Engineers to support their Banking and Insurance clients. Three to five years experience in CICS, IMS-DC in an IBM MVS environment. To $48,000.

Software Engineer — A.I. Start-Up Opportunities *(341-10)* Many positions open for experienced Software Engineers with backgrounds in customer support, knowledge engineering, UNIX internals, LISP or PROLOG, compiler development. Silicon Valley location. To $100,000.

Senior Programmer/Analyst — HP 3000 *(341-12)* Consulting division of major worldwide corporation seeks individuals with application development experience using COBOL in an HP 3000 environment. Strong promotional opportunities for those willing to assume additional [illegible] Silicon Valley. To $38,000.

Programmer/Analyst — Management and CICS Training *(331-01)* Rapidly expanding San Francisco data processing organization seeks a professional with at least two years of IBM OS/COBOL and VSAM experience to work on information systems. Excellent opportunities for advancement. To $40,000.

Programmer/Analyst — Long-Term Growth Position *(331-04)* Major San Francisco manufacturer seeks aggressive, results-oriented individual with two years System 34 or 36, RPG II experience. New system development project offers skill enhancement and promotion potential. To $42,000.

Programmer/Analyst — IMS DB/DC *(331-05)* Major California department store chain offers highly visible and challenging opportunities to professionals with four years structured COBOL and some IMS experience in an IBM/OS environment. Excellent training program. Beautiful suburban San Francisco location. To $50,000.

Systems Programmer — Communications, MVS, IMS *(331-08)* Leading San Francisco computer manufacturer seeks Systems Programmers with a minimum of two years in installation, troubleshooting, and product support of network systems, VTAM, SNA, MVS, IMS, and VM/CMS. Must have experience in multiple major system products support. To $48,000.

OREGON

Software Engineers — Hi-tech Start-up *(311-01)* Portland based high-tech software firm developing application specific software for Array Processors. Multiple opportunities in Signal/Image/Seismic processing, Cat/Medical imaging, CAD/CAE simulations, ASW, etc. Requires solid background in mathematics with FORTRAN or Assembler. To $45,000.

Programmer/Analysts — New Development *(311-02)* High-growth Portland manufacturing firm has just begun a large new development effort to install fully integrated Manufacturing and Financial applications. Seek professionals with two or more years in applications development with solid skills in CICS, ADDS/O, IDMS structured programming and COBOL. Excellent growth potential. To $36,000.

Data Base Architect — Relational Data Base *(311-03)* Extremely progressive Portland firm seeks a Data Base Technical Professional for an exciting research and development project. Lead the implementation of a relational data base and data base machine. Requires a strong technical background in relational data bases such as DB2, ORACLE, INFORMIX or SEQUEL, and knowledge of data modeling, normalizing, and data views. Excellent technical career opportunity. High visibility. To $50,000.

Programmer/Analysts — Minicomputers *(311-05)* Expanding software house has recently created multiple opportunities for Programmer/Analysts with solid backgrounds in BASIC language and the PICK operating system. Develop new on-line applications for Order Entry, Manufacturing, Inventory and Financial applications. Excellent career growth potential to lead positions, management or technical areas. Very progressive and creative environment. Portland. To $35,000.

Applications Engineer — UNIX O/S *(311-06)* Well-established hi-tech company for OEM market manufacturing a 32-bit multi-board computer seeks experienced and innovative individuals to develop operating system, drivers, utilities, etc. Campus atmosphere in a hi-tech park allows individuals to work in a creative, atmosphere. Requires knowledge of C and UNIX internals. Portland. To $50,000.

Systems Analysts — Growth to Management *(311-08)* Utilize your strong verbal and written skills as well as structured design techniques to lead special projects in a pure Analyst role for this well-established Portland company. Initially you will be involved in the conversion of manufacturing systems [illegible] to IBM 4XXX under MVS. Requires four to six years of solid background as PA and SA in COBOL with one year experience in CICS. Data base experience is very helpful. To $36,000.

Software Engineers — Graphics *(311-09)* Four year old rapidly growing hi-tech firm specializing in software and firmware for graphics applications has recently created new, exciting career positions for Software Engineers. Positions exist in graphics applications, data base applications, firmware development, and quality assurance. Requires experience with C, UNIX, Graphics Applications or Graphics Kernal. Portland. To $40,000 plus stock.

Senior Programmer/Analyst — CICS *(311-10)* Rapidly expanding, well-[illegible] based seeks professionals for the design and development of applications to support a variety of applications including distribution, inventory and Financial in an on-line, large scale IBM environment. Require minimum two years of structured COBOL and one year of CICS experience. Prior experience with DB2 would be a real plus. Firm offers exciting career potential. To $38,000.

WASHINGTON

Data Base Analyst *(301-01)* Seattle office of well-established manufacturing firm is expanding its staff to add to the company's data base administration. Successful candidate will possess expertise in a major data base management system such as IMS, TOTAL or IDMS. To $42,000.

Micro Systems Software — Industry Leader *(301-03)* Rapidly growing Seattle based software development organization has several openings for Micro Systems Software Specialists. Position involves design and development of leading edge products such as compilers and operating systems for major microcomputers. To $40,000.

Systems Programmer *(301-07)* Expanding Northwest firm offers state-of-the-art exposure to an experienced IBM OS Systems Programmer. The successful candidate will join the state industry leader while enjoying the unique advantages of the Pacific Northwest. CICS, MVS/XES systems, internals desirable. To $45,000.

Programmer/Analyst — On-line Development *(301-08)* Major Seattle firm is offering the opportunity for solid IBM OS/COBOL Programmers to learn both CICS and IMS/DC. Minimum of two years experience is required. Relocation assistance. To $35,000.

Telecommunications Systems Programmers *(301-09)* Large manufacturing firm located in the Pacific Northwest has multiple opportunities in IBM communications systems. Develop, implement, and design networks. IBM ACF/NCP, VTAM/NCP, BTAM, SNA experience helpful. To $50,000.

Software Engineers — CAD/CAM/CAE *(301-12)* Highly successful suburban Seattle based company which develops manufacturing/engineering software products, has multiple openings. Background in CAD/CAM/CAE, CADAM, CATIA or CADDS desired with FORTRAN C or PASCAL IBM mainframes. To $40,000.

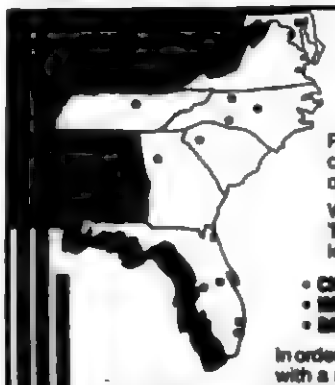
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AN OPEN LETTER TO SENIOR INFORMATION SYSTEMS PROFESSIONALS

The County of San Bernardino Office of Management Services is looking for several highly qualified and motivated senior Information Systems professionals, to fill Programmer Analyst III and Programmer IV positions. These are the top positions within their classification series.

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San Bernardino County is ideally located in Southern California for access to mountains, beaches, and deserts. I think you'll find our cost of housing, and living expenses in general, substantially less than the larger metropolitan areas to the west and the south. We are the largest County in the continental United States, and one of the fastest growing. Because of this, there will be plenty of challenges and opportunities for our Information Systems organization for many years to come.

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M.J. HOWARD
Director of Information Systems

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France: Axel LeBlois, Computerworld Communications S.A., 185 Avenue Charles De Gaulle, 92200 Neuilly Sur Seine, France. Phone: 747 1272. Telex: 613234 F.

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Italy: Daniele Comboni, Computer Publishing Group S.R.L., Viale Restelli 5, 20124 Milano. Phone: (2) 688 9773. Telex: 333436 (GEJIT).

Japan: Mr. Shuji Mizuguchi, Computerworld Japan, 7-4 Shintomi 1-Chome, Chuo-ku, Tokyo 104. Phone: (03) 551-3882. Telex: 252-4217 (Computerworld Japan only).

Steven Yamada, Tokyo Representative Corp., Sanshin Kogyo Bldg., 2-10 Kando Jimbocho 3F, Chiyoda-ku, Tokyo 101, Japan. Phone: 230-4117. Telex: J26860 (reps for all CWCI publications except Computerworld Japan).

Mexico: Henry Morales, Computerworld Mexico S.A. de C.V., Oaxaca 21-2, Mexico City 7 D.F. Colonia Roma, 06700 Mexico. Phone: (05) 514-4218. Telex: 177 1300 (ACHAME).

The Netherlands: Wout Berends, CW Communications B.V., van Eeghenstraat 84, 1071 GK Amsterdam, The Netherlands. Phone: (020) 64 6651. Telex: 18242 (CWCOM NL).

Norway: Mr. Morton Hansen, CW Norge A/S, Hovinveien 43, P.O. Box 2862, Toyen, 0608 Oslo 6, Norway. Phone: (20) 64 77 25. Telex: 76476 9 (CW NOR N).

People's Republic of China: Chen Mingkun, China Computerworld, 74 Lu Gu Gun Road, P.O Box 750, Beijing 10039, People's Republic of China. Phone: (47) 814 6174. Telex: 222214 (CCW CN).

Spain: Neil Kelley, Computerworld/Espana, Barquillo 21-3 izda. Madrid-4, Spain. Phone: 231 23 85; 231 23 86; 231 23 88. Telex: 47894 (CW E).

Sweden: CW Communicabons AB, Sodra Hamnvagen 22, S-115 41 Stockholm, Sweden. Phone: 46 8 67 91 80. Telex: 14904 9 (NOVACW).

Switzerland: Gebhard Osterwalder, CW Publikationen AG, Wiukonerstrasse no. 15, CH - 8032 Zurich, Switzerland. Phone: (01) 55 10 77. Telex: 816710.

Taiwan: Grace Tang, ACE Media Agency Ltd., Room 503, 1, Fu Hsin S. Road, Sec. 1, Taipei, 10587, Taiwan, R.O.C. Phone: 751 3636. Telex: 14142 (ACE GROUP). (Representative for all CWCI publications).

United Kingdom: Martin Durham, CW Communications Ltd., 99 Grays Inn Rd., London, WC1 8UT, United Kingdom. Phone: (01) 831-9252. Telex: 262346.

Euan Rose, Bill Dunlop, Barbara Levy, Christine Taylor, Beere Hobson Assoc., 345 Goswell Rd., Islington, London EC1, United Kingdom. Phone: (01) 278 3415. Telex: 311951. (Representatives for CWCI publications).

Venezuela: Kalman von Vajna Nagy, CW Comunicaciones, C.R.L. Torre Maracaibo, Piso 10, Oficina H, Av. Libertador, Caracas, Venezuela. Phone: 72-76-30.

West Germany: Eckhard Utpadel, CW Publikationens GMBH, Friedrichstrasse 31, 8000 Munchen 40, West Germany. Phone: (089) 38172-0. Telex: 5215350.

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COMPUTER INDUSTRY

U.S. high-tech group decries looming Canadian trade war

By Mitch Betts

WASHINGTON, D.C. — The Computer and Business Equipment Manufacturers Association (CBEMA) last week issued a statement deploring the emerging trade war between the U.S. and Canada, which has begun to affect U.S. exports of computer parts to Canada.

In retaliation against a U.S. government decision to raise tariffs on Canadian cedar shingles, the Canadian government announced it will reimpose tariffs on U.S. computer parts and semiconductors and impose tariffs on U.S. publications.

The Canadian tariff will be 3.9% for computer parts and 6.8% for semiconductors.

Canada is the leading export market for U.S. computer manufacturers, buying 15.3% of all U.S. computer exports. Just six months ago, the U.S., Canada and Japan eliminated tariffs on computer parts and semiconductors, a move that CBEMA vigorously supported (CW, Dec. 2).

"We can only deplore the protectionist pressures that have led to the current raising of tariff barriers between the U.S. and Canada," said Vico E. Henriques, CBEMA president, in a statement last week.

"This sort of trade war skirmish, which ends up harming everyone, is precisely what we have been warning against as fever has grown for protectionist trade legislation in recent months," Henriques said. "Once cross-sectoral retaliation gets started, there's no end to the jobs that can be lost and the industries harmed," he added.

On another trade matter, CBEMA urged the Reagan administration to terminate special trade benefits given to Indonesia, on the grounds that Indonesia has inadequate copyright laws. U.S. firms lose an estimated $206 million a year from Indonesian piracy, including $3 million a year in losses from software piracy.

INDUSTRY NOTES

DEC acquires Trilogy division

Making another investment in the firm in which it lost $26 million in 1983, **Digital Equipment Corp.** last week announced it would pay $10 million for **Trilogy Ltd.**'s technology group. The group is responsible for development of new semiconductor packaging techniques.

DEC was one of the original investors in Trilogy's ill-fated wafer-scale integration research project, with **Sperry Corp.**, **Control Data Corp.** and the joint venture unit of **Honeywell, Inc.** and **Groupe Bull**.

■

Comdisco, Inc. expanded its Far East leasing business, forming a joint marketing venture with six Japanese computer leasing firms under the name **Nihon Comdisco K.K.** Three of the Japanese firms are also affiliated with three of Japan's five largest banks.

■

Prior to going public in the U.S., **Borland International** plans to list its stock on the London Stock Exchange. Borland founder Phillippe Kahn said last week that he has chosen the UK's Unlisted Securities Market (USM) for his company's debut.

The USM is regarded as a less expensive, preliminary step toward a full public listing on the London Exchange. Kahn said a full listing will follow and admitted that a U.S. offering was "a strong possibility." Scotts Valley, Calif.-based Borland's move is expected to net approximately $100 million.

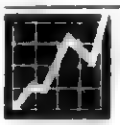
■

Facing probable acquisition by **Citicorp**, **Quotron Systems, Inc.** made an acquisition of its own. The stock quotation services vendor purchased **Securities Industry Software Corp.**, an Evergreen, Colo.-based vendor of on-line order management, brokerage accounting and other services for the financial industry. Terms were not disclosed, and Quotron said the move was not related to Citicorp's pending tender offer.

■

The ongoing saga of the future ownership of **Computerland Corp.** took an unexpected twist last week when founder and owner William Millard announced that his 96% share of the company, valued at $200 million to $400 million, is for sale. The proposed sale appears to be subject to court approval, because investor group **Micro/Vest** was awarded 20% of Millard's Computerland stake in last year's highly publicized court decision, which Millard has appealed.

Wall Street split on future of Sperry, Burroughs stocks



ACTIVE ISSUES
Kathy Porteus

"Should I hold my Sperry shares or take the money and run?"

Such is the choice Sperry Corp. shareholders have faced since Sperry (SY — 74⅜) accepted Burroughs Corp.'s (BGH — 59⅛) takeover offer two weeks ago. The merger calls for Burroughs to purchase about 54% of Sperry's shares outstanding on a fully diluted basis for $76.50 in cash and pay $76.50 in newly issued Burroughs preferred stock and convertible debentures for each remaining share.

If investors sell their Sperry shares now, they receive the stock's current value in cash, minus commissions. If investors decide to tender their shares to Burroughs, most likely they will receive half cash and half new Burroughs securities totaling a value of $76.50 per Sperry share.

Many Wall Street firms such as E. F. Hutton & Co., Bear Stearns & Co., Eberstadt Fleming & Co. and Dean Witter Reynolds, Inc. recommend investors take their profits from Sperry, now trading 35% above price levels before Burroughs' takeover.

According to Louis Giglio, a consultant with Bear Stearns, the reason behind his firm's recommendation to sell is skepticism concerning what will happen to the value of Burroughs' new stock once it is issued and begins trading.

"I would rather have $75 cash in my hand than tender my shares to Burroughs and stand the chance of receiving $37.50 in cash and a volatile equivalent in this new piece of paper," Giglio says.

Michael Geran, mainframe analyst with E. F. Hutton, says he recommends sale of Sperry because "it is fundamentally valued." Most analysts argue that the money in a Sperry share could be more effectively put to work somewhere else.

Such analysts remain neutral on Burroughs, preferring to wait until the smoke clears before recommending any action on the stock. However, Jonathan Fram, analyst with Bear Stearns, recommends sale of Burroughs because he estimates 1987 earnings of the combined company to be under $5.00 a share, much lower than the $8.00 a share predicted by Burroughs Chairman W. Michael Blumenthal.

1987 earnings of the combined company will depend on how effectively Burroughs absorbs Sperry in the next 18 months. Blumenthal expects the merger to result in cost savings of $150 million next year.

Analysts cite administrative support, manufacturing, marketing and research and development as fertile areas for cost cutting. According to Don Young, research analyst with Sanford C. Bernstein & Co., cutting R&D costs, currently totaling $675 million, by 11% (a figure used by Burroughs) translates into a "sizable impact on the bottom line."

Young and William Easterbrook, vice-president with Kidder, Peabody & Co., are among the few analysts currently bullish on Sperry and Burroughs. Both analysts recommend holding Sperry shares to obtain the combination of cash and Burroughs securities. Both also recommend purchase of Burroughs.

According to Young, there will be some short-term damage to Burroughs results as the company faces a confused Sperry customer base and substantial reorganization and cost-restructuring challenges. "But long term, I think this move by Burroughs will add value to shareholders," Young says.

Easterbrook estimates the combined company will earn $6.00 a share in 1987 and between $7.00 and $8.00 a share in 1988. "If this is the scenario 18 months from now," Easterbrook says, "the stock will be trading closer to $90 or $100."

Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

Power struggle at MDS Qantel

From page 164

stantial cash compensation. "I don't believe in golden parachutes," Christo said. Tutino said the details of the dispute were "an internal matter."

Tutino denied Christo's assertion that Chief Financial Officer Joseph O'Dowd and Vice-President of Manufacturing James Brayne had resigned in support of Christo and Lucier.

The Qantel management dispute came as a surprise to Bruce Anderson, a partner in one of the venture capital firms that negotiated the purchase of the five MDS units with Tutino. "They seemed to get along quite well in all our conversations," said Anderson. "Something must have happened subsequent to our transactions, or else they camouflaged it very well."

Molecular closes U.S. operations

SAN JOSE, Calif. — Multiuser micro vendor Molecular Computer, Inc. has closed its U.S. operations and laid off all 70 of its workers. Company President Frank Zurcher last week said the company plans to file for protection from its creditors under Chapter 11 of the Federal Bankruptcy Code.

Molecular manufactured multiuser microcomputers and local-area networks (LAN). Founded in 1981, the company's annual sales reached as high as $30 million and dropped to about $24 million this year.

According to Zurcher, Molecular has produced a high-speed 100M bit/sec. LAN, but debts prevented the company from bringing it to market. "The basic issue is that every time we tried to do something, we had to do it with a lot of debt," he said.

The Chapter 11 petition lists $14 million in liabilities and $10 million in assets. Molecular has about 500 creditors, Zurcher said.

"The problem is when you're carrying a heavy load, you just keep fighting an uphill battle. If the only problem we had was to compete in the LAN market, that in itself would have been tough," he noted.

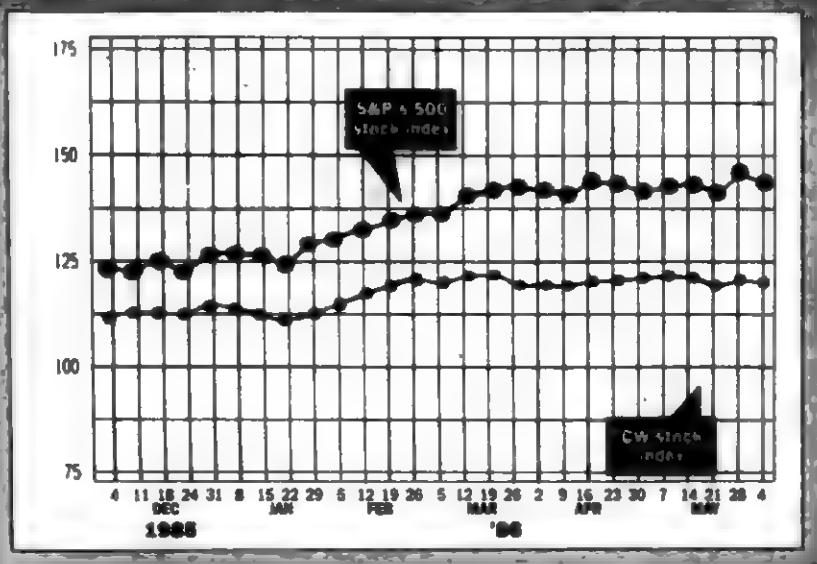
Zurcher claimed Molecular is prepared to present a "skeleton" reorganization plan to creditors, but a court-approved reorganization could take months.

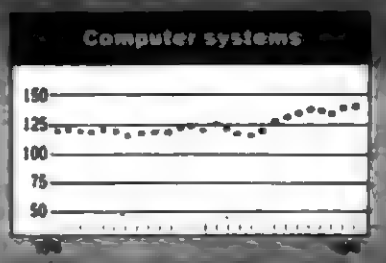
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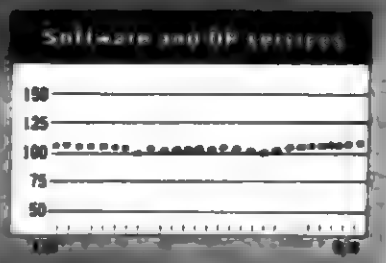
COMPUTER INDUSTRY

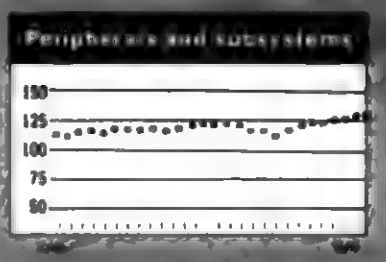
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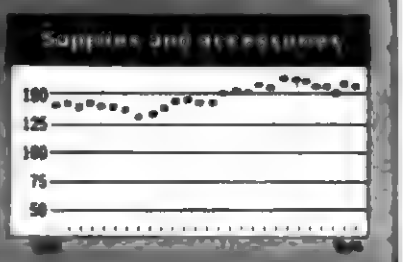
Computerworld stock trading index

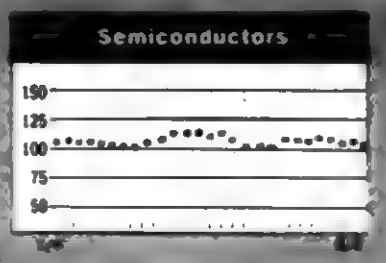


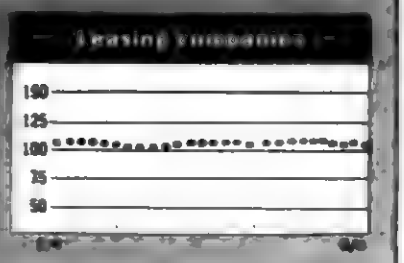












All indexes reflect a historical base of 100 on Dec. 31, 1984, and track stock market performance in relation to that date. The CW stock index represents the unweighted average performance of the six computer industry sectors.

	5/28/86	6/4/86
Computer systems	130.5	130.9
Software and DP services	106.4	106.7
Peripherals and subsystems	126.4	126.4
Supplies and accessories	155.8	154.9
Semiconductors	106.4	103.2
Leasing companies	104.6	103.6
CW stock index	121.3	120.6
Standard and Poor's 500 stock index	147.5	146.9

Computerworld stock trading summary

CLOSING PRICES WEDNESDAY, JUNE 4, 1986

EXCH		52-WEEK RANGE (1)		CLOSE JUNE 4 1986		WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS						
O	ALPHA MICROSYSTEMS	5-	9	6	1/2	-1/4	-3.7
O	ALTOS COMPUTER SYST	9-	19	16	1/8	0	0.0
A	AMDAHL CORP	10-	18	17	1/8	+1 3/8	+8.7
O	APOLLO COMPUTER	9	31	14	1/2	-3/4	-4.9
O	APPLE COMPUTER INC	14-	39	38	3/4	+1 1/2	+4.0
N	AT&T	19-	28	24	1/2	-5/8	2.4
N	BURROUGHS CORP	52	71	58	3/8	-1/4	-0.4
O	COMPAQ COMPUTER CP	5-	18	16	1/2	-3/4	-4.3
O	COMPUTER AUTOMATION	1-	9	3	1/4	+1/8	+4.0
A	COMPUTER CONSOLES	5-	14	11	1/8	+3/8	+3.4
N	CONTROL DATA CORP	15	39	25	1/2	-3/8	1.4
O	CONVERGENT TECHNOL	5	13	8	1/2	-1 1/2	-15.0
O	CPT CORP	4-	8	4	1/2	+1/8	+2.8
N	CRAY RESEARCH INC	25-	94	93	1/2	+4 3/8	+4.9
O	DAISY SYSTEMS CORP	11	38	12		0	0.0
N	DATA GENERAL CORP	31-	76	40	1/8	+1	+2.5
N	DATAPOINT CORP	5	22	8	1/2	+5/8	+7.9
N	DIGITAL EQUIPMENT	42	91	89	3/4	-1/4	-0.2
A	EECO INC	13	20	19	5/8	+3/4	+3.9
N	ELECTRONIC ASSOC	3-	7	5	5/8	1/4	-4.2
N	FLOATING POINT SYST	18-	42	37	3/8	+1/8	+0.3
N	FOXBORO	22-	31	30	1/2	1/4	-0.8
N	GOULD INC	20-	38	23		1/4	-1.0
N	HARRIS CORP	22-	35	31	1/2	3/4	-2.3
N	HEWLETT PACKARD CO	29-	46	43	7/8	2 1/4	-4.8
N	HONEYWELL INC	54	87	78	1/8	+7/8	+1.1
N	IBM	117	158	150		-1 3/8	-0.9
O	IPL SYSTEMS INC	1	4	3		0	0.0
N	ITT CORP	28-	48	46	3/4	1 5/8	-3.3
N	M/A COM INC	13-	24	16		-7/8	-5.1
N	MANAGEMENT ASSIST	2-	28	2	1/2	+1/8	+5.2
N	MATSUSHITA ELEC(ADR)	49-	98	88	3/8	-5/8	-0.7
O	MENTOR GRAPHICS	13-	30	17	7/8	+1 3/8	+8.3
N	MODULAR COMPUTER SYS	6-	9	8	7/8	0	0.0
N	MOHAWK DATA SCI	1	13	3	1/8	0	0.0
N	NBI INC	11	20	11	1/2	0	0.0
N	NCR	25-	56	56		+1 1/8	+2.0
N	PERKIN-ELMER	22	36	29	1/4	3/4	2.5
N	PRIME COMPUTER INC	15-	27	19	3/4	-3/8	-1.8
N	SPERRY CORP	39-	75	74	3/4	+1/8	+0.1
O	STRATUS COMPUTER INC	9-	25	23	1/2	+1 3/4	+8.0
O	TANDEM COMPUTERS INC	13-	34	33	1/2	+2 5/8	+8.5
N	TANDY CORP	24	44	41	1/2	5/8	-1.4
O	TELEVIDEO SYSTEMS	2-	4	3	1/4	1/4	-7.1
O	TELXON CORP	6-	23	23		+1 7/8	+8.8
N	TEXAS INSTRUMENTS	86-	141	135	1/2	+7/8	+0.6
A	ULTIMATE CORP	8-	34	31	7/8	-2 3/8	-6.9
O	VECTOR GRAPHICS INC	1-	1		1/8	0	0.0
A	WANG LABS "B"	15-	29	17	1/8	+5/8	+3.7
A	WANG LABS "C"	15-	29	17	1/4	+3/8	+2.2
N	XEROX CORP	37	72	58	5/8	-3	-4.8
	SUPPLIES & ACCESSORIES						
N	AMERICAN BUS PRODS	21	36	33		0	0.0
N	BARRY WRIGHT	17-	29	23	3/4	+1/8	+0.5
A	DUPLEX PRODUCTS INC	13-	22	21	1/2	-1/4	-1.1
N	ENNIS BUS FORMS	14-	28	25	1/8	+1/4	+1.0
N	3M COMPANY	74-	107	105	3/8	1/8	-0.1
N	MOORE CORP LTD	15-	27	25		-1	-3.8
O	STANDARD REGISTER	22	45	39	3/4	+1/4	+0.6
N	WALLACE COMP SERVICE	30-	49	48	1/8	-7/8	-1.7

EXCH		52-WEEK RANGE (1)		CLOSE JUNE 4 1986		WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE AND DP SERVICES						
O	ADVANCED COMP TECH	2	6	6		-1/4	-4.0
N	ADVANCED SYSTEMS INC	9-	20	17	5/8	+1/8	+0.7
N	AGS COMPUTERS INC	10-	25	20	3/8	-1 1/8	-5.2
O	AMERICAN SOFTWARE	9-	15	12		3/8	-3.0
N	ANACOMP INC	2-	6	5	3/8	1/2	-8.5
O	ANALYSTS INTL CORP	5-	11	7	1/4	-1/4	-3.3
O	ASHTON TATE	6-	34	33	5/8	+2 1/4	+7.1
O	ASK COMPUTER SYSTEMS	7-	25	13		+7/8	+7.2
B	ASTRADYNE COMP IND	1	3	1	5/8	0	0.0
N	AUTOMATIC DATA PROC	35-	77	73		-3 5/8	-4.7
O	COMPUTER NETWORK	5-	9	7	5/8	-1/8	1.6
O	COMPUTER ASSOC INT'L	9-	25	24	3/4	+1	+4.2
O	COMPUTER HORIZONS	5-	11	13	7/8	0	0.0
N	COMPUTER SCIENCES	13-	38	38	7/8	5/8	1.6
O	COMPUTER TASK GROUP	7	19	18	1/4	+1	+5.8
O	COMPUTER USAGE	1-	3	2	3/4	1/4	-8.3
O	COMPUTONE SYSTEMS	3-	11	3	5/8	-5/8	-14.7
O	COMSERV CORP	1-	6	3	1/2	+1/4	+7.6
O	COMSHARE	7-	13	13	1/8	0	0.0
N	CULLINET SOFTWARE	12-	33	15	7/8	3/8	2.3
O	CYCARE SYSTEMS INC	13-	27	17		+1/4	+1.4
O	HOGAN SYSTEM INC	4-	12	11	1/2	+1 3/8	+13.5
N	GENERAL ELECTRIC CO	56-	81	81	1/4	+1/4	+0.3
N	GEN. MOTORS E (EDS)	20-	49	48	1/2	+3/8	+0.7
N	GTE CORP	38-	54	49	1/4	1 1/8	2.2
O	INFORMATION SCIENCE	1-	5	3	1/4	1/8	3.7
O	INFOTRON SYSTEMS CP	13-	24	16	1/2	0	0.0
O	KEANE ASSOCIATES	10-	20	13	1/2	-1/2	3.5
N	LOGICON	25-	43	35	7/8	2	5.2
O	LOTUS DEVELOPMENT CP	15-	38	38	1/4	+1 3/4	+4.7
O	MCI COMMUNICATIONS	7	13	9	1/4	1/2	-5.1
O	MINGT SCI AMER INC	7-	16	16		+1/4	+1.5
O	MATHEMATICAL APP GRP	1	8		1/2	0	0.0
O	MICOM SYSTEMS INC	12-	35	13		1 3/4	11.8
O	MICROPRO INT'L CP	2-	4	2	3/8	1/8	7.3
O	NATIONAL DATA CORP	8-	25	23		+1 3/4	+8.2
O	ON LINE SOFTWARE INT	4	16	15	1/2	1/2	3.1
N	PANSOPHIC SYSTEMS	14-	35	35	1/4	+1	+2.9
N	PLANNING RESEARCH	11	23	20		1 3/8	-6.4
O	POLICY MGMT SYSTS CP	16-	35	20	1/4	0	0.0
O	PROGRAMMING & SYS	4-	10	9	1/2	+3/4	+8.5
O	REYNOLDS & REYNOLD	30-	65	34	1/2	+3 1/4	+10.3
O	SEI CORP	13	27	22	1/2	1	4.2
O	SHARED MEDICAL SYST	26-	38	35	1/4	3/8	1.0
O	SCIENTIFIC COMPUTERS	4	8	4	3/4	0	0.0
O	SOFTWARE AG	12	22	19	3/4	1/4	1.2
N	URS CORP	10-	18	16	7/8	+1/4	+1.5
N	UCCEL	11	23	22	3/4	+1 3/8	+6.4
O	VM SOFTWARE	17	31	31	1/4	+1 3/4	+5.9
	SEMICONDUCTORS						
N	ADVANCED MICRO DEV	22	36	24	5/8	1 3/8	5.2
O	ADV'D SEMICONDUCTOR	7	23	11		1/4	-2.2
N	ANALOG DEVICES INC	14	24	20	1/2	2 3/8	10.3
O	ANALOGIC CORP	11-	16	12	3/4	+3/8	+3.0
N	APPLIED MAGNETICS CP	9-	19	18	1/2	3/8	1.9
O	AVANTEK	18-	28	19	1/4	1/8	-0.6
O	HADCO CORP	3-	7	5		1/2	-9.0
O	INTEL CORP	21	33	26	1/4	+1/4	+0.9
O	MICRO MASK INC	5	12	5		3/8	-6.9
N	MOTOROLA INC	29-	48	45	3/4	3/4	1.6
N	NAT'L SEMICONDUCTOR	10-	15	13	1/2	7/8	-6.0
N	TERADYNE	17	33	26	3/4	+1	+3.8

EXCH		52 WEEK RANGE (1)		CLOSE JUNE 4 1986		WEEK NET CHNGE	WEEK PCT CHNGE
	PERIPHERALS & SUBSYSTEMS						
P	AM INTERNATIONAL	3-	8	8		-3/8	-4.4
A	ANDERSON JACOBSON	2	5	2	1/4	0	0.0
O	AST RESEARCH INC	7	33	15	1/2	1/4	1.5
O	AUTO TROL TECHNOLOGY	3-	13	4	3/8	0	0.0
O	AVANT-GARDE COMPUTING	3-	21	4	1/4	+1/8	+3.0
O	BANCTEC INC	6-	13	12	1/2	0	0.0
O	BEEHIVE INT'L	1	2		1/8	0	0.0
N	BOLT,BERANEK & NEW	20-	47	47	3/8	+3/8	+0.7
O	CAMBEX CORP	1	3	1	1/4	1/4	16.6
N	CENTRONICS DATA COMP	3	11	7	1/8	+5/8	+9.6
A	CETEC CORP	6	9	7	1/8	+1/4	+3.6
A	COGNITRONICS	4	7	4	1/8	1/2	10.8
N	COMPUGRAPHIC CORP	23-	36	23	3/4	0	0.0
O	COMPUTER TRANSCEIVER	0-	1		3/4	1/8	13.3
N	COMPUTERVISION CORP	9-	44	18	5/8	1 1/4	6.9
N	CONRAC CORP	12	18	16	3/4	3/4	4.2
A	DATAPRODUCTS CORP	11	20	17	1/2	+1/4	+1.4
A	DATARAM CORP	4	17	14	5/8	2 1/4	13.3
O	DATA SWITCH CORP	4	9	7	3/8	+1/8	+1.7
O	DATUM INC	5	9	6	1/2	1/4	3.7
O	DECISION IND CORP	10	20	14	1/2	+1 5/8	+12.8
O	ENDATA, INC	2	8	6	1/4	0	0.0
O	EVANS & SUTHERLAND	12	27	25	3/8	3/4	2.8
O	GANDALF TECHNOLOGIES	5	13	6	3/8	1/4	3.7
N	GEN'L DATA COMM IND	8	21	13	7/8	+1/2	+3.7
N	HAZELTINE CORP	17	30	17	1/2	+1/2	+2.9
O	ICOT CORP	3	12	11	3/4	1/4	2.0
O	INFORMATION INTL INC	10	17	15	1/8	3/8	2.4
O	INTECOM INC	3	11	5	5/8	+1 1/16	+11.1
O	MEGADATA CORP	3	8	3	3/8	+1/4	+8.0
A	MSI DATA CORP	7	14	13	7/8	0	0.0
N	NASHUA CORP	24	53	53		+1/4	+0.4
O	NETWORK SYSTEMS CORP	11	27	14		+1/8	+0.9
N	NO AMERICAN PHILIPS	32	47	44		+2 1/4	+5.3
N	NORTHERN TELECOM LTD	26	41	29		7/8	2.9
O	OMEX	1	3		3/8	-1/8	-50.0
N	PARADYNE CORP	6	18	10	1/4	3/4	6.8
A	PENRIL CORP	7	14	7	3/8	0	0.0
N	PLESSEY CO (ADR)	19	38	32		2 1/2	7.2
O	PRINTRONIX INC	9	18	13	1/4	+1/8	+0.9
O	QMS INC	6	16	13	7/8	-1/8	+0.9
O	RAMTEK CORP	2	7	5	5/8	0	0.0
N	RECOGNITION EQUIP	9	17	13		3	18.7
N	SANDERS ASSOCIATES	29-	44	28	3/4	7/8	2.9
O	SCAN TRON CORP	9	22	21	1/2	+1 3/4	+8.8
N	SCIENTIFIC ATLANTA	10-	15	10	7/8	+1/2	+4.8
O	SEAGATE TECHNOLOGY	5-	13	12	7/8	+1/8	+0.9
N	STORAGE TECHNOLOGY	1	5	4		1/8	3.0
O	SYKES DATATRONICS	0	2		1/8	0	0.0
A	T BAR INC	5-	9	5	7/8	0	0.0
A	TAB PRODUCTS CO	9-	15	14		1/8	0.8
O	TANDON CORP	3	9	6	3/4	3/8	5.2
A	TEC INC	5	13	5	1/4	1/8	2.3
N	TEKTRONIX INC	47	68	59	1/4	2 7/8	4.6
N	TELEX	34	68	64	1/8	+2	+3.2
O	TESDATA SYSTEMS CP	0	3		5/8	0	0.0
N	TIMEPLEX INC	15	23	17	1/2	7/8	4.7
N	TITAN CORP	4	11	9	1/2	1/2	5.0
O	VISUAL TECHNOLOGY	1	3		1/2	1/8	20.0
	LEASING COMPANIES						
N	COMDISCO INC	7	24	19	7/8	5/8	3.0
N	CONTINENTAL INFO SYS	5	11	9	1/8	-1/4	2.5
O	FINALCO GROUP INC	3	5	3	1/8	3/8	10.7
O	PHOENIX AMERICAN INC	2	6	4	1/2	1/4	5.2
O	SELECTERM INC	6	12	7	1/8	1/4	3.3
N	U S LEASING	32	46	41	1/4	5/8	1.4

EXCH: N – NEW YORK; A – AMERICAN; P – PACIFIC; B – BOSTON; I – NATIONAL; M – MIDWEST; O – OVER THE COUNTER; S – SPLIT

- O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Source: Trade Quotes, Inc

COMPUTER INDUSTRY

INSIDE

Word Perfect Corp. tries to stay low-key in the fast lane of micro word processing software/**130**

Hitachi and other Japanese vendors report their first profit declines in several years/**136**

Computer leasing firms are finding a hot market in telecom equipment/**138**

Burroughs, Sperry shareholders face a dilemma/**162**

INSTANT ANALYSIS

"We certainly feel that every regional holding company should own a software vendor."

— Curt A. Monash, Paine Webber, Inc., on the postdivestiture telephone companies

Power struggle at the top

MDS Qantel directors leave in bitter dispute over control

By Clinton Wilder

HAYWARD, Calif. — Barely one month after solving its debt problems and establishing a new corporate direction [CW, May 26], MDS Qantel is in turmoil again.

Two members of MDS Qantel's three-man board of directors, Thomas K. Christo and Francis P. Lucier, left the minicomputer company last week after a bitter management dispute with Chairman and Chief Executive Officer Matthew E. Tutino. Christo, the controversial attorney who won several user and distributor lawsuits against computer vendors, said he and Lucier plan to seek court action to force Tutino out of the company's operations.

"I'm afraid I'm going back to court; it sure looks that way," said Christo, who was MDS Qantel's president and chief operating officer. "We are going to ask for injunctive relief to force him to accept the board that the shareholders elected."

Christo and Lucier have denied that they formally resigned from the board, as Tutino claims. "Their seats are being filled, and a new board will be announced shortly," Tutino said. "We are looking for a new president and chief operating officer."

Tutino said last week's management split "doesn't impact customers at all," but it appears to set up a protracted battle for control of MDS Qantel at a highly inopportune time. Qantel appeared to be rebounding from more than two years of financial and organizational headaches as the computer systems division of Mohawk Data Sciences Corp.

Last month, Mohawk removed some $100 million of debt and negotiated a significant bank credit line by selling five other divisions to two New York venture capital firms, which reorganized the units into Momentum Technologies, Inc. [CW, May 12].

Christo and Tutino gave markedly different versions of the management rift, but the dispute appeared to center on the operational roles of the two men. Christo claimed Tutino refused to give up a day-to-day role that he was not intended to have, while Tutino said Christo's post as president and chief operating officer was intended to be temporary until a replacement was found.

Christo also claimed Tutino refused to relinquish the CEO position without sub-

See **POWER** page 162

CBEMA: Trade bill news mixed

By Mitch Betts

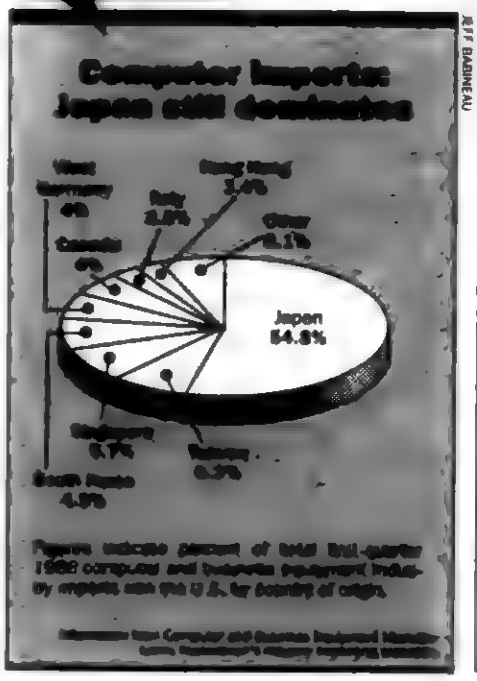
WASHINGTON, D.C. — The omnibus trade bill passed last month by the U.S. House of Representatives has both good and bad features for the computer industry, according to Bill Maxwell, director of international issues for the Computer and Business Equipment Manufacturers Association (CBEMA).

Separately, the industry association released statistics showing that the U.S. balance of trade in computers and telecommunications equipment worsened in early 1986.

Maxwell said CBEMA is adamantly opposed to the so-called Gephardt amendment to the House bill, which would require U.S. retaliation against countries that have excessive trade surpluses with the U.S. unless the surplus is reduced 10% a year. Specifically, it would affect Japan,

See **CBEMA** page 135

DATA VIEW



JEFF BABINEAU

INDUSTRY INSIGHT
Clinton Wilder

Can a shotgun wedding work?

Sperroughs. Burry. Critical Mass, Inc. Or simply the Blumenthal Corp.

Whatever name the collective minds of Detroit and Blue Bell, Pa., come up with for the industry's new No. 2, the question is always the same. Will the shotgun marriage of Burroughs Corp. and Sperry Corp. really work?

A lot of people don't think so. They see two giants with incompatible product lines, overlap rather than synergy and little telecommunications capability in a market crying out for connectivity.

Despite what Burroughs Chairman W. Michael Blumenthal says, the industry's best hope of keeping IBM honest still appears to lie with Digital Equipment Corp.

Burroughs' bold move to reshape the mainframe computer industry, interestingly, comes at a time when BUNCH companies NCR Corp. and Honeywell, Inc. are seeking to de-emphasize traditional mainframe applications and forge ahead in transaction processing and office automation, respectively.

And as most of the world knows by now, NCR and Honeywell both turned down the choice of playing white knight for Sperry. The unattractive finances of such a scenario, however, were at least as negative a factor as NCR's and Honeywell's choice not to follow the Blumenthal theory of bigger is better.

Bigger, of course, is a relative term. According to market research firm Infocorp, Burroughs and Sperry combined were responsible for 12.6% of the worldwide market for systems priced higher than $350,000 in 1985. The other company, with the blue logo, sold 62.6% of them.

Despite the work force consolida-

See **CAN** page 135

Wilder is Computerworld's *senior editor, computer industry.*

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*Independent research has confirmed KEY/MASTER the leading data entry software system for IBM mainframes; KEY/MASTER has outsold its largest competitor by almost two to one.

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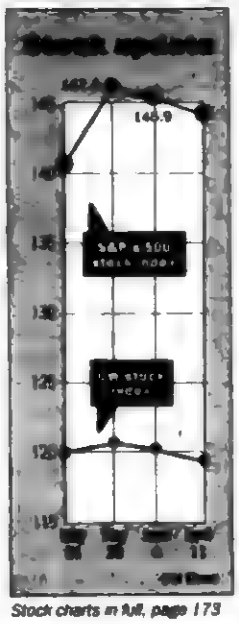
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Executive Roundtable
Issues and answers from five at the top of MIS/57

In Depth
Voice technology turns a profit for office users/79

TOP OF THE NEWS

Action by leading retail chains to sell their own PCs sparks debate over the potential impact on micro vendors that rely on the retail market. **Page 174.**

■

Struggling against competitors, wood products giant Weyerhaeuser Co. is trying to harvest profits from its information systems unit. **Page 108.**

■

Kurzweil is scheduled to unveil next week a desktop voice terminal system. **Page 9.**

■

Edson W. Spencer, Honeywell's chairman, says the real BUNCH companies are those grouped around IBM. **Page 45.**

■

Sharing data and resources across a multivendor network is AT&T's promise with the rollout of its latest version of Unix System V. **Page 14.**

■

Data General claims it will be first to deliver peer-to-peer document distribution via IBM's Systems Network Architecture Distributed Services. **Page 10.**

■

Originally scheduled for an October shipment, the smallest of IBM's 3090 family of mainframes arrived at the first customer site last week. The 3090 Model 150 uniprocessor was delivered Tuesday to Lockheed Aircraft Service Co. in Ontario, Calif., where it will replace an IBM 3031 in supporting computer-aided design and manufacturing, accounting and production. The Model 150 was announced in February, and in April, the schedule was advanced by four months. Lockheed officials expect the system to be on-line today.

■

Javelin Software Corp. next week is expected to unveil an upgrade to its financial analysis software for the IBM Personal Computer. The Javelin 1.1 package can handle up to 16,000 variables per model, supporting up to 8M bytes of random-access memory under expanded memory schemes. The release also can

See NEWS page 4

User lifts veil on DEC PC

VAX-Mate release stalled by network software hitch

By Douglas Barney

Digital Equipment Corp.'s still-unannounced IBM Personal Computer AT-compatible workstation was demonstrated for *Computerworld* last week by a user close to DEC, who disclosed that the eagerly awaited VAX-Mate has been further delayed due to software development problems.

The DEC desktop has a front measurement of 16 inches and is 15½ inches deep (see illustration page 12). The 13-inch monitor can swivel up and down and has a ratchet-type device to keep it in place. In addition, the monitor unit, which includes the floppy disk drive, can attach to the

See USER page 12

Users: Minis for central DP only

By James Connolly

DELRAN, N.J. — Advocates of departmental systems have yet to win their share of a minicomputer market still dominated by systems that serve a complete organization, according to a recent survey of minicomputer users.

While IBM and other vendors may advertise minis such as the IBM System/36 as departmental processors, only 11% of the 2,338 surveyed users — 587 of whom run the System/36 — classified their systems as such, compared with 86% who said they run organizational systems, Datapro Research Corp. officials said.

See USERS page 54

IBM splash expected to launch NCC

By James Connolly

LAS VEGAS — IBM plans to heat up today what was anticipated to be a quiet 1986 National Computer Conference with a chain of product introductions expected to realign the company's mid-range System/36 and 38 product families.

IBM's anticipated activity will run counter to that of many traditional NCC exhibitors, which have dropped out of this year's show. These include most leading minicomputer manufacturers and numerous microcomputer software vendors.

In addition to its expected announcement of top-end models for the System/36 and 38 lines, industry observers say they believe IBM will introduce features that could signal an eventual merger of those families and also roll out other products such as a replacement for its 3370 disk drive.

Despite the exhibitor drop-off, IBM's will not be the only new product activity at NCC this week. Other companies planning introductions include the following:

- Nixdorf Computer Corp., with an IBM Personal Computer XT-class system and two competitors for the System/36 (see story page 4).
- Memorex Corp., with an IBM 3480-compatible tape cartridge.
- NEC Information Systems, Inc., with its first Unix-based multiuser system.
- Sytek, Inc., with two new products for its System 2000 line of large-scale broadband networks.
- Bridge Communications, Inc., previously specializing in Ethernet local-area networks, announcing its first IBM Token-Ring network-based product.
- Britton Lee, Inc., with an office-scale relational data base system.
- Zenith Data Systems Corp., demon-

See IBM page 6

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NEWSPAPER

CW EXCLUSIVE

Net conflict: Macintosh execs clash with MS-DOS managers

By Peggy Watt

SAN ONOFRE, Calif. — Reconciling the mouse-driven world of Apple Computer, Inc.'s user-friendly Macintosh with the conventional reality of an organization committed to the Microsoft Corp. MS-DOS architecture demands imagination and adjustment from both the Macintosh-proficient executives and MIS directors.

When Harold Ray, vice-president of Southern California Edison and site manager of the San Onofre Nuclear Generating Station, was offered his choice of microcomputers two years ago, he asked for the Macintosh, which had recently been introduced. For a manager who had no inclination to invest time in mastering obscure operating system commands or programs he would use only occasionally, the Macintosh, with its menu-driven interface, was an easy alternative.



Harold Ray

Now, two years later, Ray's commitment to the Macintosh has caused problems at his office. The 16-member MIS staff at San Onofre is building a personal computer network with gateways to the mainframe systems in the central processing site at Rosemead, 60 miles north. The electrical utility, which supplies power primarily to Southern California, also plans a future connection to a backup computing center scheduled for construction in El Toro, located between San Onofre and Rosemead.

Southern California Edison is installing a Novell, Inc. local-area network using Advanced Netware software to link 500 microcomputers for application sharing, file transfer, calendar and electronic mail functions, says Russ D. Henderson, nuclear information systems supervisor, who oversees systems at the San Onofre site.

The network itself, a modified token-passing ring, may be among the largest such installations, stretching 2¼ miles between its farthest

See MACINTOSH page 34

House Judiciary Committee passes electronics privacy bill

Aims to close wiretap loophole, protect E-mail

By Mitch Betts

WASHINGTON, D.C. — The Judiciary Committee of the U.S. House of Representatives last week approved a privacy bill intended to protect data communications from interceptions and unauthorized disclosures.

The committee passed an amended version of the Electronic Communications Privacy Act of 1986 by a 36-0 vote and sent it to the House for action in the next few weeks. A companion bill is pending in the Senate Judiciary Committee.

The bill is aimed at closing a loophole in the existing federal wiretap statute that protects oral telecommunications but not data communications. The new bill would prohibit the interception of data communications, such as electronic mail and bulk data transfers, during transmission and while stored in a computer.

In addition, the measure would prohibit service providers from making unauthorized disclosures of electronic messages and would require government agents to get a court order to obtain electronic messages.

The bill has attracted widespread support from the computer and communications industries and the American Civil Liberties Union. Supporters include the Electronic Mail Association, ADAPSO and the Information Industry Association, as well as AT&T, GTE Telenet, Inc., Digital Equipment Corp. and Electronic Data Systems Corp.

The Department of Justice agreed to support the bill after negotiating amendments designed to reduce the procedural burdens for law-enforcement agents seeking court approval for obtaining electronic communications.

The bill is sponsored by Rep. Robert W. Kastenmeier (D-Wis.) and Sen. Patrick J. Leahy (D-Vt.).

Walter Ulrich, an industry analyst and consultant in Houston, praised Kastenmeier and Leahy for "taking action on this now, on a proactive rather than reactive basis." He said there have been no major privacy abuses publicized so far, but the electronic mail industry hopes to head off problems in the future.

"Right now, many forms of electronic mail are in legal limbo. Somebody could electronically access messages and read them, and it's not clear that they have violated a law or that there is any form of redress for the party intruded upon," Ulrich said.

Ulrich and Michael F. Cavanagh, executive director of the Electronic Mail Association, said all signs point to final enactment of the bill this year.

HP to trim 1,500 from work force through voluntary, early retirements

PALO ALTO, Calif. — Hewlett-Packard Co. is hoping to trim about 1,500 employees from its work force by October through voluntary severance and enhanced early retirement programs.

The two programs, announced by HP last week, are designed to address "work-force imbalances" at the company's 45 manufacturing facilities in the U.S., which the company says are manufacturing fewer components in-house.

"It would be a mistake to call this part of our continued effort to reduce employment," HP spokesman Roy Verley told *Computerworld*. "This is related to changes in our business and is not really a response to how we did in the second quarter."

HP already has an early retirement program for 15-year veterans age 55 or older. The voluntary program announced last week gives eligible employees an additional two weeks salary for every year of employment up to a maximum one-year salary. About 1,800 HP employees today qualify for early retirement, the company said.

The voluntary severance program applies to predetermined HP divisions. Workers will be given six months severance and two weeks salary for every year of employment for a maximum of one year's salary.

In other news at HP last week, Spectrum designer William Worley left the company to join the Dana Group, a Sunnyvale, Calif., start-up company founded by former Convergent Technologies, Inc. President Allen Michels. The company is planning to manufacture a personal supercomputer.

— Maura McEnaney

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Hard as we try to give our readers the most complete information available, some good news and feature stories never reach us.

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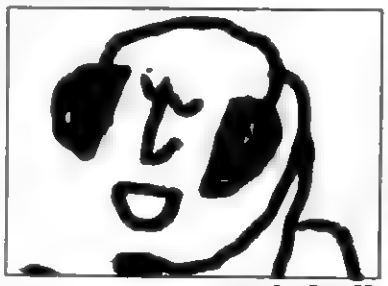
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TURBO

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Nixdorf to introduce micro, mid-range products at NCC

Will also add software for 4300-compatible

By James Connolly

WALTHAM, Mass. — Nixdorf Computer Corp. plans a multifaceted introduction today with the announcement of new systems to challenge the IBM Personal Computer XT and the IBM System/36, as well as operating system enhancements for its IBM 4300-class computers.

Introduced in conjunction with the 1986 National Computer Conference, the systems are said to provide storage and performance gains over existing Nixdorf products, while the operating system enhancements allow the packaging of several previously separate components with a menu facility.

The System/36 competitors are the 8870 Models 25 and 75, which replace the 8870 Models 15 and 65.

Features increased memory

The Model 25 reportedly features increased memory, a 41-msec processing time and a new 132M-byte, 5¼-in. Winchester disk drive with twice the capacity of the Model 15's disk drive. The Model 25 supports up to 1M byte of memory, compared with 256K bytes in the Model 15. It also supports up to 10 terminals and five printers.

Nixdorf said its Model 75, with 1M byte of main memory, uses a team-processor concept, under which dedicated processors are used for specialized functions. The Model 75 uses a programmable line controller (PLC) for communications, a hardware arithmetic unit for calculations and an intelligent disk controller (IDC) to speed disk access.

The IDC is a modular multiprocessor with an additional 512K bytes of memory and its own Intel Corp. 80286 16-bit microprocessor and 8-bit processors for memory management.

Nixdorf officials said the IDC is controlled by a real-time multitasking operating system that supports parallel processing between the CPU and the disk drives, thus reducing the number of head movements and increasing disk access rates by up to 40%.

The high end of the 8870 line, the Model 75 will be available initially with two 264M-byte, 14-in. fixed disk drives. Nixdorf said that deliveries of systems supporting two more drives for up to 1G byte of disk storage will begin in 1987.

The Models 25 and 75, as well as existing low-end and mid-range 8870 products run Nixdorf's NIDOS operating system. They will be available during the third quarter of 1986. The basic Model 25, featuring 256K bytes of memory, a streaming mode cassette, a 42M-byte fixed disk, a workstation and a dot matrix printer costs $22,550. The basic Model 75 includes 1M byte of memory, the 512K-byte IDC, the arithmetic unit, a streaming mode tape, a 396M-byte disk drive, a workstation and a 300 line/min printer. It costs $83,600.

Runs MS-DOS 3.10

The 8810/35 Desktop Personal Computer is based on an Intel 8088 microprocessor and runs Microsoft Corp.'s MS-DOS 3.10 operating system. It also includes Microsoft's GW-Basic interpreter. The memory is upgradable to 640K bytes. Other options include Intel's 8087 math coprocessor and a 20M-byte hard disk drive.

The basic 8810/35 costs $2,145 with 256K bytes of memory and dual floppy disk drives. Volume shipments are scheduled for October.

For its 8890 line of IBM 4300 compatible systems, Nixdorf is scheduled to announce NIDOS/VSE Easy and NIDOS/VSE DDP. The enhanced operating systems reportedly are workstation oriented and designed to simplify system generation and maintenance by allowing non-DP users to utilize menus.

Nixdorf also announced NIDOS/VSE Assist, a utility that relocates frequently used control routines in microcode when users run NIDOS/VSE Easy.

NIDOS/VSE Easy costs $1,200 per month, NIDOS/VSE DDP costs $295 per month, and NIDOS/VSE Assist can be purchased for $6,140. All three software products are available now.

Altos adds to 80286-based micro family

By Peggy Watt

SAN JOSE, Calif. — Altos Computer Systems, Inc. last week announced two additions to its 80286-based multiuser microcomputer family.

The announcement came amid layoffs intended to lessen the impact of flat earnings for the fourth fiscal quarter, which ends this month.

About 50 employees were laid off without notice in manufacturing, marketing and finance, bringing Altos' employment force to about 700. A company spokesman said about half the layoffs were of temporary staff, made to bring costs in line.

Altos 3086

Altos expanded its 80286-based line with the introduction of the 3086, an up-to-32-user system and the six-user 686 system, which will be sold largely through value-added resellers. The price of the mid-range 886 system dropped about 20%.

Earlier members of the processor line, the 1086 and 2086, can be upgraded with a 12.5-MHz CPU board to replace the built-in 8-MHz system, for $2,490.

The Altos 3086 system is based on a 12.5-MHz 80286 microprocessor and includes 4M bytes of random-access memory (RAM), expandable to 8M bytes, in its basic configuration; a 170M-byte small-device interface hard disk drive; 60M-byte streaming tape cartridge; and an Altos IV terminal with three expansion slots. It is scheduled to be available in August, priced at $29,990 in its basic configuration.

The Altos 686 runs at 7.5 MHz and comes in its basic configuraton with 512K bytes of RAM, expandable to 2.5M bytes in 1M-byte increments; and an internal 25M-byte hard disk drive.

The upgrade of Altos' AOM, Version II Plus, combines word processing, spreadsheet, business graphics, data base management, electronic mail and window functions. It is scheduled to be available in July and is priced at $2,000 to $2,500, depending on the number of users.

Second-class postage paid at Framingham, Mass., and additional mailing offices.

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export work sheets to Lotus Development 1-2-3 files, DIF files or other Javelin models. Additionally, the software will import files from 1-2-3 or Lotus' Symphony or import lines from text files as labels.

■

Sun Microsystems, Inc.'s bid to make its Network File System an industry standard continues to gain momentum. The workstation vendor announced last week that 20 more vendors, including Hewlett-Packard, Toshiba, NEC, Atex, Inc., Harris and Silicon Graphics, Inc., have recently licensed the software, which reportedly allows users to transparently access files on a network of multivendor systems.

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404/394-0758
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Computerworld News Service
Susan Blakeney, Director
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Main Editorial Office
Box 9171, 375 Cochituate Road,
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Many major vendors tighten purse strings, pass up NCC

Quadram, CDC, Harris no-shows for first time

By James A. Martin

Citing the need to tighten dollars spent on general trade shows and concentrate instead on targeted vertical market shows, several of the computer industry's best-known equipment vendors have decided to stay home during this year's National Computer Conference.

The American Federation of Information Processing Societies (AFIPS), the Reston, Va.-based sponsor of NCC, expects about 400 vendors to exhibit in Las Vegas this week, compared with almost 600 last year and more than 700 the year before.

Many vendors will be absent for the first time, including Hayes Microcomputer Products, Inc., Harris Corp., Quadram Corp., Control Data Corp., Datasouth Computer Corp., Mannesmann Tally Corp. and Fox Research, Inc. In addition, Burroughs Corp., which did not attend for several years in the late 1970s, has, after exhibiting last year, dropped out again this year.

> ***'The timing for NCC is real bad. The spring Comdex show is the first week of May, so new products have already been showcased, and there hasn't been enough development time for more new ones.'***
>
> — Len Boscarine
> Mannesmann Tally Corp.

Mainframe vendors offered varied reasons for not attending, ranging from the belief that big spenders do not attend the show to the fact that trucking a mainframe across the desert to Las Vegas is difficult.

This year Burroughs has chosen to focus instead on "vertical trade shows as opposed to horizontal hardware shows," the company said.

A CDC spokesman, meanwhile, said slow sales in 1985 caused the company to cut trade show participation, adding that NCC was not singled out for any particular reason. "It was simply a business decision," the spokesman noted.

IBM plug-compatible manufacturers Amdahl Corp. and National Advanced Systems Corp. (NAS) reported that they passed up NCC again this year, although NAS' parent company, National Semiconductor Corp., will attend and exhibit Unix software for its 32000 microprocessor.

'Customers aren't there'

"We just don't participate," noted an Amdahl spokesman. "Our customers and prospects just aren't there. Our people are the top executives in the Forbes 500 and Fortune 500-type of companies, and they traditionally aren't at NCC."

An NAS official commented, "It's mostly a question of cost. But most of what we would display are large mainframes and peripherals like disk drives. And, you just can't pack up a mainframe and put it on the floor. Our environmentals are good, but they aren't that good."

"A lot of computer companies are trying to get the most bang for their buck and are looking for new ways to market their products," said Marty Byrne, marketing manager for AFIPS.

"Some might skip a year and then return the next. It's been a trial-and-error method for a lot of companies that don't know how to best market their products," Byrne said.

Focus on vertical market

The majority of vendors queried by *Computerworld* said the need to focus on vertical market shows in the face of dwindling revenues and scaled-back operations was the main reason for not participating in NCC this summer.

"There are so many national shows now that you have to choose, because each one is a drain on the corporation," said Dan Broussard, national sales manager for Fox Research, a local-area network vendor.

His firm will skip NCC this year because previous shows "didn't have the response that we expected. There are too many junior programmers there and not enough people in a decision-making position to buy," Broussard said.

"The timing for NCC is real bad," said Len Boscarine, marketing communications manager for Mannesmann Tally, a printer vendor. "The spring Comdex show is the first week of May, so new products have already been showcased, and there hasn't been enough development time for more new ones."

Competition for attendees

Because NCC, Comdex/Spring and PC Expo are held within a few months of one another, there is more competition for attendees.

NCC, being in the middle, sometimes loses out, Boscarine said. "People aren't going to take off from their businesses every two months to attend a trade show," he added.

The quality of NCC shows has declined in the last few years, lacking a strong focus and a solid target audience, according to a spokesman for Quadram. "There have been too many attendees there who want to look but not buy," the spokesman added.

Ted Jernigan, a spokesman for Texas Instruments, Inc., said the company has eliminated NCC and Comdex/Spring from its list of trade show activities, opting instead for more focused shows. "We had been evaluating our participation at these shows for several years and decided to focus instead on vertical shows."

Senior Editor James Connolly contributed to this report.

IBM splash to launch NCC

From page 1

strating its IBM-compatible laptop with 3½-in. drive options announced last week (see story page 15).

Although Burroughs Corp. and its subsidiary, Memorex Corp., will skip the show this year, the Memorex Media Products Group, which is another arm of Burroughs, plans a product introduction of its Toughshell tape cartridge, designed for use with IBM 3480-type tape drives.

While not a traditional mainframe vendor, relational data base machine maker Britton Lee tomorrow will use NCC to introduce its RS350, one of a series of systems designed to provide data base management in an office environment.

More typical of the plans for large-systems vendors is the approach taken by Honeywell, Inc., which announced its new line of DPS 6 Plus office systems and One Plus integrated office system on June 3. Honeywell is not expected to show much of its large systems equipment, but will be pushing its 2-week-old office line.

Sperry Corp. also promises to attend and expects to focus its activity on the mini and mid-range lines.

Control Data Corp.'s systems group, which a spokesman says is concentrating on vertical trade shows rather than general-purpose shows, will not attend.

Software vendors closely located

Software vendors at NCC this year will be clustered together near the intersections of Halls B and C so people interested in software "will have to walk 200 feet instead of 2,000 looking for the vendors they want to see," says a spokesman for one of the companies attending.

Software vendors that will be showing their latest products include: Cullinet Software, Inc., Cincom Systems, Inc., Relational Technology, Inc., Oracle Corp., Symbolics, Inc. and others.

Oracle Corp. will be demonstrating Version 5 of the Oracle relational data base management system and related fourth-generation language tools and interfaces released last week. It will also demonstrate IBM SQL/RT DB, a DBMS for the RT Personal Computer based on Oracle.

"We nailed down in excess of $1 million in new business at NCC last year," says Kenneth I. Cohen, Oracle's director of product marketing.

Relational Technology, Inc. will be exhibiting its recently announced Ingres/Star [CW, June 9], a distributed data base management system, Release 4.0 of Ingres and the new Ingres graphics package, Vigraph.

Relational Technology spokesman Randy Livingston says NCC is "the one national computer show that really represents the corporate mainframe users. It's important for us in contacting corporate customers."

While most traditional mid-size systems vendors have decided not to show at NCC this year, users of minicomputer equipment will find a variety of third-party products.

Emulex Corp., which makes products for a number of vendors' equipment, will exhibit its wares, says spokeswoman Jennifer Heinly. Emulex has attended NCC since 1979 and finds that the show benefits its IBM PC-related products much more than its main business, which is Digital Equipment Corp.-related products. "Last year's NCC brought us the highest number of sales leads we have gotten from any show," Heinly says.

Although communications companies are scarce at NCC this year, several of those that have chosen to attend are making significant product announcements.

LAN vendors busy

Local-area network (LAN) vendors will be generating most of the communications action on the conference floor, with vendors of IBM PC-based networks predominating.

Sytek, Inc. is unveiling two new products for its System 2000 line of large-scale broadband networks. The 2555 Translator Switch detects and repairs faults in 2550 Translator Units, which move transmissions between different channels on the broadband medium.

"I think you'll find mixed opinions here on NCC," says Sytek President L. George Klaus. "I'm not all that high on it, but you do get a lot of Fortune 500 accounts there."

Bridge Communications, whose specialty until now has been Ethernet local-area networks, will be introducing the first of a series of IBM Token-Ring network products, President William Carrico says. The CS/1-TR enables up to 64 asynchronous or 3270 terminals, IBM PCs and IBM hosts to communicate and share resources over an IBM Token-Ring network, using the Xerox Network Systems communications software.

"Generally we like more vertically oriented data communications shows," Carrico says. He adds, however, that the applications of Bridge products is so broad that "NCC is still valuable to us."

Network Systems Corp. will be exhibiting its Hyperchannel line of high-speed, host-to-host local-area networks. It will also host a presentation on trends in communications, and make a "significant announcement about future plans," a company spokeswoman says.

Among the 25 largest independent suppliers of micro business software, not one will be exhibiting at NCC.

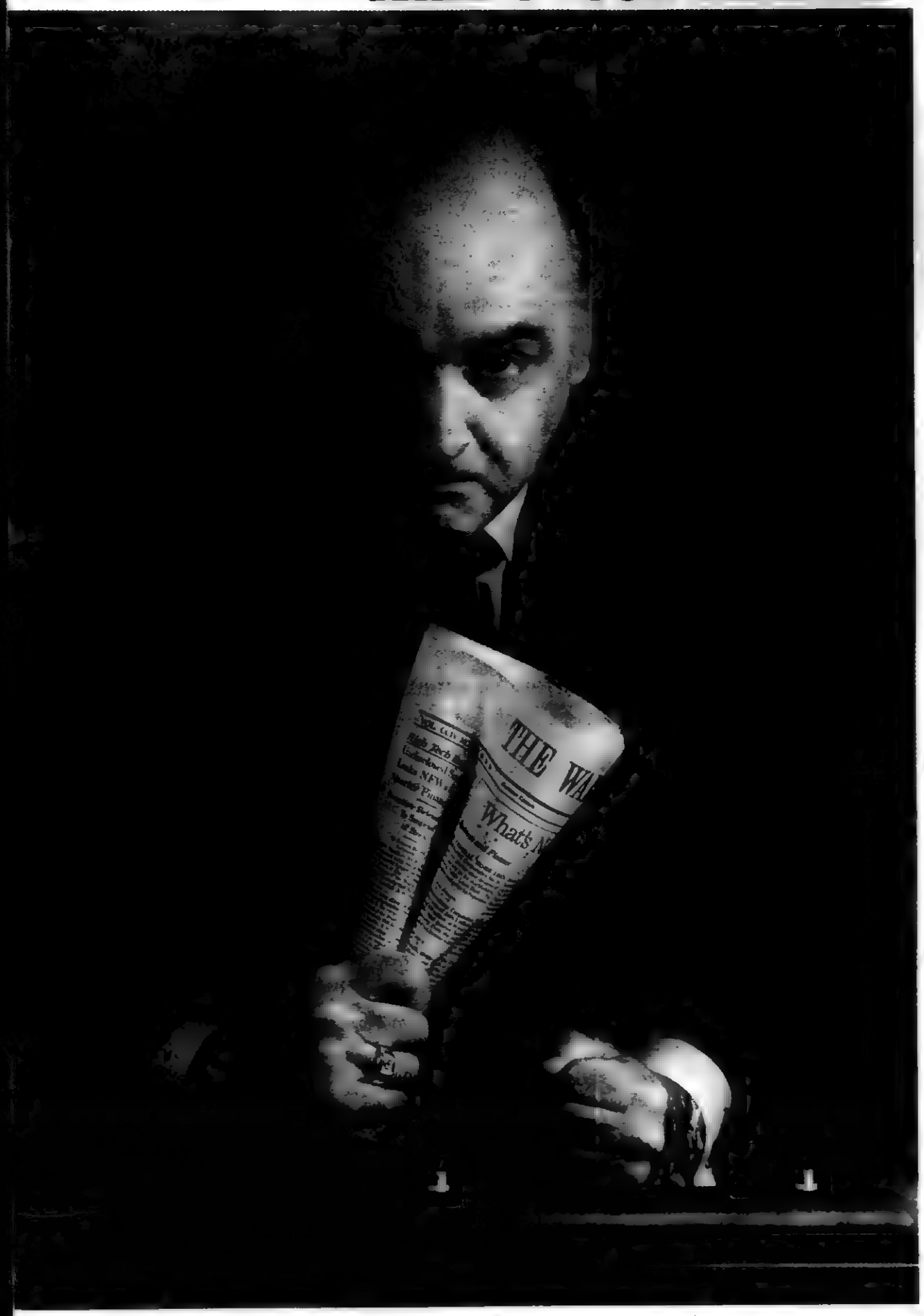
Hardware announcements

The situation is a little less grim among hardware suppliers, with IBM, AT&T and Zenith Data Systems among the major players in attendance. However, among these, only Zenith is scheduled to make any substantial product announcments, with the company expected to demonstrate the IBM-compatible laptop with 3½-in. drive options announced last week.

The picture is slightly better among peripheral suppliers. This year's crop of inexpensive laser printers should be in evidence, along with numerous storage products. One highlight among optical storage systems will be the Philips Subsystems & Peripherals, Inc. exhibit of compact-disk read-only memory equipment. A number of conventional disk drives also will debut, including one 5¼-in. system from Micropolis Corp. that provides 382M bytes of storage with an 18-msec average seek time.

Contributing to this report were staff members Charles Babcock, Elisabeth Horowitt, Donna Raimondi and Eric Bender.

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1-CWX-880616

Oracle claims 100% performance gain for DBMS Version 5

Beta-test users report faster loading times

By Charles Babcock

BELMONT, Calif. — Beta-site users of Version 5 of the Oracle relational data base management system say it has shown a dramatic improvement in performance.

Oracle Corp. announced the new version last week, claiming a 100% performance improvement, along with upgraded fourth-generation application development tools, company spokesmen said.

"It used to take 20 seconds when we entered the five screens of information on a new policy. Now we can accomplish that in five seconds," said Eddie Abdo, vice-president of data processing at the General Insurance Co. in Miami Beach, Fla.

Glen Sparks, data base programmer analyst at pacemaker producer Intermedics, Inc. in Houston, said Oracle Version 5's performance in loading and exporting data is one of its chief improvements.

"We have consistently loaded 250,000 to 270,000 records in 3 to 4 hours. It used to take 10 to 12 hours. They are using array processing now," Sparks said.

Abdo loaded Version 5 onto General Insurance's VAX 780 without informing his users, and the same day, "everybody came back to ask what happened — Oracle was running so much faster," he said.

Version 5 is now available to run on Digital Equipment Corp.'s VAX line at a price of $48,000 for the VAX 780. Version 5 will be available for IBM's VM operating system in June and for MVS in July, said Kenneth I. Cohen, director of product marketing at Oracle.

The users said the 100% performance improvement claim represents an average that will vary depending on the application. In some cases, applications are running two to four times faster, while in others, such as report writing, there is no evidence of an increase in speed, they said.

Oracle released a test from Nokia Information Systems, a Finnish independent laboratory, that purported to show Oracle outperforming its relational competitor, Ingres, from Relational Technology, Inc.

Using the DeWitt benchmark, Nokia concluded from both single-user and multiuser tests that, on the average, Oracle "was about twice as fast as Ingres," four times faster at deleting single rows and six times faster at updating single rows.

The users cautioned that they would like to see results from a variety of benchmarks before concluding a product is superior in across-the-board applications.

Prior to Version 5, Oracle spokesmen made no claims of superior performance to Ingres.

"Oracle and Ingres are systems that implement the relational model," noted George Schussel, president of Digital Consulting Associates, Inc. in Andover, Mass. Both use a version of IBM's SQL command language, an emerging industry standard, and both appear to share an intense rivalry to capture the emerging relational DBMS market. Both have many installations at VAX sites, while Oracle appears to have the edge at IBM VM sites, Schussel observed.

Schussel said Oracle has lived up to its past performance claims, but he would like to see benchmark results of Version 5 run against Version 4 rather than Ingres.

OR statement queries

Sparks said that in queries using an OR statement, such as, "Where doctor equals Jones or Smith," Oracle used to conduct a full table scan. In Version 5, it appears to have optimized that process by creating an index in less than a second; the previous procedure took 20 to 30 minutes, he said.

By writing queries in Fortran, Sparks claimed he is able to take advantage of the performance improvements. Fortran takes advantage of Oracle's new array processing capabilities; using Cobol or Oracle's own fourth-generation language would probably be slower, he said.

In addition to the performance improvement, Oracle announced SQL Forms, an updated version of its Interactive Application Program application generator, Abdo said.

SQL Plus is an interactive command utility for ad hoc data access and report writing, spokesmen said.

SQL Menu allows the creation of menu trees to provide end users with a simple operating environment for their applications.

SQL Graph permits the display of SQL-Retrieve data in bar, pie and line charts.

Easy Link has been enhanced to provide a full-screen, point-and-select interface to Oracle's micro-to-mainframe link.

Pro Ada provides an interface between Oracle and the Ada language.

Oracle also announced three interfaces for its development tools geared to novices, experienced end users and programmers.

Product marketing director Cohen said Oracle has added intelligent sorting to its DBMS, which contributes to the performance improvement, rather than relying on operating system sorts.

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SPSS enhances statistics tool

File translation feature for PC software added

By Eric Bender

CHICAGO — SPSS, Inc., which claims to have cornered more than half of the worldwide market for microcomputer statistical software with its SPSS/PC+ product, last week introduced data entry and file translation enhancements. SPSS also disclosed several site licensing plans for its IBM Personal Computer software.

Priced at $295, the data entry offering simplifies the development of full-screen high-resolution forms, SPSS said. The on-screen form can be created to look like the paper document on which information has been recorded, simplifying the entry and editing of data by inexperienced users. Alternatively, data can be entered in a spreadsheet-style form.

Designed as an integrated part of SPSS/PC+, the option also permits users to put validity constraints on any field and helps to clean up the data, the vendor said.

The file translation facility, bundled with new shipments of SPSS/PC+, offers import-export capabilities to Lotus Development Corp.'s 1-2-3 and Symphony, Microsoft Corp.'s Multiplan, Micropro International Corp.'s Wordstar, Ashton-Tate's Dbase II and Dbase III. Previously, users could translate files through standard formats such as Data Interchange Format, the company noted.

Additionally, SPSS outlined details of a new site licensing program that allows users to copy SPSS/PC+ and distribute the package internally. Three agreements are available for commercial customers, beginning with first-year fees of $6,000 for 100 copies and climbing to $15,000 for 600 copies, the company said. Corresponding arrangements also are offered for SPSS/PC+ options.

No other business decision at SPSS has received so much debate, commented President John Grillos; but early results of the site licensing program have been positive. He discounted fears of pirated copies, noting, "It's just not a product that's going to sit on everybody's shelf."

SPSS, which introduced its first statistical product in 1968, has versions of its software running on machines that range from Cray Research, Inc. Cray-2s to IBM Personal Computer XTs, Grillos noted. SPSS/PC+, which debuted in 1984, has sold over 20,000 copies.

The firm's products are in widespread use at universities, where statistical software has become key in business courses, Grillos remarked. SPSS' main competition comes from SAS Institute, Inc., whose products Grillos described as aimed more at programming and information-center-style use than SPSS offerings.

He emphasized SPSS' heavy investments in research and development, which run between 27% and 47% of sales, and discarded any suggestions that larger software vendors could move swiftly into the statistical software arena.

"The applications are brutally difficult, and beyond that, it takes years to establish a reputation. If you're first with the best product, and you don't fall asleep, it doesn't matter who comes after you," he said.

Priced at $795, SPSS/PC+ requires 384K bytes of random-access memory (more for some options), 10M bytes of hard disk storage and a graphics adapter.

Kurzweil to announce intelligent voice recognition terminal

System provides access to minis, mainframes

By Eric Bender

WALTHAM, Mass. — Kurzweil Applied Intelligence, Inc. is set to unveil next week the Kurzweil Voice Terminal (KVT), an intelligent terminal designed to provide voice access to applications on mainframes and minicomputers.

Carrying a starting price tag of $9,900, the KVT incorporates the same technology and 1,000-word vocabulary for discrete speech as the firm's year-old Kurzweil Voice System (KVS) attachment for IBM Personal Computers.

However, the preconfigured system integrates KVS hardware with an IBM Personal Computer XT-compatible micro and ASCII communications software in a compact desktop unit.

For customers linking into IBM mainframe environments, a $10,900 model featuring IBM 3270 emulation will also be sold.

The KVT is aimed at customers who can benefit from voice commands for mainframe or minicomputer applications but do not want to assemble a complete system themselves, said Robert Steingart, manager for product marketing.

Additionally, Kurzweil will disclose a cooperative marketing agreement with Ask Computer Systems, Inc., along with software that links the voice commands to Ask's core set of manufacturing software modules and costs $500 per Ask module.

"This is our first relationship with a large supplier of manufacturing software," noted Ed Marcato, marketing operations manager.

Technically sophisticated users can write similar translation software that allows voice commands to drive their own applications, Steingart said. Also, KVT software now allows users to expand the system's vocabulary "on the fly," he said.

Kurzweil's KVS costs $6,500, or $7,500 with training and support. During its first year of shipment, an estimated 250 KVS units have been installed.

Marcato acknowledged that voice recognition has seen only gradual market acceptance but maintained that there are many applications in which customers can recoup their investments within a year.

During internal tests with voice-commanded Ask software, Kurzweil found a 50% increase in order processing transaction throughput and a 40% increase in the speed of general inventory transactions, Marcato said.

About the size of a standard PC XT, the KVT features a single floppy disk drive and a 10M-byte hard disk drive. It will formally bow at the Advanced Manufacturing Systems Expo in Chicago next week.

Epson printer to offer color

By Peggy Watt

TORRANCE, Calif. — Epson America, Inc. will formally introduce this week a new high-speed dot matrix printer with a color capability option.

The EX-800 is Epson's fastest nine-pin printer, capable of printing as fast as 300 char./sec. in draft mode and 54 char./sec. in near-letter-quality mode of 12 char./in.

The 80-col. printer has built-in parallel and serial interfaces to connect to most microcomputers. It comes with an 8K-byte buffer, with a 32K-byte buffer option available.

It also has an eight-button membrane control panel for giving instructions such as type style and type quality directly to the printer instead of going through the software. All software with drivers for Epson's earlier color dot matrix printer, the JX-80, released in 1984, will also run the EX-800, said Dave Ball, technical product manager. However, color commands must be given through the software.

The printer is priced at $749, and the optional, user-installable color cartridge will be priced at less than $100, according to Ball.

"This is a repositioning of color in our line," Ball said. "We learned with the JX-80 that color is a tremendous asset that needs a marketplace." The expense of color printers has hampered their proliferation, he said.

Epson's newest color printer is priced close to the JX-80's original price of $799, but it includes more options and enhancements, Ball said. Epson recently dropped the JX-80's price to $499, and the firm will continue to support that printer.

The EX-800 comes with a one-year warranty. Epson plans to show the new printer at the 1986 National Computer Conference in Las Vegas this week. According to Ball, shipments will begin within three months.

The EX-800's optional color cartridge includes a four-color ribbon that can produce seven colors (black, red, blue, violet, yellow, orange and green) and 256 shade variations.

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- MVS and DOS/VSE JCL for jobs that use VSAM files



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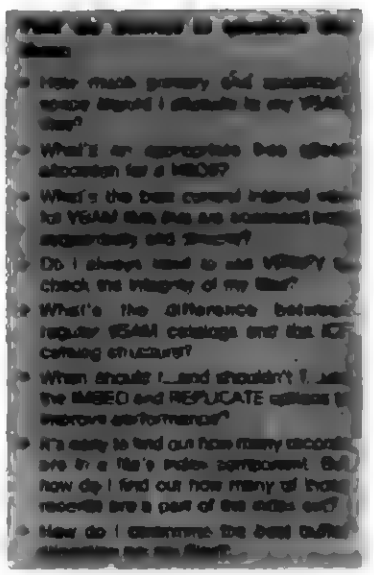
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DG Eclipses linked with IBM hosts as peers via SNADS

Adds to Eclipse's processing ability

By Elisabeth Horwitt

WESTBORO, Mass. — Data General Corp. last week introduced what it claims is the first commercially available non-IBM product that provides peer-to-peer document distribution via IBM's Systems Network Architecture Distributed Services (SNADS). The company also announced memory modules that double the maximum capacity of its Eclipse MV/2000 DC and DS/7500 workstations from 5M bytes to 10M bytes.

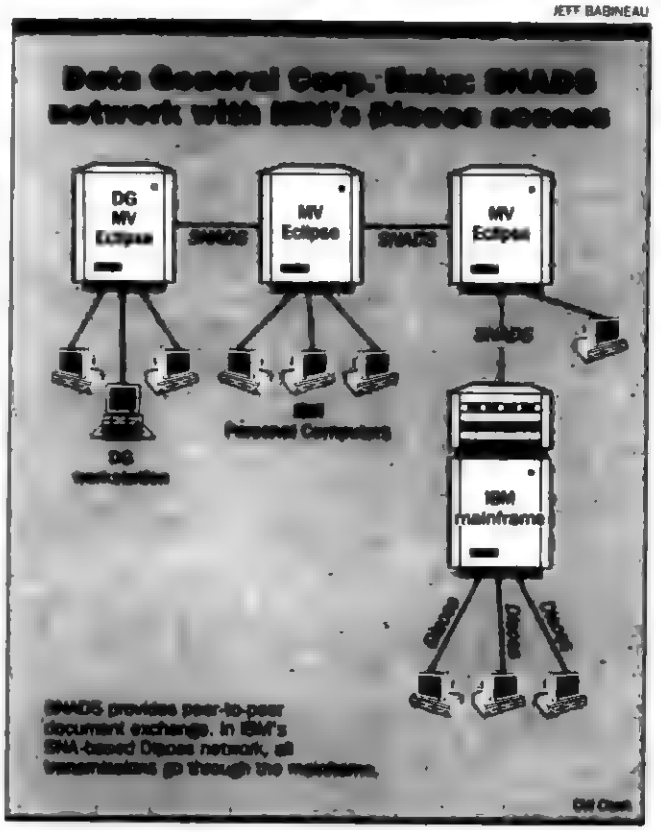
SNADS connectivity increases the viability of DG MV Eclipse minicomputers as departmental processors in IBM environments, according to David Lyons, vice-president of business group marketing.

"MIS departments are frustrated with IBM's ability to deliver departmental solutions. We're being invited to submit proposals in that area, but users are telling us they want connectivity into their existing IBM installations," Lyons said.

The new offering consists of a software enhancement that implements SNADS on DG's Comprehensive Electronic Office/Document Exchange Architecture (CEO/DXA). Formerly, CEO/DXA enabled users of CEO MV Eclipse-based office automation software to access IBM's Distributed Office Support System (Disoss) document distribution system — but only in terminal mode. This meant that all document transfers between any two nodes had to go through an IBM host.

This type of setup has two disadvantages, according to communications product manager Joseph Clabby. First, it is often inefficient; two nodes in the same office might end up exchanging documents by way of a remote IBM host. Second, handling document transfers for multiple Eclipses puts a heavy strain on the IBM mainframe.

JEFF BABINEAU



SNADS provides peer-to-peer document exchange. In IBM's SNA-based Dipose network, all transmissions go through the mainframe.

"Ultimately, you don't want to use an IBM host as a message board," commented Molly Upton, a senior analyst at Framingham, Mass.-based consulting company International Data Corp.

Eclipses equipped with the latest version of CEO/DXA can exchange documents directly with one another and with IBM mainframes and departmental processors using SNADS peer-to-peer routing and addressing functions, Clabby said.

Document transfer

Documents can be transferred from point to point or routed among different systems using store-and-forward protocols. Users can access SNADS through the CEO menu-driven interface.

The new CEO/DXA version includes PU2.1 and LU6.2 software packages. PU2.1 controls the physical link between nodes in a SNADS network; LU6.2 provides the basic interface between DG and IBM application programs.

Application Program Interface LU6.2 (APILU), also announced last week, is DG's version of the IBM LU6.2 program-to-program interface. Developers can use APILU to develop links between programs written in DG AOS/VS Cobol, Fortran, PL/I and macro assembler and other programs that conform to the LU6.2 protocol.

Software developers will have to write APILU-based programs before users attain transparent peer-to-peer connectivity between DG and IBM departmental processors and hosts, Upton said.

Beneficial Data Processing Corp. of Peapack, N.J., perceives a use for APILU, "once applications start being developed," according to Vice-President of Office Information Systems Luciano Corea. "It's a potential solution for which we haven't yet defined the problem."

The company, which provides data processing services to parent Beneficial Corp., uses more than 21 Data General MV/2000 DCs running CEO for electronic mail and other office automation functions. "We have a lot of IBM hardware, but no Disoss or SNADS," Corea said.

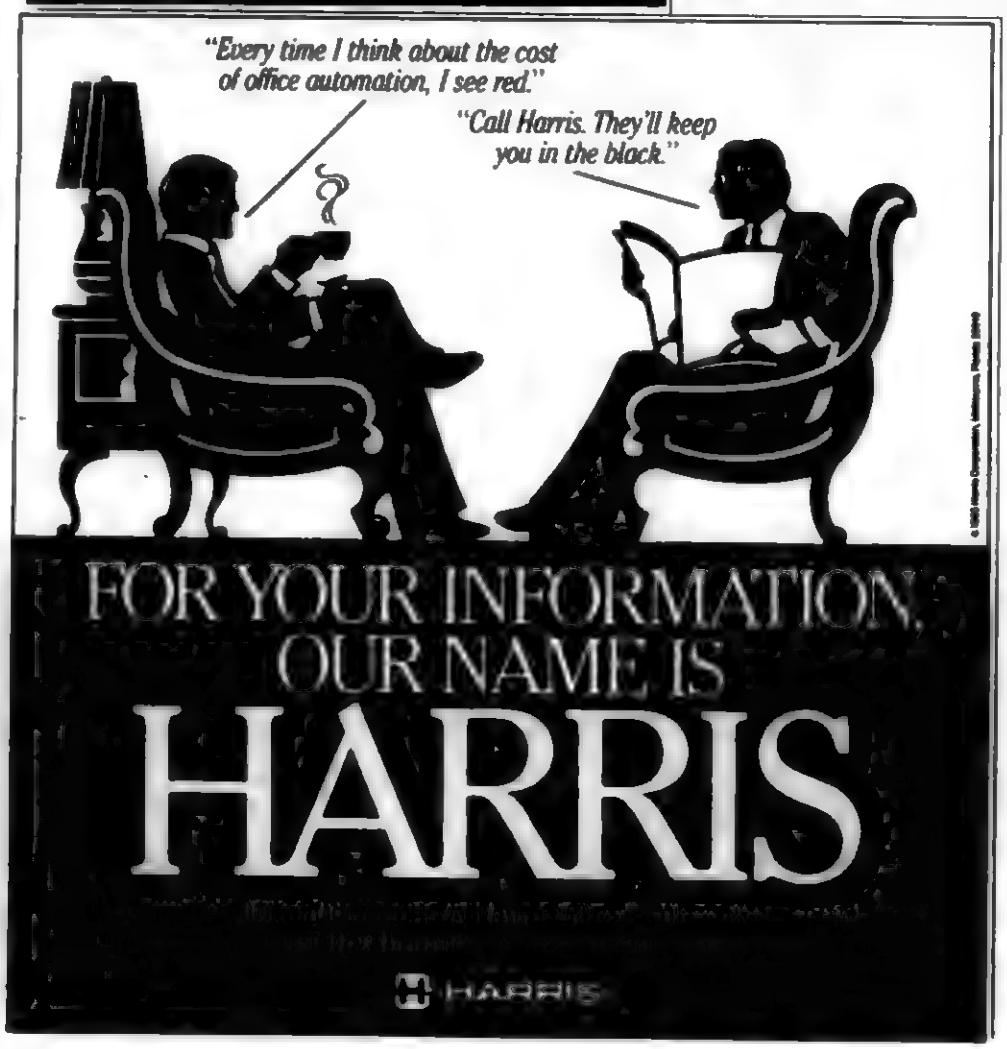
An expanded Disoss interface included in enhanced CEO/DXA enables MV Eclipses to access files in IBM host data bases via the Disoss Library Service.

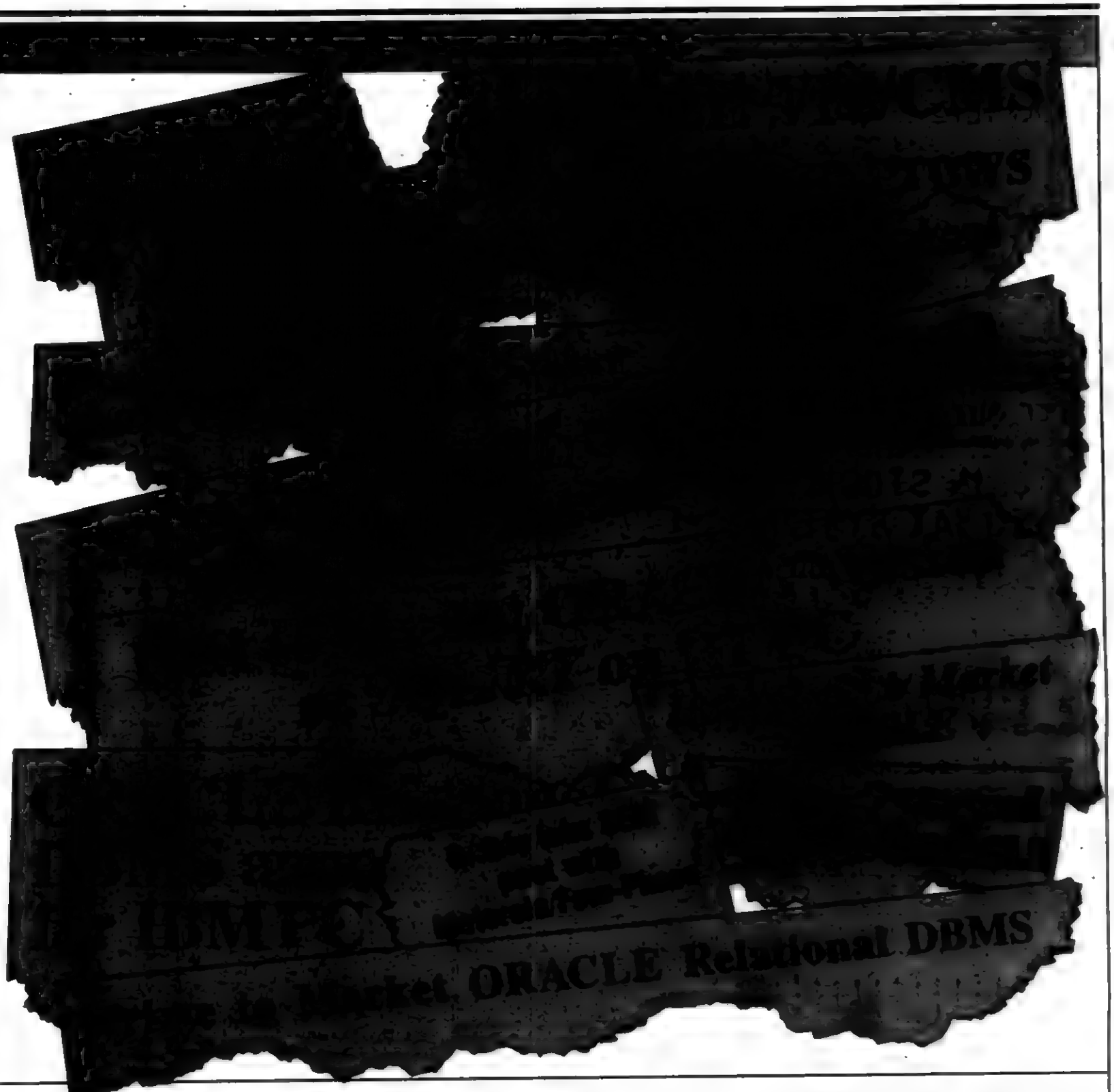
The enhanced CEO/DXA also incorporates Document Interchange Architecture/Document Content Architecture (DIA/DCA), IBM's protocols for generating and packaging documents. As a result, computers running DIA/DCA-compatible software can exchange editable documents or send them to an IBM host Disoss network through an MV Eclipse.

According to DG, prices for the enhanced version of CEO/DXA are the same as for the earlier version, starting at $9,000. APILU is priced from $1,500 to $7,200.

DG also announced the 4M-byte Model 8924-D and 8M-byte Model 8924-E memory modules, which can run on an Eclipse MV/2000 DC system or DS/7500 system. The 8924-D costs $8,600, the 8924-E, $17,200.

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User runs VAX-Mate

From page 1

CPU case or can be unattached and placed beside the CPU. The look of the machine was of prime importance, according to a January 25, 1985, internal DEC memo that outlined the VAX-Mate strategy.

"The next-generation personal computer from Digital will be a state-of-the-art design achieving a minimum desktop form factor and elegant user-perceived packaging," the memo said.

Some of the other unique features of VAX-Mate include a modem phone jack and an Ethernet connection on the back of the machine and a vertical floppy disk drive covered by a hinged panel built into the terminal.

Those who have seen the machine were impressed. "I think the system is going to be a great success within the VAX community," a source said.

Analysts say DEC is on the right track with VAX-Mate. "DEC has really been gobbling up the mid-range, but the thing that has been missing is a desktop strategy," said Michael Goulde, a market analyst with the Yankee Group, a Boston-based research firm.

"It was only a matter of time before they entered that market with a compatible offering that had added the value of communications into the DEC architecture," he said.

"I think its a great idea. What DEC is saying is, 'Hey, we've got this great customer base, let's just keep giving them products that interact with the other products,'" said Bruce R. Watts, an analyst with Morgan Keegan, Inc., a Memphis, Tenn.-based investment firm. "It is a very innovative product that, at least at the outset, will especially be attractive to the existing customer base."

VAX-Mate is based on the Intel Corp. 80286 microprocessor, comes bundled with a DEC-modified version of Microsoft Corp.'s Windows operating environment and communicates with larger systems through VT220 emulation.

DEC's VT220 emulation package is not available on IBM personal computers. Because VAX-Mate makes extensive use of Windows, it comes with a round three-button mouse. The VAX-Mate uses a standard VT220 keyboard.

Despite the non-IBM standard keyboard, a source who has used the machine reports no compatibility problems running off-the-shelf IBM-compatible software.

Under Microsoft Windows, users can run VT220 sessions and Windows-based applications concurrently. Non-Windows based applications, however, will take up the entire VAX-Mate screen and cannot be run concurrent with VT220 sessions.

"Any Windows-based application can run in a Window, but something like Lotus will take over the whole screen," one of the sources said. Data, however, can be "cut and pasted" from a VAX or Microvax to Lotus 1-2-3 and vice versa.

Although Windows on IBM and compatible personal computers makes extensive use of color, VAX-Mate will not have color capability in its initial form.

Windows on the machine demonstrated to *Computerworld*, however, ran quickly and flawlessly. In order to run color, the video board must be redesigned, and the VAX-Mate CPU case will probably have to be enlarged, a source said.

Once expected to be released in early spring [CW, February 3], VAX-Mate may not be available until late fall, the sources said. The introduction has been delayed because of problems involved in networking the machine to VAX and Microvax computers, they claimed.

"They have had a lot of problems on the hardware side, but most of those are behind them now. The networking software still needs some work," said a source with close ties to DEC.

The current delay centers on difficulty in developing networking software that will reside on VAXs and Microvaxes and allow them to act as file servers for the VAX-Mate.

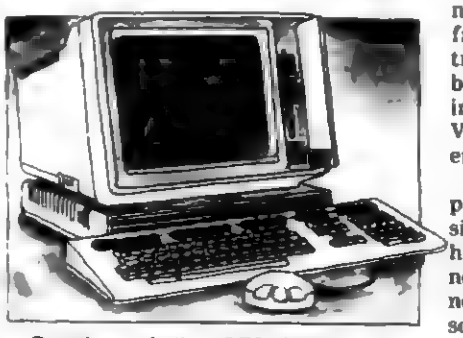
Using thin Ethernet cable and Decnet DOS, the VAX-Mate can store programs and data on DEC's larger systems, but network crashes prompted DEC to rewrite much of the networking software code.

Configurations

VAX-Mates may be available in various configurations, including one 1.2M-byte floppy disk drive and or a 20M-byte internal hard disk drive, or no drives at all, storing all programs and data on larger systems.

Some shops concerned about the security of corporate information prefer diskless PCs, a source noted.

The machine comes standard with 1M-byte of random-access memory (RAM) that can be boosted to 2M bytes. Memory above 640K bytes can be used as a RAM disk.



Drawing of the DEC VAX-Mate is based on a photo of the unreleased system provided to *Computerworld* by a beta user with the stipulation that the actual photo not be used. DEC itself describes the system as having "state-of-the-art design achieving a minimum desktop form factor and elegant user-percieved packaging."

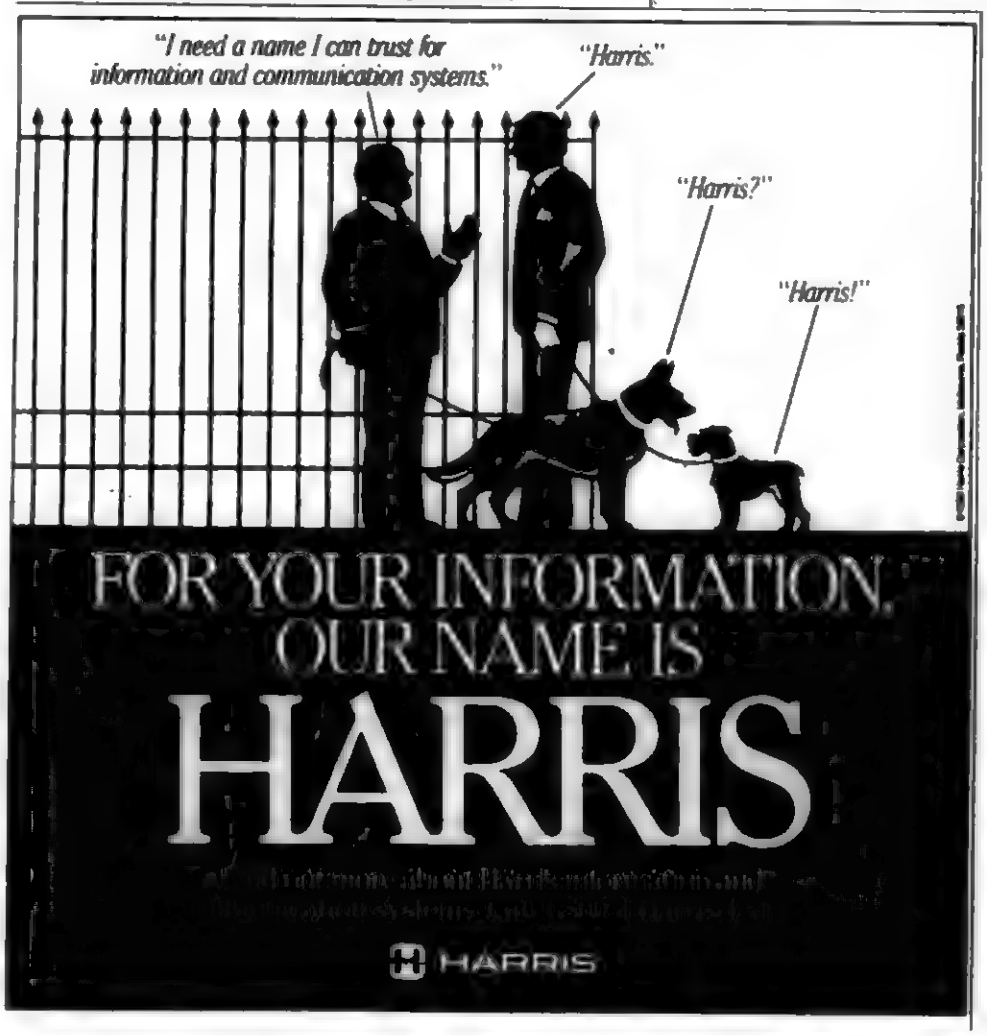
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New VDT study OKed

By Mitch Betts

WASHINGTON, D.C. — The Reagan administration has approved a revised study of the effects of VDTs on pregnant women, following a controversy over the administration's previous rejection of the long-delayed government study, a spokesman said last week.

Approval by the U.S. Office of Management and Budget (OMB) allows the National Institute for Occupational Safety and Health (NIOSH) to begin its VDT study. The VDT study will compare the pregnancy outcomes of 2,000 VDT users with the pregnancies of 2,000 women who do not use VDTs [CW, Jan. 14, 1985].

The OMB said its approval is conditional, however. James B. MacRae Jr., chief of OMB's reports management branch, said NIOSH must agree to delete numerous items from its questionnaires, including questions about the effect of VDT exposure on fertility, and must agree to obtain medical records to verify all adverse reproductive outcomes reported on the questionnaires.

Several months ago, the OMB rejected the institute's scientific proposal on grounds that it had design flaws [CW, Feb. 24].

Computer residual value worth questioned in research report

Long-term cost 'trivial' next to running expenses

By James Connolly

A $500,000 gain or loss on the residual value of a piece of computer equipment is significant, but when spread over five years, the value can be trivial compared to the potential residual expense of running that system for those five years, according to a theory presented by a research firm.

The theory that residual value may be a minor consideration in comparison to the long-term cost of running a piece of equipment — particularly equipment that requires a significant software investment — was offered in a report released recently by Input based in Mountain View, Calif.

"Questions of whether the residual value of hardware will be 25% or 10% of manufacturer's list price in five years is a trivial consideration compared to the potential residual expense associated with the development of computer and communications systems," the Input report said.

Mixed responses

When asked about the Input theory, consultants and other market researchers offered mixed responses, with even those in agreement noting that calculating the long-term cost of a system is hampered by the lack of workable formulas.

"You always have to do residuals. But an analysis of the residual cost of systems over the life cycle of the system is going to be the more important consideration, rather than just what the residual value is going to be at the end.

"In making the decision to purchase or to lease, regardless of what the system happens to be, there are other very important factors," said Mountain View, Calif., independent consultant Tim Tyler, who contributed to the Input report.

Tyler suggested that if computer users look at factors such as the cost of maintenance and software development they will shift to simpler systems, rather than get caught up in an increasingly complex and expensive mainframe growth pattern.

He encouraged users to undertake an orderly distribution of processing, by using minicomputers to handle much of their data base activity. He said such an approach requires users to take close looks at the overall cost and benefit of installing a distributed network.

There appears to be little agreement as to how important residual values are for typical computer users.

"I think what most of our clients do is acquire equipment with the idea of holding on to it until the residual value will be basically zero, which is a very short time, especially for CPUs these days," said Per Flaatten, information technology research manager for Arthur Andersen & Co. of Chicago.

Flaatten noted that users examine residual values most closely and do most of their residual value forecasting when a product is nearing the end of its life cycle.

> ***'Residual value is very important to these people, because if a residual value of 15% is worth $1.5 million, that buys a lot of programmers.'***
>
> — Dale Kutnick Gartner Group, Inc.

He said users are now planning to write off IBM 4381s within three or four years because it is near the end of its new-product life.

Other contributing factors

Flaatten added that two factors to consider when calculating residual expenses for a system are the tendency for maintenance costs to increase as a system gets older, and the cost of space to house large, older-technology systems.

Analyst Frank Gens of International Data Corp. in Framingham, Mass., noted that the maintenance cost increases cited by Flaatten can be the result of the expense for vendors to keep spare parts inventories for obsolete systems for several years, and can be the result of vendors wanting to force users to buy new systems.

However, he said there is some declining importance of residual values. "I think the reason there has been so much emphasis on hardware costs and values is that the costs probably were the lion's share, or at least the largest part, of an MIS budget. That has changed now that software is so expensive and the greatest cost is people. The reason there is still an emphasis on hardware cost in many cases is that it is a capital expense, so it is easy to measure."

Important to decision makers

Gens noted that residual value remains important to the financial decision makers in user companies but that DP managers base their decisions most often on the reliability of a system and the quality of vendor services.

He added there are three basic types of users with respect to residual value: Large companies that are constantly installing, replacing and selling equipment because of its importance as an asset; large and medium-size firms that keep depreciated equipment in the company by moving older systems into development or low-demand applications; and smaller companies that depend on equipment maintaining its residual value because they cannot afford to depreciate it to zero.

Dale Kutnick, executive vice-president for research at the Gartner Group, Inc. in Stamford, Conn., maintained residual values are very important, particularly for large companies.

"The people who are really concerned about it are big customers. In large companies, the MIS manager is becoming an asset manager. The bottom line plays a significant part in which machine to buy and when to buy it," Kutnick said.

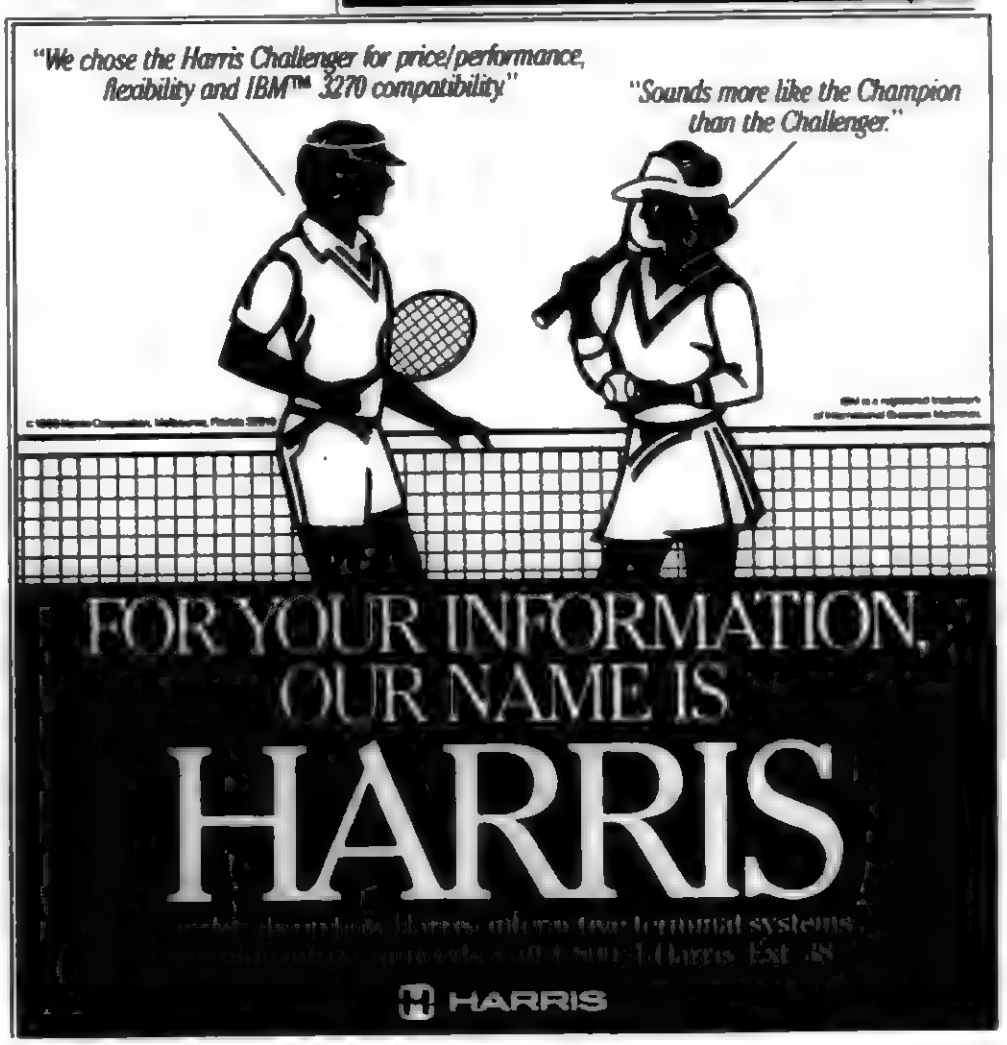
Kutnick noted the residual value question and the issue of complexity are unrelated for those large customers because they have decided how complex their systems will be before they look at new equipment.

"Residual value is very important to these people, because if a residual value of 15% is worth $1.5 million, that buys a lot of programmers," Kutnick added.

He maintained residual values are becoming increasingly important, not only for CPUs, but for tape drives, disk drives and even some major software packages.

He said smaller companies have little control over residual values because their computers, such as the IBM System/36, will be written off within three years.





AT&T offers Unix System V Release 3.0, pursues OA mart

Promises ability to share resources across networks

James A. Martin
and Eddy Goldberg

ATLANTA — Promising users the ability to share data and office resources across a multivendor network, AT&T Information Systems last week formally unveiled Unix System V Release 3.0 at the Summer 1986 Usenix Conference and Exhibition.

At the conference, AT&T focused on the Streams networking and Remote File Sharing capabilities it had promised in its bid to make Unix a standard [CW, May 26].

"The office automation market wants a standard way of transferring data, files and applications between heterogeneous machines in a standard operating environment," said Dave Sandel, division manager for product marketing support in AT&T's Summit, N.J., office. "Unix System V Release 3.0 provides that capability."

Streams reportedly enables programmers to develop network applications independent of the media or protocol used.

AT&T also announced support for Ethernet and Transmission Control Protocol/Internet Protocol, de facto standards in the Unix community.

Mark Hatch, group manager for networking and operating systems at Apollo Computer, Inc., said AT&T had responded to criticism of earlier Unix versions. "With System V Release 3.0, AT&T has created a Unix system that can pull together all the variations that existed and have hindered portability."

Targeting business

Hatch said that until System V Release 3.0, University of California at Berkeley's Unix 4.2 was the better system from a technical point of view. However, Unix System V Release 3.0 has blunted complaints that Unix is not suitable for business applications, he said.

For example, with RFS, users can lock files across a network, ensuring data integrity. Lack of file locking has been a standard complaint from business users considering Unix.

An additional new feature in V.3, a shared library function, is said to reduce disk space and memory requirements by allowing one processor to house a data base that can be accessed by others on the network.

Nevertheless, communications and file sharing are only a first step, Hatch said. The next step is to figure out how Unix fits into the business community, where it is still plagued by perceptions that it is difficult to work with. "Until we get some really good Lotus Development Corp. 1-2-3 types of applications for Unix, it will be a problem," he said, adding that highly accessible products like Interleaf, Inc.'s Unix-based publishing systems are a step in that direction.

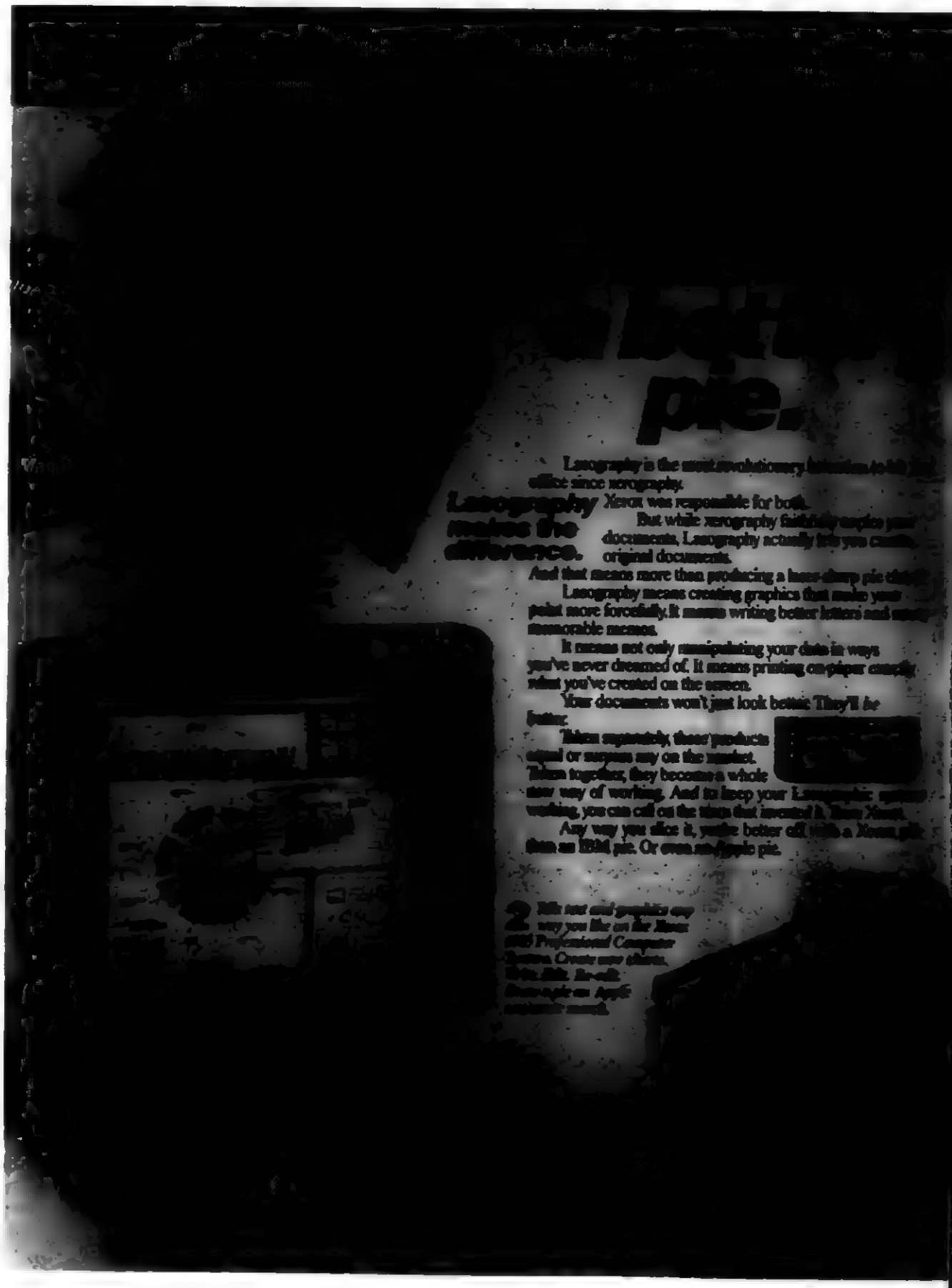
AT&T has been struggling to wedge Unix into commercial and corporate markets, which are dominated mainly by IBM's PC-DOS and Microsoft Corp.'s MS-DOS operating systems.

"One of the problems Unix systems had in the past was talking to the types of systems used by commercial vendors. By providing Streams, the door is opened to Unix becoming a full partner with all the machines an MIS department is likely to have in its shop," Hatch said.

Hatch said the greatest deficiency in System V Release 3.0 is the lack of windowing and graphics capabilities. "People buy Unix for its portability. Without a standard interface for a windowing system, people lose the benefits of portability," he said. The story is the same for graphics, he added.

Still, AT&T remains publicly optimistic, hoping the

See AT&T page 15



Zenith laptop boasts 3½-in. drives, full-size LCD screen

Aims to outgun PC Convertible

By Douglas Barney

NEW YORK — Zenith Data Systems Corp. last week announced the Z-181, a sub-$2,500 laptop that features dual 3½-in. floppy disk drives, and what the firm claims is the industry's first full-size, backlit, LCD screen.

The machine's 3½-in. pop-up floppy disk drives follow on the heels of the IBM PC Convertible, a laptop machine introduced April 2 that uses the smaller drives. All leading microcomputer software vendors announced 3½-in.-drive versions of their packages shortly after the Convertible announcement.

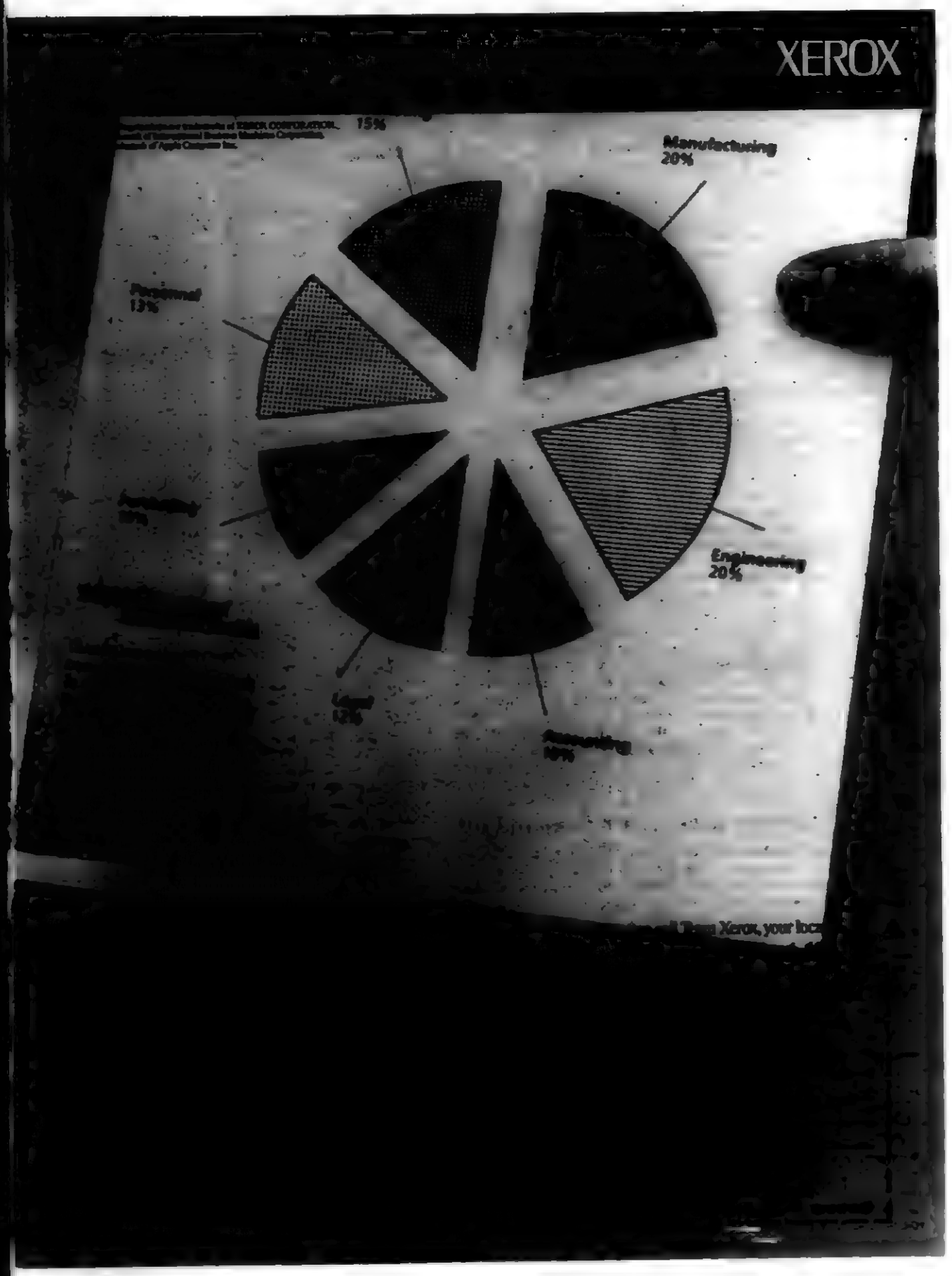
Zenith made headlines when it beat out IBM for a $27.6 million Internal Revenue Service laptop contract in late February. The IRS chose the Zenith Z-171, a laptop that uses standard 5¼-in. disk drives. Zenith will now sell both machines and provide an interface for transferring information from an external 5¼-in. drive to the 3½-in. drives. Zenith officials were not available for comment as of press time.

Some see the Zenith as superior to the IBM PC Convertible. "They are going to do the Convertible the right way. The Convertible has a problem in its ability to get back and forth from the PC world. While there are some links, they are not very well developed," said Aaron Goldberg, vice-president of Microservices for International Data Corp., a Framingham, Mass.-based research firm. "Zenith is promising to do better with a pure RS-232 connection."

The 10½-in. screen on the Z-181 displays 80 characters by 25 lines, with a resolution of 640 by 200 pixels. According to Zenith, the screen has a true aspect ratio, meaning graphics will have the same appearance on the Z-181 as on a standard 12-in. desktop monitor.

The Z-181 comes standard with 640K bytes of random-access memory, uses an Intel Corp. CMOS 80C88 microprocessor running at 4.77 MHz, runs Microsoft Corp. MS-DOS 3.2 and weighs 11.8 pounds.

The machine comes standard with a five-hour rechargeable battery, AC adapter and battery recharger.



AT&T offers Release 3.0

From page 14

new release will build momentum for the Unix operating system across the board and help to dispel the apathy some markets and users have for Unix.

But a number of Usenix conference attendees randomly queried by *Computerworld* at the exhibit area said they were not familiar with the Release 3.0.

"A lot of people forget AT&T only entered the computer business in March 1984," AT&T's Sandel said.

"The number of Unix applications two years ago was a handful. Today, the number is well over 1,000, and that includes only AT&T and not third-party developers. Also, a number of industry leaders, such as Digital Equipment Corp., have come out and developed products around System V.

" The momentum is growing, and more and more applications will take advantage of the financial, scientific and engineering aspects," Sandel said.

Announcing
Computerworld's
MICRO DIRECT SHOPPER
SEE PAGE 144

VIEWPOINT

EDITORIAL

Departmental DP: What solution?

Departmental computing is one of those phrases that everyone in the computer community seems to recognize in word and concept. However, while vendors and consultants debate the merits and claims surrounding departmental computing, a sizeable chunk of users seems to be sending a different message. According to the exclusive Datapro Research Corp. survey reported in this issue of *Computerworld*, only 11% of those questioned use minicomputers for departmental computing.

While this is only a small, albeit scientific, sampling, the sentiment does support the contention that, *at this point*, departmental processing is largely a myth. Despite IBM's billing of the System/36 as *the* strategic office automation product, for example, the vast majority of System/36s and other minicomputers continue to be used as general purpose remote systems.

Despite what vendors claim, integrated office packages like Data General Corp.'s Comprehensive Electronic Office and Digital Equipment Corp.'s All-in-1 run best on general-purpose intermediate computers, most likely tied to a remote mainframe and most often used for single-application electronic mail.

The notion of departmental systems does bring with it an array of problems. To name just two: the lack of software that supports PCs on one hand and simultaneously provides a mainframe link on the other and the lack of control over both costs and the corporate data base.

Meanwhile, vendors have provided too few real solutions, too many "answers" falling far short of the problem that exists: the need for a flexible system that allows MIS managers to allot the right power and tools to each user. The truth is, what is too much computer power for one — whether desktop or departmental — is too little for another.

Recently, though, we have noted encouraging signs signaling the possible transition of departmental computing from myth to reality. Last week Relational Technology, Inc. introduced a new version of its Ingres DBMS, said to allow data bases within various departments or sites to be accessed as one large relational data base. Last month IBM reaffirmed its commitment to department- and work-group-level systems, citing customer surveys that predicted substantial movement of applications and data to mid-range processors.

Those companies that have IBM mainframe data base and application systems and have ported them to DEC's VAX say the latter market is developing rapidly. Cincom Systems, Inc., Information Builders, Inc., Oracle Corp., Relational Technology and others all have versions of their software that run on the VAX; applications developed under them may run under the same brand of the software designed for IBM mainframes.

Here is the precursor to departmental processing: an organization that is accustomed to having mainframe and mini functions and is now trying to link them up in limited ways through software intermediaries.

Departmental computing may not exist yet, but it seems that the chances are good that it will be a major force in the near future: a new portfolio of solutions to corporate problems.



LETTERS TO THE EDITOR

Netview already fulfills predictions

The article, "IBM's Netview links five network packages" [CW, May 26], reported a prediction that IBM would announce Netview support for the System/36 and System/38 in the future. In fact, the initial release of Netview already supports these processors.

One of the major benefits of Netview is the ability to see "alerts." These are special messages that can be generated by equipment throughout a network to warn the central site operator of a failure or to advise him of a special situation. This is part of a Systems Network Architecture facility called Record Formatted Maintenance Statistics, which is supported by IBM on most of its communications products already and by several other vendors. Any products that can support this facility are implicitly supported by Netview. This includes the System/36 and System/38.

Joseph T. Mohen
The Teleprocessing Connection, Inc.
Garden City, New York

Agency cures state's computer ills

When a child burns his hand on a hot stove, he is reluctant to return to the kitchen. This is an analogy that applies to computer users with their first computer system, whether a personal computer, mini or mainframe.

The recent decline in sales and profits bandied about by all data processing vendors may be related to the hot stove syndrome.

If Big Blue and the rest of the pack want to turn this declining trend around, then these vendors must put more emphasis on service and support after the sale and less on up-front packaging and sales promotion. For what good is a Focus software package or Lotus, Hypercube or Megaflop technology when the "box" is broken and there is no one available to fix it?

The Information and Resource Center (IRC), at the Bureau of Central Computer Services, has been helping Maine's state agencies deal with these problems for the past three years, and, like many corporate info centers, the IRC is sometimes the middle man between the agency and the vendor.

A scenario may go something like this: Agency A determines the need for a PC to process a local data base and provide word processing in the director's office. The agency selects a vendor. The agency may call the vendor representative, or it may not. Four to six weeks later a covey of boxes arrives with an invoice.

Two days later the office is in chaos, the boss is screaming because nothing is getting done and the user hasn't slept. The agency decides to call the IRC for help. One of the staff rushes over to the agency, sorts the system out, plugs it in, runs diagnostics, makes a few recommendations, provides some on-the-spot training and then returns to the IRC.

A few months later the user calls in a panic again, stating the system doesn't work. The staff member rushes over to the agency again and determines there appears to be a problem with some part of the CPU. The next question the IRC staff member asks — "What type of service agreement do you have?" — always prompts the same answer: "What is a service agreement?"

When the vendor service office contact is made, the result is less than positive. "Well if you drive to our office or mail it to East Podunk, we'll have it back to you in a few weeks."

Throughout this series of events, the agency views the data processing purchase in the same light as that for a typewriter or calculator: Easy to use and able to run by itself. And the vendor made no attempt to point out any difference.

Touch the hot stove? Not all states or organizations have an IRC to bail agencies out. The vendor must take the responsibility of informing all data processing purchasers of the importance of a service contract and what support the customer can expect from the vendor. The alternative is an increased reluctance by all to purchase DP products, and the vendors might just as well throw down their shovels and complete their graves with a backhoe.

Richard O. Howe
Department of Finance and Administration
State of Maine

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*Letters should be addressed to the Editor, **Computerworld**, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.*

VIEWPOINT

The decline and fall of programming excellence

A good friend who has been involved with computers for the past 25 years or so recently became director of software documentation for a major New York brokerage house. He has been bemoaning the convoluted code that he receives daily from the company's army of high-priced programmers. "Spaghetti code," he called it.

"But don't those people use Cobol?" I asked. "And doesn't that impose some organization on the program?" Replied my friend: "In answer to your first question, yes, and to your second, no. The minute they get to the procedure division, all hell breaks loose."

One study found, for example, that 75% of the programs undertaken by businesses are never used — either because they are never completed or because they are completed too late to be useful.

Moreover, the programs that are completed display more bugs and poorer coding than ever before. Lotus Development Corp., for example, recalled 25,000 copies of Symphony Version 1.1 when it discovered a fatal bug that could cause loss of the user's data.

To what can we attribute this deterioration in programming quality and programmer productivity? There are many causes, but they all seem to fall into one of three categories: people, approach and systems.

The people problem begins with programmer training. As the need for programmers has increased, industry has come to rely upon institutions of higher education for its supply of trained coders. But for the most part, these schools do not produce graduates prepared to do state-of-the-art programming. It is one thing to teach theoretical concepts; it is quite another to impart an understanding of the way these theories can be applied — albeit imperfectly — to real-world programming problems.



By DAVID B. AHL

Another problem is that, with programmers in short supply and high demand, they can command salaries far in excess of those paid to their classmates working in other fields. Thus, when the stress of a particularly large or complex job begins to make life uncomfortable, a young programmer may look for greener, less stressful pastures. When he moves on, he frequently leaves behind an unstructured, undocumented mess. Results: delays and cost overruns.

One manager I met recently has solved many of his personnel problems by hiring only "untrained" people. He has found that liberal arts college graduates with good communications skills can be more easily taught to program than computer scientists can be taught to communicate.

Partially in response to personnel problems and partially because of a desire to get the job done as soon as possible, managers frequently take the position: "I don't care how it looks as long as it works." This I refer to as the approach problem.

Programmers and their managers have never been known for their ability to communicate with one another. For one thing, there is the familiar difference in lifestyle. Managers generally work in spacious offices fitted with handsome furniture, and programmers in untidy cubicles surrounded by motley collections of posters and empty soda cans.

But most dangerous are differences in notions of time and scheduling. Although managers recognize the importance of long-range forecasts, plans for next year usually take a back seat to the time and budget pressures of tomorrow. As one senior executive expressed it, "If you don't make it in the short run, the long run doesn't matter."

This pressure to get the program working — "Forget about the overall system; we'll fit it in later" and "Don't worry about the documentation; we'll get someone else to do it" — leads directly to spaghetti code, incompatible systems and high maintenance costs.

Compounding the problem is the lack of any sound, easy-to-apply method for measuring programmer productivity. Lines-of-code measures tend to penalize coding ingenuity and skill and discourage the use of high-level languages. Cost-per-defect measures imply a curious paradox: As program quality rises, so does the cost per defect. Good programs are penalized, and buggy ones are rewarded with low cost-per-defect ratings.

Not the fault of programmers or managers, but major contributors to poor programming style, are the computer systems themselves — particularly personal computers. As recently as five years ago, the average memory on a PC was about 32K bytes. While this didn't encourage the same efficiency in coding as did the early minicomputers, which often had 4K bytes or fewer, it did force a certain tautness of style — something that has vanished entirely with the current generation of machines sporting 512K bytes and more of memory.

Likewise, multiuser, multitasking, windowing and other advanced features have forced programmers to pay considerably more attention to the environment than to the functionality of the program. This is usually done in the name of user-friendliness, but I question the value of user-friendliness without user-usefulness.

Are there solutions to the problems of declining programming excellence? Yes, at least to some of the problems. Old techniques, including modular coding, concurrent documentation, reuse of parts of old programs and use of the best known algorithms, can help. So can new techniques like rapid prototyping, computer-assisted software development and restructuring engines

But even the easiest of these require just a bit more time and effort than plunging ahead with the first scheme that comes to mind. And after all, isn't the programmer supposed to get the job done as quickly as possible?

Ahl founded Creative Computing Magazine *and is the author of more than 20 books on recreational, educational and professional computer applications.*

Avoid swallowing vendor solutions hook, line and sinker

There are two kinds of Alaska salmon — pink and white. The white-salmon folks wanted a competitive edge. So they advertised, "Guaranteed not to turn pink in the can!" Not to be outdone, the pink-salmon folks countered: "Guaranteed: No bleach used in processing!"

The moral of the story is simple: There's no magic. We all know that. But our knowing it doesn't stop the salmon people from trying. They show up again and again, always trying to gain a competitive edge by implying that there's something fishy about the other folks' wares.

The computer industry is not immune to salmon peddlers. An example comes up whenever integrated departmental systems are sold. It has to do with counting terminals per processor. It goes something like this:

White-salmon sales rep: "Look how inexpensive our terminals are. If you bought Brand P, you would pay twice as much for each."

Pink salmon sales rep: "Look how many users our Model 30 processor can support. If you bought the comparable Model 850 processor from Brand W, it could only support half as many."

A little common sense tells us this: Nobody's office automation software or operating system (all other things being anywhere near equal) is twice as efficient as anybody else's. Nobody's central processors (all other things being . . .) are twice as cost-effective as anybody else's. And nobody's terminals (ditto) are twice as expensive for the same capability as anyone else's.



By EFREM MALLACH

As with salmon, there is no magic. Two vendors have been fishing on different sides of the bay and have come up with different shades of salmon. But in the final analysis, both will do the same thing for the user at approximately the same cost.

The simple truth, which vendors often go to great lengths to obscure, is that it takes a certain amount of processing power to support an average office user. You can put the power in one place and hook it to the users' terminals. Or you can put some of the power in the terminals. If you do this, you still need some centralized processing capability for file storage, for message routing and the like. But you don't need as much as you would need if the central system did all the work.

With the first approach, you can use dumb terminals. If you let dumb mean very dumb, you can get them for less than $400 apiece. But you'll need a high-powered central processor to run them.

With the second approach, you need intelligent terminals. In 1986 this usually means a personal computer for word processing and spreadsheet calculations. It looks to the central system for large files, communication to other terminals in the network and to systems outside the network and perhaps for computation-intensive applications.

A given central system under these conditions can easily support twice as many users as it could with dumb terminals. But the processor cost savings will be absorbed by the $1,500 to $2,500, 256K-byte, dual-diskette terminals that run IBM PC-DOS and Microsoft Corp. MS-DOS.

Both approaches end up costing about the same per user when all the relevant costs are taken into account. So how should a user choose between them?

Centralized system technically efficient

On purely technical grounds, a centralized approach is inherently more efficient and can bring more processing power to bear when it is needed. This can be a great boon to users with large spreadsheets. But giving each user a private processor saves software overhead, and the market has driven PC prices well below the point at which theoretical technical efficiency and comparative processing power would put them.

The answer depends on the individual user's situation. If you have personal computers, there is a lot to be said for keeping them. If your prospective users are not already on PCs, the inherent advantages of a centralized system may be convincing. It's your money, your choice.

The important thing is to understand what is behind the vendor claims, both technically and in terms of the reasons for a given vendor's strategy. Then you can evaluate the claims and the products as they apply to your needs. As the customer, you have the right to know what's inside the can and where it came from. Don't fall for a fish story.

Mallach is associate professor of computer science at the Boston College School of Management and a consultant to top managers of vendor and user organizations.

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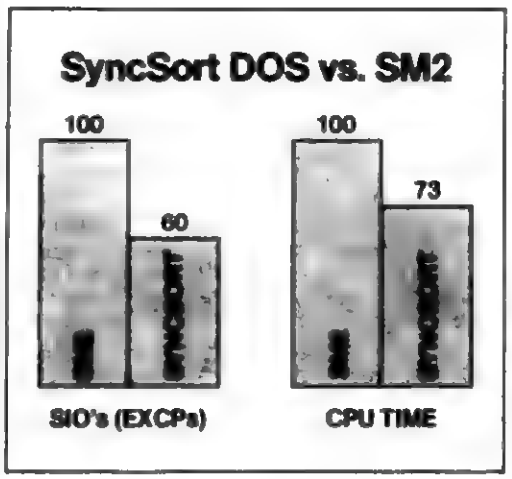
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SOFTWARE & SERVICES

SMALL TALK
Frank Sweet

Counseling vs. appraisal

There is a passage of dialogue in one of John D. Macdonald's stories, between Travis McGee and his friend Meyer that goes something like this:

McGee: "You know, I have never really fit in. Even when surrounded by friends having a good time, I feel like an outsider. I find myself studying everyone else as if they were specimens. Something's wrong with me."

Meyer: "Good God, man! You mean no one's ever told you? Everybody feels that way. It's part of being human!"

What made me think of that was something a recently promoted manager friend said some weeks ago: that she did not know the difference between appraisal and counseling. I felt like blurting out, "Good God! You mean no one ever told you?" How, I wondered, could she possibly be expected to lead a team of intelligent professionals?

The reason we confuse the two is because we do both at the same time each year when we fill out the form that determines merit increase. But appraisal and counseling differ. The former is objective, easy, nonnegotiable, one-sided and directly affects a paycheck. The latter is subjective, difficult, arguable, shared and indirectly affects a career. The former rates performance. The latter suggests improvement.

Appraisal is when we don our con-

See COUNSELING page 24

Sweet is a free-lance consultant in Jacksonville, Fla. He is the author of Building Database Applications *and publishes "Boxes and Arrows," a monthly newsletter for Cullinet Software, Inc. IDMS users.*

Tool manages source code

Insurance firm assists in development of Control-1

By Charles Babcock

NEW YORK — Source-code programs used to be stored in pyramids of punch-card boxes; the earlier the version of the program that you wanted, the deeper you had to dig into the pile.

Today, even that rudimentary level of organization is sometimes lost as programs are stored on-line and programmers delve into them to make ad hoc changes.

A source-code manager like Pansophic Systems, Inc.'s Panvalet or Applied Data Research, Inc.'s Librarian tracks and stores those changes but still requires a high level of programmer participation.

A small company in New York has introduced a product that it claims chronicles the evolution of source code automatically and controls the way a modified source code program goes back into production.

John Abraham, president of Condor Technology, Inc., says his firm's product, Control-1, "compares what source code is being returned vs. what was released and stores only the changes."

From this archive of changes, Control-1 can reconstruct any previous version of the program and reinstitute any current version that has been lost.

ADR's Librarian Release 3.5, with its new Change Control Facility, also stores only changes and restricts the way changes are made to source code but requires a programmer to follow strict procedures, according to users familiar with the product.

Pansophic's Panvalet is even more restrictive. It stores complete versions of programs each time they are modified, using up memory, and moves unused versions of a program out of memory onto tape after a preset time lapse, says David S. Harper, senior assurance systems analyst with Empire Blue Cross, Blue Shield in New York, an early user of Control-1.

"Control-1 is a lot more flexible. Panvalet will only allow you to go so far back," Harper says.

See TOOL page 22

NEW THIS WEEK

- MacKinney Systems offers CICS utilities
- Enmasse upgrades its data base management system

For more on these and other new products, see pp. 117-130.

INSTANT ANALYSIS

"An awful lot of companies are flirting with [IBM's] DB2. The trouble is DB2 is an engine that doesn't have anything around it."

— David Tory, Computer Associates International, Inc. senior vice-president, planning, before Computer Associates' first user conference in St. Louis

SOFTWARE NOTES

Software vendors' warranties longer

A recent survey by **International Data Corp.** of 147 MIS managers found that software vendors provide warranty coverage on their products for a longer period than hardware vendors. About half of the hardware warranties were for three months, while 67% of the software warranties were for 12 months. However, hardware vendors tend to offer on-site support during the warranty period more often than software vendors, the survey found.

■

The **Burroughs Corp.-Sperry Corp.** merger brought a new software compa-

See NOTES page 22

RT/PC Cobol software bows

By Jeffry Dexter

PALO ALTO, Calif. — Micro Focus, Inc., convinced that IBM's RT Personal Computer will appeal strongly to business as well as technical users, last week became what is believed to be the first vendor to furnish Cobol software to the multiuser workstation.

At the same time, the UK-based microcomputer software supplier also announced a joint agreement with AT&T to produce programming languages and application development tools for Unix. The products will be designed to make Unix more attractive to commercial users, according to Micro Focus spokesmen.

Paul O'Grady, cofounder and vice-president of worldwide sales, said Micro Focus

See RT/PC page 24



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Notes: DBM tool by ADR, Sharp

From page 19

ny out of the woodwork — **Command Technologies** of Boston. The company's first product will allow a Burroughs mainframe to operate with a Sperry mainframe, said spokesman Franco Vitaliano. As a matter of fact, it allows any computer to work with any other by using artificial intelligence to reformat command structures between operating systems, he claimed. Maybe Burroughs Chairman Michael Blumenthal knows something we don't . . . .

■

Applied Data Research, Inc. (ADR) of Princeton, N.J., signed an agreement with **I. P. Sharp Associates** of Toronto to jointly develop Sharp's **Viewpoint** package to operate with ADR's Datacom/DB relational data base management system. Viewpoint is an information center tool used in report writing, graphics, electronic conferencing and telecommunications. The products will be designed to run on the IBM 370 line.

■

Mitrol, Inc. of Woburn, Mass., is trying to revitalize its fourth-generation languge, **Mitrol**, which is not well known commercially but has been around since the early 1970s and has enjoyed success among aerospace companies. Users include Lockheed Corp. and TRW, Inc. Mitrol reportedly has the ability to handle large, complicated applications for tracking thousands of small parts. Mitrol has introduced a Multi-Region version to connect as many as 500 online users at a time, said President Michael Regentz. Mitrol runs under MVS.

■

SAS Institute, Inc. has made Version 5 of the SAS System available to run under MicroVMS, the operating system of the **Digital Equipment Corp. Microvax II.** The SAS System includes data management, statistical analysis, report writing and application development tools.

■

A user-level interface to IBM's Distributed Office Support System (Disoss) has been announced by **Communications Solutions, Inc.** of San Jose, Calif. Disoss/Talk was designed as an option for its Access/DIA package, said Steve Martinez, Communications Solutions vice-president.

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Tool monitors source codes

From page 19

With both Panvalet and Librarian, naming successive versions of a program is left to the programmer; Control-1 enforces a shop's naming convention automatically, Empire Blue Cross spokesmen say.

The insurance firm had an interest in developing Control-1 because, by state directive, it must maintain a clear audit trail in its use of source code. With 12 million lines of code representing a $1.5 billion asset to the company, the task was enormous, said Victor A. Guarnera, director of data processing quality assurance at Empire Blue Cross.

Abraham, a former associate of Guarnera's at CGA Computers, Inc. of Holmdel, N.J., was given time on an Empire Blue Cross mainframe to develop Control-1 in exchange for a "sweetheart relationship" that enabled Empire Blue Cross to install it early and receive close support, Guarnera said.

Load modules must be compiled

With Control-1, production programs or load modules may not be changed at will by programmers. They must be compiled from the modified source code, ensuring that the latest run version has source-code backup, Abraham said.

Control-1 can store up to 10,000 separate sets of changes.

Empire Blue Cross has used Control-1 for eight months, according to Harper.

"Before, if we had a program in production, we couldn't be sure it was created from the source code," he said. With enough modifications, the production program would cease to resemble the source code. And if the production version was lost, it was hard to reconstruct, Harper added.

In another vein, programmers sometimes filed away source code in their own areas. If they left the company, that source could be hard to retrieve, he noted.

"We had a 50-50 chance something might blow in production, and we would have a hard time recovering," Harper said.

Reliability said to increase

Under Control-1, Empire Blue Cross has increased production code reliability to between 80% and 90%, he said.

Control-1 is written in IBM assembler language and can work with mainframe security packages such as IBM's RACF, SKK, Inc.'s ACF2 and Computer Associates International, Inc.'s CA/Top Secret. Once a programmer retrieves a source-code program, Control-1 automatically logs any changes and requires a quality assurance division operator to execute a Move command before the source-code version can go back into production, according to Harper. Control-1 can also work with Pansophic's Panvalet, ADR's Librarian and the partitioned data sets of other mainframe software providers, including IBM.

Control-1 was designed to run under MVS and is available immediately. It is priced from $26,000 to $56,000, depending on options, Abraham said.

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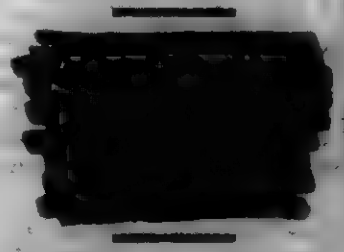
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InformationWEEK

THE NEWSMAGAZINE FOR INFORMATION MANAGEMENT A CMP PUBLICATION

SPECIAL ISSUE

Giving administrators better access to data has prompted a number of information center-type activities at the Veterans Administration, in Washington, D.C., according to James Edwards, director of technical support service. As the arm of the federal government that runs veterans' hospitals and keeps track of benefits for millions of the country's former military personnel, the V.A. has always had to maintain a staggering amount of data.



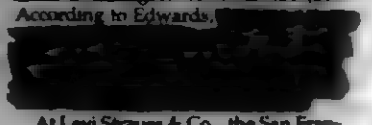
Back in the 1960s, the Veterans' Administration created a huge batch-processing system called the Automated Management Information System (AMIS), which contained all the essential data gathered by the agency's numerous field offices. The trouble was that AMIS, which resides on Amdahl Corp. mainframes located at the V.A.'s data center, in Austin, Texas, was built before the era of relational data bases and the notion of enabling nonprogrammers to tap mainframe data with easy-to-use query tools.

The lack of such query tools made it difficult for administrators to look in different ways at the data stored in the AMIS files. For example, getting payroll information on the V.A.'s 250,000 workers was straightforward enough. But taking that data and monitoring minority hiring trends over 12 months required a programmer—and often months of waiting as well.

The V.A. is moving to change that by making it easier for managers to work with data. The administration launched a project 18 months ago to establish a relational data-base management system that would extract the data that departmental users needed most from AMIS.



According to Edwards,



At Levi Strauss & Co., the San Francisco-based manufacturer of dungarees and other leisure wear, the duties of the information center are split between mainframe-oriented functions and microcomputer support. Says Jim Wilson, director of the microcomputer support center, "Our dividing line is whether the product is mainframe-based or microcomputer-based."

When it comes to support, however, the line between mainframe-based packages and micro-based packages is becoming increasingly blurred. If micro-to-mainframe products weren't enough, now information center managers must plan strategies to handle a myriad of local-area network products, departmental computing packages, and in some cases integration of the PBX system.

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The leader in information services and technology

Counseling vs. appraisal

From page 19

pany hat, represent the firm and inform the employee of how well he or she performed. It is objective in two senses.

First, its goal is simply to communicate the employer's measurement of the employee's productivity. Employer opinion is the only thing we're trying to communicate.

Any member of a well-knit team knows exactly how productive the others are. It is nonnegotiable and one-sided because the appraisee's own perception cannot count.

It directly affects a paycheck because productivity is the only thing that determines merit increases — not effort, hours worked, how well he communicates, charisma, strength, dexterity, endurance nor any of the other qualities personnel folk put on the form. Productivity. That's all.

Counseling, by contrast, is when we share with a colleague our ideas on how he can become more skillful. It is hard to do because it seems to demand more than we can give.

After all, if I knew the secrets of success and wealth I would be basking on my yacht's foredeck in Rio, not writing computer programs. We can offer useful advice though because we have one great advantage over the person we're counseling — we are on the outside looking in. Counseling is arguable because our advice can be wrong. I recall an analyst who always took longer than expected to negotiate data and functions. The analyst's presentations were disorganized and confusing, so I suggested she take a public speaking course. My reasoning was that her presentations would improve, users would understand her better and negotiations would flow more smoothly.

She followed my advice and learned to deliver excellent presentations. However, her productivity remained at its prior level. She still took too long to deliver goods and her next appraisal reflected it. "But I did what you suggested," she reasonably argued. I apologized, "It didn't work. I guess we'll have to try something else."

Judging a book by its cover

Another case was the bearded young analyst, Jeff, who insisted on wearing shoulder-length hair, tie-dyed shirts and sandals. His users ran a heavy manufacturing facility. They were hard-boiled, self-made businessmen and would not give Jeff the time of day. He couldn't even get appointments, much less negotiate application features.

I suggested he shave, cut his hair and wear a business suit. He refused, saying my advice infringed on his right of self-expression. "It's up to you," I shrugged. "All I care about is getting the job done."

Eight months later, Jeff was a star performer. The applications he negotiated went up smoothly and with full user support. The manufacturing bosses spoke highly of him. They had grown to respect him and to trust his advice, although he hadn't changed his appearance.

As I gave him a well deserved raise, I could not resist asking how he'd done it. "I started hanging out at the same bar they went to after work. I bought a few rounds of beer and made friends. Now I'm on their bowling team."

Counseling is shared and indirectly affects careers because we must know where an employee is going before advising him how to get there. Career development, in our profession, takes one of two paths; technical specialization or management. So counseling is matched to the individual's career goals.

But the most important point is this: Whether or not our counseling is useful, we must not confuse it with appraisal.

RT/PC Cobol software bows

From page 19

plans to make four of its existing Cobol offerings available for the RT PC, including the following:

- Compact Level II Cobol/ET, an ANSI 74 standard compiler.
- Animator, an application migration aid.
- Forms-2, a screen painter and prototyping tool.
- Upgrade III, a preprocessor and facility for porting Ryan-McFarland Corp. Cobol applications to Compact Level II.

The software tools reflect Micro Focus' belief that the IBM machine may have wider applications than many assumed.

Although Big Blue positioned the RT PC primarily as a workstation for computer-aided design and other technical tasks, "we're already getting users who are demanding business applications for the RT PC," O'Grady said.

A package of the four products costs $3,750.

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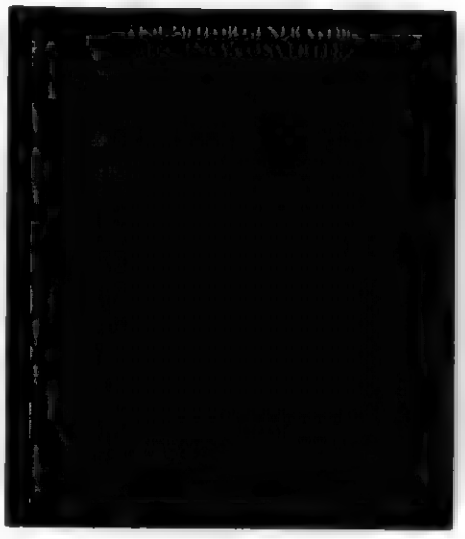
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COMMUNICATIONS



DATA STREAM
Daniel Minoli

Making use of spare FM band

On April 7, 1983, the Federal Communications Commission deregulated the use of frequency modulation (FM) subcarriers, two 10-kHz-wide subchannels on the commercial FM broadcast band used by FM radio stations.

Prior to deregulation, these subchannels could only be used for analog broadcasts such as background music. Now each can be used for any legitimate communications purpose, including broadcast transmission of business data at rates of up to 9.6K bit/sec. Rates of up to 19.2K bit/sec. may become available if proposed new modulation schemes are implemented.

One advantage of subcarrier technology is price; receiving terminals typically cost between $150 and $300. And unlike receive-only stations used in satellite-based broadcasting systems, subcarrier terminals can be hand-held devices that travel with the user.

Of course, a satellite network has a far greater geographic range than a single FM station whose transmission typically covers a 20- to 40-mile radius. But a group of FM operators could agree to interconnect their broadcasts in order to provide a nationwide paging, electronic mail or stock market quotation system.

A business that needed to broadcast data to a large number of regional customers would need to contract with an FM radio station owner to use the

See USING page 29

Minoli is a lecturer with New York University's Information Technology Institute as well as a full-time data communications researcher and strategic planner.

Network switch ties LANs to local Centrex facilities

By Eddy Goldberg

RESEARCH TRIANGLE PARK, N.C. — Dynamic Network Gateway (DNG-1), a network switch that enables customers to hook up a local-area network to local telephone company Centrex facilities, was recently announced by Northern Telecom, Inc. The DNG-1 will work with Northern Telecom's DMS-100 family of digital central office switches and is part of the company's Meridian Business Service line.

A combination of hardware and software, the DNG-1 "is positioned as a local-area network designed specifically to go at the end of a Centrex loop to offer very high-speed data transport plus voice capabilities," said Bob Dyer, vice-president of market development for Northern Telecom.

The DNG-1 performs voice and data switching over ordinary telephone lines. The lines can be hooked up to a Meridian voice/data workstation or to an IBM Personal Computer and standard telephone set. IBM PCs equipped with Northern Telecom's Lanlink local-area network boards can transmit data at 2.56M bit/sec. over telephone twisted-pair cable. PCs that interface with DNG-1 via an integrated voice/data interface module or RS-232 port can only transmit at 19.2K bit/sec., a company spokesman said. A V.35-based connection between DNG-1 and mainframe hosts supports a rate of 56K bit/sec.

Both local and long-distance voice transmissions are routed by the DNG-1 out to the Centrex system at the local operating company's central office. Local data transmissions are handled solely by the DNG-1. Long-distance data transmissions go out through the DNG-1 to the DMS-100 central office switch either over Datapath, a 19.2K bit/sec. service offered through DMS-100, or over a dedicated 1.54M bit/sec. link.

A customer premise DNG-1 can act as a file, modem or printer server and as a gateway to an X.25 or X.3 packet-switching network. It also can provide an IBM host

See SWITCH page 28

Networks add to user control

By Elisabeth Horwitt

ATLANTA — New products recently unveiled by BBN Communications Corp. and Cohesive Network Corp. significantly increase customers' ability to configure and limit access to private networks, spokesmen claimed.

The Network Access System from BBN implements security, access control and connection management features on private packet-switched networks based on the company's equipment. The multilevel security system includes password-based user authentication as well as profiles that determine which network hosts and services can be accessed by a specific user or from a specific port.

See NETWORK page 29

All-In-1-based PBX monitoring system introduced by DEC

By Elisabeth Horwitt

ATLANTA — The All-In-1 System for Telecom Management, a software package that enables users to maintain cable inventory and monitor line usage on a wide range of private branch exchange systems, was introduced by Digital Equipment Corp. at the Telecom '86 conference held recently in Atlanta.

Through RS-232 connections the product monitors passing, blocking and queuing for up to 89 PBX switches for accounting and allocation purposes, the company said. The system monitors digital PBXs in real time. The system also pro-

See ALL-IN-1 page 27

NEW THIS WEEK

- Concord Data Systems offers modems supporting X.PC
- Cincom Systems ports Net/Master to DOS/VSE environments

For more on these and other new products, see pp. 117-130.

INSTANT ANALYSIS

"The slow emergence of ISDN standards is great for vendors, who can splash ISDN hype around their product literature without having to produce anything solid."

— Greg Carlsted, senior industry analyst, Dataquest, Inc., Cupertino, Calif.

AT&T enhancements fill gaps in System 75 digital PBX

Service interfaces will conform to ISDN specs

By Elisabeth Horwitt

ATLANTA — Major enhancements to AT&T's digital private branch exchange line, in particular to the low- to mid-range System 75, were recently announced by the company at the Atlanta Telecom '86 conference. The new products are being presented to customers as pre-Integrated Services Digital Network (ISDN) services because they are offered over AT&T interfaces that eventually will conform to ISDN specifications, explained Donald Hirsch, AT&T's vice-president of product planning and development.

Hirsch added that many of the newly announced features, such as call detailing and screening, offer users a foretaste of ISDN. He admitted that the applications are not new, but claimed that the advent of ISDN will "simplify customer wiring and numbering plans as well as the job of putting applications in place." ISDN also eliminates worry about how to couple the wire to different types of terminals," Hirsch said.

"I think the announcements reflect AT&T's strategy of selling more than just plain PBX lines, which have become a commodity item," said David Terrie, president of Boston-based Newport Consulting. "They're saying, 'Look, we can sell lines at a competitive price *and* we provide extras as well.' "

AT&T announced that two products formerly available only on the System 85 will now be offered with the System 75.

Automatic Call Distributor/Call Management System (ACD/CMS) targets telemarketing departments and other user groups that require special call handling. The product offers configuration control features such as automatic routing of calls to the least busy extension and gives supervisors the ability to reconfigure the system for more efficient line use during peak traffic periods.

CMS software installed on an AT&T 3B minicomputer works with the ACD to provide historical and real-time reports on system use. Prices for the System 75 ACD range from $1,000 to $2,200 per line, supporting from 15 to 100 telemarketing agents. A CMS for this configuration, including a 3B2 minicomputer and software, costs approximately $40,000.

Audix-Medium is the new System 75 version of AT&T's voice mail system, Audio Information Exchange The product costs $90,000 for a 16-port system.

"Availability of ACD and Audix on the System 75 is by far the most significant part of AT&T's announcement," said Greg Carlsted, senior industry analyst of Cupertino, Calif., consulting group Dataquest, Inc "Other PBX vendors have been taking advantage of the fact that the System 75 lacked those features when they were competing for con-

See AT&T page 28

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All-In-1-based PBX system out

From page 25

vides customizable traffic management reports and maintains cost-allocation reports by cost center or department. It maintains an inventory data base of PBX equipment and cabling and station software features and keeps track of cabling and wiring paths and telephone extensions.

A common menu provides access both to Telecom Management and to basic All-In-1 office automation functions such as report generation and electronic mail, DEC spokesman Richard Tritter said. Designed for the Microvax II or VAX, the product offers users a "total telecommunications management solution," he added.

"Divestiture has cast the telecommunications manager adrift," Tritter said. "Since most companies now treat telecommunications as a profit center rather than a cost center, the manager must look beyond providing basic dial-tone service to doing business reporting, inventory management and chargebacks. And he has to deal with multiple vendors in the process.

"The bridge to All-In-1 office automation functions enables telecommunications managers to generate cost accounting and capacity planning reports and then send them via electronic mail to MIS departments that increasingly want centralized reporting from all sites," Tritter said. He cited a study by Framingham, Mass.-based International Data Corp. stating that 54% of all telecommunications departments now report to MIS, with the figure projected to grow to between 75% and 85% in five years.

A communications manager for a Cambridge, Mass., university who attended Telecom '86 said that while he had not yet seen the DEC product, his organization is currently looking for a more powerful system to help manage and maintain a planned multimedia, multivendor telecommunications facility consisting of approximately 20,000 user stations.

A heavy user of Microvaxes and VAXs, the university currently uses a Microvax II-based PBX facilities management system based on Ingres, a data base management system and report generator from Relational Technology, Inc.

"The system is inadequate even for our current 5,000-station network installation," the communications manager said. He added that he had talked to a number of other managers who had similar facilities management problems.

Technological advances have made customization possible, and yet most commercial telecommunications management systems use generic approaches that do not address organizations' individual needs, the manager complained. "One software company told us they could tailor their system to our needs. That was two years ago; we talked to them today and they haven't done it. And yet their system seems to sell; customers end up making compromises."

The All-In-1 System for Telecom Management is available now. Prices range from $43,860 for a Microvax II to $107,960 for the VAX 8600.

Networks add to user control

From page 25

The system tracks and generates reports on use of network resources for accounting and billing purposes and maintains a log of failed attempts to access the network.

A Network Access System configuration consists of a Master Database and one or more Access Control Servers. The Master Database maintains a master file of user access information and network resources. Access Control Servers process network log-in requests from packet assembler-disassemblers, switches and gateways.

Pricing for a minimum Network Access System configuration of one Master Database and one Access Control Server is $235,500. Additional servers cost $89,000 each.

The CN-2 network controller from Cohesive performs automatic bandwidth allocation, adaptive route selection, monitoring and fault isolation for up to 36 1.5M bit/sec. T1 links. Cohesive's earlier network controller offering, CN-1, only handles up to 16 T1 lines, according to Chairman Arthur Caisse. The CN-2 can also handle 45M bit/sec. T45 lines, he added.

Both CN-1 and CN-2 are intelligent network processors that automatically allocate new bandwidth, calculate least costly routes, perform error monitoring and take a circuit out of service if error rates exceed a predetermined threshold, according to Caisse.

A human operator can monitor the network from a central terminal hooked up to Operations Management System, a software package that runs on any AT&T Unix V system, according to Cohesive.

The CN-1 and CN-2 are both compatible with local operating company T1 services and AT&T Accunet T1.5 and Customer Control Reconfiguration offerings. The CN-2 is base priced at $70,000.

CORRECTIONS

Overall U.S. communications expenditures for 1985 were misstated in Daniel Minoli's Packet Switch Perspective column [CW, March 31]. Actual expenditures were $140 billion.



Switch ties LAN, Centrex

From page 25

gateway by emulating an IBM 3274 controller.

"We will be adding attractive options to DNG-1," company spokesman Tom Hill said. The system will support Integrated Services Digital Network 23B+D primary rates in the future, he added.

Another feature to come is DNG-1 support of Northern Telecom's Dynamic Network Controller, which provides billing, terminal moves and changes and network configuration control both of customer-premise- and central-office-based networks.

The DNG-1 also can be offered as a 19.2K bit/sec. service equivalent of a local-area network by local operating companies, Hill noted. The service supports the X.25 and X.3 gateways but not the 3274 interface because of the Second Computer Inquiry decision regulations, he added.

Dyer said the idea behind the DNG-1 is to allow telephone companies to increase their Centrex capabilities by offering additional features to their customers. "Data transmission is the hot spot for corporations," he said. Each DNG-1 can support up to 1,200 users, with 400 active at any one time.

According to William Rich, telecommunications analyst at Northern Business Information, Inc. in New York, the market for central office switches will peak at the end of this year and into 1987. If it does, Northern Telecom will have lots of capacity and no place to sell it, Rich also said.

"Northern Telecom ultimately wants to sell more DMS-100s. Anything that makes the DMS-100 more attractive increases its chances," Rich said. He added that the additional capabilities are also a way to sell into their installed base.

The first rollout of the DNG-1, scheduled for second-quarter 1987, will be a stand-alone product that will work with any analog switch or with the DMS-100.

On-site testing of the DNG-1 is scheduled for the first quarter of 1987 and availability during second-quarter 1987, the company said. Pricing is targeted at between $250 and $300 per port.

AT&T fills PBX gaps

From page 25

tracts." System 75, which supports up to 200 user stations, "may dominate the low- to medium-end market for the next five years, according to some people," Carlsted said. "The announcement eliminates its biggest weak points."

A third new System 75-based offering, Hospitality Package, automates call station administration tasks for capital-intensive businesses such as lodging and health care.

The system supports customer service features such as automatic wake-up service and message waiting, as well as single-digit dialing for guest services such as room service.

Tracks long-distance calls

It also keeps records of guests' long-distance calls, enables operators to remotely disconnect a station's long-distance service and keeps records of requests for telephone services. A 175-line configuration connecting 150 rooms and 25 administrators costs $800 per line.

Inbound Call Director (ICD) and Outbound Call Director (OCD) are new Speech Response System enhancements that are available on both the System 75 and System 85.

ICD prescreens calls and gathers caller information before passing the call on to an attendant. OCD can automatically place calls from either a computer-generated or manually loaded list.

When a call is answered, the system can ask a series of questions, then pass qualified calls on to an operator. Pricing is unavailable.

Unified Messaging Manager and Unified Messaging Link provide a universal mailbox for text messages delivered by AT&T's local electronic mail systems, Office Telesystem and General Purpose Unix-Mail, by electronic mail service AT&T Mail or by attendant call coverage software Message Center. Users are notified of messages waiting on the Audix system.

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Much more than a micro-to-mainframe "link," Arbiter is a Cooperative Processing Subsystem. It operates as a VTAM application, capable of supporting hundreds of PCs without interfering with the performance of your essential development and production subsystems. It is fully compatible with SNA, with a carefully planned growth path into IBM's LU 6.2 protocol and Advanced Program-to-Program Communications.

Arbiter interfaces directly with VTAM and executes in its own address space, where it presents none of the performance or integrity exposure problems associated with CICS- or TSO-based link products.

Because Arbiter is a VTAM application, there are fewer layers of software between the PC user and the information, saving processor overhead. Even more efficiency is gained by Arbiter's advanced data compression scheme that uses your network more effectively than other products that transfer and receive data as 3270 screens.



As a subsystem, Arbiter is fully compatible with RACF and other popular security software. It also feeds data into IBM's SMF—data you can use to tune Arbiter. Or use for network capacity planning, usage accounting and auditing.

Using spare FM band

From page 25

extra FM bandwidth. The business would transmit data to the station, perhaps over a dedicated line. At the station, equipment costing between $5,000 and $10,000 would modulate — and possibly compact and encrypt — the data before sending it over the subcarrier along with the FM signal normally broadcast by the station.

Normal radio sets do not pick up the subcarrier information. A subscriber to the service would be provided with a special receiver, tuned to the subcarrier and also with a decoder, if necessary.

Companies such as Pageamerica, Telemet America and Dataspeed use the subcarrier to distribute stock quotes and commodities prices. Customers pay about $300 for terminal devices about the size of a pocket calculator or access the service with IBM Personal Computers or compatibles, which can load the data into spreadsheets for subsequent analysis.

Financial institutions such as Citibank N.A. and Chemical Bank are reportedly using the subcarrier to broadcast banking credit information. Two other possible applications are slow-scan video — using the subcarrier to transmit photographic stills — and fleet dispatching.

It should be noted that FM subcarrier data distribution has several limitations including the following:

- First, it remains one way unless an auxiliary return path via a land-based network is provided. This prevents it from being a real alternative to a packet-switched network that handles true interactive communications.
- Second, the 9.6K bit/sec. data rate makes subcarrier technology unsuitable for some applications, such as tranferring large files. Two possible solutions involve data compression and more sophisticated modulation techniques to achieve more bits per hertz.
- Third, FM subcarrier reception suffers in the presence of high-rise buildings. The signal can be strengthened with externally mounted, quality FM antennas costing about $200. At least one company claims to have developed a microprocessor-based indoor antenna that also addresses the problem. This requires that the receiving terminal be stationary.
- Finally, data refreshment delays result from the subcarrier posting data in round-robin fashion — from data base provider to FM station to receiver. The delay is generally in the 1- to 2-minute range, which can be a major problem for financial data but not for most electronic mail distribution. The permissible delay in the cycle and the channel bandwidth determine the maximum number of users.

> ***Further deregulation of the wireless technologies should open the way to new applications and services.***

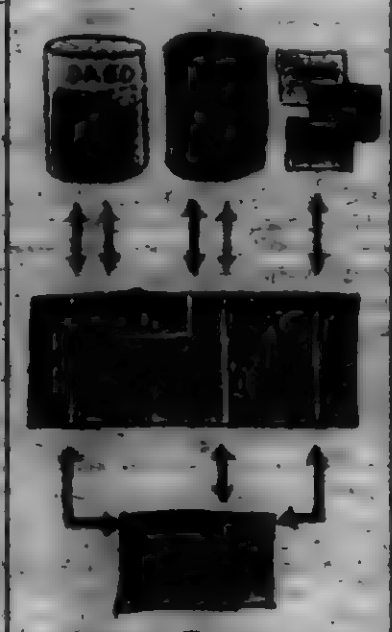
In the next few years, two important developments should significantly improve the viability of FM subcarrier technology. First, further deregulation of the wireless technologies should open the way to new applications and services. And second, radio technology will be digitized.

This will mean improved bandwidth management, security features such as encryption, hardware economies of scale resulting from digital circuitry, very large-scale integration and microcomputers and subcarrier transmissions that are less vulnerable to noise and bandwidth limitations.

These events should help move FM subcarrier technology into the data communications mainstream.



Arbiter has three components. The Remote Disk Environment (RDE) provides a seamless interface to remote disks on the host, which may be accessed by PC apps or host application programs. The External File Interface (EFI) transfers data to and from files on the host and the remote disks. The Interactive Session Relay (ISR) allows "power users" to connect a PC to another mainframe subsystem — for example, TSO or CICS — without disconnecting from Arbiter.



Arbiter not only gives the data center more control over the micro/mainframe environment, it increases the ease with which PC users can access mainframe data. Instead of time-consuming file transfers and data reformatting, Arbiter allows the PC user to access corporate data via remote disks—already formatted for Lotus 1-2-3,* dBase II or III,* or other popular software. Remote disks are accessed exactly like the A, B or C disks attached to the PC.

Arbiter enables your information center to extract data from any host-formatted file structure (e.g., IMS or VSAM) using its editing tools—whether they're COBOL, Pascal, PL/I, SAS* or FOCUS.* That data is delivered onto the remote disks in standard PC formats like DIF, WKS and CSV.

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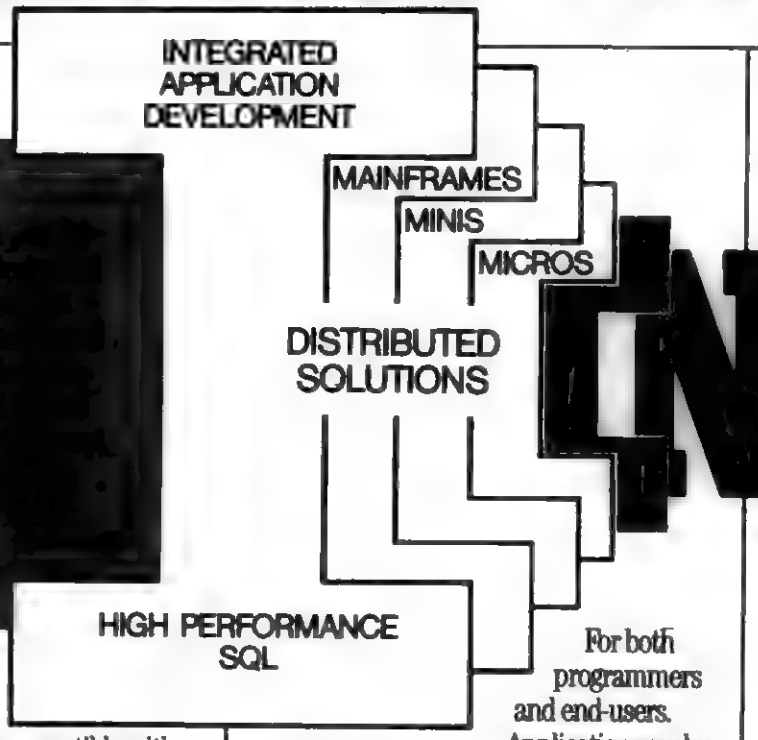
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MICROCOMPUTERS

SMALL TALK
Eric Bender

Better living through silicon

If you rip apart an IBM 3090 mainframe — turn off the pumps that look like they could drive a jet boat up the Colorado River, pull out those 80-pound boards and take a close look at the logic and memory circuits — you find silicon chips with considerable family resemblance to today's microcomputer CPUs.

This family is not really that close; bipolar silicon technology is fundamentally different from the unipolar architecture offered by Intel Corp. and other semiconductor makers. But both give an impressive demonstration of how quickly software designers' worries about processing power and memory limits may dwindle away.

Beginning with the 3080 series, the heart of IBM's high-end mainframes has been what the company calls Thermal Conduction Modules (TCM). These place more than 100 bipolar chips in the top layer of a 30-layer-plus ceramic sandwich.

For the 3090, the sandwich design requires 200,000 elements to meet 200,000 other elements *exactly*.

After the sandwich comes out of the furnace that fuses it together, one side is a rather extreme-looking pincushion that then hooks into a mare's nest of wiring. The flip side carries the heat-removal systems, with each chip nestling near a piston. (How that must have pleased the engineers, to build a computer around pistons!)

In the case of the 3090, put nine of these modules into a board, plug in

See BETTER page 32

Bender is Computerworld's senior editor, microcomputers.

Users stand by Unix PCs

Despite dismal sales, users praise speed, ease of use

By Douglas Barney

Although AT&T's Unix PC has made few inroads into the corporate marketplace since its release last year, most users contacted by *Computerworld* were pleased with the machine.

The Unix PC has sold poorly because of its initial inability to run Microsoft Corp. MS-DOS applications, its limited number of Unix applications and the lack of acceptance of Unix on the desktop, analysts and users agreed.

Sales have been so disappointing that Convergent Technologies, Inc., which manufactures the machine for AT&T, recently announced it will reduce its 3B1 (an enhanced version of the Unix PC) and Unix PC shipments by some 30% to $25 million for the second quarter. Last year Convergent shipped 40,000 to 50,000 Unix PCs, analysts said.

According to International Data Corp., a Framingham, Mass.-based research firm, only about 12,000 units were shipped to users by AT&T by year-end 1985. IDC analyst David Moschella said not many more systems have been sold since. Consensus is that most were sold within AT&T.

However, users sound generally satisfied, and some wonder why the machine is not more popular.

"We are using the Unix PCs for church management systems where they need multiuser capabilities. It is primarily because they are settling in on software that only runs on Unix," said Richard Wasilauskas, vice-president of the National Catholic Group Purchasing Association (NCGPA), which bought 250 to 300 Unix PCs. "It has been satisfactory. The churches like it, and there have been no problems with it." However, NCGPA now is considering purchasing AT&T 6300 Plus microcomputers.

Some users are more enthusiastic. "It is a really easy machine to use," said Robert Plotnik, a partner with Maranatha Natural Foods, of Ashland, Ore. Maranatha has

See USERS page 32

Supercalc4 offers new interface, more powerful macro capabilities

By Peggy Watt

SAN JOSE, Calif. — This month Computer Associates International, Inc. will release Supercalc4, an updated version of the 7-year-old spreadsheet program Supercalc, with new macro capabilities and changes in the interface. The company said a network version of the new release, which runs on Microsoft Corp. MS-DOS systems, will be available in the fall.

Computer Associates also launched its User Maintenance Program, a subscription warranty offer with various options in support, training and upgrades. All buyers of Supercalc4 will get six months of the maintenance program free. A full-year subscription is priced at $100, a fee that will eventually climb to $150, a spokeswoman said.

Supercalc's price also increases to $495 from $395 with the new release. Upgrades are available for $20 in shipping and handling charges to registered owners of Supercalc who bought the program between April 1 and Sept. 1. Users who bought Supercalc before April 1 can get the new version for $100, which includes a year's subscription to the User Maintenance Program.

The upgrade's most noticeable change is a full-word menu in place of the menu that included only the first few letters of commands, said Nancy Twomey, marketing manager of the productivity product line. However, the commands from earlier versions will still work, because all versions of Supercalc are compatible with each oth-

See SUPERCALC4 page 34

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For more on this and other new products, see pp. 117-130

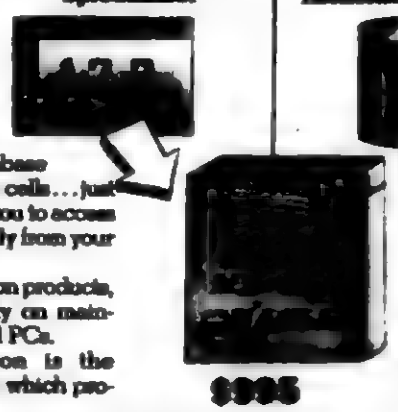
INSTANT ANALYSIS

"Many products don't have user groups; the things that come to mind are Mr. Coffee and Maytag washers. But we in the computer industry have offered products that require our customers to band together."

— John Boyd, vice-president, AT&T Computer Systems

Oracle's SQL★Calc makes a relational DBMS as easy as 1-2-3.

Oracle Corporation has developed a Lotus 1-2-3 compatible spreadsheet and integrated it with its ORACLE® relational database management system (DBMS). The new product, SQL★Calc,® is the first to combine a mainframe-class relational DBMS with an easy-to-learn and familiar PC spreadsheet user interface.



SQL★Calc is designed for 1-2-3 users who've run out of memory, flexibility and patience. SQL★Calc allows you to put SQL database commands into spreadsheet cells... just like formulas. This permits you to access large amounts of data directly from your spreadsheet.

Like all Oracle Corporation products, SQL★Calc runs identically on mainframes, minicomputers and PCs.

SQL★Calc's foundation is the ORACLE relational DBMS, which provides users with a complete set of SQL commands through which they can create, retrieve, modify and otherwise control their data. SQL is the industry standard database command language for large computers. The SQL commands available in ORACLE are identical to the SQL commands in IBM's premier mainframe relational DBMS products, SQL/DS and DB2.

Built on this powerful DBMS foundation is a Lotus 1-2-3 compatible spreadsheet that allows users to put SQL commands into spreadsheet cells in the same way as they enter formulas. When a SQL command for data retrieval is entered into a spreadsheet cell, information is automatically retrieved from the database and placed into the spreadsheet. SQL★Calc also permits users to modify the database—and even create new database tables—directly from the spreadsheet.

SQL★Calc is easy to learn because its menu and command structure are compatible with those of Lotus 1-2-3. And SQL★Calc's ORACLE DBMS requires no supplement: it is vastly more powerful than the database components of 1-2-3, Symphony, Framework, dBase II, dBase III, or any other PC DBMS.

SQL★Calc is available immediately for IBM PC/XTs and ATs for $995.* SQL★Calc will soon be available on a wide variety of systems, including IBM mainframes, DEC, DG, and other superminis, and most UNIX systems.

For further information, or to order your copy of SQL★Calc, call 1-800-345-DBMS. Or write Oracle Corporation, Dept. CS, 20 Davis Drive, Belmont, CA 94002.

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Users stand by their Unix PCs

From page 31

four terminals running from a Unix PC and uses it for accounting and other business functions. "It is pretty quick. I am impressed with the performance with all the terminals on it," Plotnik said.

Software programmers also are pleased with the desktop Unix PC. "I love it. It is really the most enjoyable computer I have worked on in a while. I basically use it to develop software, which we port over to an IBM PC, and there is no comparison," said Doug Kellogg, director of software development for Unix Development Corp., based in Ashland, Ore.

Kellogg has written software that runs on both the Unix PC and the IBM PC. "The obvious difference is that it runs faster on the Unix PC," Kellog said. "Compared with an IBM PC AT, the Unix PC, even with virtual memory [reading from the disk] was still about twice as fast as the 6 MHz AT," he said.

"At this point the market has still not accepted Unix 100%," acknowledged Dennis Lo, vice-president and director of software development for Sourcemate Information Systems Corp. in Mill Valley, Calif. Nonetheless, Sourcemate is currently porting its accounting software over to the Unix PC and believes the machine has a good future.

"Some of our customers are moving to Unix, but it is hard to find good accounting software that runs under Unix," Lo said. "We feel that Unix is a great operating system, and we don't have to take too much time to convert our programs from PC-DOS to Unix."

Other vendors agreed that the market is in the very early stages of accepting Unix for desktop systems. "I think AT&T kind of misjudged the sentiment that exists at the one- and two- and three-user machine level for a machine that didn't offer [Lotus Development Corp. 1-2-3] or the things that people are generally more comfortable with," said Nigel Spicer, senior vice-president, sales and marketing, for Alloy Computer Products, Inc. in Framingham, Mass. "When it didn't have DOS, it acquired a bum rap, and it has never quite recovered from that."

Alloy produces the DOS-73 board that allows MS-DOS to run as a task under Unix on the Unix PC. In an effort to boost sales of the machine, AT&T currently offers the DOS-73 board for 99 cents with the purchase of a Unix PC.

Not surprisingly, sales suffer from market confusion over the positioning of the Unix PC, a Unix machine that now runs MS-DOS, and the AT&T 6300 Plus, an MS-DOS machine also currently running Unix.

In a further effort to boost the machine's popularity, AT&T may allow Convergent to sell the Unix PC to other vendors, but AT&T spokesman Barry Campbell said there has been no announcement from AT&T or Convergent about such a move.

Better living through silicon

From page 31

power and data connections, and you've got one building block for a mainframe.

Near the East Fishkill, N.Y., plant where the TCMs are assembled from scratch, IBM is throwing the better part of a billion dollars into a giant facility for semiconductor manufacturing. In this mammoth three-story structure, the second story is constructed like a building within a building, with high-purity clean rooms braced down to the bedrock against vibration.

An hour's drive south at the huge Yorktown Heights, N.Y., lab, you can get some idea of the role of the new factory, looking at experiments that create ever more compact chips.

IBM has fabricated working devices with half-micron spacing, and scientists are working away on ¼-micron chips — down at the level of molecular chains. Gazing at prototype chips with an electron microscope, you're on a scale where a human hair looks like the New York State Thruway.

This will pay off in memory as well as CPUs. Today 1M-bit chips are in volume production, incorporated in 3090s, and company officials discreetly hint that 4M-bit chips might be around within a year or so.

OK, enough about mainframes. You can see corresponding price/performance advances among the merchant vendors of CMOS components.

Intel's 80386, which also is rolling off the production line, boasts more than 275,000 transistors. This tiny CPU now chugs along at more than 3 million instructions per second (MIPS). And it fits into your Personal Computer AT's motherboard with a little circuitry here and cache memory there. (Of course, there's no real way to leverage it yet except as a kind of turbo AT.)

Naturally, none of this silicon is free. Those mammoth investments in research and development and production facilities must be paid back. And some ingredients — like gold caps — aren't so cheap. Even the silicon, which once came from Brazilian beaches, but now is more likely to come from a German quartz mine, carries a hefty price tag.

But never mind that. Component costs will take their usual dive, system costs will continue their slide, and a rather grand landscape will greet the software professionals now in college.

This is all so encouraging it's downright scary, particularly when you think of cooperative processing, image management and all the rest of the glitz on its way here. Or when you consider the awesome distributed networks of machines on which all this software will run.

When micros become mainframes, what do mainframes become? And as one senior IBM official asks, "What kind of trauma will it be to run a 50-MIPS machine when you've never done that before?"



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Source: Tony Liberoni, Manager of Operations and Systems, PPG Industries Chemical Group

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Supercalc4 offerings

From page 31

er. The previous upgrade was to Supercalc3 Release 2 in July 1985.

Supercalc4 also offers more powerful macros, Twomey said. Previously, the program had only file-based macros. Now it has more macros, which are both file- and spreadsheet-based. Computer Associates also added a "learn capability" to write macro commands with a single keystroke.

The newest release is more compatible with other spreadsheets than previous versions and can now directly read files written for both Versions 1A and 2 of Lotus Development Corp. 1-2-3. Additionally, users can label parts of a spreadsheet by a descriptive word instead of coordinates.

"This is the best by far. And I can call up models I created years ago and enhance them on the new version. They've maintained compatibility, and that's phenomenal," said Lee Hoffman, software developer with Laguna Hills, Calif., value-added reseller Philanthrotec, Inc. Hoffman, who has been using Supercalc since his first version on an Osborne1 in 1979, added that Supercalc4 answered most of his wish list of features.

John Doscher, a CPA who works with Imaginaction, Inc., a Menlo Park, Calif., business and financial consulting firm, liked the new financial indexing features in Supercalc4. The Business Simulator, a turnkey financial forecasting system his firm built on Supercalc, will benefit both from this capability and from the continued compatibility among Supercalc versions.

'Best of both worlds'

"Supercalc4 offers the best of both worlds," Doscher remarked. "Users of Supercalc3 can upgrade. Users of older programs not used to executing files and full-screen menus can move over and use macros."

He thinks Computer Associates may pick up some Lotus 1-2-3 users with the latest Supercalc. "Lotus users can come over to Supercalc now without having to learn a lot of new commands," he said. "In fact, my first impression was that the new version was a Lotus look-alike. But once I got into it, I realized it's really an enhanced Supercalc with Lotus-like features."

The network version of Supercalc4 is scheduled for release in late summer and will support IBM Netbios-compatible networks, including IBM's PC Network and networks from Novell, Inc. and 3Com Corp.

Computer Associates will not release a separate, multiuser package but will add the networking capability to Supercalc4 for the same price, Twomey added.

Individual users will be able to make their own configurations for use on the network.

The program has never been copy-protected, and the supplier will offer site licenses to corporations through its Corporate License Program, Twomey explained. Computer Associates will count copies of Supercalc purchased earlier and already in use in determining volume of users for site license provisions, she added.

"We err on the side of believing our customers are honest," she said, commenting on the lack of copy protection. "Most companies are careful and police themselves because they realize they have a lot to risk."

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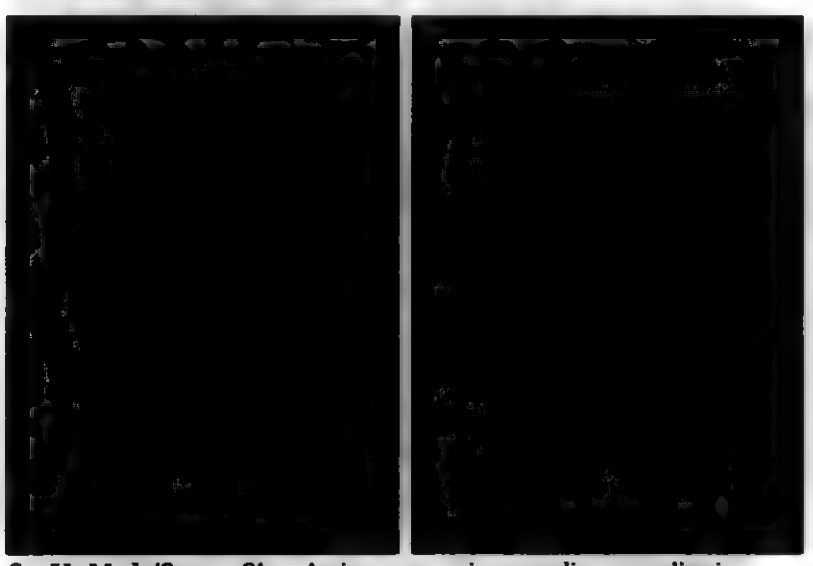
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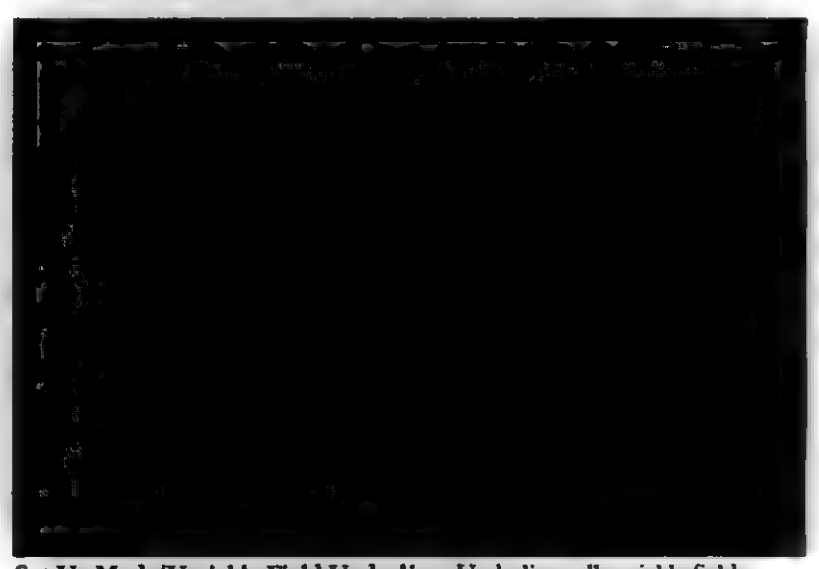
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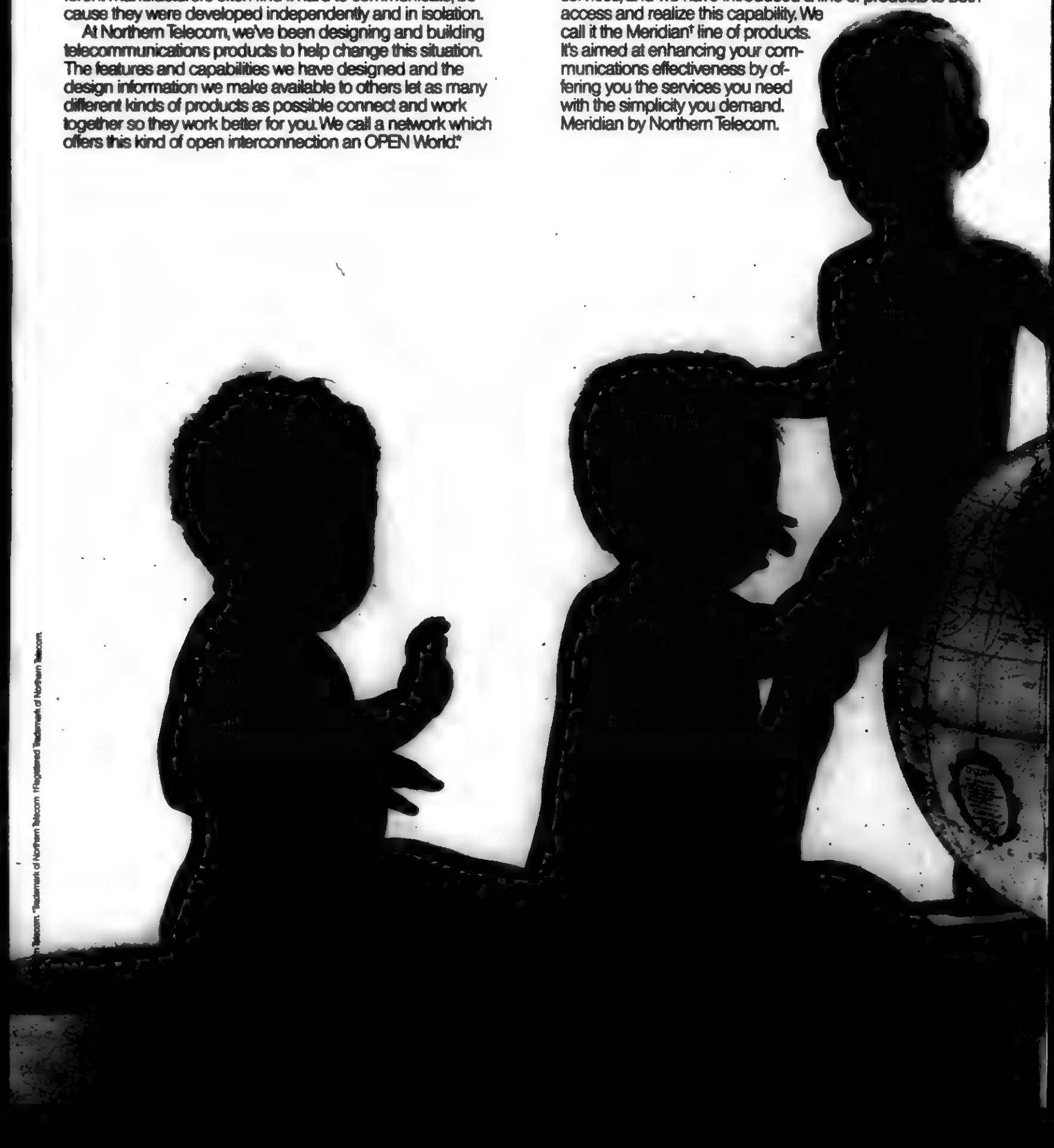
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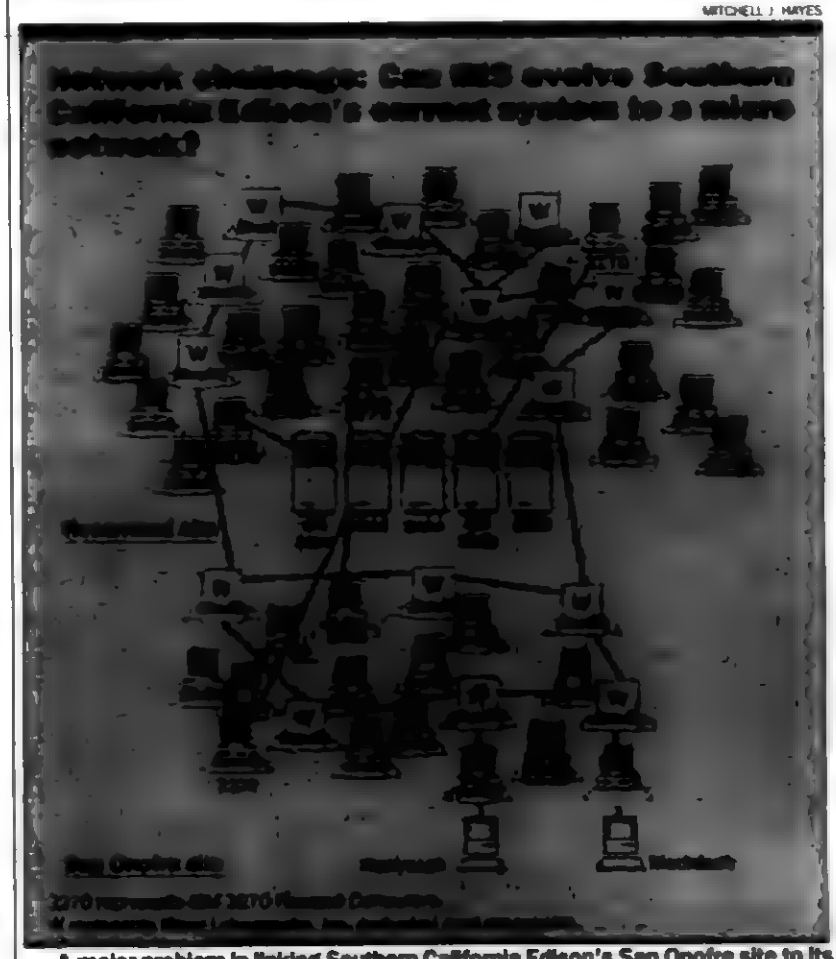
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A major problem in linking Southern California Edison's San Onofre site to its Rosemead mainframes entails fitting Apple Macintoshes — preferred by some high-level executives — into the local-area network.

Macintosh execs, managers clash

From page 1

nodes. The project, undertaken with the assistance of consultant and value-added reseller Vitek, Inc. of San Marcos, Calif., began in February and is about half finished. Approximately 200 micros, including IBM Personal Computers and PC XTs and Compaq Computer Corp. Deskpros and Portables, are on-line now. Others are joining the network at the rate of about 20 each week, Henderson says.

The network will also include Systems Network Architecture gateways to the host computers in Rosemead — two IBM 3090s and three IBM 3084s. About 25 IBM 3270 PCs at San Onofre also provide a gateway apart from the network. The site still maintains several dozen Wang Laboratories, Inc. dedicated word processors, which can dial up other Wang systems at Rosemead.

The Rosemead staff, while not involved directly in the San Onofre project, is watching its progress with plans to network its own nearly 1,000 PCs later, Henderson adds.

But the Novell network can now link only MS-DOS systems, and Novell declines to say whether a Macintosh connection is in the works. The choice underscores the Macintosh's position as a minority in a Big Blue world — and the complications created when employees, like the four San Onofre devotees, are not prepared to relinquish their devices.

"The senior managers are the ones using the Macintoshes, and they are quite attached to them," Henderson says. He adds that any Mac withdrawal will be made "very gently" — and not until he has a feasible alternative.



Henderson

Among his options are both hardware and software solutions to make the Macintosh more IBM PC-compatible without sacrificing its own features. This, Henderson confesses, is virtually a contradiction in terms.

Henderson says he is still exploring use of a PC with a graphical interface such as the Graphical Environment Manager (GEM) from Digital Research, Inc. of Monterey, Calif., and Windows from Microsoft Corp.

But, he says, one problem with GEM is that every program on the system shows up on the screen as an icon, creating a virtual forest of icons when using a hard disk or, worse, a network. It even shows icons for some programs the user cannot access. Henderson says he found that Windows shows every program on all drives, cluttering the screen even more.

Even a Macintosh interface to the network would not solve everything; the network interface uses color, inaccessible to the black-and-white Mac, Henderson adds. But he can't just take away the site manager's Macintosh, especially when it has proven to be a useful tool, he says.

"The objective of computers is to keep the users productive, any way we can," says Ken Slagle, manager of material and administrative services and Henderson's supervisor at San Onofre. "If we can keep them on a Mac, we'll try. Otherwise, we'll give them what we can with a PC."

Slagle says the MIS department will support both DOS and Macintosh

See **MACINTOSH** page 40

Macintosh execs clash

From page 39

systems regardless but wants "to streamline our work processes. We're going ahead on the PC-Novell network. If we can get the Mac on, all the better."

For the moment, the micro managers have sewn a patchwork system to let Macintosh users electronically talk to the rest of the company, if in a roundabout way.

Originally, site manager Ray gave printouts from his Macintosh files to his secretary, who rekeyed them into her Wang dedicated word processor, which could then communicate with the Wang system throughout Southern California Edison sites. That was less than optimum, and Ray's secretary switched to an IBM PC.

Now they use Apple's ASCII Maclink to communicate over modems and phone lines from Macintosh to IBM PC, Ray says. A Bluecom bisynchronous communications card from M-H Group of Chicago in her PC XT lets secretary Joanne Bullington send Ray's edited file through a modem to the Wang system.

"It still isn't perfect. There's still certain codes in the PC that come across as garbage in the Wang," Ray says. But so far, it has enabled him to hang onto his Mac.

He has a Southern California Edison Macintosh at home as well, and says he does about one-third of his work there. He even once took the Macintosh on a business trip. Both have been upgraded since their installation and are now Macintosh Plus systems with hard disk drives.

"I'm still a little satellite at the far end of that network," Ray says. "I guess I'm going to have to convert to a PC eventually, but until then, I'm taking a wait-and-see attitude. But I don't think I'm going to be able to interact with that network by sending everything to my secretary."

Besides missing out on direct electronic mail, a nonnetworked Macintosh will not be able to take advantage of Hewlett-Packard Co. plotters and laser printers and Dest Corp. optical scanners that will be shared on the network.

Ray also has some doubts about a Mac-like PC interface. "I'm not sure whether I'd like an IBM that looks like a Mac," he says. "I guess I'd face that at the time when I have to give up my Mac. But I haven't gotten to that point yet." His department assistant also has a Mac and has a similar arrangement with his secretary.

> ***'When the top man uses a Mac and does his work on it almost to the final draft, you have more acceptance among the ranks.'***
>
> — Russ D. Henderson
> Southern California Edison

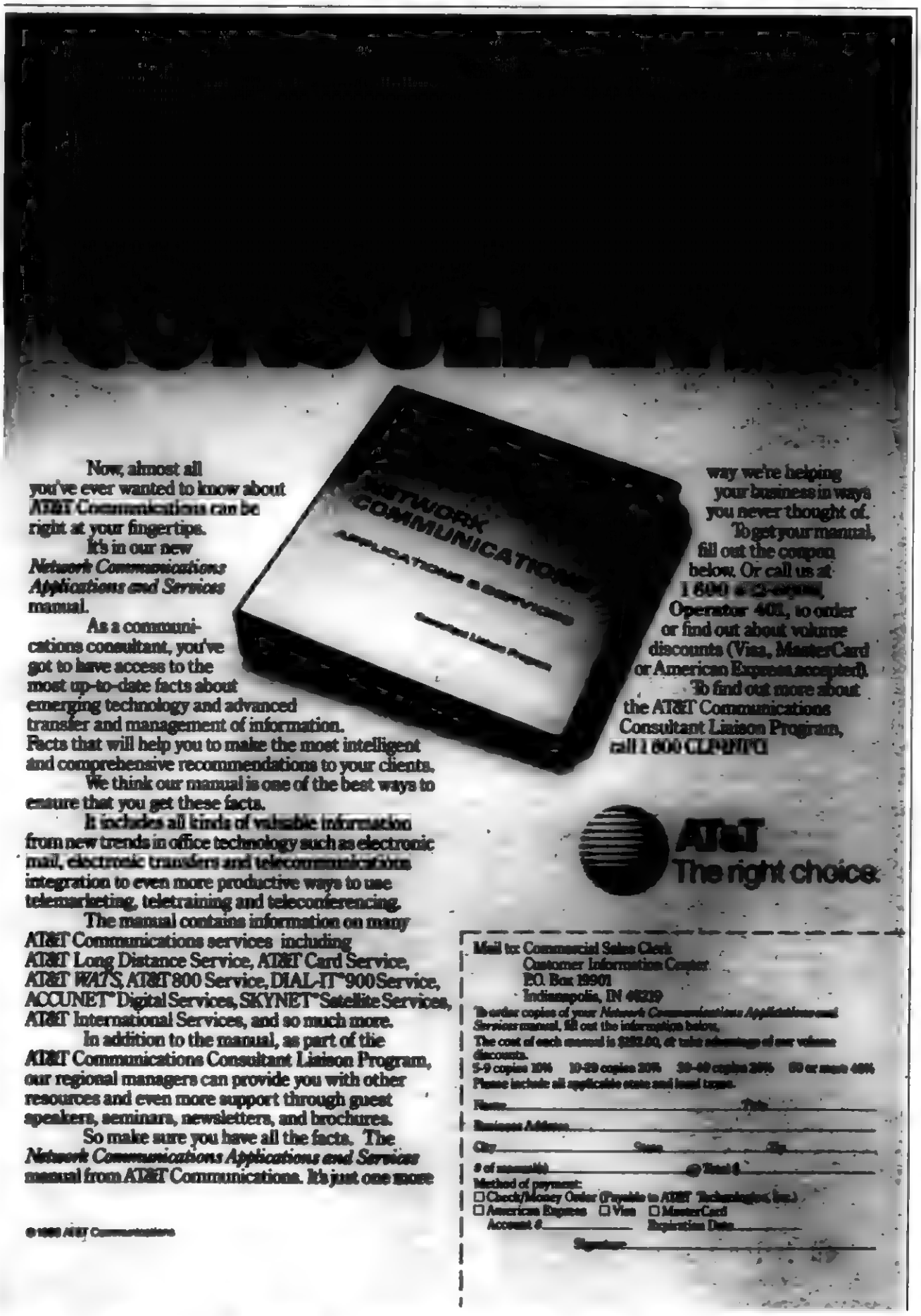
Encouraging micro use

Despite its current stumbling block, the Macintosh has served a purpose by encouraging the use of microcomputers among all levels of workers, Henderson says.

"They've been good because they brought management into innovation, and when the top man uses a Mac and does his work on it almost to the final draft, you have more acceptance among the ranks," Henderson says.

Slagle agrees. "You could say we have an eclectic approach. We're trying anything we can," he says. Ray has "been a strong advocate of office automation," he adds.

Whether it ever joins the network, the Macintosh will not disappear, Henderson says. He uses a Macintosh as a front end to the on-line data base Plato and is evaluating the Mac for in-house desktop publishing applications.



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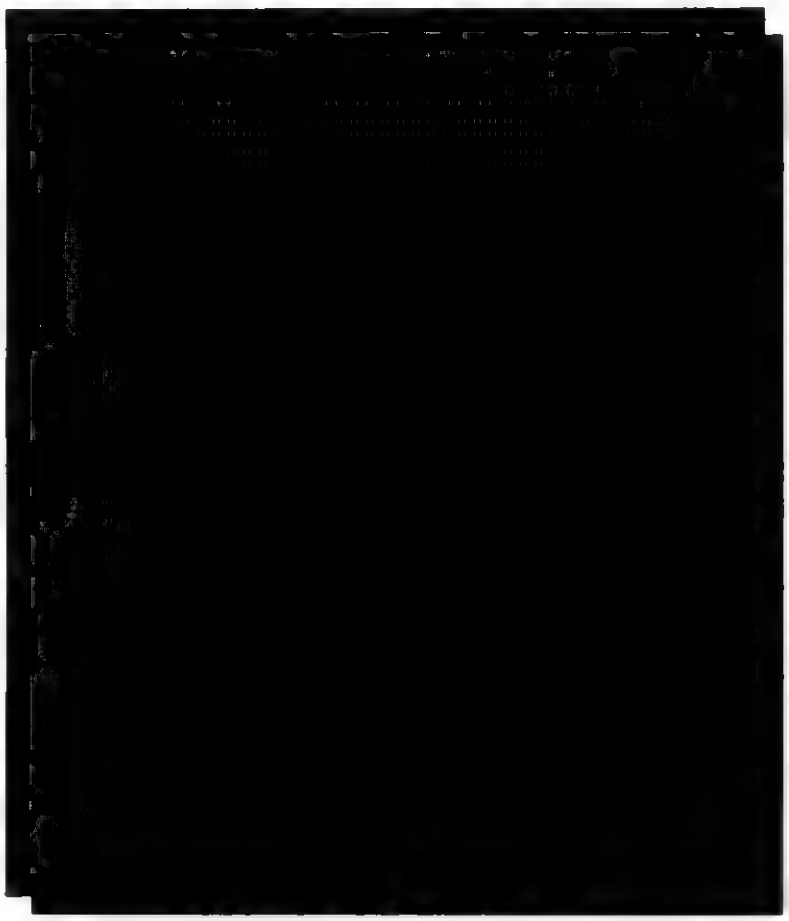
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SYSTEMS & PERIPHERALS

HARD TALK
James Connolly

Keeping an ear to the ground

The rumble evokes memories of the 1906 San Francisco earthquake. Something is up at IBM, and the world is likely to find out what today or tomorrow.

The rumbling is the sound of what seems like every IBM watcher and minicomputer industry analyst guessing what will become of the System/36 and the System/38. Each observer is offering an opinion, although that opinion frequently seems tailored to jibe with the opinionator's previous predictions.

Even normally silent IBM has fueled speculation by tossing out teaser hints during consultant briefings, by scheduling user briefings on changes to products that haven't been changed in a year and by calling consultants to ask, "Where do you plan to be during NCC week?"

It doesn't take a genius to guess that something is ready to hit the news this week. Now, what will it be? The predictions range from a 32-bit System/36 to a common hardware platform and operating system for the System/36 and 38. As in any predictions, most of the guesswork is based on a few facts and a firm belief that the prognosticator has been right in what he has been saying for two years.

Rather than speculate about details, however, let's take a look at the general direction in which IBM appears to heading.

The signs indicate that there may be good news for those who are weary of IBM running a half-dozen in-

See KEEPING page 50

Connolly is Computerworld's senior editor, systems & peripherals.

Spencer fights IBM 'bunch'

Honeywell chief says Blue dominance began in 1980

By James Connolly

The BUNCH of the mainframe world is shrinking, with Burroughs Corp. buying Univac (Sperry Corp.), NCR Corp. focusing on intermediate systems and Control Data Corp. suffering financial woes.

Most of those companies shun the BUNCH label, but the top executive at the "H" in BUNCH — Honeywell, Inc.'s Chairman and Chief Executive Officer Edson W. Spencer — almost explodes when the term is mentioned.

"Let me tell you who the BUNCH are. The BUNCH are IBM, Amdahl Corp., Hitachi Ltd. and Fujitsu Ltd., the people who are clustered around IBM's operating system. BUNCH implies that people do things the same way, and those people do," Spencer charges.

"We are the freewheeling entrepreneurs who are charging off in our own direction," he says of Minneapolis-based Honeywell and the other vendors that offer themselves as alternatives to IBM.

Interviewed after Honeywell's introduction of hardware and software product lines for office automation recently, Spencer spoke of Honeywell's strategies and surviving in a world increasingly dominated by IBM.

He says that it was relatively recently that other vendors really began to feel IBM's power. Honeywell continues to rely on the mainframe technology of NEC Corp. but will introduce a new homegrown mainframe soon. Honeywell's best opportunity, according to Spencer, is in its ability to link the data center with the office and the manufacturing and control systems.

"I don't think IBM's power was really there to be recognized until the antitrust suit was settled. During the 1970s, with the rapid growth in the large-user marketplace, all of us were operating in the IBM price umbrella, and they were very conservative in the introduction of new technology and very conservative in pricing," Spencer says.

It was around 1980 and 1981, when IBM and the U.S. Department of Justice were settling the long-running federal antitrust suit against IBM, that other mainframe

See SPENCER page 50

Hitachi doubles drive capacity

By Donna Raimondi

SAN BRUNO, Calif. — Hitachi America, Ltd. has announced an 8.8-in. disk drive that costs $14,700 and holds 1G byte of data. The new drive is said to offer twice the capacity of the vendor's current top-end 8.8-in. drive, the DK815-5.

The DK815-10 allows system designers to fit two units side by side in a 19-in. rack for a storage capacity in excess of 2G bytes, the vendor said. The unit uses the enhanced storage module device interface. An intelligent peripheral interface drive and controller are also available.

"There are not a lot of systems that can use the 9-in. drive yet, so I do not think you will see this used much until 1987 or 1988," said storage analyst Dave Vellante of Framingham, Mass.-based International Data Corp.

"It will definitely be important to the mid-scale system market because 9-in. drives tout some of the best reliability figures in the industry," he said. Anybody who uses the Fujitsu America, Inc. Eagle 10½-in. drive should definitely consider a 9-in., he said, because the high-capacity 9-in. drives offer faster access time, high reliability and can be mounted side by side.

In comparing the DK815-10 to the older DK815-5, the vendor said the average access time was reduced from 18 msec to 15 msec, the recording density was increased to 20G bit/in. and mean time between failures was increased from 20,000 to 30,000 hours.

Vellante noted that NEC Corp. and Control Data Corp. are working on similar units and that most minicomputer makers are working on the controllers for them.

INSIDE

Fujitsu is set to announce two hard disk drives and an enhanced SCSI controller at NCC/**40**

NEW THIS WEEK

- Wang introduces a 32-bit Nacsim-compatible minicomputer
- Alpha Data releases its Atlas 520M-byte hard disk drive

For more on these and other new products, see pp. 117-130.

INSTANT ANALYSIS

"We're talking about 4 MIPS of power here. That's a pretty powerful machine. Maybe some people call it a minicomputer. Ten years ago that would have been a supercomputer."

— Honeywell, Inc. Chairman Edson W. Spencer on his company's DPS 6 Plus office system

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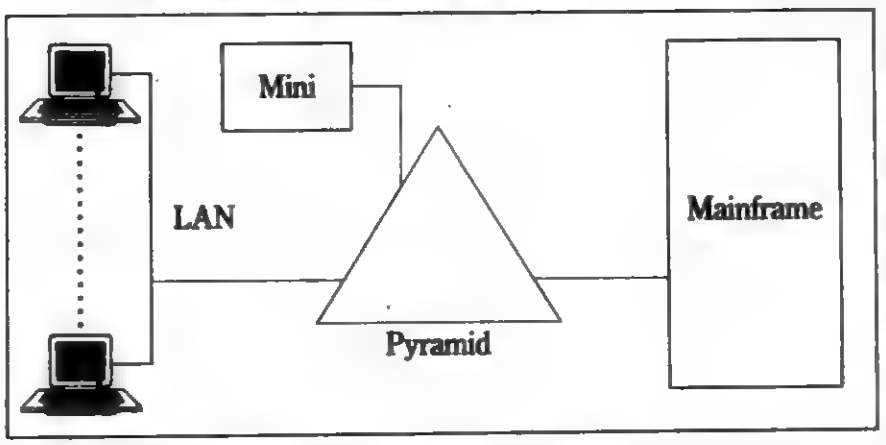
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This superior throughput is further enhanced by our optimizing compilers. Which take advantage of another high performance feature, our RISC-based architecture.

Our I/O processors free up the CPU while keeping terminals and disks responsive. So users see nothing but performance, yet there's no overhead to the rest of the system.

Finally, our dualPort™ OSx operating system makes both UNIX* standards (Berkeley 4.2BSD and AT&T's System V) available concurrently. Making the broadest possible choice of software and vendors available as well, while protecting your own software investment.

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This combination of features and openness makes our systems ideally suited for three important applications: As data base servers, pc/workstation servers, or software development environments. We'll talk about each one of these applications at length in a series of advertisements.

In the meantime, to learn more about Pyramid systems and the company behind them, contact us at 1295 Charleston Road, P.O. Box 7295, Mountain View, CA 94039-7295. Or call 1-415-965-7200, Ext. 3450.

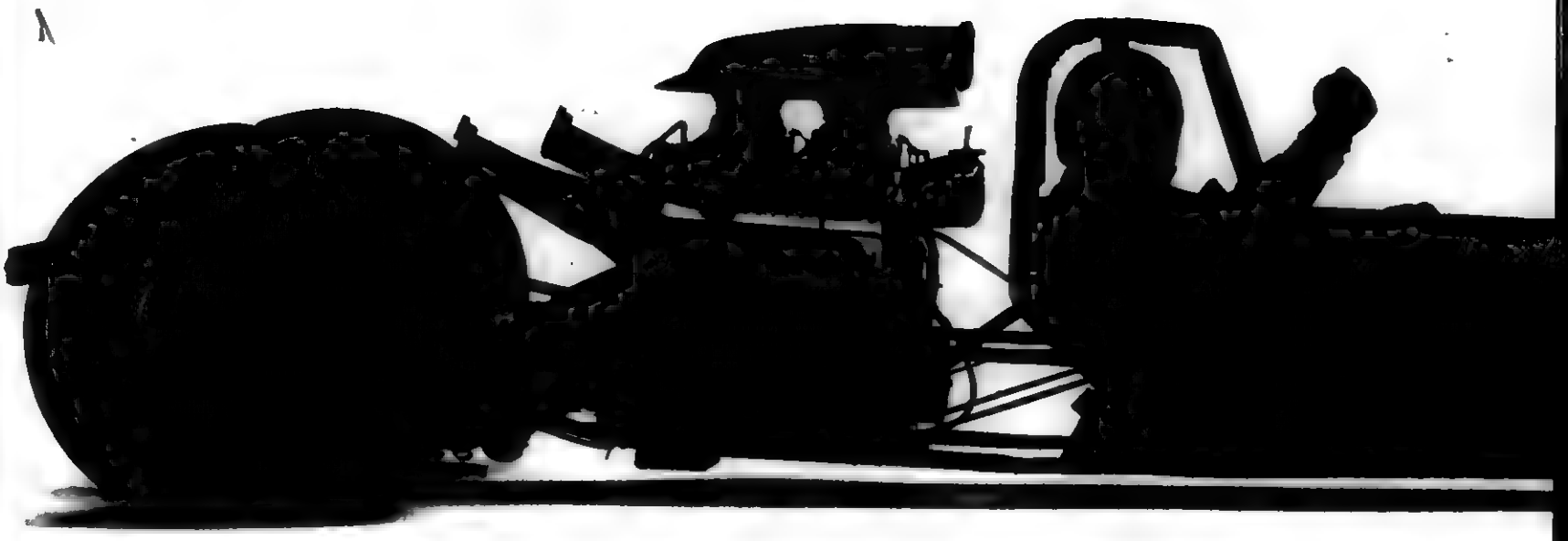
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The Shape of Performance.

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GUESS WHO WINS THE DATA BASE RACE?



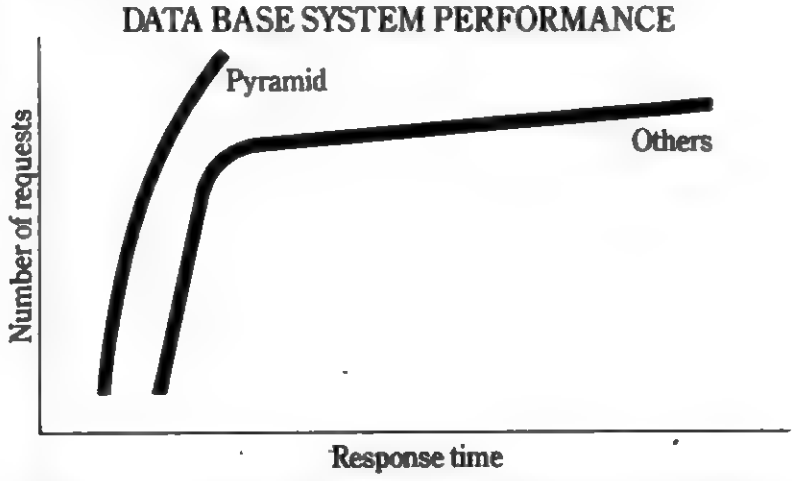
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Other superminis have a very pronounced "knee" in their curve. That's where their I/O subsystems hit the wall. But not Pyramid. Thanks to our distributed processor architecture, we deliver crowd-pleasing performance. For as little as 2/3 the cost of our competitors' systems.

Smooth data base management requires high *aggregate* throughput. So you need MIPS, but you also need performance from every other part of your system, too. And that's why Pyramid comes in first.

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And our XTEND™ bus is the ultimate in handling. With an advanced cacheing scheme and a message-based, 40 Mb bandwidth, it's no wonder.

But performance isn't the only thing we offer.

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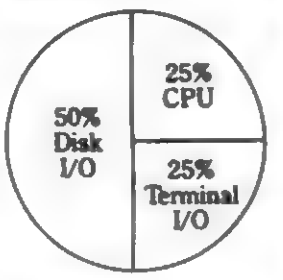
We have strong relationships with every major relational data base manufacturer. So not only will you have a choice of what to run, you'll get support from both us and them. No matter who "them" is.

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While raw MIPS are important to a data base system's performance, the system still spends most of its time on terminal and disk I/O. That's why we use multiple distributed processors. They put the computing power where you need it. So you're not sitting there spinning your wheels.



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Keeping ears to the ground

From page 45

compatible product lines in the middle range.

Based on what William O. Grabe, IBM vice-president and assistant group executive for the Information Systems and Product Group, told consultants at a May conference in Palm Springs, Calif., one thing seems clear: The architectures of the System/36 and 38 are moving together while moving away from the 370 family. What Grabe said indicates that analysts were off base when they predicted the 370-based 4361 would be merged with the System/36 or 38 or that the System/38 would be driven into the 370 world.

"The announcements we have made and continue to make are growing the System/36 and System/38 together," said Grabe, noting that IBM plans to merge the best features of both systems — the relational data base and programming strengths of the System/38 and what he considers the "low cost, ease of use" of the System/36.

Lumps systems together

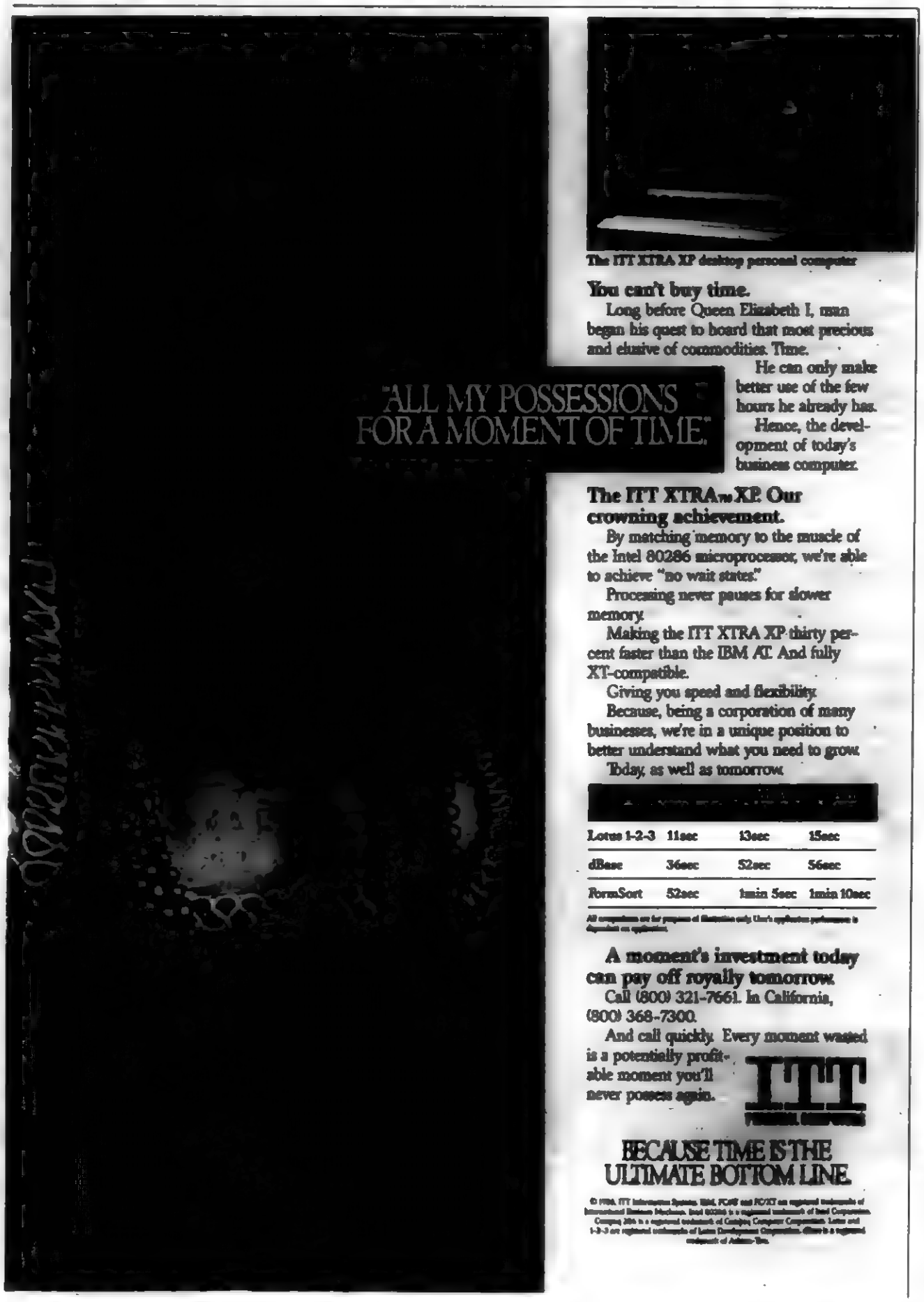
He lumps the systems together in the distributed system, departmental system and personal computer controller markets. One should not be surprised to see either a statement of direction on the future of the systems this week or at least product announcements that indicate where the products are heading.

Note that Grabe stops short of saying there will be a common hardware and software system for the System/36 and 38 and that he says there are enhancements coming for each.

It appears that neither system is ready to die. However, it also is interesting that he refers to the 370 systems as "the other flagship of our intermediate systems strategy."

Grabe says IBM is taking steps to address the shortcomings customers cite in the 370 family, which in this case includes the 4361 and the lower end of the 4381 line.

One complaint he says is in the process of being addressed is the need for a lower entry point. That promise indicates that we finally may see the Micro370 or desktop 4300 that has long been rumored, even if that product is many months away.



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Fujitsu drives out, controller improved

By David Bright

SAN JOSE, Calif. — Fujitsu America, Inc. recently introduced two high-performance hard disk drives and improvements to its SCSI Intelligent Disk Controller. The three products are scheduled to be shown at the National Computer Conference in Las Vegas this week.

The new drives are the 10½-in. M2360A Eagle and the 8-in. M2333P. The Eagle uses a parallel transfer method to provide fast data transfer and large storage capacity.

With a 12.29M byte/sec. transfer rate, an 18-msec positioning time and a 689M-byte capacity, the Eagle is intended for real-time applications such as medical imaging and seismic analysis. The drive offers a 33% increase in the transfer rate and a 45% capacity increase over Fujitsu's earlier M2350A drive.

The Eagle drive is priced at $19,000 in OEM quantities.

The 8-in. M2333P features a 337M-byte capacity, a 20-msec positioning time and an embedded IPI-2 interface, which is compatible with the latest ANSI X3T9.3 specifications. Its price is $4,995 in OEM quantities. Both drives should be available in the fourth quarter.

Conforming to the small computer systems interface specifications, the enhanced SCSI Intelligent Disk Controller works with Fujitsu's M2333KS 337M-byte 8-in. drive and the M2361B 689M-byte 10½-in. drive. Newly incorporated into the controller are the common command set for multiple device compatibility, a 16K-byte buffer and differential drivers.

Available in July, the controller is priced at $895 in quantities of 100.

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Spencer fights IBM 'bunch'

From page 45

vendors started to see IBM reach its potential.

"The power wasn't recognizable before then; but when they made those huge factory investments, they said, 'We're going to compete with the Japanese,' and the government permitted them to go after new market share without fear of antitrust reprisal. That's when the name of the game changed, and that's the point at which we had to redirect our own strategies. And that is when we did," Spencer says.

Mainframe revenue growth will come from existing customers, Spencer maintains. "The needs for those customers to add power and performance are there. What is very difficult is to attract new-name customers. Because of the customer's investment in software, it is very difficult to persuade an IBM user to switch to Honeywell, and IBM has to fight every time they want one of our users to switch to their operating system. So the growth in that market is not from new names. It's from expansion of existing systems.

"The growth in new names comes from the manufacturing business, the integrated building business and the integrated office business because we are getting into new, expanding and rapidly growing markets where the marketplace hasn't been picked over and defined."

Honeywell, which now acquires many of its mainframe and intermediate systems from NEC, NCR and Groupe Bull, is scheduled to announce later this year or in early 1987 a mainframe built at its Phoenix facilities, which produce the DPS 8 and DPS 88 processors, Spencer says. He claims that the new system will carry Honeywell into the 1990s.

He says of the joint agreements, "It is very difficult to compete costwise with IBM, so if we have Bull and NEC using similar architectures, let's go where we can get the hardware at the least cost, the least development cost, the least manufacturing risk and base our growth on the software part." He reports that Honeywell would consider more joint agreements but none are pending.

At the mid-range level, Honeywell announced its DPS 6 Plus and an integrated office system two weeks ago. The company also outlined plans to use the DPS 6 Plus technology, as well as various network tools, to link the office, data center and manufacturing and controls segments. Spencer says that reaching all of those markets within a user organization requires a coordinated sales and support approach.

He says, "The end user has to have something that is friendly and he can understand. But you are still going to have to sell the MIS people. You really have to work at both levels. I don't see that you can concentrate on one or the other because the MIS department is getting involved in the selection of the vendors, the creation of the list of vendors who qualify and so on. So rather than concentrating on one or the other, rather than sell just to the MIS manager, which used to be, we are adding that we are going to sell to the departmental user. The same thing in the factory. If you are selling factory data processing, work center controllers and things like that, you better get the guy on the shop floor who is going to use it to say, 'Yes, I want that.' "

Spencer observes that the June 3 announcement "sets the standard for what is going to happen in the office end of things." He notes, "There will be a lot of software added, but certainly, the hardware path that was laid out is what is going to happen in the next two or three years."

> ***'The end user has to have something that is friendly and he can understand. But you are still going to have to sell the MIS people.'***
>
> — Edson W. Spencer
> Honeywell, Inc.

Those announcements relate in part to how Honeywell deals with IBM, according to Spencer, who says, "When we were building our base in the 1970s, it was the proprietary operating system that we sold because it had different features from IBM, and that is how we competed. But today you have to recognize that IBM is there, and you can't run the IBM operating system on a Honeywell machine, but we have to interface with it through the Systems Network Architecture network and be able to access data bases."

He also notes that in the inflationary years of the 1970s, firms could make poor investments in new ventures and absorb the losses in price increases, which the business environment does not allow in the 1980s. As a result, Honeywell began a two-year study of the company's strategy in 1983, with Honeywell's "younger, brighter people" recommending that unprofitable ventures be eliminated. Typical of those ventures was the Dallas-based communications network division, which recently was sold to a venture capital group.

Looking at his own future, the 60-year-old Spencer says he doesn't face mandatory retirement until age 65 and that he plans "many years of hard work." He notes that the May appointment of Vice-Chairman James Renier as chief operating officer was a clarification of functions, not a transfer of power.

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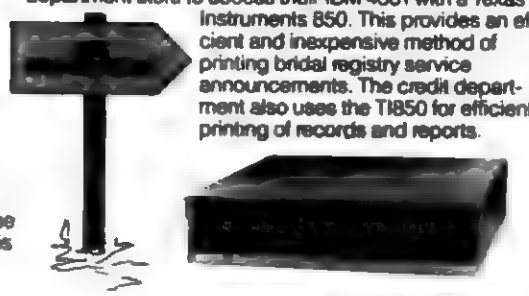


Get immediate host access from an async PC, CRT or printer with DataLynx/3274 or 5251. Use it instead of a cluster controller for economical, secure local and remote connectivity.

A Fresno (CA) hospital uses DataLynx to bring nine DEC VT-100 terminals on line with a BSC host 200 miles away at Blue Cross offices in Los Angeles.

The hospital transfers confidential patient and medicare data to Blue Cross using inexpensive async modems. Administrative productivity is increased through better patient account control and cash flow problems are solved with faster insurance compensation payments.

InterLynx/3287 attaches virtually any low cost ASCII printer anyplace you can plug in a 3287, allowing a major department store to access their IBM 4381 with a Texas Instruments 850. This provides an efficient and inexpensive method of printing bridal registry service announcements. The credit department also uses the TI850 for efficient printing of records and reports.



Convert your 3270 coax devices to RS-232 today. Then place your coax terminals anywhere your PABX, data switch or LAN wiring goes. Mix or match Async and Coax terminals in the network. Sound great? It is.



TruLynx PC software provides fast easy file transfer to IBM host programs through DataLynx Protocol Converters. In one major application company executives update financial planning databases from PC's at home and in the office. In another application source code for large mainframe application programs is transferred to and from PC's for demonstration, test and editing.

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InterLynx/5251 connects to the host at the twinax port, eliminating the costly communications adapter. Users access the host by way of asynchronous modems or local RS-232C connections.

InterLynx/5251 moves data at 38.4Kb and supports print rates to 5200 cps. DataLynx/5251 recognizes up to 32 LUs, dual sync hosts and supports data at 19.2Kb and 9600 baud.

Customers of a restaurant supply house in Denver dial an IBM/36 host through a DataLynx/5251, check inventory levels, current pricing and perform their own order entry.

This is especially helpful to ski area concession operators who prepare large quantity orders during off hours, cutting delivery time to their mountain locations.

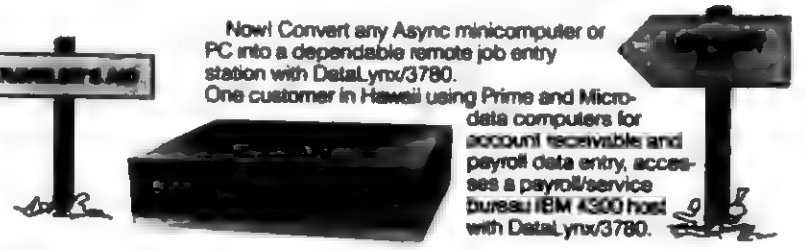
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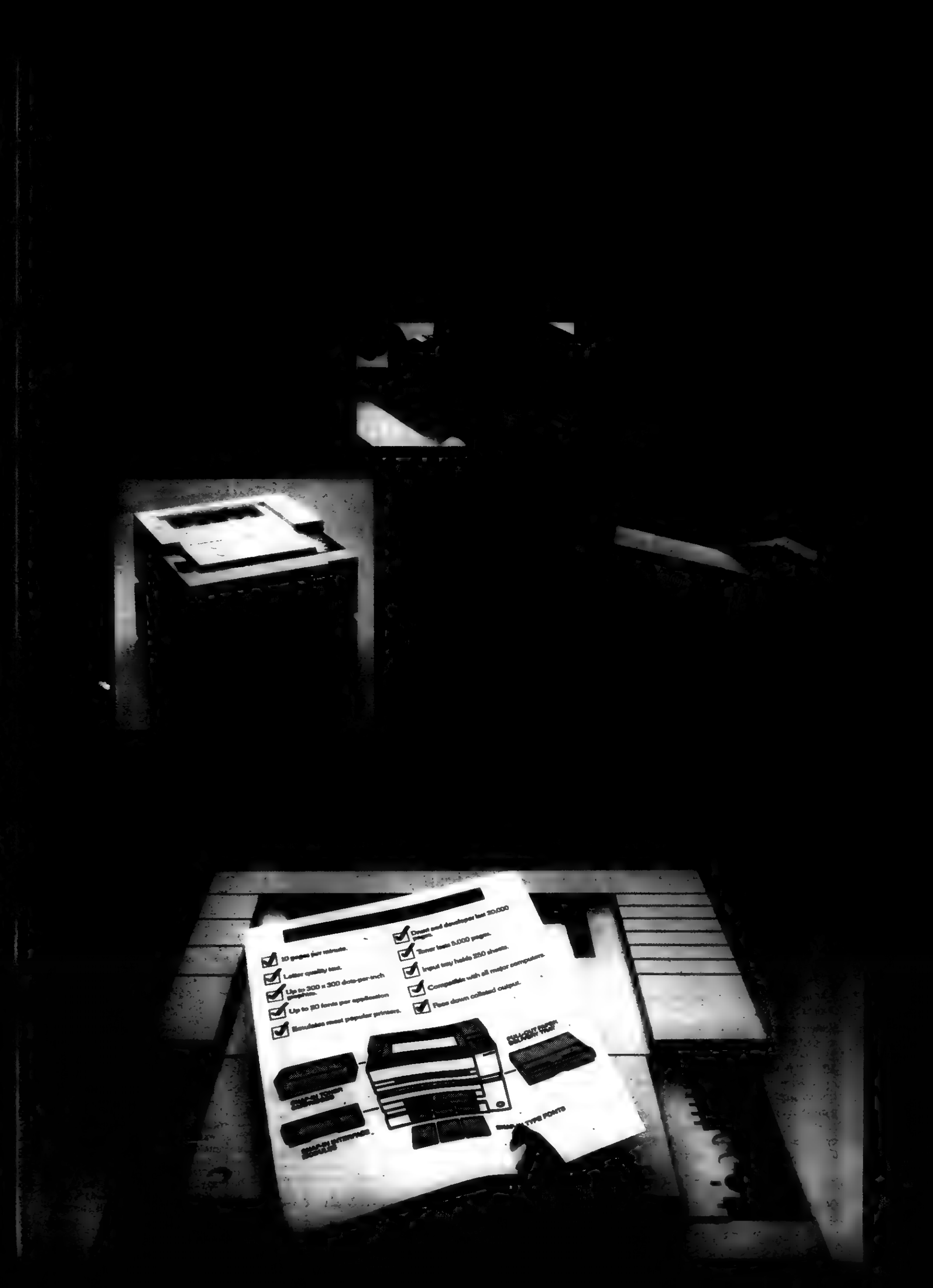
Now! Convert any Async minicomputer or PC into a dependable remote job entry station with DataLynx/3780.

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Users: Minis for central use only

From page 1

Other results of Datapro's annual minicomputer users survey showed a reversal of a 1985 trend toward greater overall user satisfaction with their systems. More than half of the vendors scored lower satisfaction marks than they did in 1985.

Five of those who scored well were bunched at the front of the field when users rated products on a one-to four-point scale, with four being the best score.

IBM and Tandem Computers, Inc. each scored overall satisfaction ratings of 3.47. They were followed closely by Digital Equipment Corp., Hewlett-Packard Co. and Prime Computer, Inc. with scores of 3.46.

The lowest score, 2.40, was recorded by Modular Computer Systems, Inc. (Modcomp). However, Modcomp was rated by only five users, which is the minimum to be included in the Datapro report. The next lowest scores were posted by Concurrent Computer Corp. at 2.81 and Sperry Corp. with 2.99, which represented a gain over Sperry's 1985 figure of 2.83.

Monitoring breakdown of systems

In looking at the general shape of the minicomputer industry, Datapro officials said they will continue to monitor the breakdown between departmental systems and organizational systems.

"It will be interesting to see if those numbers begin to slant more toward departmental usage in the next few years as smaller, office-installable minis are integrated into vendors' product lines and as the manufacturers make available a larger number of micro-to-mini and mini-to-mainframe links," a Datapro official said in a report accompanying the survey results.

Datapro found that, as in 1985, the most common minicomputer uses are accounting, billing, payroll, personnel, order processing, inventory control and purchasing.

The Delran-based research company also detected a slight gain in user satisfaction with hardware manufacturers' software offerings, although the most common source of applications remains in-house personnel.

RPG was the most popular programming language, apparently because of the heavy response rate from users of IBM's System/38 and 36. Cobol was the second most popular language and the most popular in the non-IBM responses.

Acquisition plans

Datapro asked users about their 1986 acquisition plans, and more than 60% said they planned to expand their hardware configurations. Expansion of data communications facilities rated second (45%) on the acquisition list.

The researchers also added what Datapro considered "burgeoning and widely publicized" technologies to the acquisition question. Laser printers landed in fifth place (20%), apparently because of the increased availability of less expensive printers in the 8 to 12 page/min category. Scoring poorly on the same question were optical disks (2%) and Unix (3%).

Seven system families earned what Datapro considers special merit for recording overall satisfaction scores of at least 3.20 and no scores lower than 2.8. Those systems were the DEC VAX and PDP-11, the HP 3000, Tandem's Nonstop, Prime's 50 series, IBM's System/36 and the DG Eclipse MV family.

> ***Datapro found that, as in 1985, the most common minicomputer uses are accounting, billing, payroll, personnel, order processing, inventory control and purchasing.***

Datapro officials noted that four of those families are composed largely of 32-bit systems, which indicates an "increased infiltration of the medium-systems market by high-end minicomputers and concomitant user satisfaction with the enhanced performance provided by those more powerful systems."

The Wang Laboratories, Inc. VS family, with a score of 3.72, and the NCR Corp. 9300, with a 3.67 score, were judged the easiest to operate. But Wang, with a 3.30 overall satisfaction rating, saw its scores slip in terms of maintenance, technical support and compatibility of hardware carried over from other systems.

The System/38 and the NCR 9300 tied for first at 3.84, edging out the System/36 at 3.83 for system reliability, while Burroughs Corp.'s B1900 family earned the highest rating for operating systems at 3.73.

Datapro asked users two yes-or-no questions, the first being whether the system did what they had expected, and the second being whether they would recommend the system to another user.

The responses showed 93% of the users thought their systems did what was expected and that 92% would recommend their systems to other users. Concurrent received some of the lowest scores, with 72.73% of its users saying their systems did what they expected and only 60.61% saying they would recommend the systems to others.

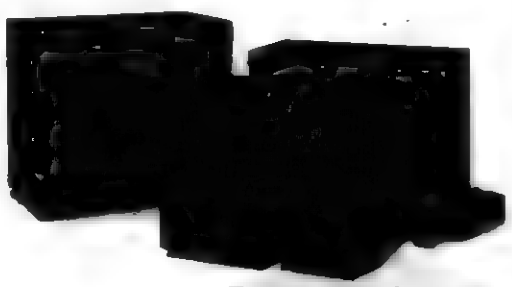
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Users rate their minicomputers

Survey Item								
No. of User Responses	68	33	133	99	265	24	8	283
Average Life of System (months)	42 94	43 84	35.18	55 75	42 97	51 32	70 86	39 82
Acquisition Method (%)								
Purchase	60 29	93 94	80 45	80 81	78 87	75 00	87 50	65 72
Rental or Lease from Manufacturer	19 12	0 00	3 76	2 02	5 28	8 33	0 00	22 26
Lease from Third Party	17 65	6 06	14.29	15 15	15 09	12 50	12 50	11 31
System Ratings (4 0-1 0)								
Ease of Operation	3 63	2 82	3 51	3 49	3 64	3 38	3 00	3 64
Reliability of System	3 57	3 39	3 66	3 61	3 67	3 46	3 50	3 76
Reliability of Peripherals	3 35	3 27	3 45	3 49	3 51	3 21	3 50	3 62
Manufacturer s Maintenance Service								
Responsiveness	3.43	3 03	3 48	3 45	3 60	3 25	3 50	3 59
Effectiveness	3.28	3 00	3 43	3 35	3.42	3 17	3 25	3 59
Manufacturer's Technical Support								
Troubleshooting	2 94	2 72	2 99	3 18	3 28	3 13	3 25	3 31
Education	2 85	2 58	2 95	3 00	3 21	2 83	3 38	3 19
Documentation	2.58	2 52	2.85	2 96	3.28	2 88	3.00	2 92
Manufacturer's Software								
Operating System	3 73	2 71	3.47	3 41	3 65	3 04	2.88	3 56
Compilers & Assemblers	3 48	3 00	3 24	3 34	3 55	3 29	3 14	3 39
Applications Programs	2.61	2 52	2.89	2 97	3.12	2 83	2.86	2 99
Ease of Programming	3 26	2 90	3 16	3 27	3.42	3 21	3 00	3 29
Ease of Conversion	3.08	2 57	3 16	3 00	3.33	2 88	2 57	3 30
Overall Satisfaction	3.39	2 81	3.25	3 34	3.51	3 13	3 14	3 47
Additional Ratings (4.0-1.0)								
Timeliness of Hardware Installation	3 17	3 25	3.45	3 28	3.30	3 25	3 13	3 56
Timeliness of Software Installation	2.98	2 88	3.30	3 14	3.28	3 29	2.88	3 40
Ease of Expansion	2.97	3 22	3.51	3 33	3.48	3 33	3.00	3 59
Compatibility of Hardware Carried Over from Other Systems	3 17	2 92	2.94	3 30	3.29	2 78	2.50	3 04
Compatibility of Programs/Data Carried Over from Other Systems	2 97	2 72	3.09	3.01	3.12	2 83	2.38	3 13
Power/Energy Efficiency	3.02	2 80	3.10	3 01	3.14	2 96	3.00	3 26
Productivity Aids Help Keep Programming Costs Low	2.88	2 52	2 73	2 75	3.07	2 42	2.38	3 04
Software Support Delivered by Vendor	2.71	2 39	2.63	2 70	3.02	2 88	3.14	3.09
Keeping Up with & Implementing Vendor Changes to Hardware/Software (Very Easy = 4 0, Very Difficult = 1 0)	3 12	2 74	3.06	2 93	3.10	3 22	2.67	3.34
Did the system do what you expected it to do? (%)								
Yes	91.18	72 73	80.23	89 90	93.58	95 83	87.50	93 64
No	1.47	15 15	2.26	4 04	2.26	0 00	12.50	2 83
Undecided	7.35	9 09	4 51	6 06	3.77	4.17	0.00	3 18
Would you recommend system to another user? (%)								
Yes	91 18	60 61	87 22	87 88	94 34	83 33	87.50	93 99
No	2 94	12 12	4 51	7 07	2 26	12 50	12.50	1 77
Undecided	5.88	27 27	8.02	4 04	2 26	4 17	0.00	3 89

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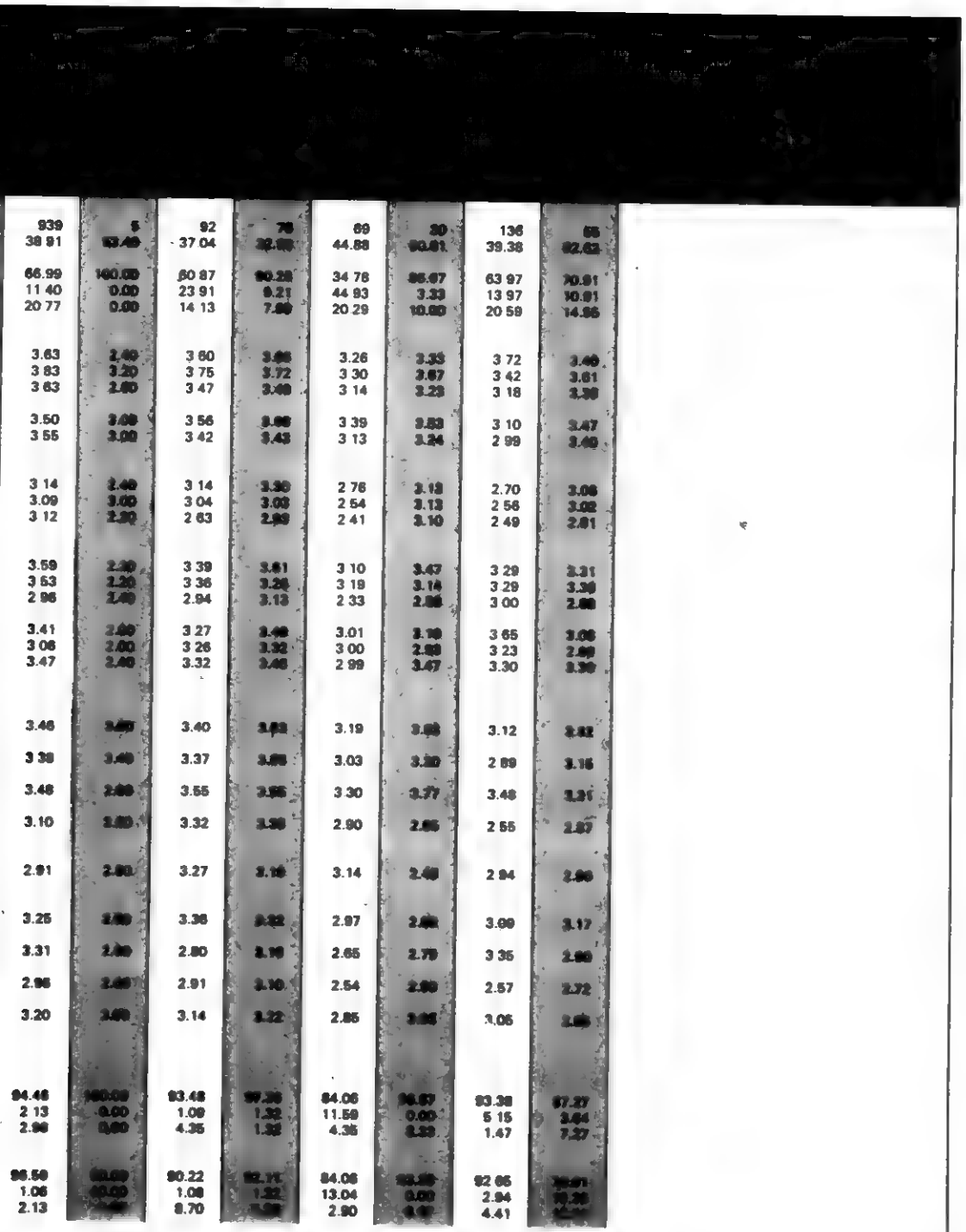
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42 00	42 25	31 77	50.91	53 40	46 34	32 56	32 99	44 86	50 81	39 38	52 62
73 91	100 00	67 80	65 13	100 00	62 07	60 32	80 26	34 78	86 67	63 97	70 91
4 35	0 00	12 78	9 22	0 00	20 69	25 40	9 21	44 93	3 33	13 97	10 91
21 74	0 00	18.23	25 36	0 00	17 24	12 70	7 89	20 29	10 00	20 59	14 55
3 04	3 40	3 63	3 63	2 40	3 45	3 67	3 66	3 26	3 33	3 72	3 40
3 09	3 80	3.83	3 84	3 20	3 54	3 84	3 72	3 30	3 67	3 42	3 61
3 26	3 80	3.64	3 61	2 60	3 46	3.48	3 49	3 14	3 23	3 18	3 38
3.39	3 20	3.47	3 55	3 00	3 55	3.56	3 68	3.39	3 53	3 10	3 47
3 04	3 60	3.53	3 59	3 00	3 24	3.50	3 43	3 13	3 24	2 99	3 40
2 83	2 50	3.14	3 16	2 40	2 96	3 23	3 30	2 76	3 13	2.70	3 06
2 91	3 00	3.06	3 15	3 00	2 96	3.08	3 03	2 54	3 13	2.56	3 02
2.96	2 60	3.11	3 14	2.20	2 54	2.68	2 93	2.41	3 10	2.49	2 81
2 87	3 00	3.53	3 71	2.20	3 34	3.41	3 61	3.10	3 47	3.29	3 31
3.00	2 80	3.50	3 60	2 20	3 31	3.39	3 26	3.19	3 14	3.29	3 38
2.83	2 67	3.01	2 89	2 40	2 77	3.02	3 13	2.33	2 88	3.00	2 88
2.86	2 25	3.31	3 59	2 00	3 21	3.20	3 49	3.01	3 10	3.86	3 06
2.71	1 67	3.24	2 78	2.00	3 03	3 37	3 32	3 00	2 93	3.23	2 89
2.91	2 80	3.41	3 58	2.40	3 17	3.39	3 46	2.99	3 47	3.30	3 30
3.17	3.20	3.43	3.51	3.80	3 36	3.41	3 63	3.19	3 53	3.12	3 32
3.08	3 00	3.34	3 47	3.40	3 40	3.35	3 38	3.03	3 20	2.88	3 15
3.30	3.40	3.38	3 63	2.80	3 39	3.62	3 55	3.30	3 77	3.48	3 21
2.56	1.50	3.27	2 83	3.00	3.36	3.30	3 33	2.90	2 65	2.55	2 87
2.81	1 25	3.14	2 55	2.80	3 11	3.35	3 19	3.14	2 48	2.94	2 90
3.13	2 80	3.28	3 20	2.80	2 84	3.98	3.32	2.97	2 89	3.09	3 17
2.86	1 80	3.18	3 54	2.00	2 70	2.94	3 16	2.86	2 79	3.35	2 90
2.42	1 80	2.94	3.00	2.00	2.82	2.96	3 10	2.54	2 90	2.57	2 72
2.96	3.20	3.15	3.28	3.00	3 10	3.16	3.22	2.86	3 03	3.05	2 96
82.61	80 00	93.38	96.83	100.00	93 10	93.65	97.36	94.06	96 67	93.38	87 27
4.35	20 00	2.39	1 44	0.00	0 00	1.59	1 32	11.59	0 00	5.15	3 64
13.04	0 00	3.76	1.73	0.00	6.90	3.17	1.32	4.35	3 33	1.47	7 27
82.61	80 00	96.74	98 56	80.00	82 76	93.65	92 11	94.06	93 33	92.65	70 91
17.39	20 00	1.19	0.58	40.00	3 45	0.00	1 32	13.04	0.00	2.94	16 36
0.00	0 00	2.80	0.86	0.00	13 79	6.35	5.26	2.80	6 67	4.41	10 91

Users rate their minicomputer ve

Survey Item							
No. of User Responses	[illegible]	33	133	364	24	291	28
Average Life of System (months)	[illegible]	43 84	[illegible]	46 54	[illegible]	40 62	[illegible]
Acquisition Method (%)							
Purchase	[illegible]	93 94	[illegible]	79 40	[illegible]	66 32	[illegible]
Rental or Lease from Manufacturer	[illegible]	0 00	[illegible]	4 40	[illegible]	21 65	[illegible]
Lease from Third Party	[illegible]	6.06	[illegible]	15 11	[illegible]	11 34	[illegible]
System Ratings (4.0-1 0)							
Ease of Operation	[illegible]	2 82	[illegible]	3 80	[illegible]	3 63	[illegible]
Reliability of System	[illegible]	3 39	[illegible]	3.65	[illegible]	3 75	[illegible]
Reliability of Peripherals	[illegible]	3 27	[illegible]	3.51	[illegible]	3.62	[illegible]
Manufacturer's Maintenance Service							
Responsiveness	[illegible]	3.03	[illegible]	3 49	[illegible]	3 58	[illegible]
Effectiveness	[illegible]	3.00	[illegible]	3.40	[illegible]	3.58	[illegible]
Manufacturer's Technical Support							
Troubleshooting	[illegible]	2 72	[illegible]	3.26	[illegible]	3.31	[illegible]
Education	[illegible]	2 58	[illegible]	3 15	[illegible]	3 20	[illegible]
Documentation	[illegible]	2 52	[illegible]	3.20	[illegible]	2.92	[illegible]
Manufacturer's Software							
Operating System	[illegible]	2 71	[illegible]	3.59	[illegible]	3 54	[illegible]
Compilers & Assemblers	[illegible]	3 00	[illegible]	3.49	[illegible]	3 38	[illegible]
Applications Programs	[illegible]	2 52	[illegible]	3.09	[illegible]	2.96	[illegible]
Ease of Programming	[illegible]	2 90	[illegible]	3.38	[illegible]	3 28	[illegible]
Ease of Conversion	[illegible]	2.57	[illegible]	3 25	[illegible]	3.28	[illegible]
Overall Satisfaction	[illegible]	2.81	[illegible]	3.46	[illegible]	3.46	[illegible]
Additional Ratings (4.0-1 0)							
Timeliness of Hardware Installation	[illegible]	3.25	[illegible]	3 29	[illegible]	3.55	[illegible]
Timeliness of Software Installation	[illegible]	2 88	[illegible]	3.24	[illegible]	3.38	[illegible]
Ease of Expansion	[illegible]	3.22	[illegible]	3.44	[illegible]	3.58	[illegible]
Compatibility of Hardware Carried Over from Other Systems	[illegible]	2.92	[illegible]	3.29	[illegible]	3.03	[illegible]
Compatibility of Programs/Data Carried Over from Other Systems	[illegible]	2.72	[illegible]	3.09	[illegible]	3.11	[illegible]
Power/Energy Efficiency	[illegible]	2.80	[illegible]	3.10	[illegible]	3.26	[illegible]
Productivity Aids Help Keep Programming Costs Low	[illegible]	2 52	[illegible]	2.96	[illegible]	3.02	[illegible]
Software Support Delivered by Vendor	[illegible]	2.39	[illegible]	2.94	[illegible]	3.09	[illegible]
Keeping Up with & Implementing Vendor Changes to Hardware/Software (Very Easy=4.0, Very Difficult=1 0)	[illegible]	2.74	[illegible]	3.06	[illegible]	3.32	[illegible]
Did the system do what you expected it to do? (%)							
Yes	[illegible]	72 73	[illegible]	92.58	[illegible]	93.47	[illegible]
No	[illegible]	15.15	[illegible]	2.75	[illegible]	3 08	[illegible]
Undecided	[illegible]	9.08	[illegible]	4.40	[illegible]	3.08	[illegible]
Would you recommend system to another user? (%)							
Yes	[illegible]	60.61	[illegible]	92.58	[illegible]	93.81	[illegible]
No	[illegible]	12 12	[illegible]	3 57	[illegible]	2.08	[illegible]
Undecided	[illegible]	27.27	[illegible]	2.75	[illegible]	3.78	[illegible]

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endors



939	5	92	78	69	30	136	85
38 91	93.40	37 04	32.00	44.88	90.81	39.38	82.62
66.99	160.00	80 87	90.26	34 78	86.67	63 97	70.91
11 40	0.00	23 91	9.21	44 93	3.33	13 97	10.91
20 77	0.00	14 13	7.69	20 29	10.00	20 59	14.86
3.63	2.40	3 60	3.66	3.26	3.33	3 72	3.40
3 83	3.20	3 75	3.72	3 30	2.67	3 42	3.61
3 63	2.80	3 47	3.49	3 14	3.23	3 18	3.39
3.50	3.00	3 56	3.66	3 39	3.53	3 10	3.47
3 55	3.00	3 42	3.43	3 13	3.24	2 99	3.40
3 14	2.40	3 14	3.30	2 76	3.13	2.70	3.06
3.09	3.00	3 04	3.03	2 54	3.13	2 56	3.02
3 12	2.80	2 63	2.89	2 41	3.10	2 49	2.81
3.59	2.40	3 39	3.61	3 10	3.47	3 29	3.31
3 63	3.20	3 36	3.26	3 19	3.14	3 29	3.39
2 96	2.40	2.94	3.13	2 33	2.86	3 00	2.88
3.41	2.80	3 27	3.49	3.01	3.10	3 65	3.06
3 08	2.00	3 26	3.32	3 00	2.89	3 23	2.99
3.47	2.40	3.32	3.46	2 99	3.47	3.30	3.39
3.46	3.40	3.40	3.53	3.19	3.66	3.12	3.32
3 38	3.40	3.37	3.66	3.03	3.30	2 89	3.16
3.48	2.80	3.55	3.66	3 30	3.77	3.48	3.31
3.10	2.80	3.32	3.39	2.90	2.86	2 55	2.87
2.91	2.80	3.27	3.16	3.14	2.40	2 94	2.90
3.25	2.80	3.36	3.32	2.97	2.80	3.09	3.17
3.31	2.80	2.80	3.16	2.65	2.79	3 35	2.90
2.96	2.40	2.91	3.10	2.54	2.80	2.57	2.72
3.20	3.40	3.14	3.22	2.85	3.06	3.06	2.86
94.46	160.00	93.48	99.26	84.06	96.67	93.38	87.27
2 13	0.00	1.09	1.32	11.59	0.00	5 15	3.64
2.96	0.00	4.35	1.32	4.35	3.33	1.47	7.27
96.59	160.00	90.22	92.11	84.06	93.33	92 65	90.91
1.06	40.00	1.09	1.32	13.04	0.00	2.94	9.09
2.13	0.00	8.70	5.26	2.90	4.67	4.41	0.00

Executive Roundtable



Avon's Frank Giannantonio



Empire Blue Cross/Blue Shield's Geri Riegger



New York Life's Michael McLaughlin



Saks Fifth Avenue's Stewart Neill



Smith Barney's Leonard Carlson

CW PHOTOS BY P. CHARLES LADOUCEUR

The Roundtable

At the halfway point of 1986, MIS executives face old questions yet unanswered — as well as new challenges for the future. To help identify these concerns, Computerworld *invited five MIS executives of leading retail and service organizations to discuss the state of information systems within their companies. They talked candidly about such challenges as managing vendors, padding the corporate bottom line and venturing into telecommunications.*

Though the five represent widely differing industries, the two-hour discussion, moderated by Senior Editor Glenn Rifkin, revealed surprisingly similar needs.

MIS today: Managing to competitive advantage

Are the issues you face midway through the 1980s mostly technical or administrative?

McLaughlin: It's a combination. We're an old-line insurance company that was doing quite well as an insurance company. About five years ago, the world began to change around us, and we had to change quickly if we wanted to play in the game. So we're in the midst of re-architecting our DP structure to move from a policy base to a client base. We're building a system that will enable us to deal with all of our policyholders, not only as individuals, but as a resource base that is somewhat untapped today.

That's a massive technological problem, but also it's an administrative problem in the sense that the company's culture has to be changed from that of an administrative insurance company to a financial services organization, which requires a totally different perspective.

Giannantonio: The single biggest issue is the great demand for information over the last 18 months. In terms of Avon, there has been the need to expand that information for our management personnel to penetrate our markets better. Therefore the demands on the MIS function have grown considerably. It is not just to respond to ad hoc requests, but a total integrated approach toward information, where you need to supply to marketing manufacturing and financial information which had never been asked for in the past.

This information need is driving us to upgrade our systems infrastructure. As a consequence, we have a host of large major projects, moving into a more centralized processing environment.

You really are implementing these changes and not just talking about them anymore?

Giannantonio: The information revolution is taking place, and many companies have used it for their competitive advantage and spawned new industries out of it. That information revolution is starting for us, and we have to be in a position to manage it effectively.

Carlson: I consider it fortunate that we're at a juncture where we can start grappling with both hands on technical issues, for which we are ultimately getting paid, rather than having to worry about not hav-

Executive Roundtable

Managing MIS to competitive advantage

Continued from previous page

ing the appropriate staffing and infrastructure with which to grapple and manage technology.

If you happen to be undesirably understaffed and have people who are incapable of dealing with a lot of the emerging technologies that have substantially made obsolete the systems in place at a securities firm before, then what you have to do is play catch-up ball and be able to live with what are otherwise inadequate systems.

Fortunately, I look forward to 1986 as substantially a year of managing large projects and revamping parts of our securities firm to provide various types of composite information services to supplant the individual point-to-point market data services we've been receiving in the past.

So 1986 for us is a little bit of a plum pudding. We get to take a look at fault-tolerant composite information systems, local-area networking, greater levels of end-user computing and time sharing.

Neill: The main considerations from my perspective relate to the same area — that is, how to make our systems more flexible, more readily modifiable and be able to create systems more rapidly in order to respond to a much a greater demand.

In 1985, my requests from users doubled over any previous year. And that was not because of some change in the company. It was because we had done enough things for enough people that there was a critical mass of computer literacy.

My requests did not come from people I'd done the least for but from people I'd done the most for, because they were the most conscious of what other possibilities there were. It has made being able to do things more quickly and change them more rapidly more important than before. In addition, since we have put most of the traditional base sysetms in place, it has become more important for us to be in synch with a more global corporate strategy, using information to a competitive advantage.

For all the talk about it, I don't see decentralization as an issue for us. I see greater centralization, because everybody wants all the information. It is dispersed — we have a network to everywhere in the world — but though we have a lot of personal computers, they are doing stand-alone things.

Riegger: I'm surprised by how similar our answers are, but I guess that means we're all correct.

While we are in the business of managing computer technology, I don't find most of my problems or issues are related to technology. They are more administrative or managerial.

My two main issues are No. 1, applying computer or communications technologies to the goals of the business in an effective manner and No. 2, once you've tried to do that, to actually get the productivity you need to deliver the products that you've sold to your corporation.

MIS tends to encourage stressing the technology. Sometimes technology is viewed as an end in itself.

I spend quite a bit of time trying to make that transition from just technology for its own sake to choosing the technologies that are most appropriate for the business goals of the corporation.

On the other side, corporate or general business management needs to understand more fully how MIS could be effectively used as a competitive weapon.

We're in a business that is changing. We're in the business, as you all are, of trying to become more competitive. That results in a great number of demands on MIS.

How does MIS respond to that challenge? It is difficult to find people who can mesh the technology with the business goals. Skills are still somewhat in short supply, even though it's better than 20 years ago.

Development is a difficult, complex and brain-intensive business. It is amorphous and unstructured, and therefore, bringing off a product that is really going to satisfy the user's requirements is still a challenge.

> ***'I consider it fortunate that we're at a juncture where we can start grappling with both hands on technical issues, for which we are ultimately getting paid, rather than having to worry about not having the appropriate staffing and infrastructure with which to grapple and manage technology.'***
>
> — Smith Barney's Leonard Carlson

Using information systems for competitive advantage

Using information systems for competitive advantage seems to be common across your five different industries. Has management said to you, "Do it"?

Giannantonio: Everyone thinks of computers when they think of information and competitive advantage, but it's really not only computers. There's factory automation and a variety of other types of automation.

There's a lot of new technology out there, but all of it just doesn't fit into your company's goals. Bringing it together and giving your company that edge — in terms of allowing you to do things a lot more efficiently, lower your product costs, lower your service costs — is a way in which the MIS function can provide that capability.

Over the last two years, the MIS community has been inundated with so many new tools and so many different ways to effectively go after a business solution, that the merging of the technologies between the data processing, telecommunications and the office automation is now incredible.

And what's the best solution? Do you do a traditional MIS systems development solution or look at alternatives? Our end users are very sophisticated in terms of understanding the applications that are available on PCs. And our role is to facilitate that, bring that information together, otherwise you get stand-alone solutions, and it just doesn't all fit together. We probably won't see the end result of all this integration for about five years.

Carlson: In the securities industry, it has taken a little bit different bent. Historically, MIS has concentrated on efficiency — to be able to produce a certain amount of fixed output at lesser and lesser costs.

With the advent of end-user computing, the emphasis is on product differentation. In certain instances in our business, product differentiation has advanced to such a sophisticated level that if you do not have some baseline of sophistication, you're not even playing the game.

A case in point is mortgage-backed securities. It's a relatively new area for the securities business, perhaps only about 5 years old. And in order to be able to play that game, Smith Barney has to have dedicated end-user computing resources. In particular, we have to be able to structure these relatively complex mortgage transactions by playing an awful lot of "what-if" games. The amount of work that is done by the end-user computing group is very intense and tends to be repetitive. Without the computing support, they could not even be in the business.

So there's definitely been a transition at Smith Barney over the last few years from basic computer operations to a more advanced type of business structuring using PCs and other computer resources.

MIS spending and its effect on the industry slump

Every MIS department is facing the mandate to give the company a competitive edge. But vendors are experiencing a serious computer industry slump, to some degree because you folks have stopped buying and are simply evaluating what you've already bought.

McLaughlin: No, we have not stopped buying. We're not buying as much or as fast as IBM would like us to — and we're an IBM shop — but we're continuing to buy. Our budget has not been sliced. It hasn't grown as fast as it did for a while, but we like to think that is because we are being more efficient and cost-conscious.

The main project we are involved in is data base oriented. So it is going to be hardware intensive. If anything, our expenditures for mainframes — the IBM 3090 line — will continue to grow.

We're also committed to end-user computing, so that our expenditures for PCs are going to continue to grow. We're in the process of substituting PCs for terminals with all of our programmers so they will have PCs as programmer workstations.

Riegger: We have not seen a tapering off and maybe it's related to the business cycle. Some years ago, we had some retrenchment because we had a focus at that time on reducing our costs — again for competitive reasons — and that did affect DP also.

We're in a period of growth now and trying to expand, trying to add new product lines. We've recently segmented the business in a different way, so in fact, we are seeing substantial growth in terms of the hardware budget — we're capitalizing some labor-intensive areas — as well as growth in the development budget, because we've got so much new product development going on. DP development is a critical portion of that, so we are seeing very substantial increases.

Giannantonio: We parallel what Mike [McLaughlin] and Geri [Riegger] just said. We're capitalizing labor-intensive projects. Many of our new systems, especially the large systems, are data base oriented and hardware intensive. And we are going after end-user tools. One of our strategies as it relates to PCs has been that the PC will be our universal workstation. So, be it for the programmer or the management person, that workstation would be a PC integrated throughout the environment.

Neill: We are spending a lot less on new hardware at the moment, but



Michael McLaughlin
New York Life

Michael McLaughlin is senior vice-president in charge of information systems and services for New York Life Insurance Co., based in New York.

A lawyer by training, McLaughlin joined New York Life's legal department in 1968. In 1978, he was elected a vice-president and transferred to personnel. In 1981, in an exchange of jobs under a management development program, he was given the responsibility of supervising marketing's Greater New York region. He attained his current position when the information systems and services department was created in 1984.

New York Life is 141 years old and the fifth largest insurance company in the country with $31.7 billion in assets. It is a supplier of consumer and institutional investment services and of group and individual life and health insurance.

The roundtable participants



Geri Riegger
Empire Blue Cross/Blue Shield

Geri Riegger is vice-president of electronic data processing for Empire Blue Cross/Blue Shield and manages one of the largest computer operations in New York.

Under her supervision is the central data center, housing five IBM 3090 and 3081 mainframes, which process 2,000 jobs and 500,000 on-line transactions daily.

Riegger began her career in 1961 with IBM as a systems engineer. After eight years, she moved to Manufacturers Hanover Trust Co. She served as a White House Fellow in 1974 before returning for another stint with IBM. Prior to joining Empire Blue Cross/Blue Shield in 1982, Riegger was a vice-president at the Federal Reserve Bank of New York.

Empire Blue Cross/Blue Shield is the largest, private nonprofit health insurance company in the nation, serving more than 10 million people in the state of New York.



Leonard Carlson
Smith Barney, Harris Upham & Co.

Leonard Carlson is vice-president in charge of global technology planning within the information services division of Smith Barney, Harris Upham & Co. He reviews all new technology and evaluates its pertinence to Smith Barney's business.

Prior to his current job, Carlson served as manager of computer resources for corporate finance at Smith Barney. He came to the firm from Commercial Investment Trust Corp., where he worked as a sales manager.

Carlson also held positions at E. F. Hutton & Co. and Kidder, Peabody & Co. after gaining both a bachelor's degree and an MBA in finance from Fordham University in New York.

Smith Barney, headquartered in New York, is a leading investment banking and brokerage firm serving the domestic and international debt and equities markets.

SMITH BARNEY



Frank Giannantonio
Avon Products, Inc.

When Avon called 12 years ago, Frank Giannantonio answered. As director of information services planning and technology for Avon Products, Inc., Giannantonio heads data resource management, the information center and all MIS functions in Latin American, Asia and Europe.

Giannantonio coordinates strategic planning with corporate headquarters and explores new technology for the company.

As head of the information center, he also has responsibility for end-user computing, personal computers and office automation.

AVON

Prior to joining Avon, Giannantonio worked as a consultant for a small MIS consulting firm.

Avon is the world's leading manufacturer and distributor of cosmetics, fragrances and fashion jewelry. Its products are sold by nearly 1.4 million representatives in more than 30 countries.



Stewart Neill
Saks Fifth Avenue

Stewart Neill, vice-president of MIS, joined Saks Fifth Avenue in 1978 as director of systems and programming.

He assumed responsibility for all data processing functions within the company in 1981.

Prior to joining Saks Fifth Avenue, Neill worked for 19 years as a systems engineer for IBM's New York retail office and also served as an IBM consultant to several major retailers in the New York area.

Saks Fifth Avenue

In the past year, Neill hired a director of electronic data processing, which now frees him to spend more time on strategic planning for development, operations, technical services, office automation and information systems.

Headquartered in New York, Saks Fifth Avenue is a fashion-oriented specialty store chain with 40 stores nationwide.

specifically because we intend to spend money on hardware. I'm getting a 3090 next year.

Next year I will spend the most we've ever spent in history. All these things are going to land in one year and that obviously is going to be a problem because the capital lump is going to get unusually big. But that's really a reaction to the timing of IBM products.

Organization: Centralized vs. decentralized

I'm sure vendors will be happy to hear that generally you expect to be buying more hardware. But then why is the computer industry so slow right now?

Riegger: Maybe it's in certain industries that are retrenching.

Neill: There's another aspect that I see. Within two years, I'm not sure what my expansion might be, because the things that we are looking at doing will put every piece of information — down to every single transaction in the entire corporation for a three-year history — on-line.

What's left to put up after that? In terms of disk space and peripherals, the growth of that base is just not dramatic.

But I see potentially — and I could end up like Jeanne Dixon on this prediction — not very far down the road, having all the information available, and it simply becomes a question of how you play with that information in different ways.

Giannantonio: What you're saying is very real. In fact, I think some of the strategies we'll have to consider over the next few years address this great demand on information: Do we centralize all that information? Or do we do it via distributed networks and place a heavier emphasis on telecom? The latter may really come about.

Your buying decision is affected by which way you will go.

Neill: I see us remaining heavily centralized. It may be more intelligent to play with data locally in some cases. But that data will all have to be pulled centrally.

Riegger: Basically, there isn't one solution for MIS. I think MIS' organization ought to reflect the corporate organization. If the corporate organization is decentralized, then MIS in general should be decentralized also, although you may have some common components like networks that cut across all those parts of the business.

McLaughlin: The centralization of data but the decentralization of access is what we're trying to do.

We're trying to create a system in which the agent from his office in as remote a location as we have will have direct access to mainframe data that relates to his client and will be able to deal with that data in a meaningful way. We're not there yet, but we're on our way.

Riegger: We're moving from centralization to a more decentralized or segmented approach for that reason.

DP itself is getting more segmented, but we envision that there will still be a corporate data base, and the network in many senses crosses those segment lines. So that is a common component. You can then decentralize the processing.

Basically we're trying to structure it so that the processing can move where ever it needs to move, depending on the needs of the business.

But the point is that the business ought to drive how MIS is structured, not some theoretical idea of "Is one better than the other?" Depending on your situation, it may be either centralized, decentralized or some mesh of the two.

The challenge of cost-justification

Are you getting what you need from your companies in terms of the MIS budget?

Giannantonio: There's never been a carte blanche. Everything has to be justified appropriately. It depends on whether your business is growing, stagnating or declining. With your cost expenditure programs in place, it really depends on what your company is doing.

McLaughlin: We go through an annual budget process, and we start with an idea in mind that the total company budget shall not be larger than X. And then people do their internal negotiating.

But very often before the budget is finalized, everyone is told to do overall reducing.

And the data processing budget is such a big number that it looks like it ought to be easy to do some reducing.

Do you feel constrained by your budgets, that the money is only half of what you need?

McLaughlin: No, we are well in the ballpark of what we need.

Neill: I haven't had problems. Our budget has not grown faster than the company but faster than most other internal budgets.

I'm constantly doing things that are cost-justified — straight up and down in hard dollars — that save money for other people. It goes into my budget and then gets charged back to them because I'm zero-based.

But when you look at my budget, it's big. Now those other people who got savings from me, when they go negotiate their budgets, they never go in and say, "I saved $500,000 here." They say, "I want a half-percent increase." But they got $500,000 out of me that could have been a reduction.

So that gets tricky, because all the things I do save money predominantly outside my department and increase my budget.

Giannantonio: That's a good point. In fact, I think what we have to do for each of our companies is show our senior management that at times an investment in MIS is necessary so you can propagate savings throughout the business. And look at that as an investment as opposed to a fixed cost, because those opportunities exist with MIS to save money in other departments.

Riegger: MIS really has two budgets. It has an operational budget. And certainly, you need to be aware

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of your transactions costs over time. But there is also the investment part, which is in the development budget. And that ought to be evaluated on the basis of return on investment. Are you saving money elsewhere in the corporation? I just don't know how many corporations have a formal method of evaluating that.

Neill: In most of our areas we do that when we begin a project. And it's followed up to see that those savings were achieved. But then it tends to be forgotten about.

Riegger: If you are doing that much, that's good.

Neill: My development costs are a very small part of my budget. I have so many systems out there that my hardware is overwhelmingly dedicated toward production. My other equipment is even more so — 99% of the peripherals out there relate to production. And then I've got a fair amount of my staff doing maintenance work, and I'm below the industry average from what I see. But development is still a small piece of the whole.

> ***'All the things I do save money predominantly outside my department and increase my budget.'***
> — Saks' Stewart Neill

Giannantonio: You are certainly not alone. As you build more systems, it requires more day-to-day support, and that area of your budget has to grow. And the problem is if you have a fixed budget with minimum growth, then you are going to erode the new development functions over to the operational areas. That's where the investment has to be made so your company can see that investment is necessary. Otherwise you can't provide that type of future service.

Keeping up with growth through development

Neill: But I only see 8% to 12% of my budget is in development. I don't feel really constrained. I'm involved in a proposal now to add staff, not because it has been skimpy but because of this surge of requests that occurred. It has created a different backlog situation than I used to have. And I've got to come to terms with that, and the company feels that those requests are legitimate. But it would be inconceivable to me to have 25% of my budget be development.

Riegger: I wonder sometimes if we can keep up with the growth because the inventory keeps getting larger. And every time you build a system, you not only incur the cost of doing it for the first time, you incur the cost of maintaining it over time and replenishing it after some period of time. I wonder how we can keep up with this, especially since we are also seeing the requests for entirely new products that are not in our inventory at all.

Giannantonio: That is hopefully where technology could support us.

Riegger: The hardware has progressed at a faster rate, with orders of magnitude improvement every five years, depending on whether you are talking CPUs, DASD or tape. That has progressed so much more than our ability to address the development problem, which is still rather brain intensive. There have been improvements over the last 20 years, but not in the range of what we've seen in hardware.

Giannantonio: What I meant by technology . . . what we're looking at is how do you manage a limited number of resources for development? And the things that are coming on the marketplace, new tools like fourth-generation languages that hopefully are going to improve your programmers' productivity and produce those systems a lot faster, use different techniques to do just that. Because with a small percent of your budget dedicated to development, you just don't have that luxury. That's where I see new tools aiding us. Now, how much or what percent of that increase in productivity will be gained by using those new tools, I couldn't give you a fixed percent.

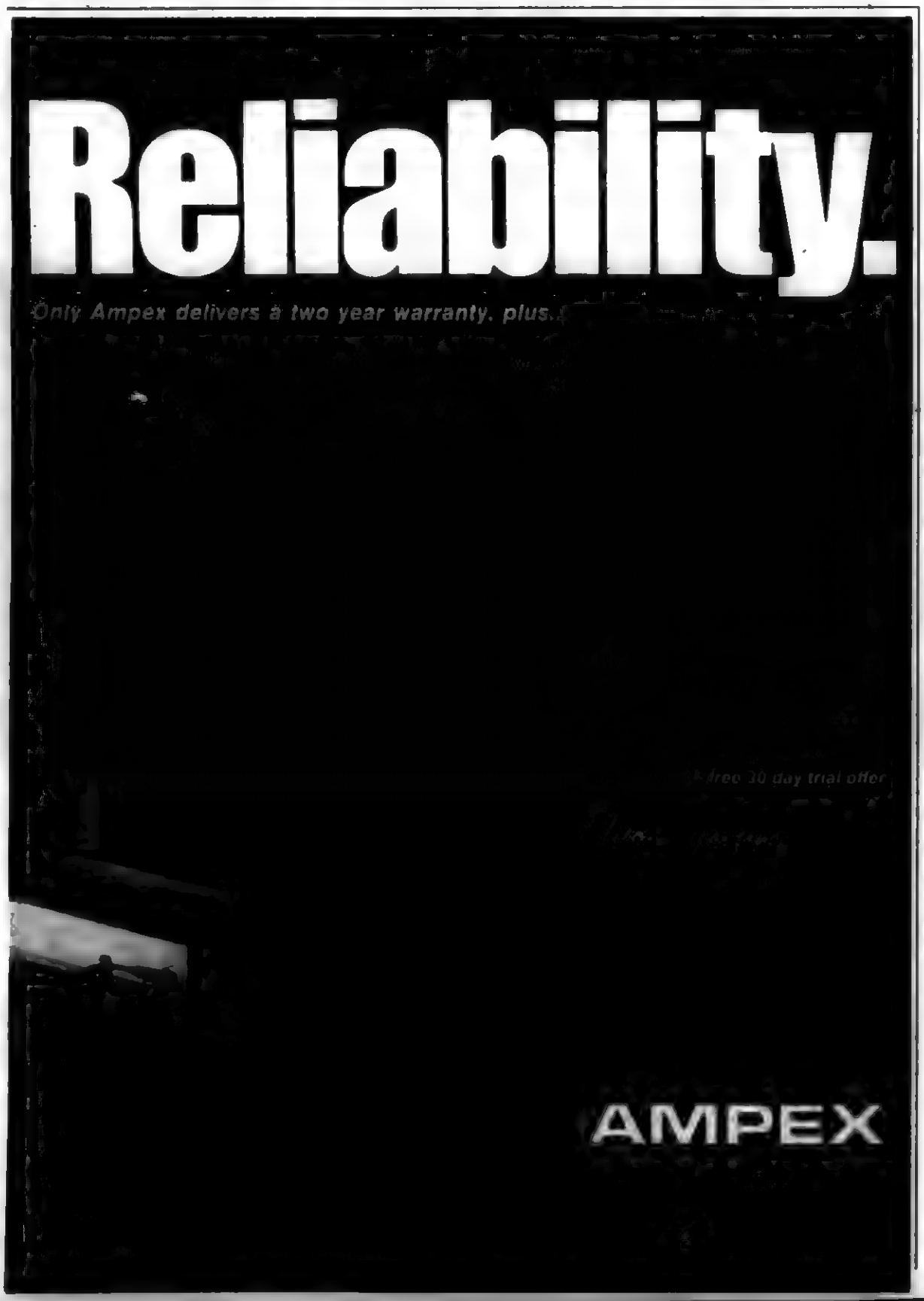
Riegger: True, but does it meet the demand?

Giannantonio: I don't know if you can ever meet the demand. The information center concept was introduced many years ago with the thought that it would reduce the proverbial backlog, and people tried to measure their backlog. I don't think you can measure your backlog. Your backlog just grows. It's infinity. The user will keep asking, and he has a lot of needs and demands. So it's always interesting when I hear someone say, "I have a two-year or three-year backlog." I don't know how to measure it.

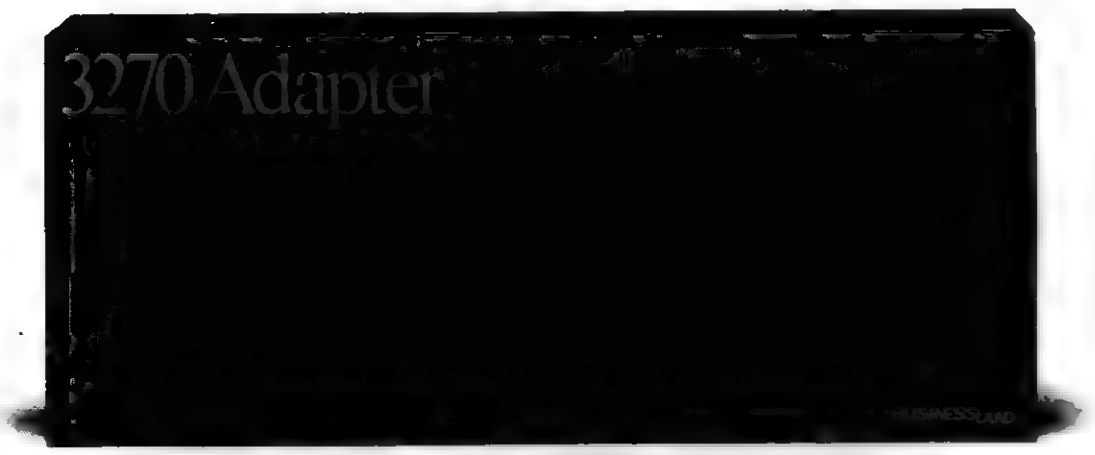
Neill: I find that a very substantial amount of time putting a system together is spent having the user decide what that system truly is. The tools address that a little, but not much. That's the slowest piece of the process, and it's the one that the tools address the least. Users aren't used to thinking in systematic terms; therefore, when you start dealing with them, they may have a manual system and tell you they want to automate that. And that's not even marginally the right way to do it.

Giannantonio: But those are some

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of the new tools that we have to provide for the user.

The conventional way of developing systems — where the user would come to you with just such a request and we would go back and define it, build it and then implement it — no longer applies. With those users that don't have those analytical capabilities, you have to do other things. So building the systems that way has to change. The system evolves over time as opposed to a fixed calendar.

With the hardware costs coming down, you really don't worry too much about how efficiently it's being built at the time. It grows over time. And you deliver to the end user a system that is very usable and it can be delivered faster.

Carlson: It almost appears that the organization, like an organism, goes through different life cycles, and if you happen to be primitive, if you get some wheels on your cart, that's considered a future. But if you are already used to end-user computing and you have intelligent users, all of a sudden what were not problems in the past have become problems.

One of them happens to be manageability. Very often users become so demanding they don't care what might be a good approach to getting it done.

Something that has emerged at Smith Barney over the last couple of years is that users have become somewhat able to appropriately specify both the data bases and applications that they want. The problem there is you can actually go down the road doing quite a bit of work trying to develop a system, only to find it is no longer adequate. And you may have to start again.

> ***'I don't think you can measure your backlog. Your backlog just grows. It's infinity. The user will keep asking, and he has a lot of needs and demands.'***
>
> — Avon's Frank Giannantonio

So there is a lot of precaution that has to be built into our approach to end-user computing, so that we don't get dragged along by the user only to find that we have to develop the same system twice.

Riegger: We have to put the emphasis on product strategy. MIS should be part of the product strategy development and try to work together with the users to get agreement up front on what the product goals are. That's where I think the main problems are, that we are not necessarily involved and don't necessarily talk the same language when it relates to products.

That's the point we have to get to, the agreement on the strategy of the product part of the cycle. That's what takes the time.

We've all been saying that the tools we've got so far really address the back end of the process, the more routine parts, like coding and testing. We've made progress there, but it's not clear to me that we've made that much progress at the front end of the cycle.

Some of the more traditional ways of doing development according to the project life cycle have still not worked that effectively over time. We still need more work on the front end of the cycle, the part where you are working and designing with the user.

Some people have suggested things like getting the user and MIS together in a room to get clear on objectives and agreements on design — instead of doing requirements for six months, handing them over the wall and having someone go off and design it. Anything you can do to bring the two together and to have common accountability for the product addresses this problem of development taking too long and then after it is done, not meeting specifications.

Giannantonio: Yes, in fact we started doing that a year ago.

Riegger: Have you found that to be effective?

Giannantonio: Yes. Bringing the users together in the business requirements portion of your life cycle — using different types of simple tools — can be effective.

Instead of drafting down the requirements, we used storyboard or displayed thinking, putting 3- by 5-in. file cards on the board. We even videotaped the session. And we'd have a facilitator run the meeting. It may go for three or four days. And you agree on an acceptance criteria at that stage before MIS would go into the computer systems design phase.

McLaughlin: We've used that approach somewhat successfully to the point that for the first time, the ability to go forward with a development project may be affected by the unavailability of users rather than by the unavailability of programming resources.

Time management: Finding enough hours

That's an interesting turnabout from what we've heard for so long. What about time management, budgeting your time? What would you do if you had five more hours per week — get out to trade shows, read more magazines?

McLaughlin: God forbid, read more magazines.

Giannantonio: I can't read anymore.

McLaughlin: I'd get out of my office and talk to people, both my staff and the end users. We've got two data centers, one in New York and one in New Jersey, and we've got about 1,000 people — about 600 pro-

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grammers. I deal with about 25 department heads on a regular basis, but I don't spend a lot of time with them.

"Trapped" is a bad word, because I control my own schedule, but I find myself being trapped in my office or in meetings and not spending a lot of time out on the floor. And I ought to be out on the floor more than I am.

Giannantonio: In covering Latin American, Pacific and European areas, it's quite difficult to really get the input. The MIS people around the world have excellent ideas, and I want to tap that effectively so that I can share that across all Avon locations internationally. It's very difficult. We all have limited resources to manage that.

Educating senior management about MIS

Does senior management understand better in 1986 than ever before what your needs are? Or are you still fighting an education battle?

McLaughlin: Management certainly understands the business need. Because they don't have DP backgrounds, it is very difficult for them to understand what it takes to get it done. They are asked to commit huge amounts of money to create this system, based on a statement that it will do this and this and this. But because of their background, they cannot satisfy themselves in advance that it will, in fact, do this and this. That must be a very difficult position for senior people to be in.

Carlson: That's a good point, because as a practical matter, we have some folks who are eminently capable of evaluating the trends and the business side of the securities business. However, there's definitely a requirement for a stewardship function in the area of technology. Because the assumption is that there is a laundry list of these apparent benefits, but there is no ability to understand whether this vehicle that's being proposed — this unusual combination of software, hardware and people — is going to deliver it; whether, in fact, upon delivery it's already going to be obsolete.

As you offer all these piecemeal benefits, then rises a different ogre, which is integration. And that is a real problem, because what we're discovering is our word processing/office automation function has a life of its own and its own growth rate.

Then there are the computer operations and other data communications capabilities.

The problem is that now you are starting to see the ability of great parts but certainly not the whole thing. And there is a strong desire to be able to integrate various parts and pieces, not all of which you can anticipate in advance.

So the problem starts to become, "Have I implicitly said that I am going to have to revamp large chunks of this down the road, or is there a much more sane approach to trying to be able to manage the life cycles of all these pieces and have them merge somewhere down the road?"

Giannantonio: You bring out a good point. The way senior management views us and the large expenditures on DP really cause MIS people to be better business planners because we have to pull everything together, and — as Len [Carlson] indicated — integrate it effectively over the long range. So you effectively manage a strategy that is going to lead you somewhere, as opposed to putting various pieces together and then three, four or five years later notice that they don't fit together.

The business planning portion becomes very significant in the 1980s for each of us to do.

Riegger: There is sometimes a problem in overintegration. If you integrate too much, then you are not always able to be responsive, because it does make your projects more complex. So you need some combination of the two. That's why I was stressing that I think data is a point of integration. Networks are a point of integration. It's not clear that processing ought to be a point of integration. You could have it redundant, repeated in different locations. You could move it out and still get the net effect of integration. But I have some concern, especially in systems that cross corporate lines, that it gets extremely complex to have everything integrated in one place. You end up with these long, complicated development efforts.

Giannantonio: You're right. But you have to ask yourself some key questions: What is your PC strategy? How does it fit with your mainframe long-term strategies? Where is it going with OA and your telecommunications strategies? How do they all fit together? If they don't, then what's driving your business will drive you even further apart from your goal.

No. 1, we have to understand where each of our businesses is going and what its needs are. How much integration, as you suggested, is actually needed? It may not be a lot. When you look at your data base strategy, your application development strategy, your PC, OA, productivity tool strategy, are they all fitting together? Because in a large department you could have separate groups go after these, and what happens is they work well but they don't fit together.

Riegger: If integration is meeting the business needs, then fine. But, for example, another buzzword in the industry is voice and data integration. And sometimes we say that and it's a glamorous thing and it's desirable in and of itself. That's not clear to me. I think integration of

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Executive Roundtable

Making the decision: Which 4GL?

During Computerworld's recent executive roundtable in New York, the discussion turned to fourth-generation languages. Of great concern to the participants, the use of fourth-generation languages presents both confusion and a challenge to those exploring their implementation.

Neill: Is anyone here using a fourth-generation language heavily? Which one and what is your experience with it? That's an evaluation I am heavily into right now, and I am finding it probably the most confusing decision I've made in my whole career.

Carlson: It's difficult; it will require a large team effort. You have to make sure everyone is prepared to go through the relatively difficult struggle to evaluate all the different packages and different features.

But ultimately, if you happen to have some good causes to bring in fourth-generation systems, they can simplify development immensely. I'm very much in favor of 4GLs as far as a productivity pop.

At Smith Barney, we brought in a time-sharing system based on the IBM 4341 series, which has now been upgraded to IBM 4381 running VM/CMS. We are very pleased with it. We personally consider it one of the strengths of the IBM line. One of the benefits of VM/CMS is that there is a lot of software that sits on top of it, particularly 4GL stuff.

And for actual applications, which happen to be numerically or computationally bound, we ultimately decided to get Express from Management Decision Systems, Inc. It is a full product line and a robust solution. It also enabled us to integrate with data bases which are key to the securities business and that we manipulate on a regular basis, such as Compustat and pricing.

For the data management or records processing side of our work, we decided to bring in Information Builders, Inc.'s Focus. We found that product to be a tremendous boon, inasmuch as there are lots of data bases that end users want but don't really get. The personal computer is a very inadequate tool for providing data services in terms of data bases.

Working with Express and Focus has permitted us to push tools out to the users and also to be able to respond more quickly to their demands.

Neill: But if you go to Focus, then you must use the Focus data base, and you have to take all that data from other data bases and have it in a redundant data base, right?



'Ramis was the only game in town, and that's why we used it.'

— New York Life's Michael McLaughlin

Carlson: Some of it has been migration into other data bases, that's true. But to a fair extent, it has been either data entry based on the business or a series of tapes that we received from vendors. For example, I mentioned Compustat or pricing tapes. We get those on a regular basis and our computer operations people load and mount those tapes.

Neill: That is not applicable to my environment at all. I'm more interested in fourth-generation languages for true development production systems. Because, unlike the financial world, where you have a tremendous amount of data that you are pulling in from a lot of outside sources, my information is 99% internal and needs to be massaged.

I've ruled out, for example, Focus, Martin Marietta Data Systems' Ramis and D&B Computing Services' Nomad on the basis that they don't work for production data bases well, and also they are mind-bogglingly inefficient. They use five, 10, 20 times more resources than other products.

I've now narrowed it down to Model 204 from Computer Corporation of America and IDMS from Cullinet Software, Inc. And they both have fourth-generation languages that are quite powerful — though not as powerful as Focus for that kind of thing. But they are dramatically more efficient and also more suited to doing true fixed applications.



'It's worthwhile struggling with the enormity of trying to evaluate a 4GL.'

— Smith Barney's Leonard Carlson

Giannantonio: We've had Express since 1979, and we built marketing and financial decision support systems on it. We basically put it up in production and turned it over to the user. And the users have built God knows how many applications off that.

However, the reason we looked into fourth-generation languages is that we have a development center that looks at productivity tools for our programmers. And we did an evaluation last year and selected Ramis II. We haven't ruled out Ramis II for the entire systems department yet, but in that comparison and during that evaluation, I actually did a pilot in eight days.

Neill: But what kind of applications did you do?

Giannantonio: It was an application in which ad hoc analysis was required, not a traditional transaction-based, large batch-processing application.

One of the things we're doing now is listing the dos and don'ts of how you would use this fourth-generation language, because you wouldn't use it for all those types of applications.

It's similar to looking at your data base, be it relational or hierarchical, and deciding how to use it and how the fourth-generation language integrates with that data base.



'The reason we looked into 4GLs is that we have a development center that looks at productivity tools for our programmers.'

— Avon's Frank Giannantonio

Neill: I've been to quite a number of sites with all three — Focus, Ramis, Nomad — and they've generally done two things: Put it on a machine by itself, or suffer with response time so slow that I never saw anything like it before. That seemed to be the nature of the beast.

McLaughlin: We're having that problem with Ramis. We have Ramis working with a data base to create reports for our group business, and it's not working. The data base is simply too big.

Ramis was the only game in town, and that's why we used it. But we are struggling to try to find some way to make it work, and we're not having a lot of success.

I think both the vendor and we thought it would work, but it had never been used on a data base the size we used it for. And it didn't work. We're not prepared to go back to square one with it.

Neill: I don't think any of those three products are suited to very large data bases.

Giannantonio: That's why, regardless of what your selection is, you should make clear how you intend to use this package and where it should be used in your organization, because it doesn't suit all jobs.

Carlson: Unfortunately, you can't summarize it in one statement.

It's worthwhile struggling with the enormity of the task of trying to evaluate a data base management system and trying to evaluate a fourth-generation language for the modeling side.

I would also suggest that you are quite right in differentiating between the Focus and Ramis types of data bases from the IDMS and Software AG of North America, Inc. Adabas types of data bases.

At Smith Barney, for the production in large data bases, indeed, we are totally committed to IDMS, and that's all we will use for those types of data bases. But for those that happen to be smaller in size and more agile and happen to be at the beck and call of users, perhaps for marketing purposes, that's the domain for Focus.

Neill: Have you gone into using IDMS/Relational features, since IDMS before IDMS/R was quite inflexible? Now it's reasonably flexible. Have you employed that at Smith Barney?

Carlson: We broke up into a series of teams, and we came up with a list of 12 data bases that were targeted for the end-user computing function. We had already made the IDMS commitment for larger data bases.

For the end-user computing side, we set up four teams. One looked into Focus, another, Oracle Corp.'s Oracle, another, IDMS/R and another, Ramis. IDMS/R was still too immature at the time, and we felt that it didn't have all the advantages that Information Builders had in its product.

And we had other types of problems with the other data bases. We had different problems with Ramis, such as performance. We decided not to make the same mistakes some other folks ran into, even though we were impressed with the robustness of Ramis.

Ultimately, you'll find out that you have to do detailed investigation with two or three different products. Look at all the features based on reporting, application building and efficiency and performance.

Ultimately, we started with our own Smith Barney evaluation criteria and painstakingly worked out the detail.

If you want to do it the fast way, get a consultant and blame it on them, or just take your gun and shoot. ■

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voice and data is appropriate at some points in your network architecture. But it's not clear to me that one ought to integrate it from the beginning all the way out to an end point. That's not necessarily valid for the business at this time.

Do you find yourself fighting that situation a lot, in which senior management reads something in *Computerworld* or elsewhere and they come to you and say, "Why don't we have this if everybody is talking about it?"

Carlson: Absolutely. Buzzwords are very dangerous, particularly on Wall Street. Just a few years back, one of our colleagues — not in my firm fortunately — said, "When we look for networks, we look for Ethernet." It's two years later, and now if there's one thing the world wants to look for, it's token ring. I don't know what it's going to be two years from now.

The point is that it can be very infectious and dangerous and there's an assumption, a nagging feeling that management has, that they are going to fall behind if they don't have the latest and the greatest.

What's very important is to make sure you have a technology services group that's potent enough to be on top of these issues. Not just to address it internally, but to actually manage it.

> ***'An important function of MIS is vendor management. Control the vendor rather than the other way around.'***
>
> — Empire's Gerl Riegger

A problem definitely arises if you have a weak technology services department that cannot catch up to what its job really is. At that point it probably is valid for the business people to put their fist on the table and demand certain types of services that they are not getting.

But more properly, there should be a technology leadership function that has enough foresight to be able to understand what is hype and what is not. Because if you let your life get driven by your vendors, your budgets will explode, and your business will not be able to function.

Dealing with the vendors: Who makes the rules?

What is your relationship with the vendors? How are the rules of purchasing and negotiating changing now in the mid-1980s?

Giannantonio: What I prefer to do is develop a partnership relationship, where the vendor is not just selling a product to me. He understands my business. And from those products he has to sell, he shows me where those products could fit in to support my business. I may not choose to pick them. But I want him to understand my business before he tries to sell me on the technical advances of some of his products, because I don't need all that technical advance.

But there may be something there I never considered. And where I consider a vendor valuable is in showing me an alternative approach to something I never even thought about. As long as the vendor is willing to take the time to learn my business and show me where he could help support that business, I'm very willing to listen.

Neill: I would agree. We're an IBM shop essentially. The principal difficulty I find in my vendor relationship is that some of my IBM equipment is used IBM equipment and that makes them very unhappy. So that's a tricky balance to deal with, because sometimes the life cycle of that gear and the cost of it are so attractive in the third-party market that it is just not sensible not to get it there. But that's where you start getting pressure from the vendor, and that makes it more difficult to have the partnership arrangement Frank [Giannantonio] discussed, which I find valuable but difficult. They want the partnership to mean that you get everything new from them.

Giannantonio: What's right and good for you might not be good for them. You are going to do what's right for your business, not what's right for your vendor. Several vendors sometimes don't see that.

Riegger: An important function of MIS is vendor management. Control the vendor rather than the other way around. If you control them appropriately, they can do good things for you. They can make proposals related to your business. They can save you money.

But there's no question they have to be controlled. The other thing MIS needs to do is sort out the hype from the reality. They do come in with an overly optimistic picture of what can be achieved, and especially if you are the one responsible for implementation, you have to sort that out for your users.

I've been on the marketing side. I spent 10 years in the technical support side of the marketing division of IBM, so I understand what they are trying to do. But, clearly, part of their intent is to present an optimistic picture, because they want you to buy. MIS has to put some reality into that.

Has the industry slump given you more leverage with the vendor, even with IBM? Are you in a more powerful

Continued on next page

Demand for corporate information services is expected to grow dramatically over the next decade. With many data centers already running 24 hours a day, *managing* this constantly increasing workload may become a bigger problem than doing the work itself.

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position now that the vendors are more hungry to sell?

McLaughlin: I don't think so. We may be different in the sense that we are totally IBM, so we don't shop for products, we negotiate with IBM. But for us, it maybe works a bit the other way. If IBM is experiencing a slump, the sales team assigned to us, about 25 people — I never realized how many IBM people were dedicated totally to us — become more aggressive in selling to us and unhappy if they don't get the business.

They get virtually all our hardware business, but the software business goes where the best place to put it is. And they become even more unhappy if they don't get all of the business, to the point of being more aggressive on what I would think are very small dollar-value items. In the past I would have thought that if we weren't going to go IBM on these small items, it would not have been a particularly significant issue. But today it is significant.

I'd like to ask a question about vendor management. We've adopted a process which allows the IBM team to have direct access to our end users, to the ultimate customer. The frame of reference is that we [MIS] should not be a funnel, a bottleneck, in the sense of imposing our views on the company and on IBM. And by involving the user directly in the process, we get a better free-flowing discussion from which ultimate decisions are made. It all runs through our budget, so we're always involved in the process but not in control.

Conceptually, I agree with it wholeheartedly. On a day-to-day basis, I don't always find it a thrilling situation. I wondered if anyone else has had experience with that process?

Carlson: I'd like to bring up one point here. I have a relatively aggressive stance on vendor management.

First, I'd like to make a broad generalization, even at the expense of being wrong in certain instances. I find that as far as vendors are concerned, on the DP technology side, ultimately you will find in your shop that you are dealing with a lot of pressure. A supplier can pressure you very much, especially if you've achieved certain levels of scale.

Obviously at Smith Barney we have scale in IBM, in AT&T and a few of our data vendor services. And they can pressure you in terms of where you are going to go next and what you can and cannot do. And trying to uplift the organization away from that coerciveness is a very difficult thing to do. It's a people-intensive thing.

In order to do that, you may have to sacrifice your weekends and work late because the vendor is saying, "If you sign up with me, I'll make your life easy. But you can't move away from me." On the other hand, you can have total independence, but you are going to run about twice as hard, twice as fast. And that trade-off is going on all the time.

What I'm trying to do on the technology planning side of things is have us look at other vendors who actually have good, bona fide ideas.

Rather than to just turn around inappropriately and say, "Let me find out what IBM has," I'm finding it very exhilarating to find out what other firms like a Tandem or a Stratus happen to have. In fact, some of these small companies have better niche solutions and are running harder just to be able to win the business. They can't seem to get it because existing suppliers control us to a great extent.

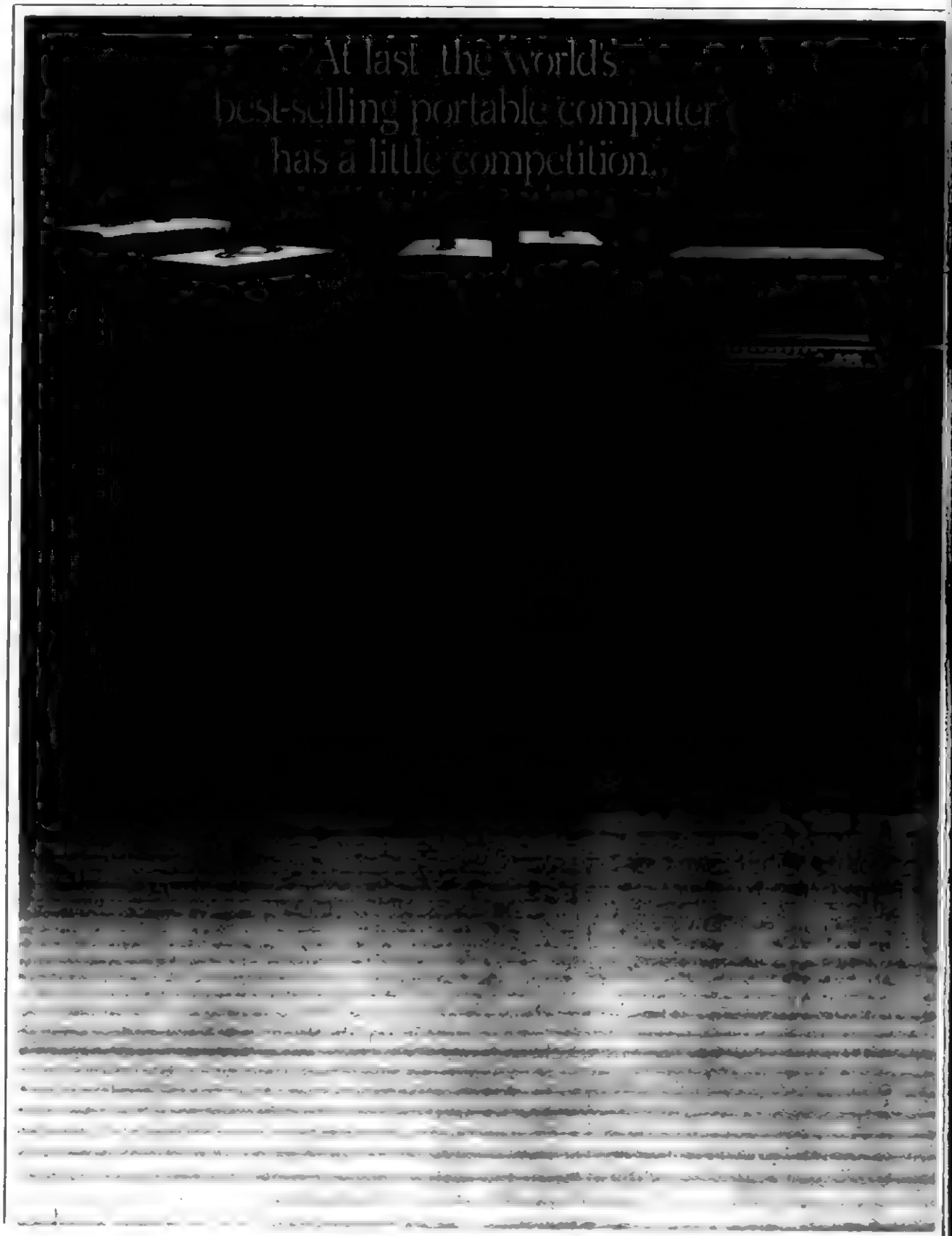
> ***'For the first time, the ability to go forward with a development project may be affected by the unavailability of users rather than by the unavailability of programming resources.'***
>
> — New York Life's Michael McLaughlin

Do you find that when you look at smaller vendors, that you are then facing a systems integration problem, where you need a third party or more of your own time to make these things work together?

Carlson: Absolutely. You are saying, when you go with one vendor, that you are going to be suboptimal in certain areas, because one vendor cannot cover all things very well. The trade-off is that you are willing to vertically integrate. You are going to add more operating leverage to your side of the house by saying, "I'm going to now buy specialty people, those that happen to be expert in a given operating system, whether it be Unix, Digital Equipment Corp.'s VMS, whatever it happens to be." You have to develop the infrastructure to be able to support that. And that is not too appealing. Because what happens is that you are talking an entirely new language and the people who have become adroit at IBM do not look very fondly, even internally in our own company, at the proposal of bringing in a DEC system.

Are there other vendors, like DEC, that you are looking at hard because IBM, let's say, doesn't solve all your problems?

Riegger: I think IBM always per-



forms a little better when there's a little competition around. The unfortunate part is that in the last few years, they've sort of sewn up the mainframe business. But it is important in the totality of the equipment purchases to try to get some competition in there. And I think competition is coming to the fore. Certainly in communications, it is not a one-vendor business.

Neill: I don't see training my people to work with multiple computers, because I'm not a big enough shop. Now at Smith Barney, you probably have many hundreds of programmers. Anytime you are in that situation, you can have a sizable group that's expert in different things. In development, I have 40 people — that's too small to get multiple systems in that environment readily.

The other thing on this whole IBM question — you [Riegger] are apparently an ex-IBM systems engineer. I am also. I spent 10 years with IBM, and I'm fairly familiar with IBM inside. They do apply a lot of pressure. They will go to your top management like that. I do not let them go to my users unless I go with them, because I have plenty of backlog anyway. The users are likely to be more confused by what happens than anything else. And I keep IBM completely away from the users, unless I go to the meeting with them in a structured situation or IBM comes to me with something and it makes sense.

McLaughlin: IBM did us a favor. It was a hard lesson, but what we realized was that when they were dealing directly with the users, they were doing a job we should have been doing. They were going to the users and saying not, "We're here to sell you PCs," per se, but "We're here to talk to you about your business problems that are not being addressed in a DP environment and that we might be able to help you with." They are very quick to offer ATT — the application transfer team. It's a closed-door session in which they bring in their people, they bring in a moderator and have a very good discussion. We're always part of that session.

We realized that we were complaining about IBM, but in point of fact they were doing something that we should have been doing on our own. We are now becoming more aggressive on that basis.

Neill: I found, though, that IBM is far less able to tell me anything meaningful in an application area than they used to be. When I was a systems engineer there, they were not unbundled when I started, and I went out to a customer and I did everything and anything. I learned about their whole business. My systems engineer today doesn't even blink about anything except IBM systems software — CICS, MVS. They don't know accounts payable exists. So they don't have any expert advice to give me or my users in that area. And therefore, they have some capable people who can go out on a fishing expedition, but they are not going to understand a lot of questions that are raised, because they don't know the business. They used to know it better.

Carlson: And again, you are going to get a very biased response as an answer, and I worry about that. Because ultimately, one of our jobs is to take a look at the panoply of systems and services and match that up to the business. That's ultimately our job. It was mentioned earlier that MIS people are starting to be groomed more as business people. I absolutely applaud that trend, because you cannot abdicate your responsibility of technology leader-

> ***'I keep IBM away from the users, unless I go to the meeting with them or IBM comes to me with something and it makes sense.'***
>
> — Saks' Stewart Neill

ship. If you don't do it, you end up having other people do it for you. Later on down the road you might find yourself painted into a corner you didn't want to be in.

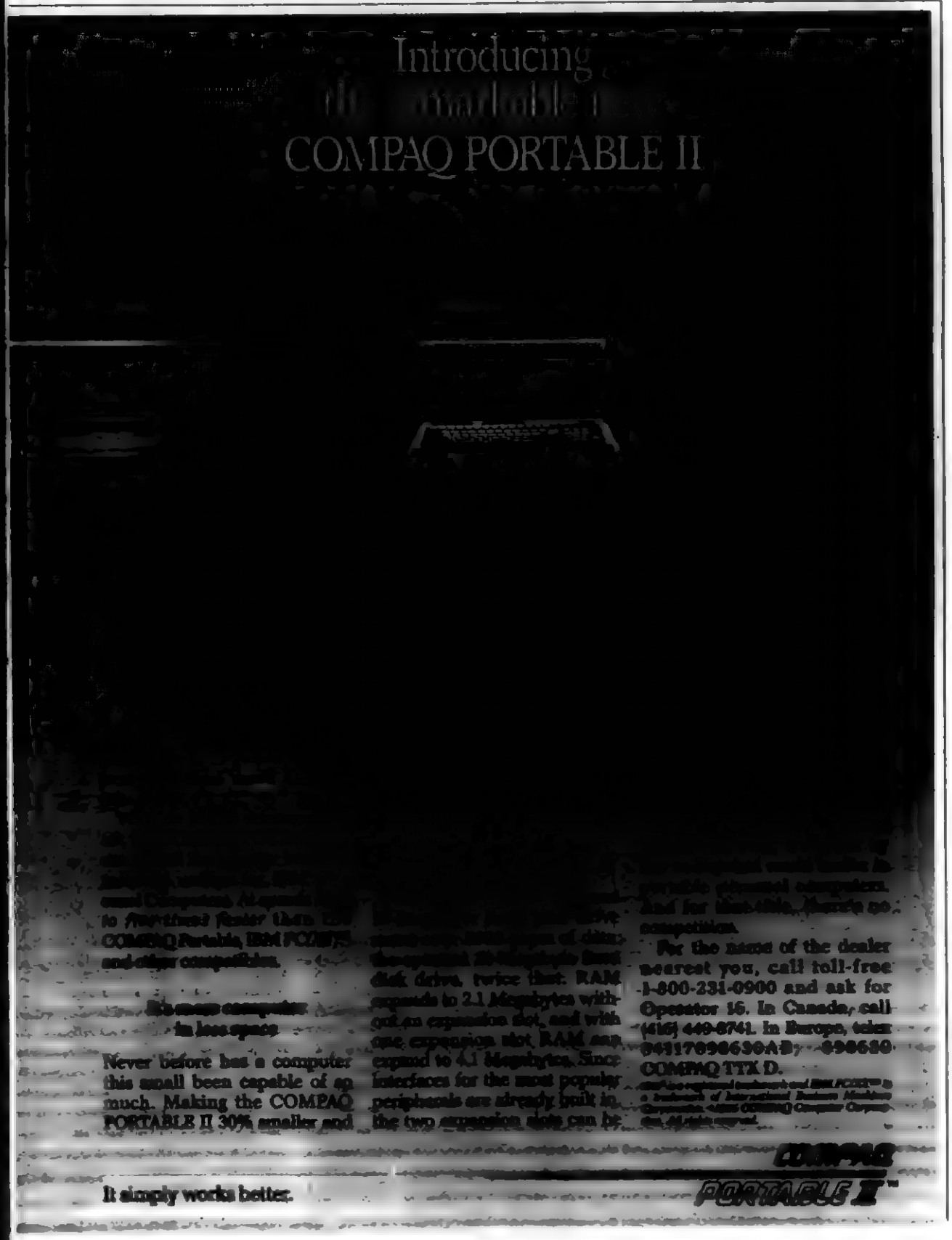
I have to recognize the realities of budgeting and not being appropriately staffed. You have to ramp up to it. And if you don't have the infrastructure at the time, you have to default to other more conservative positions just to be able to provide some level of services at all.

But ultimately I feel it is the responsibility of the MIS people to be able to have the internal wherewithal to look at the environment and decide what technology trends are emerging and which ones are going to be best in their business.

Giannantonio: I agree. You have to play a more proactive role. We have IBM do that in our shop, perhaps not as aggressively as in your shop, Mike [McLaughlin]. But we have to do that more, go out to the departments and look for areas where we can increase that white-collar productivity and bring that type of technology and capability to those departments and integrate it within the current environment. The vendor is going to be biased, as you said. They only know one solution. You can't fault them for that because that's what they've been trained to do.

Neill: I spent 10 years with IBM, and I knew their product line inside out. When I left IBM for Saks, I found out that I was not a knowledgeable DP professional when I was

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with IBM, because I didn't know anything else at all. And, in fact, that is a very limiting situation.

I currently read trade journals that I never read when I worked for IBM. I get literature from all kinds of other vendors, and I am much more aware of the options and possibilities, especially in the software area where IBM is not particularly strong.

Telecom: Dial "M" for MIS

What about telecommunications? Have you solved your problems?

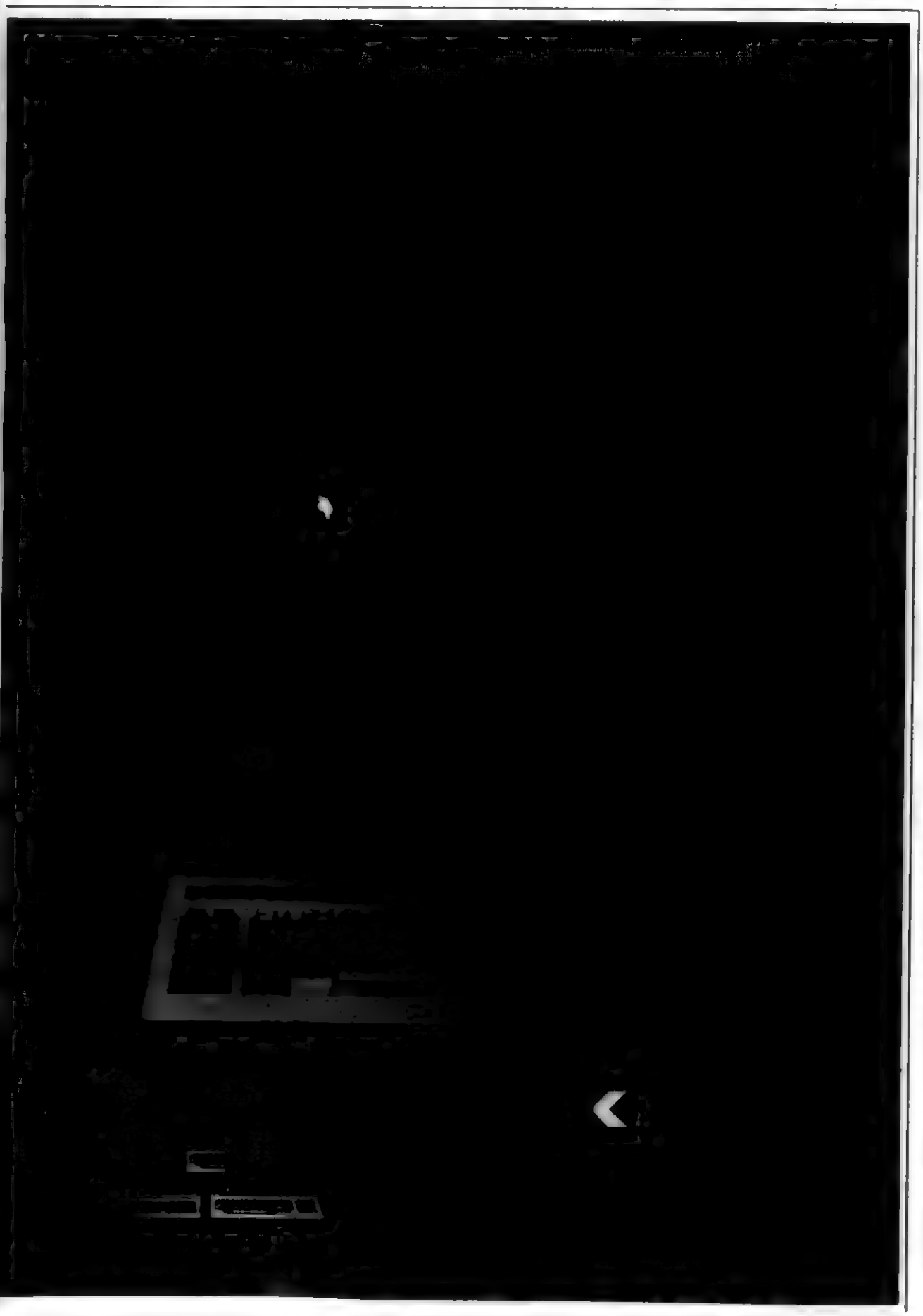
Riegger: Absolutely not. I've been spending a lot of time lately on the telecommunications and networking problems. Telecom is where computing was 20 years ago, it's very undefined. We spend a lot of money on it; it is not standardized. We're faced with the problems of the voice and data worlds coming together, and they are so far apart, it just continues to astound me.

You talk to IBM about general networking and they will talk Systems Network Architecture, and they think SNA is the totality of the networking solution.

You talk to AT&T and you get Integrated Services Digital Network, and that's the totality of the networking solution and that will solve all your problems.

We're trying to get better control over how much we spend and what we get out of our networking solutions. And we are trying to integrate more but only where it is appropriate for the business. That's where I find the challenge.

But it's still a very new, volatile segment of the MIS inventory. It's a key function that we have to learn to manage — if we haven't already — and to get that segment of the MIS business satisfying and oriented to the business goals of the corporation.



Is it tough to find good people to take on telecom problems?

Riegger: Absolutely. I find people are very localized in terms of their expertise. They also have difficulty translating that in terms of the business objective.

It's so easy in telecommunications to get lost in the bits and the bytes. You get lost in discussions about protocols and standards and hardware, and it's very hard to tell from those discussions what the impact on management and the business will be. I struggle with that a lot.

Neill: My approach is not to make any major commitment in any direction in that area that I can avoid, because whatever I do is almost guaranteed to become obsolete. It's so unstable and so undefined that my general feeling is that unless you have something in telecommunications that has a very rapid payback or your company can't do without it, go with the simplest, least investment-intensive solution you can for the short term.

I think it's going to be five years before you can get anything in that area with any confidence — or at least three.

Riegger: Maintaining your flexibility is a viable strategy. If you feel some given area hasn't been really sorted out sufficiently yet, then wait, if you can wait.

Can you put senior management off that long?

Riegger: I think so.

Neill: It depends what you need. I'm communicating. My entire company is on-line, every store in the whole corporation is on-line all the time with multiple terminals. Some of it is jerry-rigged and some is not. The response time in some cases could be better, but I have no serious problems. I have no voice/data combinations at all. I constantly look at the solutions, and they look like they are going to cost a lot of money and be very high risk in terms of being the right ones two or three years from now. So unless it has a very short payback, I'm staying traditional and conservative and renting and not buying anything, trying to buy time.

Carlson: The vendors are coming out with new technologies just to be able to make another buck at our expense. You can always shoot yourself in the foot in technology. To the extent that one can keep one's discipline and sanity and only take those risks that may be

Continued on page 72

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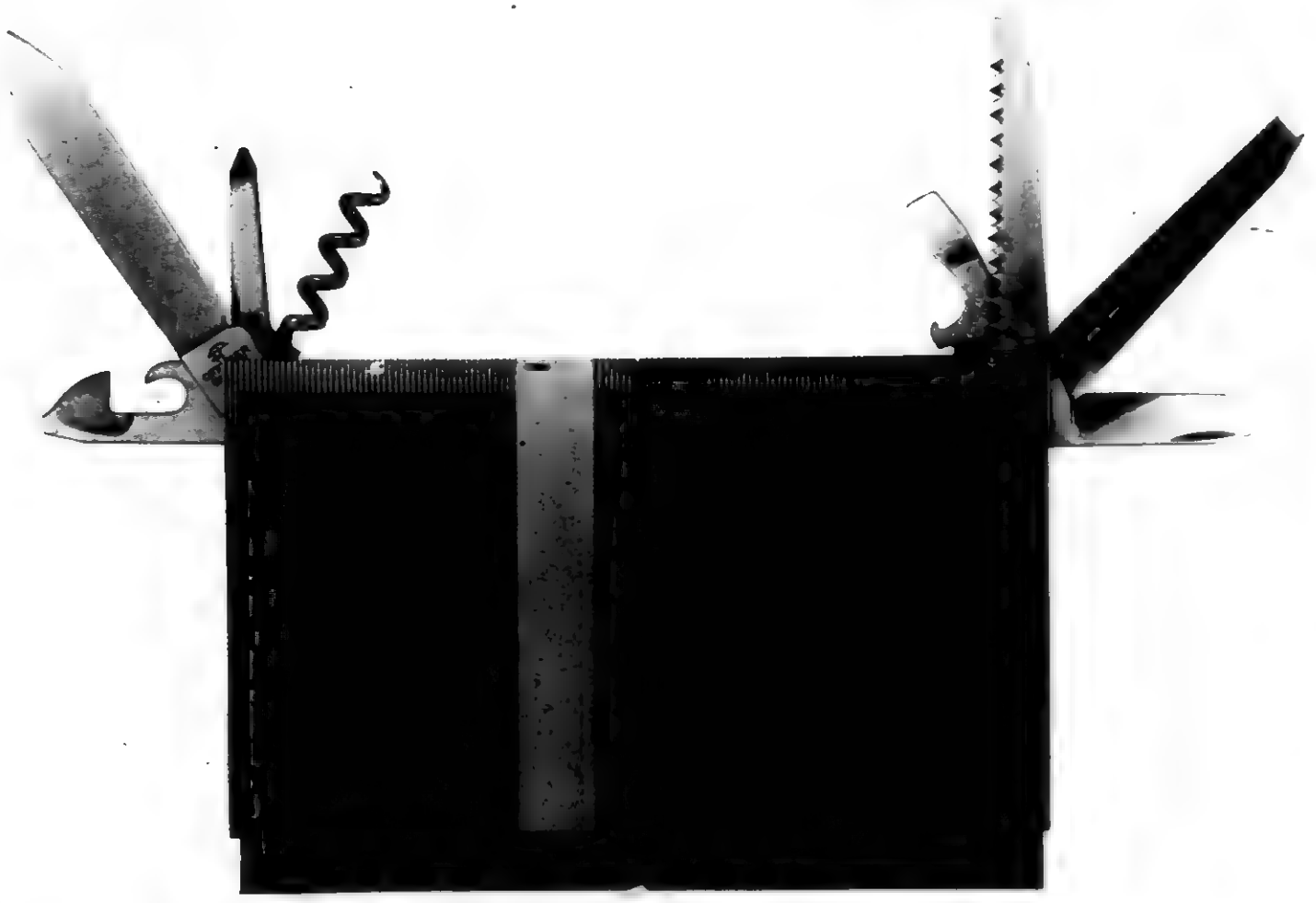
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Continued from page 70

deemed necessary because of the perceived upside or benefit it can confer to the organization, I would say leave well enough alone.

Riegger: But even leaving well enough alone is a decision. You structured something, you can't stay out of it. Even if you are going with more traditional products, you are making a decision.

Giannantonio: Do all your groups have both voice and data responsibilities?

Everyone: Yes.

Riegger: We've organizationally merged them. But the reality is that there are still pockets more oriented toward data and vice versa.

Giannantonio: We've had voice and data together under the MIS function for eight or nine years now.

> ***'I think IBM always performs a little better when there's a little competition around. The unfortunate part is that in the last few years, they've sort of sewn up the mainframe business.'***
>
> — Empire's Geri Riegger

Where I see the biggest savings opportunity is in telecommunications for our business, especially on the voice side. We've strengthened that area over the last year, adding resources, because it has such great impact on cost.

McLaughlin: You asked if we can hold management off for five years. It's not so much holding them off, but it is becoming more and more of an ongoing concern — are we maintaining a proper telecommunications position? What's written in the press is that other people are doing this and this and this. Should we be doing that? It's not so much a mandate that we must do it. But is not doing it the right decision? And management wants a comfort level to ensure that we're not falling behind the rest of the world. Demonstrating that not doing something is the right thing is difficult.

MIS needs for the future: The wish list

What's on your wish list for the next year?

McLaughlin: Mine is in the end-user area, not so much in end users using PCs, but we must move from an environment where any computer project is owned by the MIS group until it's delivered. And then when it's delivered, we'll tell you what's wrong with it. We're moving away from that.

But we need to turn the situation around, so that in point of fact, users believe they own the system from the day-one decision to design it and that we really just work for them and with them. We're working toward that, we're making progress. But in our company, that's a change in the way things have been done over the last 25 years, and it won't happen overnight. For the future, it has to happen.

Giannantonio: Instead of a wish list, I could give you a laundry list. With the information requirements being demanded of us today, I would certainly like to have more skilled people with a broader exposure to this environment. I don't know if they are there. They may be in scarce supply. But you need those types of resources to facilitate your ability to move out and get to where you should be going.

I'd also like to have a very comprehensive plan put together, better than what I have today, so I can have a road map to get there. And obviously, I'd like to have the resources to change those plans.

Carlson: On the technology planning end, I would hope that we would make a lot more progress in developing some sort of synthetic communications model, a kind of blueprint to guide us in the decisions we make.

The problem in making piecemeal decisions is that eventually you miss certain interactions between the various systems and their life cycles that pose problems later on. If you have a consistent and coherent model, you probably are making fewer mistakes and opening up more avenues for expansion than you would have without it.

We've done a fair amount of work in data base and data-sharing models, so we're probably a little more advanced in that area, but I feel there is a lot more work to do, specifically in the area of data and voice communications. I look forward to being able to develop some type of understanding of the organization and how information flows, and then superimpose some type of framework by which we can make technology planning decisions.

Neill: The area where I would like to see things settle out the most — though it won't happen that fast — is telecommunications, which has tremendous potential but is very unsettled at the moment. And another is artificial intelligence and expert systems, which I see having one of the most dramatic impacts in the history of software — within the next five to 10 years, maybe sooner. A tremendous number of things people do today I believe AI will be able to do. ■

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In Depth

Programming masters break out of the managerial mold

Managers schooled in a large-scale bureaucratic model are too rigid to oversee the production of quality software. Good design requires a master who combines creativity and insight with technical competence.

By BO SANDEN

The quality of software is a function of the conditions under which it is produced. Today, the intellectual effort needed to design consistent, large software systems remains grossly underestimated, and the creative energy necessary to maintain the conceptual integrity of a system throughout development goes unrecognized.

While the output of software products increases enormously every year, we remain unable to produce consistent software within reliable time frames. The term "software crisis" describes a situation in which ever more error-ridden software is continuously put to use. The crisis has become accepted as a fact of life to such an extent that anyone who finds it natural that a software product should be correct upon delivery runs the risk of being regarded as a dreamy theoretician, hopelessly out of touch with reality.

Software development is overadministrated; it has been fitted into an organizational model appropriate for large-scale industrial production or bureaucracy, where the work element is straightforward and well understood and the emphasis is on managing large groups of people. In such environments, the whole is simply the sum of its parts; if the assembly line has been correctly put together once and for all, the individual efforts will always yield the desired product.

This model does not apply to software production. Such bureaucratic organizations are incapable of producing quality software. When projects do succeed, they owe their success not to the formal organizations but to craft masters lacking official recognition. If the software crisis is to be overcome, these masters must be given well-defined roles in software development.

Pioneers

In *Programmers and Managers: The Routinization of Computer Programming in the U.S.* (Springer-Verlag New York, Inc., 1977), Philip Kraft identifies the following evolutionary steps in software design.

First, there was the individualistic age. Programming was an exotic phenomenon, and the few idiosyncratic pioneers enjoyed rather unlimited freedom. Then came the large projects. Large bureaucratic organizations needed large computer systems and legions of analysts and programmers to make these work. These organizations saw no difference between programming and the work done in their own industrial or military organizations and arranged the programming project structure accordingly.

Mass-educated programmers were managed by professional administrators, who were generalists with only superficial knowledge of software design. The expertise lay at the bottom of the hierarchy, with the analysts and programmers working at the module level. With the appearance of complicated standard software, a third group emerged: the product specialists with expert knowledge of a specific area, such as an operating system or data base management system.

The emergence of large systems brought about the bureaucratic age, and slogans such as "egoless

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Sanden is currently assessing the development of a new system generation for Philips Elektronikindustrier AB in Holland and Sweden. This fall, he will be a visiting Associate Professor at the Wang Institute in Tyngsboro, Mass.



ILLUSTRATION BY ALAN WITSCHONKE

programming" marked the opposition to individualistic programming. All programmers were to adhere to rules that would make their products understandable to others and make the individual programmer replaceable.

To this end, documentation became important, although it was often produced unwillingly and perfunctorily, not as an integral part of design. Methodology research addressed project management's needs and developed methods to divide systems into modules that management could conveniently assign to individual designers or small teams.

Bureaucrats

The attempts to organize software production bureaucratically have now gone on for almost 30 years, and the software crisis shows that they have been largely unsuccessful. The theory that a software undertaking can be randomly partitioned at the outset of the project, the parts distributed among workers and the finished modules assembled into a running system has been proven wrong.

The organization model — with a generalist managing module designers — cannot ensure quality. The technical competence lies at the module level, but each designer's responsibility ends at the interfaces of the assigned module. The manager has the overall responsibility and the overview but lacks the necessary technical background to handle systemwide consistency and interface issues.

> ***"Technical competence lies at the module level, but each designer's responsibility ends at the interfaces of the assigned module. The manager has the overall responsibility and the overview but lacks the necessary technical background to handle systemwide consistency and interface issues."***

Once the system has been divided into modules, it is assumed that no more technical effort is necessary at the system level; project management is a purely administrative task. When system issues arise at later stages, nobody is equipped to handle them.

Sometimes a separate quality control group is installed, but it often lacks both the authority and the energy to actually solve interface or consistency problems, and the group limits itself to issuing standards and checking formal compliance to documentation rules and the like.

Chief programmer

Attempts have been made to incorporate the advantages of the individualistic age into bureaucratic software production. Chief programmer teams represent such an attempt. Like the lonesome programmers of old, chief programmers are supposed to have a total system concept in their heads and design the system themselves down to the details.

Unlike their predecessors, chief programmers are each backed up by a "copilot," a second in command who is also well acquainted with the design, as well as a librarian who keeps track of such details as program versions. Junior programmers are assigned the least vital parts of the programming. The approach has not won global acceptance — one reason, perhaps, is that today's systems are too complex to be handled by one person from the conceptual level down to the detail level.

In his book, *The Psychology of Computer Programming* (Van Norstrand Reinhold Co., 1971), Gerald Weinberg sees management as a power structure that is independent of actual software development. He urges managers to leave the programming team alone and let the members organize themselves democratically. Neither he nor Kraft attributes constructive roles to software product managers. Kraft even foresees that the low-level administrative function will become superfluous and will be eliminated.

One spontaneous reaction to overorganized system development is the hacker subculture with its hero, the lonely, night-working youth communicating with his colleagues via computer mail. (I use "hacker" in a neutral sense to describe a computer enthusiast.) In her book *The Second Self: Computers and the Human Spirit* (Simon & Schuster, 1984), Sherry Turkle describes another reaction: A middle-aged module programmer, frustrated by the limited scope imposed on his work at the office, buys a personal computer. Working on his own project at home, he enjoys the motivation that comes from seeing the whole picture.

Champions and masters

Even though real-world software design does not fit in the bureaucratic model, successful software systems are produced. According to my experience, this is due to the existence of a formally unrecognized employee category: the mastermind.

In addition to the managers, module designers and, perhaps, specialists, each successful project probably has a mastermind — someone who unofficially assumes the responsibility for the conceptual integrity of the design. Perhaps an ordinary group leader or a rank-and-file designer — unnoticed by management

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— with a gift for seeing the total picture takes charge of the entire project. In another possible case, the project manager is technically competent enough to mastermind the design, although formally he is only supposed to be an administrator.

In recent years, interest in traditional industry has begun to shift away from army-like, hierarchical organizations and assembly lines. The bestseller, *In Search of Excellence*, by Thomas Peters and Robert Waterman Jr. (Harper & Row Publishers, Inc., 1982) showed that the success of important companies is based on such criteria as motivation, individual recognition and support of the champion — the individual promoter of an idea.

The intellectually demanding character of software development makes these findings especially relevant to that industry, in which the results depend more heavily on the individual effort than they do in other lines of business.

The champion has much in common with the unofficial master of software development. At a time when champions are recognized in industry in general, it is logical also to recognize the master — the experienced designer who combines leadership with technical competence and assumes personal responsibility for the quality of a system being produced, just as a programmer feels responsible for the integrity of a module.

Knowledge not always skill

The master's role differs from those of the individualistic programmers: the chief programmer, the specialist and the generalist manager. A master is not a one-man show. Development and description methods have evolved notably since the individualistic age, when a programmer had to keep the system idea in his head until it had been coded, since the only way to express it was in a functioning program.

Today, the master does not get involved in programming details but maintains a level of abstraction in order to control the logic of a large, complex system. He works with diagrammatic descriptions and specifications and leaves the programming to others.

A specialist with detailed knowledge of a certain system is sometimes thought to be the ideal designer for another, similar system. This is not generally true; this is another example of the confusion of knowledge with skill in software design.

While eminent specialist knowledge is necessary for maintenance, design skill is based on experience from different systems with different structures and design principles. For this reason, the master is normally not a specialist.

The administrative manager and the master both work with other people. But while the manager usually confines himself to pure coordination and needs only sufficient technical knowledge to understand what programmers tell him, the master must have the technical authority to give concrete advice and solve problems. While managers tend to be interested in *what* a system does and leave the *how* to the programmers, this latter aspect is very much the master's concern.

Risks

Sometimes such a master emerges at a stage when the formal project organization has reached a degree of despair. Typically, all modules seem to remain 90% ready forever, and the integration test reveals no end to the new errors that cannot be traced to specific modules.

If an unofficial master saves the project, all is well. Nevertheless, it is unhealthy to build an organizational philosophy on the random appearance of an unofficial actor.

There is also a concrete risk: If the conceptual integrity is maintained by someone unrecognized by the official power structure, it can easily be lost by an inadvertent move by the authorities.

In one case, a young analyst who unofficially masterminded the development of a real-time system was disappointed with the lack of support and recognition from management.

Finally, a salary dispute made the situation acute. Although the analyst stayed on, he lost interest in the project. He no longer informally supervised the design work of the others and no longer volunteered his assistance to the operating system specialist, who lacked



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the imagination necessary to find the hard bugs.

Formally, nothing was changed. Administration thought it could afford a single disgruntled analyst, assuming that the negative effect would be limited. But in reality, conceptual integrity was lost. The project went into total disarray and finally collapsed.

In another case, a key employee quits before managers realize that he plays a vital role in the project from a formally subordinate position.

To maintain the role of technical coordinator without formal authority takes tact, since people will resent anyone trying to impose himself on them with a supercilious attitude.

When such a low-key individual leaves, the hole left in the formal organization is hardly noticeable, and a manager who is sufficiently distanced from day-to-day work cannot picture the employee as the chief support of a project.

For an administrator, skill is harder to recognize than knowledge, which can be measured in years of education and number of courses attended.

Master-led design

Although masters are useful at various stages of the software life cycle, their role is perhaps the most clear in system design. Design starts with the definition of a problem and ends with a system ready for implementation. Regardless of size, it is vitally important that the entire problem be assigned to the master.

Managers must resist the temptation to divide it into subproblems and give them to different group masters. Premature division easily leads to unnatural modularization and unnecessarily complicated interfaces. Modularization is a technical issue that is accounted for later in the design process.

To tackle the design problem, the master is provided with a small group of specialists. The master is not selected for specialist knowledge but rather for design skill and experience. Thus, the problem may require an operating system specialist, a data base specialist or a data communications specialist — among others — as well as programming or programming language expertise. The group may also contain other designers.

In the group, the master primarily plays the role of a moderator who invites ideas, fits them into the total design and successfully revises them in the light of new developments.

While the specialists ensure that all technical aspects of the design are covered, the master is responsible for maintaining the conceptual integrity.

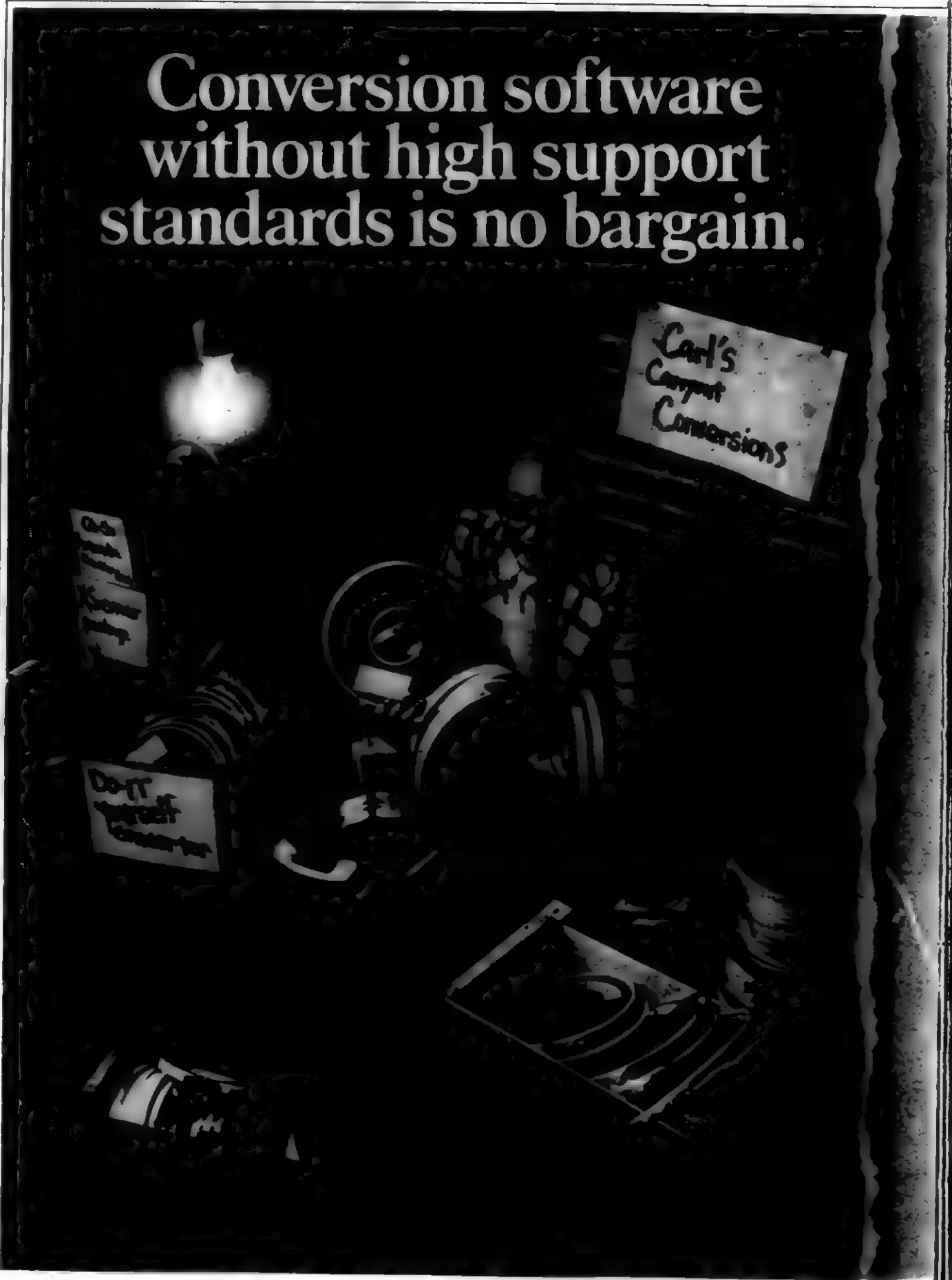
He rejects suggestions that cannot be reconciled with the limitations in mind and sees to it that the design is kept within bounds. He also looks after such long-term aspects as adaptability and maintainability, which are otherwise often neglected until the last stages of a project.

The result of the design must be a functioning system on paper, manifested in a design specification. Before this is achieved, the system structure will probably undergo drastic changes, possibly simplifications. Design should be a phase of controlled creativity in which new ideas are welcome.

The design team is not a committee, and the specification is not a committee product in which disagreement can be hidden behind vague phrasing.

Fred Brooks, who introduced the term "conceptual integrity," writes in his

> ***The master does not get involved in programming details but maintains a level of abstraction in order to control the logic of a large, complex system. He works with diagrammatic descriptions and specifications and leaves the programming to others.***



book, *The Mythical Man-month* (Addison-Wesley Publishing Co., 1982), "Design must proceed from one mind or from a very small number of agreeing resonant minds." The master is responsible for the specification, just as a programmer is responsible for a program and remains so until the system works.

Unlike a program, a system design, as expressed in a document, cannot be tested until it is implemented. Still, the master must feel about the specification as the programmer does for his program. The design document is a rendering of a system that is working in the master's mind.

A method of describing the system being developed is the master's most important tool. The design is constantly evolving and being enhanced, but must remain well defined for all involved at each stage.

Thus, documentation actually maintains a more central role in master-led design than is oftentimes the case today, where it may be seen as a boring obligation and often becomes a rerendering of an already implemented system.

It is important to find a representation suitable to the problem at hand. Detailed flowcharts are usually inadequate tools for a design group, but fortunately other methods — for example, methodologist Michael Jackson's diagrammatic notation — are now available.

Modularization is an integral by-product of the master-led design process. This is not the arbitrary assignment of the bureaucratic model, in which task division is determined at the project's outset by its administrator before any real knowledge of the system has been developed.

Instead, independent, well-defined modules are allowed to evolve naturally from the master's thorough understanding of the system design.

It is the responsibility of the master-led group to partition the system being designed into well-defined subsystems, so that the internal structure of each subsystem can be designed independently. Sometimes subsystems have such clear interfaces that they can be called orthogonal.

Continued development

Once the interface has been agreed upon, the subsystem design can proceed in parallel coprojects. More often, the subsystems have more complicated interfaces, and their internal structure depends heavily on overall design.

> ***The design team is not a committee, and the specification is not a committee product in which disagreement can be hidden behind vague phrasing.***

Such subsystems are developed in subprojects, which start when the overall design is complete. Subprojects and coprojects are defined on technical criteria as an integral part of design.

For example, in a microcomputer-based transaction system, an orthogonal relationship was defined between the multipurpose transaction control system and the set of transaction programs, which were tailored to the needs of a specific customer. An interface was defined at an early stage so the transaction programs and the control system could be developed in parallel coprojects.

The control system itself consisted of two subsystems: a real-time kernel to which the transaction programs would interface directly and a set of utility programs that were to be run after hours. The utilities had a complicated interface, since they were to work on the internal transaction log files.

Therefore, control system design continued as an integral activity until the file structure had been defined in an overall design specification.

Then, two subprojects started: one for the real-time kernel and one for the utilities. To maintain integrity, the kernel was developed in one piece by a two-man team.

However thorough the original design process, it is not humanly possible to produce a specification so perfect that no modification will

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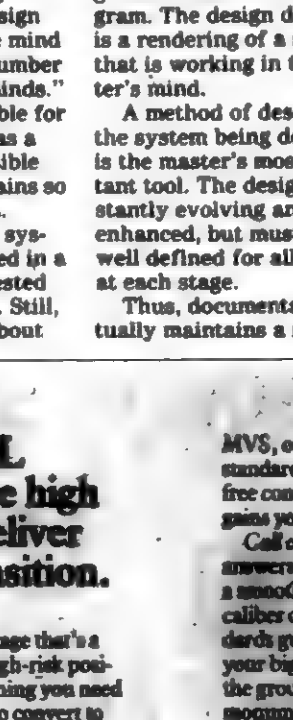
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be required during later subprojects and implementation. Masters have the continued responsibility to maintain the specification; revise it as flaws are detected; and to interpret, clarify and enhance it as necessary. They handle the change requests and ensure that changes and enhancements are made elegantly and in the spirit of the original design.

Masters must be available for such continued efforts until the system has been completed and therefore should avoid getting deeply involved in any specific part of the implementation.

Developing potential masters

Besides managers and programmers, today's software industry recognizes the category of technical specialists. Organizations have long realized that the promotion of an experienced technician to an administrative position means the loss of valuable technical knowledge. A dual ladder has been invented on which technicians can climb to prestigious positions without administrative duties.

These organizations should now recognize the masters, who differ from specialists in important ways. Where the specialist possesses deep and narrow knowledge, the master is characterized by widely applicable skill.

Still, the master is not a generalist who spends a few years at the beginning of his career in development getting a feeling for the trade while never losing sight of his management career.

> ***"It is stimulating and healthy for those entering the software development field to know that there is much more to learn from working directly with experienced masters and particularly that there is more to software mastery than technical perfection and expert knowledge of existing products."***

On the contrary, the master has probably experienced some hacker years. Technical credibility is the master's chief asset even when formal recognition is achieved, and this credibility comes only from solid, hands-on practice.

It is the responsibility of management to identify and develop potential masters. Masters-to-be can be found among the young technical enthusiasts — the hackers of any software organization. Perhaps they can be distinguished by a wider range of general interests than the specialists-to-be.

Positive guidance is needed to lead apprentices on their way toward mastery. Left to themselves, hackers tend to remain hackers and gravitate toward technical specialization.

Their elders must show them the way from the direct involvement with the code to successively higher level descriptions, although they may first hesitate to enter the thin air of specifications, finding work at the development terminal more directly rewarding.

The next step is to guide the apprentice from one system to the next to widen his scope. Technical enthusiasts' identification with their first systems may easily lead in the direction of eternal involvement through development and maintenance — toward specialization and away from mastery.

The personal commitment to the quality of the product is an asset, but it must be applied successively to larger assignments, where it is impossible to control every detail directly.

The development structure with subprojects and coprojects gives a natural opportunity for apprenticeship: The apprentice works with the master in the first part of development, then assumes the responsibility for a subproject.

The interest in coordinating other people's work probably develops naturally with the increasing difference in age and experience between the master and the new programmers and designers.

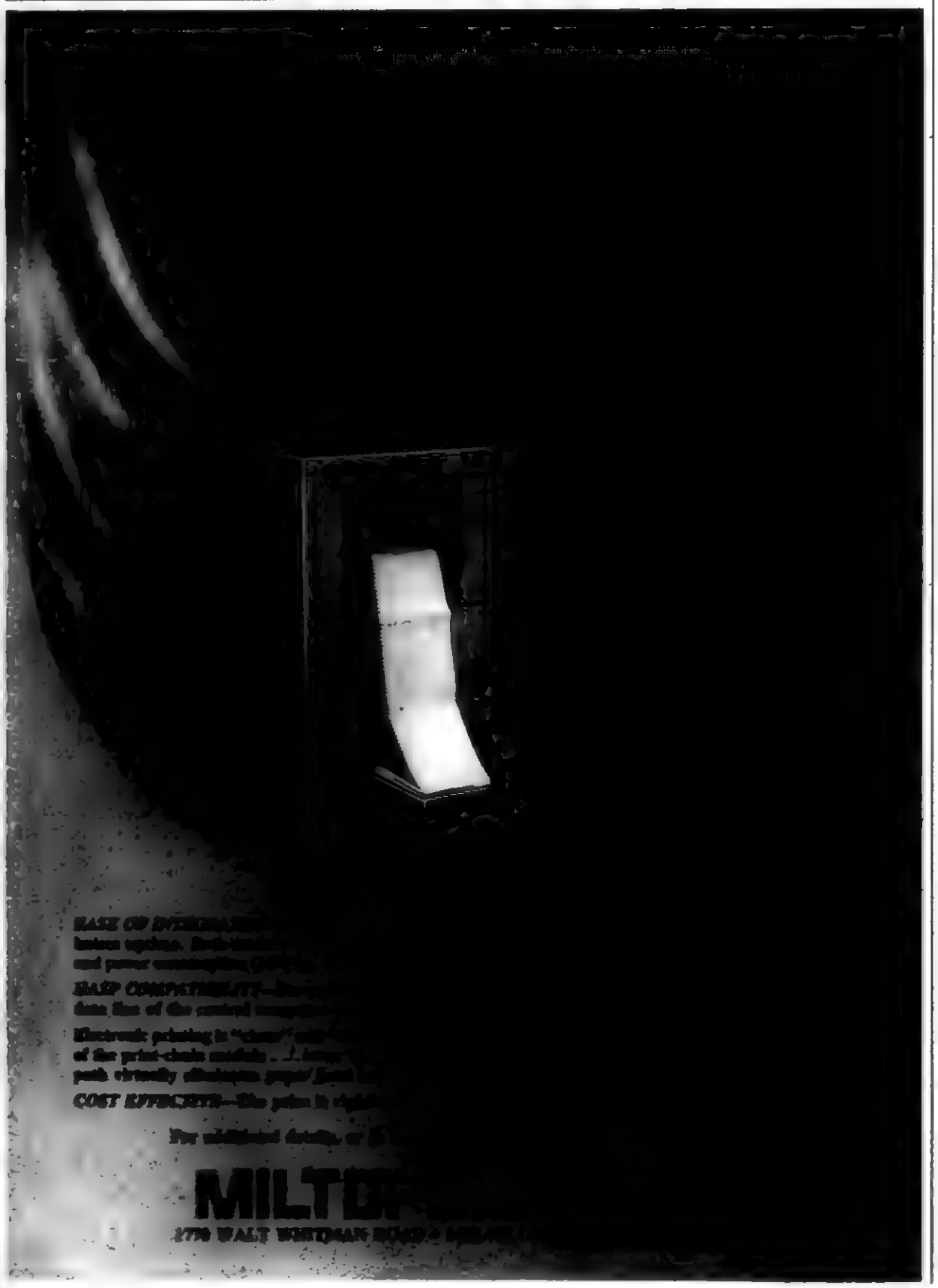
Not a trade

While the term "master" evokes associations with older trades, the intention is not to classify programming as a trade rather than as an engineering profession. Certainly, much of a programmer's training is formal, even scientific, and can be given in schools, institutes and universities.

Nevertheless, mastery is not achieved from formal training alone. It is stimulating and healthy for those entering the software development field to know that there is much more to learn from working directly with experienced masters, and particularly that there is more to software mastery than pure technical perfection and expert knowledge of existing products.

The idea of mastery carries with it the notion of professional pride and a personal commitment to quality.

The combination of leadership and technique makes masters good role models for the young enthusiasts entering the profession. At the same time, master-led design is a result-oriented activity aiming at increased quality, more reliable project planning and other strictly bottom-line concerns. ■



In Depth

Voice recognition: Six users pioneer cost-saving applications

Those who said voice technology would never work are being proven wrong every day. Innovative users who design voice applications for their personal productivity find they have an exciting and profitable tool.

By JONATHAN EPSTEIN

Voice recognition is perhaps the most highly touted technology this side of the wheel. But for observers of the voice market, the last years have been somewhat disappointing.

Despite the introduction of a new generation of powerful and less expensive personal computer-level voice boards, most voice applications make their home on the machine shop floor and the quality-control conveyor belt. Speaker-independent operations remain a pipe dream with all but the most basic vocabularies.

For 1986, though, the frontier for voice recognition systems looks brighter. Shelley Bakst, a senior analyst with International Data Corp. in Framingham, Mass., predicts that voice vendors will ship 20,600 voice units in 1986, nearly double the figure for 1985. While the large, established vendors will control most of the market, Bakst notes, the infant state of the technology will leave niches for small, brain-intensive companies.

More important, voice recognition applications are finding their way into the corporate office. Most microcomputer-level voice products come already installed with templates for popular applications programs. Innovative users who designed voice applications for their personal productivity are finding they have a marketable product as well.

Voice power is both facilitating old processes, such as report generation and device control, and creating new uses for computers, such as personal computer-based telemarketing. Some more advanced voice recognition techniques are being applied in advanced security devices and biological research.

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Biology research — Woods Hole Oceanographic Institute

The paperless office is a myth. If anything, today's businesses have more paper to push around than they did before desktop computers became commonplace. In the health care industry, where paperwork translates into insurance revenue, speed in paperwork turnaround is essential.

In any hospital, the department of radiology is a major source of insurance revenue. Staff radiologists spend their whole day making diagnoses based on films of patient examinations.

After the diagnosis is made, a report is dictated onto tape and passed to the typing pool. After the report is typed, usually about 25 lines, the medical administrator sends a copy to the insurance company and is quickly reimbursed. In a large hospital, the process from report to reimbursement takes about three hours. But in a smaller hospital with fewer people working in medical records departments, the process takes longer — sometimes much too long.

Dr. Alan Robbins, chairman of radiology at the New England Baptist and Boston Veteran's Administration

Epstein is a Cambridge, Mass.-based technical consultant and free-lance writer.



ILLUSTRATION BY TAMAR HABER-SCHAIM

hospitals, had a performance bottleneck at New England Baptist. The five radiologists in his New England Baptist Radiology Associates group would work from 9 a.m. to 5 p.m. examining films and dictating reports, but they did not have the secretarial staff or expertise to keep the records flowing. It regularly took up to a day to get reimbursements back from the insurance company.

In a smaller hospital such as New England Baptist, maintaining a cash flow is of paramount importance, so Robbins decided to implement a voice-controlled reporting system. Together with independent software consultant David Horowitz, Robbins set out to solve the problem.

After looking at products from various voice vendors, the pair decided on the Voicesystem KVS-PPC from Kurzweil Applied Intelligence, Inc. in Waltham, Mass. "My impression in working with the Voicesystem is that it's an amazing device," Horowitz notes. "It's both highly reliable and extremely well built. As a software developer, I know it's unusual to see a product so well put together."

> ***Voice power is both facilitating old processes, such as report generation and device control, and creating new uses for computers, such as personal computer-based telemarketing.***

The Voicesystem is a speaker-dependent discrete speech recognition device that currently retails at a single-unit cost of $6,500. Its speaker-dependent trait means that each user's voice has to be introduced to the device. However, the high cost of speaker-independence technology and the low number of potential users made this concern a small one.

A key factor in the hospital's decision to buy the Voicesystem was the system's 1,000-word vocabulary and high degree of accuracy as well as Kurzweil's ongoing commitment to developing a larger vocabulary. "I doubt that any other product can compare in power and reliability," Horowitz says. Clearly he is not the only buyer that feels that way; Dick Pascal, Kurzweil Applied Intelligence's vice-president of sales and service, estimates that the company has shipped more than 200 units in the last two months.

Quasi-expert system

As Horowitz worked on developing the hardware and software for the system, Robbins set out to codify a standard vocabulary for radiology reports. The physician, who also teaches at Tufts University Medical School, used a Kurzweil Omnifont character scanner to input more than 1,000 radiology reports into an IBM Personal Computer.

After performing linguistic analysis on the set of reports, Robbins came up with two sets — one small, one large — of the words and phrases most commonly used in insurance reporting. Roughly grouped, there are phrases used for normal examinations and those used in the final free-text portion of the reports. The effort took Robbins about four months and a considerable amount of personal expertise to complete, leading Horowitz to call it a "quasi-expert system."

Users have to train the machine to understand their voices by going through an enrollment procedure. Horowitz replaced the Kurzweil-supplied enrollment procedure with one of his own. "I've designed the enrollment procedure around the radiology vocabulary," he explains. "The user has to repeat approximately 300 words three times. The words we use range from 'yes' and 'no' to longer words like 'arterialsclerotic.' "

Because the Voicesystem is a discrete speech recognition device, users must pause 250 microseconds between each word. This quarter-second pause between words is no problem whatsoever, Robbins says. Even after only a partial enrollment of two repetitions a word, the system will operate at more than 95% accuracy.

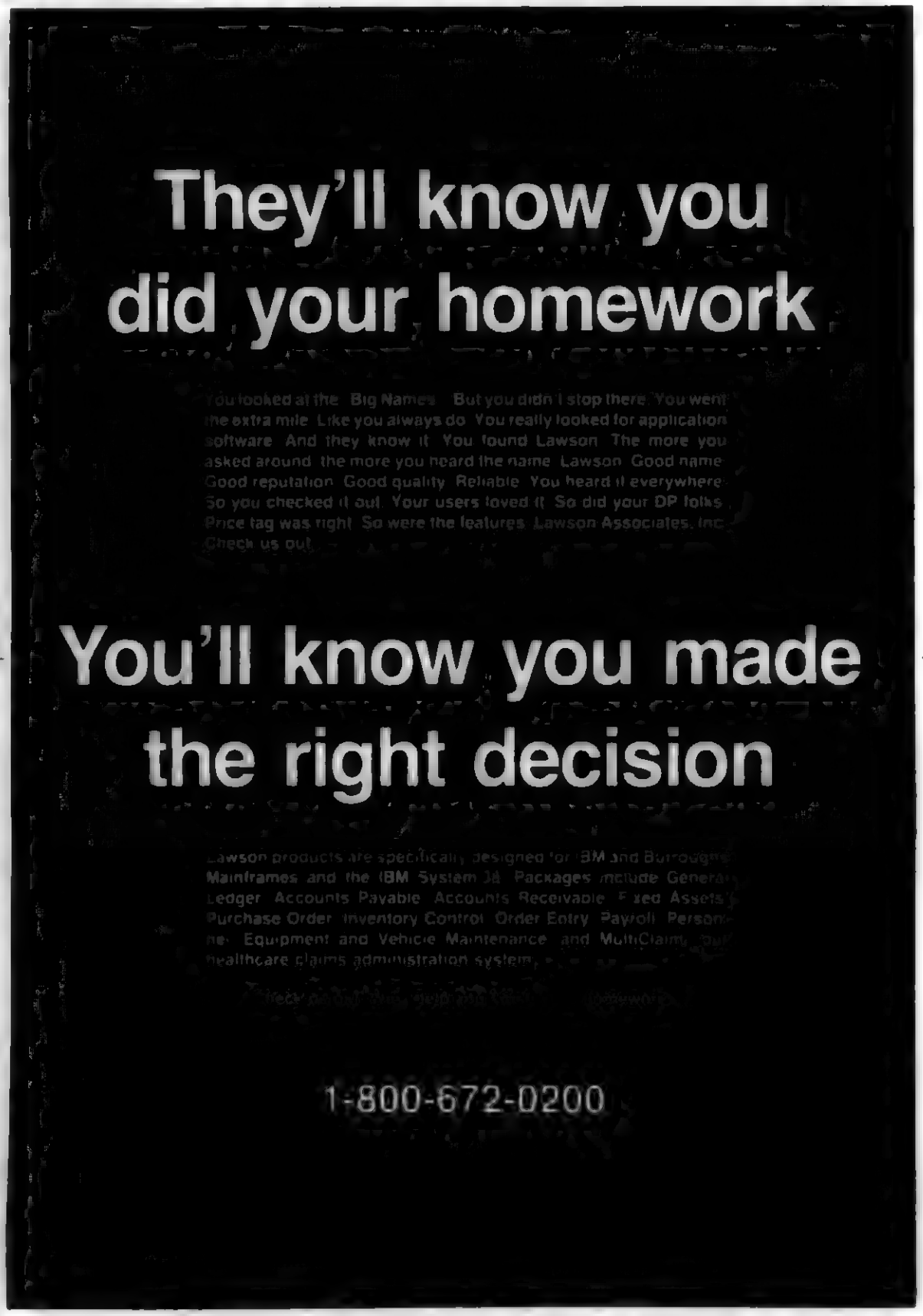
Horowitz purchased a standard IBM Personal Computer XT with 640K bytes of memory, a 10M-byte disk drive and IBM PC-DOS. Because the reports have to be dated, Horowitz purchased a clock board for the computer, which arrived bundled with Borland International, Inc.'s Sidekick desktop management software. After playing with Sidekick, Horowitz decided to use the program's Micropro International Corp. Wordstar-style editor as his interface to the Kurzweil system. Using Robbins' smaller vocabulary set, Horowitz set up the first version of the reporting system.

The radiologist receives his films and examines them. As he makes his diagnosis, he dictates it into either the Kurzweil-supplied headset or a telephone handset. The report appears on the monitor of the PC as the radiologist dictates it. If a mistake has been made, he is able to backtrack verbally and correct the error.

If the report is ready to send to the insurance company, the radiologist inserts the patient form into the system printer and tells the system, "Print this."

"When users are equipped and familiar with the system's use, what took 15 minutes will now take 30 seconds," Horowitz notes.

Horowitz and Robbins are now



implementing the larger vocabulary set. According to the consultant, this 900-word vocabulary "is adequate to cover every possible normal examination and 85% of the possible abnormals. For the other 15% of the abnormals, it is likely that the radiologist will spend more time on the report anyway."

Other departments at New England Baptist have already shown interest in Robbins' voice recognition application. A representative from the admissions department, having observed the development of the radiology system, is excited about implementing one of his own. Having gotten the jump on the rest of the radiology field, Robbins is currently examining the prospects for marketing his system to radiology departments throughout the U.S.

The hardware implementation was easy compared with the vocabulary analysis, Horowitz suggests. "When people know what they want to do, it's easy to get a system up and running."

Programming frustrations

Robert Newman knew what he wanted to do. Newman, a developer of interactive video systems, started using voice capability a couple of years ago to alleviate his programming frustrations. Now, with his son, Newman is announcing what could be a multimillion-dollar product.

"Basically, I'm a video producer — that could be a career in itself," Newman states. "But I understand how to make a computer do what I want it to do, so I put the two together. I wanted absolute control over the videodisk."

Newman started using voice recognition a couple of years ago at Davis Audio-Visual, Inc., a company that configures video systems for large commercial, industrial and military users. In addition to doing research and development work for Davis in its interactive video department, Newman used the company's equipment to design and produce videos for outside clients.

At the time, such a task was labor intensive. "Quite frankly," Newman says, "I couldn't type. After seven years of intense programming I still can't type. I guess I have a mental block when it comes to learning how. Unfortunately, it takes a lot of code to drive the video controllers."

Newman's introduction to voice came at a communications trade show, where he saw a woman issuing commands to her Apple Computer, Inc. computer through a microphone. He immediately realized the potential of voice recognition and persuaded the managers of Davis Audio-Visual to allocate some money for a voice recognition experiment.

Newman selected the Voice Connection Introvoice III IBM PC replacement keyboard for his first venture. "I looked at a lot of other products," he explains, "and a lot of them aren't around anymore. Basically, my PC was too full to handle another board." While the keyboard has only a 150-word vocabulary — low by today's standards — it was more than sufficient for his needs.

He attached the keyboard to a Leading Edge Products, Inc. Model D IBM-compatible personal computer, which was configured with 512K bytes of random-access memory (RAM) and a pair of Toshiba Corp. half-height floppy drives. The computer was already configured with the Model VIPG video board from Oklahoma City-based B.C.D. Associates. The B.C.D. board can do frame-accurate work on either videotape or laser disk.

A Video Associate Laboratories (VAL) overlay board let Newman display his video outputs on the same monitor as his computer output — in this case on a Sony Corp. KV26 26-in. monitor. The computer output is sent to the monitor in a red-green-blue signal, and the videotape and laser disk outputs are carried in a composite video signal. All synchronization is done on the VAL board.

Newman's first application of the Introvoice III was to control the two special video boards in his PC. At first, all of his experiments were confined to a single laser disk of Van Gogh's works. But that was plenty.

"There are a lot of system calls used by these video boards. Couple that with the 50,000 frames on one side of a laser disk, and you have a lot of programming possibilities," Newman explains. So he used the Voice Connection's Voice Utility Program to create his first vocabulary file. After deciding how to define his words, he input the definitions into a

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> ***The Interactive Classroom preserves the role of the teacher. Teachers can create their own video segments. The teacher decides what to show, when to show it, the nature and order of the questions and how long the students have to answer each one.***

text file. Then the machine displays the words on the screen and listens for vocal input.

The machine runs through the list three times in an enrollment procedure that takes about half an hour. "My worst problem came during the spring — I have hay fever," Newman remembers. "The Introvoice didn't understand the congested me. Now my congested voice has been enrolled also."

Pushing vocabulary limits

The system Newman set up two years ago is still in use today. The Introvoice III is a speaker-dependent board, requiring a separate vocabulary file for each speaker — supposedly. "That would be too easy," Newman jokes. He likes to train the Introvoice III to understand any speaker. He, his secretary and anyone else who happened to be around input each word a total of seven times. After such an enrollment, the keyboard will understand any speaker 97% of the time, Newman claims.

He has created some 50 vocabulary files to control his different laser disks and tapes. The B.C.D. board's macro capabilities let Newman create powerful commands easily.

"In the Van Gogh disk vocabulary file, for example," says Newman, " 'Chapter 2' means 'FIND 1287; PLVB 1423 <CR>.' " When he says "Chapter 2" into the Introvoice microphone, the laser disk player finds frame number 1287 and plays both the video and audio tracks until frame number 1423. "Browse" and "Step" perform those laser disk functions, and "Nude Lady" brings up and holds the frame with a Van Gogh nude. Other commands will quickly load new vocabulary files from disk, making the vocabulary of the Introvoice III virtually limitless.

Unlike the telephone system, which operates at a bandwidth of 4 kHz, the Voice Connection's keyboard listens on a wide frequency bandwidth and thus will not accurately understand commands over the phone. Newman has found two ways to get around this problem.

Using the Voice Utility Program's Edit mode, he can alter individual bits in the word profile to "open the translation window." In addition, using a pocket Touch-Tone dialer, he has coded his commands in the form of tone sequences. These narrow bandwidth signals can be understood in person or over the phone lines. In a more promising application, Newman uses the Touch-Tone commands for machine-to-machine control.

Using a 1,000-frame disk with which to experiment, Newman created a sound track to accompany the disk and recorded it onto the audio portion of a videotape. Using the B.C.D. board to control both the videotape and laser disk players, he starts the two running. Embedded in the sound track are barely audible Touch-Tone commands that instruct the laser disk as to what to do.

Excited by the prospect of voice in interactive video, Newman quit his full-time job at Davis Audio-Visual and went into business as a consultant. His clients include United Airlines, the state of Colorado and Nebraska's Creighton University. Since that time, he has purchased the Introvoice V card ("two generations ahead of the III") and the Introvoice card for the Apple II.

Voice in the classroom

Newman and his 17-year-old son, also named Robert, have designed their largest project to date — The Interactive Classroom — based on an Apple IIe. The Interactive Classroom consists of the Apple IIe configured with the Introvoice, B.C.D. and VAL cards. In addition, a card from Englewood, N.J.-based Reactive Systems, Inc. connects 30 transponder key pads to the computer. The computer is hooked up to a Panasonic Co. AG-6200 VCR and a Zenith Electronics Corp. wide-screen video projector/monitor. The younger Newman



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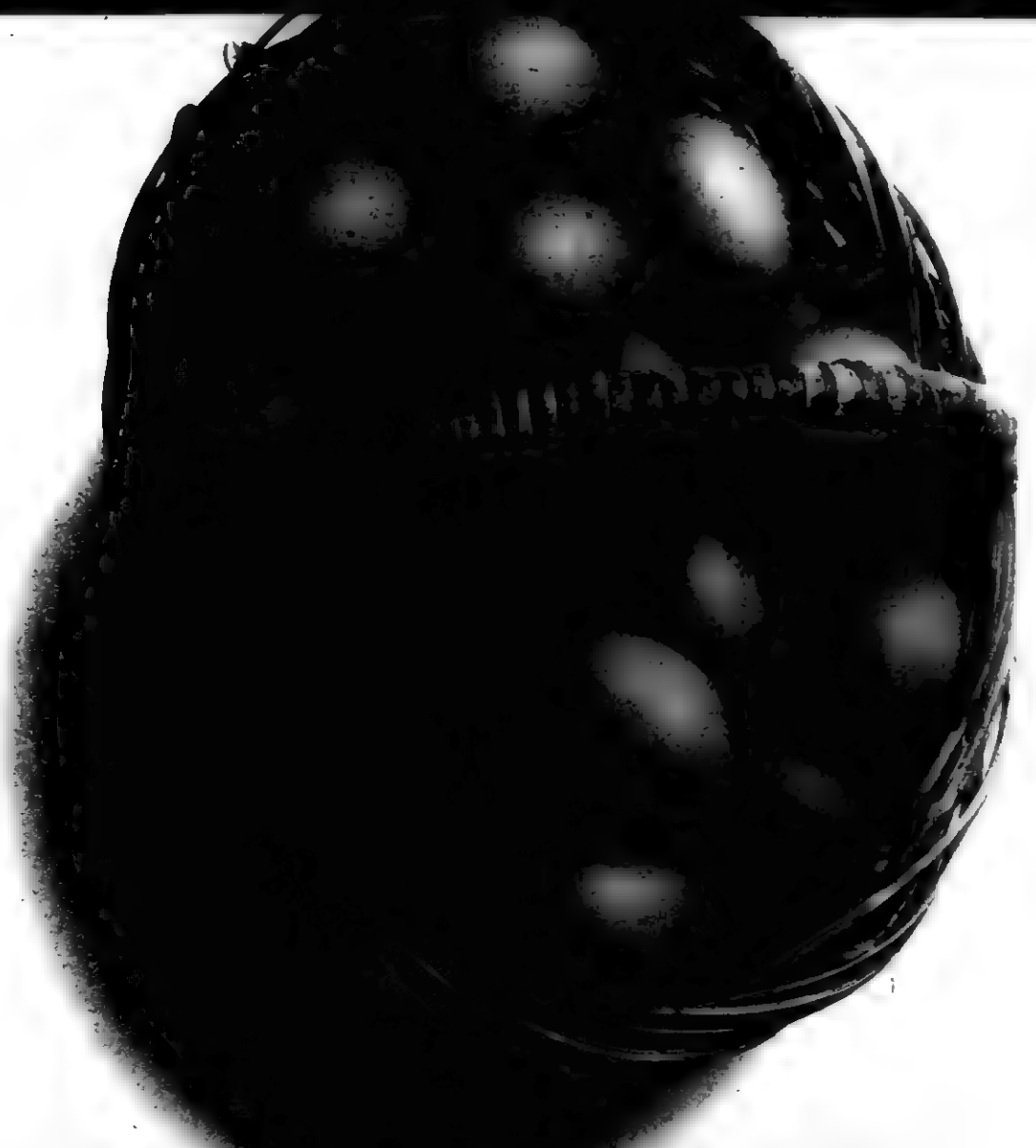
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"When speech recognition is coupled with speech output capability, a whole new field of applications opens up. Voice-configured systems can interact with remote users without requiring an operator to be present."

coded the authority system that gives the teacher complete control over the product. The whole system retails for less than $10,000.

Typically, a lesson will consist of short video passages followed by questions on the material. The teacher says "Start" to put the system online and then says "Period 2" to start the lesson for the second period.

The system first takes attendance for the class. It then shows a short video segment on, say, geography and then displays a question followed by a menu of answers.

The students use the Reactive Systems pads to answer the question — the pads have the numbers 0 through 9 and the words "yes" and "no." Using voice commands, the teacher can continue to the next segment, review the last segment or display the class average for the question. The individual record for each student is stored on disk.

Unlike other computer-aided educational tools, The Interactive Classroom preserves the role of the teacher. Using the younger Newman's camera driver, teachers can create their own video segments. The teacher decides what to show, when to show it, the nature and order of the questions and how long the students have to answer each one.

The Newmans' product is being tested in several Colorado school districts. One does not have to be an educator to realize the enormous potential that the product has in U.S. school systems. Its voice functionality allows the teacher to use it with a minimum of training.

"Voice is phenomenal — it can be very good or very bad," maintains the elder Newman, an avid fan of Kurzweil Applied Intelligence founder Raymond Kurzweil and his work. "It is a stepping-stone to the true artificial intelligence age. Remember that it is not a means to an end but merely a tool."

No operator

Neither Robbins nor Newman needs voice recognition to perform computer applications — voice recognition just makes the tasks much easier. However, when speech recognition is coupled with speech output capability, a whole new field of applications opens up. Voice-configured systems can interact with remote users without requiring an operator to be present.

The AT&T Conversant 1 system provides speaker-independent recognition of "yes," "no" and 6,000 combinations of the digits over telephone lines. Boston-based Fidelity Systems Co. is field-testing the AT&T unit. The investment company's 6,000 clients can call in and get the latest quote on their portfolios. Fidelity sees the Conversant-1 as a means of freeing up personnel for other tasks.

The AT&T system will cost users at least $50,000 each and is aimed at larger businesses with considerable phone activity. Other vendors have put voice output onto personal computer boards and targeted them at the individual user.

Both Votan Co. and Texas Instruments, Inc. make voice boards for the IBM PC that incorporate speech output capability as well as speech recognition.

Whereas machines such as Digital Equipment Corp.'s Dectalk synthesize speech from text, the Votan and TI boards store human voices in a digitally compressed format. These boards incorporate their own processors so as not to incur any overhead on the IBM PC's main processor. The Votan board is built around a Motorola, Inc. 6809 and a proprietary very large-scale integration speech processor and can do serious telemarketing without overloading the main processor.

Checking leads

Harold Weidner's insurance brokerage house had reached its capacity. While there was much more business to be uncovered in Rapid City, S.D., Weidner just didn't have enough manpower to cover it all. Sales representatives had to spend hours on the phone checking out initial sales prospects before they could set out into the field.

Then, in the fall of 1985, Minnesota-based Cantus Corp. released its Solicitor I telemarketing system. Cantus uses the Corona Data Systems, Inc. IBM PC-compatible microcomputer — configured with a 10M-byte hard disk drive, a single full-height floppy drive and 512K bytes of RAM — and installs the Votan VPC-2000 Votan Voice Card. It then loads its Solicitor I telemarketing software onto the hard disk. As Votan products use a bandwidth of approximately 4 kHz for their voice recognition, the same bandwidth as that used by AT&T and the divested Bell operating companies, there is seldom any problem with speech recognition over the phone.

Weidner decided to give the system a try. The telemarketing system can record up to 99 different scripts to use over the telephone. The user reads a script into either the telephone handset or the microphone leading to the Votan Voice Card. The card stores the speech digitally, compressing it some 16 times.

Weidner identified different groups of prospects based on demographics data and created a script for each group. After he entered the phone numbers of the prospects, the telemarketing system was ready to run.

The software dials the first prospect listed in the data base and initializes a report file for that prospect. If no one answers the telephone, the software notes that fact in the report and goes on to the next prospect. Once someone answers, the Votan voice card goes to work.

The card replays the script the user has selected. For example, it might say, "Hello, I'm calling from Dilorio Insurance. Do you have a

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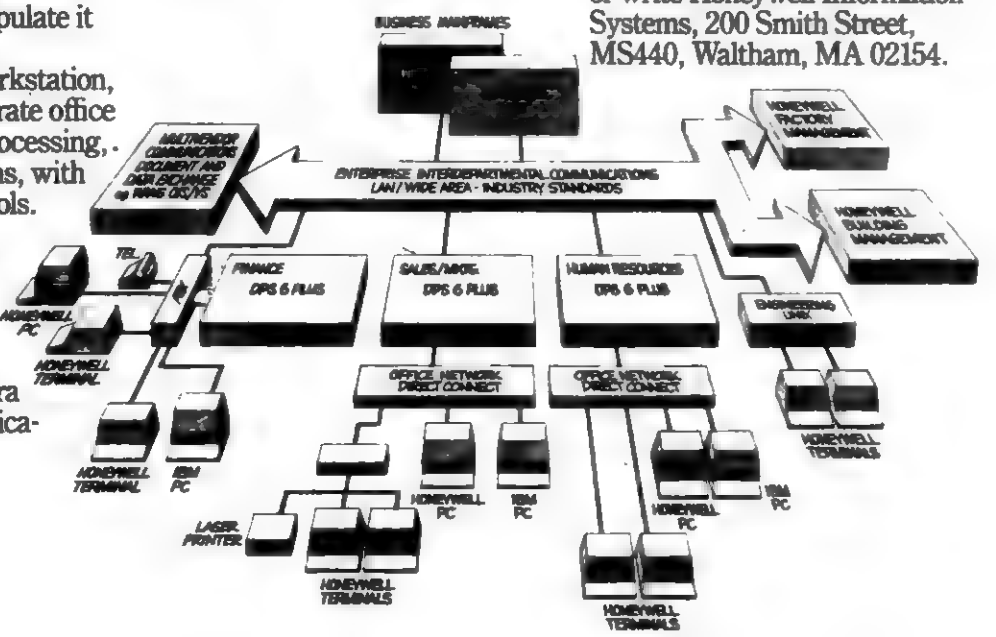
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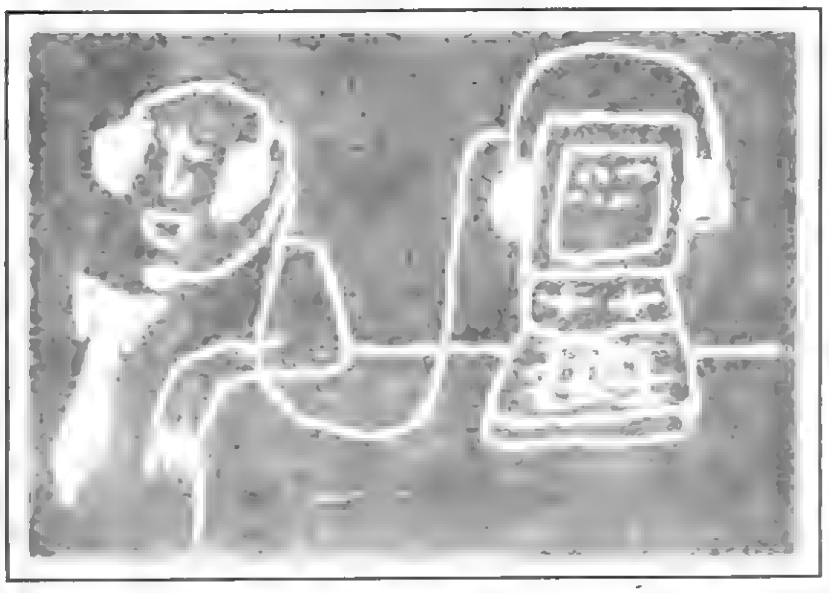
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moment to answer some questions? Please answer yes or no." The card then records the answers, sends the information to the user report file and takes the appropriate action. If the prospect says no, the machine thanks him and hangs up. If the prospect says yes, then the machine continues through the script.

Even though the Votan Voice Card is a speaker-dependent voice recognizer, it can distinguish between "yes" and "no" in over 90% of the cases. Customers can also answer questions using a push-button keyboard.

At the end of each script, Solicitor I asks the prospect for his name and any comments, which are compressed by the VPC-2000 and stored on the hard disk. The sales representative can either monitor the sessions and participate if desired or let the IBM PC work unattended for as long as disk space remains. At the end of a session, the representative can obtain a two-page hard-copy report on each phone call made that records which script was used and what the responses were. The software automatically time-stamps each record.

Weidner now has two systems of his own. "It's great. If I run the machine three hours a night, it generates enough appointments to keep a salesperson busy all day," the insurance broker says. He points to the high quality of the Votan voice reproduction as a major factor in the system's success. "While we may be getting used to it, no one really likes to talk to a machine. But the Votan reproduction is close to perfect. People absolutely did not know they were talking to a computer."

In business himself

As Weidner sees it, in the insurance business, the Cantus system can pay for itself in 90 days. He realized the system's potential and, after sounding out some friends, he set out to be a value-added reseller for Cantus.

Success Methods International, of which Weidner is director of sales, packages the Cantus system with specially targeted user data bases. The system retails at a base price of $8,995, with an additional cost of $60 per 1,000 names.

The system's 10M-byte hard disk drive can hold up to 10,000 names, Weidner says. While most of his buyers are in insurance or other direct sales businesses, he maintains that "it's ideal for any sort of repeated phone work, be it telemarketing, public opinion polling or market research." The only difficulty Weidner has ever had is transmitting over some of the non-AT&T phone carriers — such as MCI Telecommunications Corp. and GTE Sprint Communications Corp. — which use different frequency bandwidths in carrying their signals.

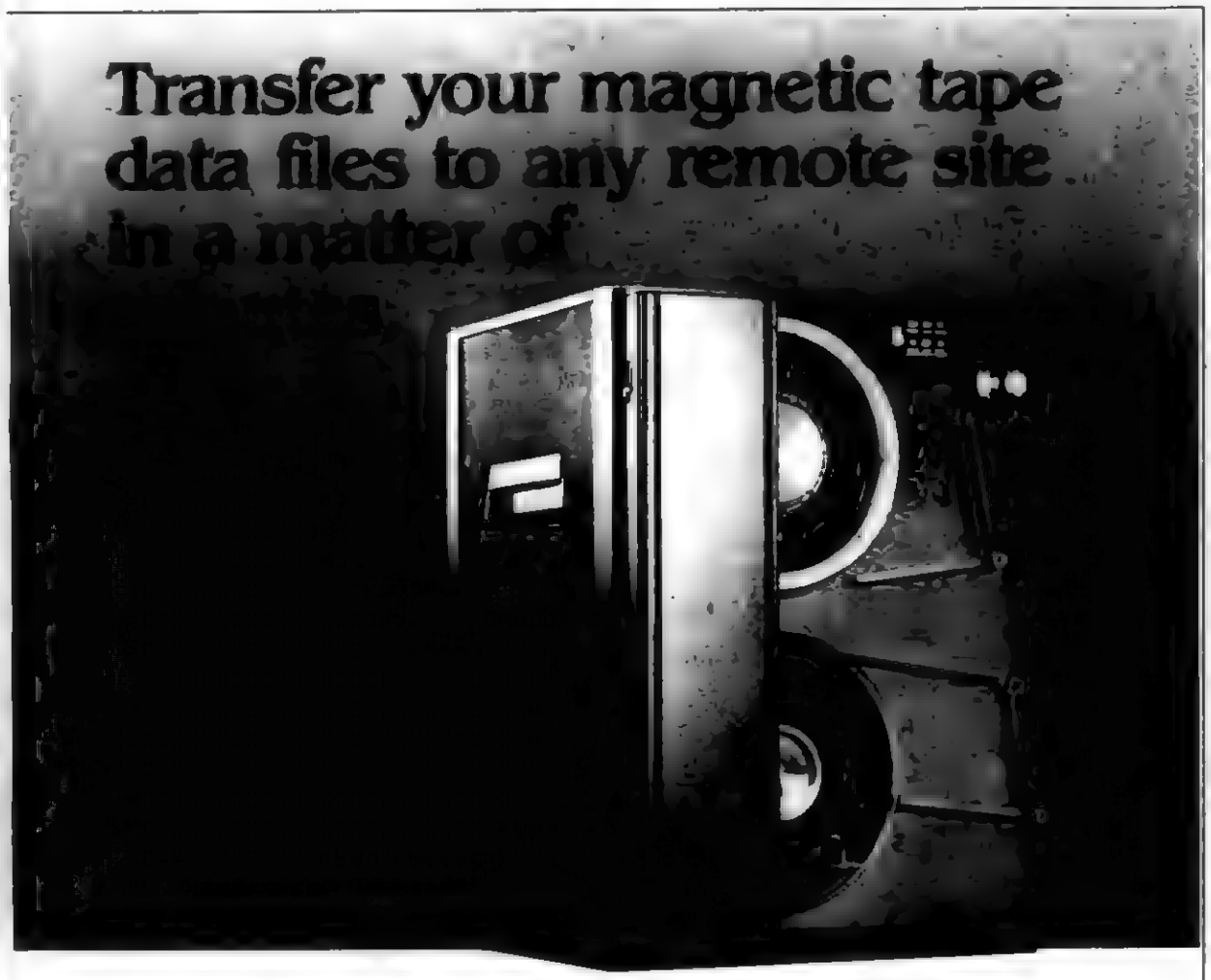
Both Votan and Cantus are improving their products, and Weidner plans to stay on the leading edge. Votan is improving the VPC-2000's vocabulary of 640 words, and the company's director of marketing, Jim Cook, says the company can double it. However, he notes that "most applications don't even need 640 words."

Of more interest to Weidner are developments on the software side. Cantus is developing an interface to the Able-1 word processing package. Using this, users could personalize letters to prospects, incorporating responses to various questions in the script. The company is also incorporating an elapsed time feature into its telephone manager. Designed primarily for lawyers, the enhancements mark the time elapsed on each call. This brings up an interesting question — should the lawyer's client pay lawyers' rates for calls made exclusively by a personal computer?

Plugging security gaps

Security is big business. Research-intensive organizations simply cannot afford the release of any sensitive material. However, security managers at high-security installations are becoming increasingly aware of the inadequacy of traditional security systems.

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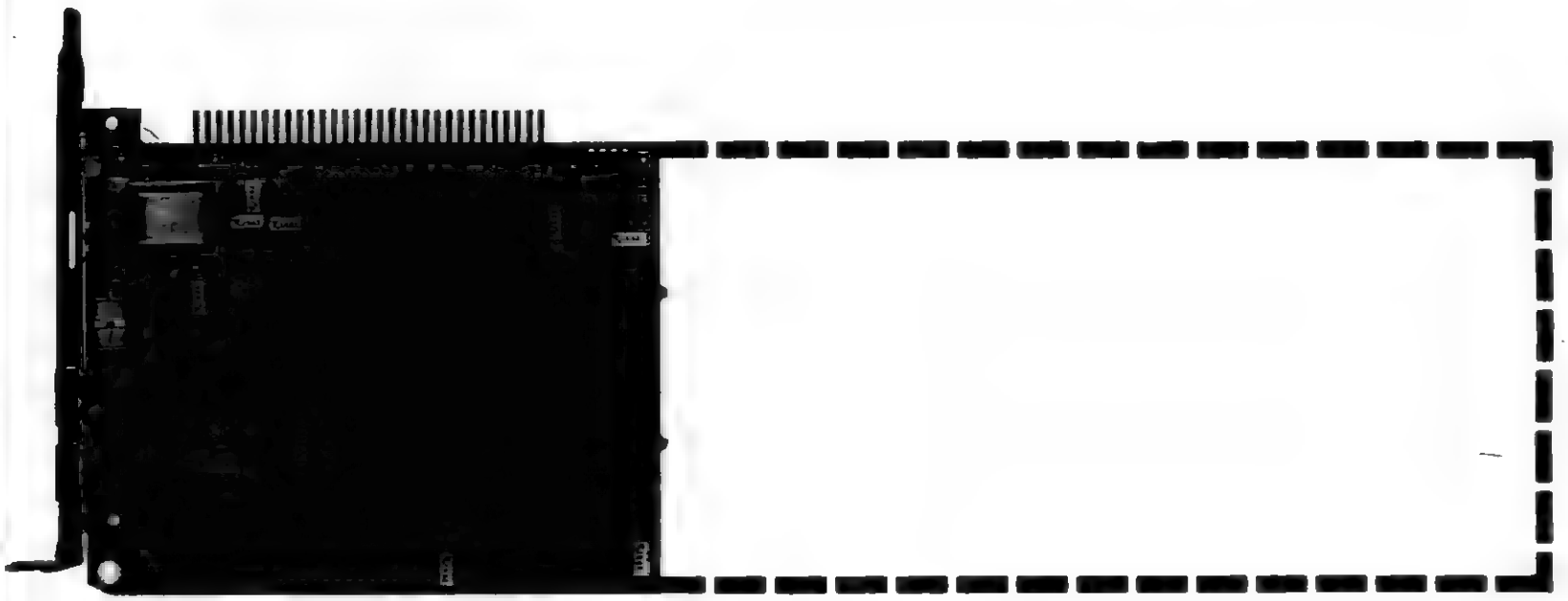
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actually holding the card. And even sophisticated callback modems are "easily defeated by any ex-telephone technician," notes George Rylander, president of Voxtron, Inc. of Braunfels, Texas. According to Rylander, savvy security managers are turning to biometrics as the solution to their problems.

The science of biometrics analyzes the set of physical characteristics that are unique to a person. This includes the person's retinal pattern, typing rhythms and pressure patterns, finger length, palm topography, fingerprints, signature and voice.

While vendors are conducting research in all of these areas, until recently the only biometric security devices available were the retinal scanners. While virtually foolproof, these systems are also extremely expensive. But Voxtron and others have now come out with voice-based security systems.

> ***Whether it is used to recognize human speech or heron screech, voice technology offers powerful tools for existing applications and building blocks for new ones.***

The Voxtron Veritron 1000 security system is based around TI's Business-Pro microcomputer. The computer is configured with a 21M-byte hard disk drive and a 1.2M-byte, 5¼-in. floppy drive. Voxtron adds a modified version of TI's TI-Speech board, which incorporates voice verification algorithms developed by George Doddington in 1974.

The Business-Pro also contains a board that controls all of the security points, whether they are locks on doors or power to a personal computer keyboard. A printer completes the central unit, which is connected by telephone lines to the security points — in most cases, locks on doors.

"When someone wishes to enter a given door," explains Rylander, "he first inputs a personal identification number [PIN] via the telephone handset. This isn't really security at all — at best very low-level security — but serves to tell the computer which voice templates to examine. After the PIN has been entered, the computer says a random phrase over the telephone and asks the person to repeat it.

"Veritron tries to verify the voice profile of the subject and, if necessary, asks him to repeat the phrase. If this doesn't pass, the computer asks to hear the phrase a final time."

In all, the Veritron checks seven voice profiles against the one in memory: each individual attempt, the sum of each pair of attempts and the sum of all three. If the subject checks out via voice profile and is allowed in that specific door, the Voxtron device sends a signal that opens the door.

If there is an attempted security breach, the Veritron 1000 can be instructed to set off different levels of alarm. The security manager can have the device call him on the telephone in the event of a breach, pipe the verbal alarm to a central loudspeaker or do nothing but record the attempt. The hard disk is large enough to record the security history for an eight-door (or eight-microcomputer) site as far back as eight months.

A second level of security guards the Veritron user against a security breach. The best-guarded port of entry is the Business-Pro itself. Anyone wishing to use the computer must undergo two separate verifications before being allowed on. The board that controls the doors and power flow to computers provides an invade-defeat circuit that automatically shuts down the area if someone attempts to cut the wires.

"Outside of the cooperative user, the only method I know of [to defeat the Veritron] — and of course we guard against it — is the digital reproduction of someone's voice," Rylander says.

"First of all, each time one of 10 phrases is selected randomly. If the client wishes a higher level of security, the computer asks for a string of digits in random order. While someone could have all the phrases and digits digitally recorded, they would require both a very

The new Diconix 150. At under four pounds,
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> ***'Outside of the cooperative user, the only method I know of [to defeat the Veritron] is the digital reproduction of someone's voice. While someone could have all the phrases and digits digitally recorded, he'd need a fine system and the ability to access digits randomly as fast as the computer spoke them.'***
>
> — George Rylander, Voxtron, Inc.

fine system and the ability to access digits in a random order as fast as the computer spoke them. And it's fast."

Handling variations

The Veritron can create a voice template for a user in as few as two phrases. The security manager can monitor the level of match that each user achieves against a given template and, if necessary, can supplement the template with additional phrases.

The Veritron tracks the user's voice each time a verification occurs and updates the voice profile.

Rylander gives an illustration: "If you have a cold on Monday morning, you probably caught the virus the previous week. The Veritron monitors the changes in your voice so that your hoarseness on Monday is easily understood. The problem comes when you screamed and hollered the night before and your voice is gone the next day."

If certain users have foreign accents or speech impediments, the security manager can adjust the level of voice match that they must attain or select a special phrase for their use. Or, as in the case of a beta test site in a Southern California foundry, the machine can query Hispanic users in their mother tongue of Spanish.

While Rylander expects a lot of business from government installations, the Veritron 1000 is targeted at the industrial and commercial markets.

"One French perfume company has a security budget of $1.2 million a year," Rylander points out. "While we in the U.S. don't think too much about it, industrial espionage is a major problem in this country."

Voxtron has several units in beta test, in sites ranging from New Mexico's Sandia Laboratories to the foundry in Southern California to the National Security Agency.

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> ***'Some people call voice recognition a toy. They used to say, "Gee Bob, what a lot of great toys you've got here." I take a lot of offense at that. You play with your toys. You make money with your tools.'***
>
> — Robert Newman, consultant

foundry has proven the most nettlesome problem to date. While the TI board operates in noise levels in excess of 95db, the human ear falters. "The hardest part is for the individual to hear the prompt, so we're installing amplifiers to increase the handset output," Rylander says.

As for the National Security Agency, he says, "Their sole intent is to break the system. They have equipment way beyond what anyone else has."

The Veritron 1000 is designed to control 16 phone handsets (entrance and egress through eight doors). Depending on the configuration, it comes completely installed for less than $50,000.

Another model, the Veritron 1200, will interface with currently installed card-key access systems so that the firm does not have to throw away a $100,000 investment.

Alternatively, the 1200 can control a bank of Veritron 1000s to secure as many as 256 locations.

Rylander acknowledges that his system is not foolproof. "Everybody has their price. Employees themselves are the oldest security problem there is." But the system offers many advantages, and he sees the product maintaining continuing sales appeal.

Software-based system

In 1983, James and Janet Baker of Dragon Systems, Inc. in Newton, Mass., provided a breakthrough in voice recognition with the release of an inexpensive board that performed high-quality speech recognition using only an analog-to-digital converter.

In the past, speech recognition devices were either hardware intensive and extremely expensive or based on inefficient algorithms and unreliable.

The Bakers, bringing highly complicated mathematics into the voice equation, produced a software-based system.

Biologists at the Woods Hole Oceanographic Institute in Woods Hole, Mass., are using similar software techniques for voice recognition — of animals. Professor Peter Tyack has recorded thousands of hours of whale and porpoise songs onto magnetic tape. Elsewhere at Woods Hole, graduate student Kurt Fristrap is analyzing tapes of bird song.

Using Fast Fourier transforms and pattern-matching algorithms, the two scientists hope to develop a vocabulary of whale and porpoise sounds and, in the words of Dr. Dolittle, "talk to the animals."

Woods Hole is one of the primary users of the Interactive Laboratory System (ILS) from Signal Technology, Inc., which uses the DEC VAX-based program and an analog-to-digital converter to capture the signal data. Woods Hole programmer Kurt Straube has designed a user-friendly front end for ILS that lets the marine-minded professionals worry about sandbars rather than space bars.

Whether it is used to recognize human speech or heron screech, voice technology offers users powerful tools for existing applications and building blocks for new, exciting ones. Those that said it would never work are constantly proven wrong, as innovative users continue to bring their products into the market.

Consultant Newman is adamant on the subject: "Some people call voice recognition a toy. They used to say, 'Gee Bob, what a lot of great toys you've got here.' I take a lot of offense at that. You play with your toys. You make money with your tools." ■



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In Depth

Taking the factory out of the office

What hampers progress toward the "Office Of The Future" is the machine mentality left over from the industrial age. Today's office should take shape according to principles and perspectives of the information age.

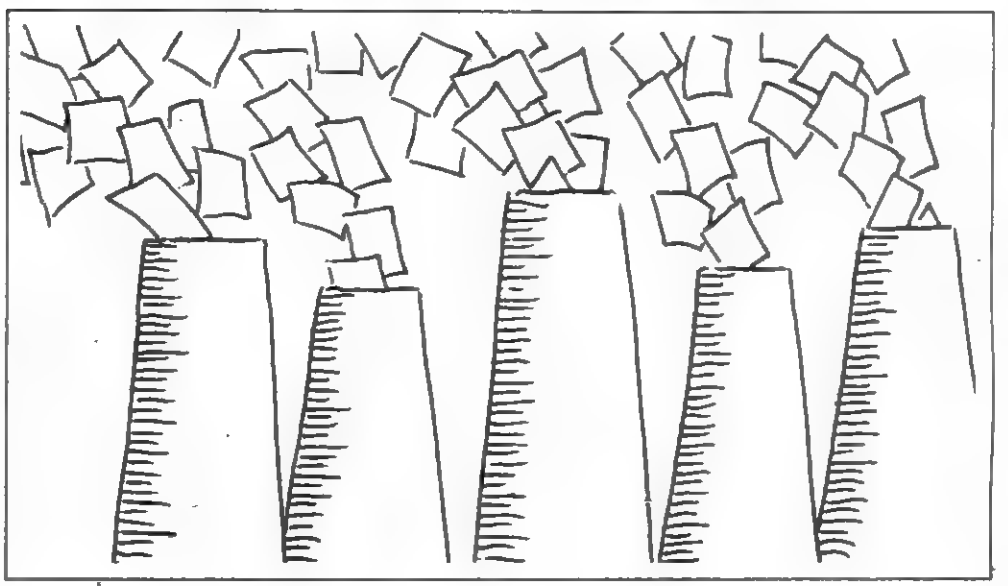


ILLUSTRATION BY P. CHARLES LADOUCEUR

By SAMUEL BLEECKER

American business has invested billions of dollars in computers and automated office equipment. Yet white-collar productivity declined in eight of the last nine quarters. Everyone seems to wonder why the computer revolution fizzled.

Where is the "Office Of The Future"? Why hasn't it helped?

True, computers speed paper flow. The automated office cranks out two, three, even four times the documents it once produced. The American Productivity Center reports that we in the U.S. churn out 370 million new business documents — backed by a stunning 1.9 billion pages of computer printouts — every single day.

New technologies stand poised to accelerate this pace further: The IBM 3800 printer knocks out 20,000 lines a minute — 576,000 pages a day, or enough output to lay down a daily paper trail 100 miles long.

But as former Xerox Corp. Vice-President Paul Strassmann notes in his book *Information Payoff: The Transformation of Work in the Electronic Age* (Free Press/Macmillan, New York, 1985), "If a secretary types 300 lines of mostly useless text per day, it does not follow that replacing the typewriter with a word processor capable of generating 3,000 mostly useless lines of text per day will be an improvement enhancing profitability of the firm."

Increased speed and what we measure as productivity seem not to be goals in themselves. If computers and automated processes do nothing but spawn new ways to speed paper around the office, the results will continue to disappoint.

From my perspective, I don't see the office of today transforming into the Office Of The Future by the abundant application of new technologies. In fact, I see the exclusive emphasis on technology as an anchor that may well sink us all.

Solutions to the wrong problems

The problems with creating the profitable workplace are not the incompatible technologies that make us gnash our teeth. The roots of the problem reach much deeper — back 250 years to the start of the industrial age, perhaps to 1733 with John Kay's patent of the flying shuttle, which revolutionized weaving and reduced the number of workers required.

Office organization derives from principles that simply do not apply to society today. The office today is organized like the factory — a factory in which the product is paper not pins or

---

Bleecker is director of The Innova Office, a year-long exhibition opening in Houston this September that demonstrates how well-designed, integrated offices contribute to productivity.

MITCHELL J. HAYES

Technology's changing targets

	Defining Technology	Strategic Resource	Transforming Resource	Product	Organizing Principle	View of Time	View of Progress	Machine Paradigm	Communication
Agricultural Age	Craftsman	Raw materials (seeds, water, soil)	Natural energy	Food	Seasons	Cyclical	Progress in history	Spindle	Conversation (transfer ideas locally)
Industrial Age	Clock	Capital (money)	Processed energy (coal, electricity)	Mass-produced items	Product design	Steadily onward	Perfectability of man and society	Heat engine	Face-to-face conference (transfer ideas by transporting people)
Information Age	Instruction-based system	Ideas (minds)	Synergy (minds working together)	Information	Inflow (information flow)	Multiplexed	Merger of man and machine	Organism (instruction-based machine)	Teleconference (transfer ideas by transmitting images)

In the industrial age, the best technology aimed at mass-producing items — beating the clock. In the information age, intelligent machines need to focus their power on creating ideas and synergy.

parasols. Since paper is the product of the office assembly line, the desire to exchange information on paper has directed the development of office design and technologies.

The modern office may be said to derive from the factory: With the production of salable product came the production of records and the employment of personnel related not directly to manufacturing but to office work.

But if we are seeking the solution to office problems in factory-modeled offices, we are hunting for the wrong key. Before we throw more technology at the problem of office efficiency and profitability, we should better determine the real product and purpose of today's office. Once that issue is settled, we can move swiftly from past to future.

Machine mentality

What hampers the step to the Office Of The Future is the heavy weight of industrial age perspectives that has embedded us in a machine mentality. According to futurist Alvin Toffler, the mechanical view of the world formed the foundation of what he refers to as the "factory civilization," in which we still labor as hostages — even in our modern offices:

"And this image of a simple, uniform, mechanical universe not only shaped the development of science, it also spilled over into many other fields. It influenced the framers of the Constitution to create a machine for governing, its checks and balances clicking like parts of a clock . . . and the dramatic spread of the factory civilization, with its vast clanking machines, its heroic engineering breakthroughs, the rise of the railroad, and the new industries such as textile, and auto, seemed merely to confirm the image of the universe as an engineer's Tinkertoy," (from Toffler's foreword to *Order Out of Chaos* by Nobel Laureate Ilya Prigogine and historian Isabelle Stengers, Bantam Books, Inc., New York, 1984).

People as accessories

Toffler might have added that the Tinkertoy culture carried from factory to office. The successful paradigm — the machine and the vast assembly line — cranked out the product in an endless stream. The assembly line accommodated the product. The design of the product determined the design of the production process and each element needed to produce it, including the design of the factory and all its machines.

Those who ran factories assembled people, machines and raw materials and processed energy in a single location for the exclusive purpose of manufacturing. The assembly line comprised a continuous stream where all the elements of production came to bear.

It was sequential, mostly linear, in process. A part arrived, a worker or machine engaged that part, in some way added value to it and moved it along the conveyor belt. Each element of the process sat in close proximity to the next element in the line. People aided machines. Where machines could not be designed to carry out the labor, people did.

But people were second choice to machines in carrying out tasks. In a time when productivity was measured by how quickly a unit product could be manufactured, man could not compete with a well-oiled machine. We measured profit simply: We took revenue to date and subtracted costs to date. It was all very neat, very machine-like.

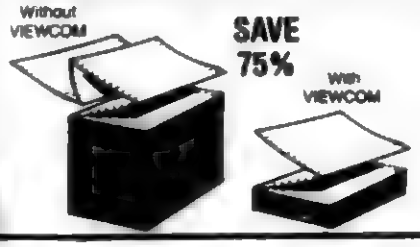
How we measured time, motion and place and, ultimately, how we defined productivity distinguished the factory culture from the agricultural culture that went before it. Each culture had its key innovation — what J. David Bolter, author of *Turing's Man* (University of North Carolina Press, Chapel Hill, N.C.,

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In Depth/Taking the Factory out of the Office

1984), calls the "defining technology" — which paced, even drove, the age (see chart page 94).

In the agricultural culture, the defining technology was the skilled craftsman, whether the skill was building furniture or growing food. In the industrial age, attention to the new defining technology, the clock, caused industrial age man to alter notions of progress and productivity. Wrote Bolter, "A craftsman may have had to work toward a deadline, but his tools were not measured by their output per unit time (a characteristic development of mechanical technology)."

Race the clock

Once the clock began ticking for industrial age man, he viewed the world in constant motion. The gears of machines spun, the engine pumped pistons, rotated belts, pulled levers and the assembly line kept pace. Measured against time, though, technical progress, economic growth, productivity and efficiency became quantifiable goals — measurable, refinable, perfectable as time went on.

In the industrial age, time did march on. In the agricultural age, time was cyclical — tied closely to the seasons. Planting, for example, generally could not happen in the middle of winter; sewing stopped in the dark of night.

But as mechanization took hold in the industrial age, we grew less dependent on the cycles. Assembly lines could work around the clock throughout the year. Time, once cyclical, now moved steadily onward.

Not constrained to "wait till tomorrow" or "hold till spring," factories in the industrial age saw the chance to get a jump on the future. By applying and refining technology, we could actually get ahead — produce more in a period of time than was possible before.

The industrial age also valued its resources differently from the agricultural age. In the agricultural age, the strategic resources were raw materials: seed, soil, water and the like. Abundant but unpredictable sunlight transformed these resources into food. In the industrial age, the strategic resource was capital and the engine of the economy was driven by cheap, processed energy.

But as Toffler notes: "Today . . . the Age of the Machine is screeching to a halt, if ages can screech — and ours certainly seems to. And the decline of the industrial age forces us to confront the painful limitations of the machine model of reality."

The limitations of which Toffler writes were primarily approached in the late 19th century when the success of the industrial age was already well assured.

Factories bustled, product spewed forth, but a dilemma arose: To maximize the enormous capital investment in machinery, the factories had to be kept at full production around the clock. More and more product exited the machine and entered the market. As the industrial revolution matured and the nation moved from scarcity to plenty, the problem was not so much how to manufacture more goods but how to sell them. So what if a factory could produce more — who would buy it all?

Enter marketing

As some observers note, this crossroad in history turned us from a manufacturing society toward a marketing society. Thus the managers, administrators, engineers, secretaries, bookkeepers and sales force grew in stature. No longer secondary in the factory process, they played increasingly important roles in that process.

For example, the ratio of administrative employees to production workers rose from 8.6% in 1907 to 20% in 1948.

At new, robot-controlled, fully automated production plants, the ratio is higher still in 1986 as mechanical "workers" replace more and more line employees.

As the significance of the office in the factory mounted, the office developed in the image of the successful factory model — more precisely, in the image of the factory assembly line in which every element in the process sat close to what came before and after.

The office model adopted the same notions of time — productivity, efficiency — and the importance of a centralized location where all machines and labor were gathered. The office, like the factory, was seen as a manifestation of physical space, not what Stanley Smith, president of AT&T's real estate division, calls "conceptual space" — where people contemplate and create.

The secretary sat in front of the administrator as the gateway for the paper product, very much like a machine that inspected the conveyor belt of bottles, rejecting those unsuitable and forwarding those that passed muster.

Aides to an administrator clustered around the administrator's office. And the offices of one department remained in close proximity to those with which they exchanged information.

Elusive measures

In the factory, the steps necessary to manufacture a product were tangible. An industrialist who wanted to improve the product called in an efficiency expert and together they shortened the production cycle, adding a few machines here and there, reducing the labor force and cutting the cost of production.

But in an office, not all that goes on is tangible. As Xerox's Strassmann notes in *Information Payoff*, "The closer one examines the details of office work, the less one knows what is going on."

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to a customer cannot be measured by the automated standards of the mechanical age. In fact, quality, not quantity, becomes the watchword. But quality must be judged, not measured.

The industrial age did just fine measuring the contributions of the workers. The machine was untiring and uncomplaining. Valued for speed and obedience, it was quantifiable and controllable. In this context, man was the imperfect machine, laboring to keep pace with metal; both were measured against the clock. Which proved to be a better laborer was determined by which put out more in less time for less resources invested. And that was called industrial productivity.

I do not mean to imply that ideas were not valued in the industrial age, only that ideas — information management, movement, storage, processing and retrieval — were valued in very few people. Smart workers did not necessarily produce more pins. So the mind was almost entirely ignored.

Today it is mind and not body that sits at the core of economy. Information is the currency or, as sociologist Daniel Bell would say, the "strategic resource." How well people understand is critical to the means of production. Knowledge workers are asked to inquire, to think, to gather information, and then to evaluate it, transform it, act upon it and communicate it.

Where indistinguishability of the work force powered the factory, individuality drives the new office. But how can we impartially measure the productivity of the mind, the impact of an idea, the value of a thought?

Clearly an idea is not like a cord of wood that burns predictably at so many calories per minute, because not all ideas are alike. To offer two ideas an hour may not be better than offering two a day or one a month. Chester Carlson, the inventor of xerography, proved the point. One idea in his lifetime was enough to create one of the world's largest industries.

In fact, the difficulty in measuring the value of a single idea or the productivity of the office worker has stifled automation in the workplace. How can the creative contributions, ideas and insights of office workers be automated?

Driven by Information

In the manufacturing process, office functions were not considered integral, and therefore they counted as overhead. And since they were "only" overhead, the factory concentrated upon automating the profit-producing assembly line, not the office.

This task often fell to outside entrepreneurs — Christopher Latham Sholes, for one, who patented the first commercial typewriter in 1868. Thus, automating the office naturally concentrated on what was common to all offices — not just the office work in a specific industry or specific department. In essence, early office automation meant automating how paper was produced.

The irony is that what is helping us dispense with the outdated machine model is itself a machine — the computer.

Computers enable us to transcend paper production to concentrate on the true product of the office: information and ideas.

> ***Managers may prefer to operate their offices like factories because of the comfort implied in the predictability of the factory organization.***

To free ourselves from the constraints of the factory civilization, therefore, we must organize the office around the flow of information, not around the flow of paper.

Flexibility

In an office driven by information, secretaries do not need to be near their bosses. Aides can be in the next room or they can be in the next country. We find new flexibility in office planning, because ideas are not restricted by location. Two people do not need to be near one another to improve a product that they can flash electronically around the globe in seconds.

If the office is organized around information flow ("inflow"), then the office worker can be viewed as enriching data while it flows through the organization. In effect, each office worker works as a kind of value-added reseller of information, taking it in, massaging it and passing it along.

Information flow in the office, however, is decidedly different from product flow in the factory. In the factory, every step of the production process was orchestrated like a massive symphony with each voice being heard at just the right moment.

Nothing in the manufacturing process was left to chance — or the serendipitous result of accident. The assembly line minimized chance, straining to overcome the individuality of craftsmen and the unpredictability of the seasons. Engineers hammered out every detail of production. So many bolts of fabric arrived at the stitcher no sooner — no later — than the mechanically ordained time.

In fact, the assembly line was a machine itself — a great mechanical beast nurtured in the minds of industrialists and engineers.

The machine was to be perfect,

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minimizing waste, maximizing profit. There was little margin for error; there was no room for surprises.

Serial vs. parallel

The entire effect of this great machine belching forth product was, for the most part, a serially organized process in which each element of the process was anticipated and accounted for.

But not so for the office. Knowledge workers thrive on spontaneity, flexibility. In the office, people share ideas, exchange information. Staff members go off in different directions to contemplate the particular problems that confront an economic engine that today runs with nearly three quarters of its work force in the service — not manufacturing — sector.

In fact, according to Malcolm S. Forbes, editor in chief of *Forbes* magazine, "Eighty percent of America's managerial and specialized professional employees are in service jobs — computers, legal, financial, health, insurance and so on."

Managers may prefer to operate their offices like factories because of the comfort implied in the predictability of the factory organization. In reality, though, people come up with creative thoughts as they have them, not as they are directed. These ideas can be encouraged, but they certainly cannot be orchestrated.

In addition, the products of today's office are not off-the-shelf solutions to clients' problems. Most companies pride themselves on customized approaches, on knowing how to get out of the tight spots with specialized expertise.

Therefore, in the office, pieces of the puzzle are acted upon simultaneously. People do not operate like machines; they tend to process information and assignments in parallel, interleaving bits of one problem with pieces of solutions to another. A study by psychologists reported in *The New York Times*, for example, shows that chief executive officers consider several alternatives simultaneously and do not make decisions in a serial, structured way.

A well-oiled office, therefore, is flexible where the factory was ordered, spontaneous where the factory was planned, parallel where the factory processed serially (see chart page 103).

New type of fuel

It took centuries to move from the agricultural into the industrial age. We moved from the industrial into the information age in decades.

In the agricultural age, time was cyclical. In the industrial age, time was linear — to "make time," we worked faster, expediting the process as best we could. In the information age, we multiplex time, accomplishing two or more things simultaneously.

In the agricultural age, the key transforming resource was sunlight: free, abundant, but unpredictable. In the industrial age, the key transforming resource was processed energy: cheap, plentiful, predictable. In the information age, the transforming resource is synergy, sharing resources and ideas to work toward solutions.

In the agricultural age, the strategic resource was raw material: seed, soil and water. In the industrial age, the strategic resource was capital used to build massive factories and assembly lines. In the information age, the strategic resource is the mind: ideas that fuel the economy.

The very nature of the "products" of the office of the future — ideas and information — holds vast promise for the development of companies in the coming decades: Information is a nondepletable resource. Sharing it does not diminish it; in fact, for the first time in history, the basis of our economic strength actually increases with use. As more people share ideas and information, we're all better off.

The rise of the new currency of ideas prompted authors John Naisbitt and Patricia Aburdene to suggest in *Re-inventing the Corporation* (Warner Books, New York, 1985) that the new labor force requires what might be called "through-life education."

To stay on top of their jobs, workers continuously need new information and the opportunity to sharpen their skills.

The consequence, note the authors, is a new alliance between business and education, with the corporation undertaking a larger share of lifetime learning. They write the following:

"*Today's educational system . . . was never meant to serve the needs of today's information society; it was custom made to fit the industrial society — a time when it made sense to treat everyone the same. Uniformity, control, centralization in the factory and in management were the ideals of industrial society. . . . Individuality, creativity, the ability to think for one's self — the values we treasure now — were hardly considered assets on the assembly line or even in the executive suite.*"

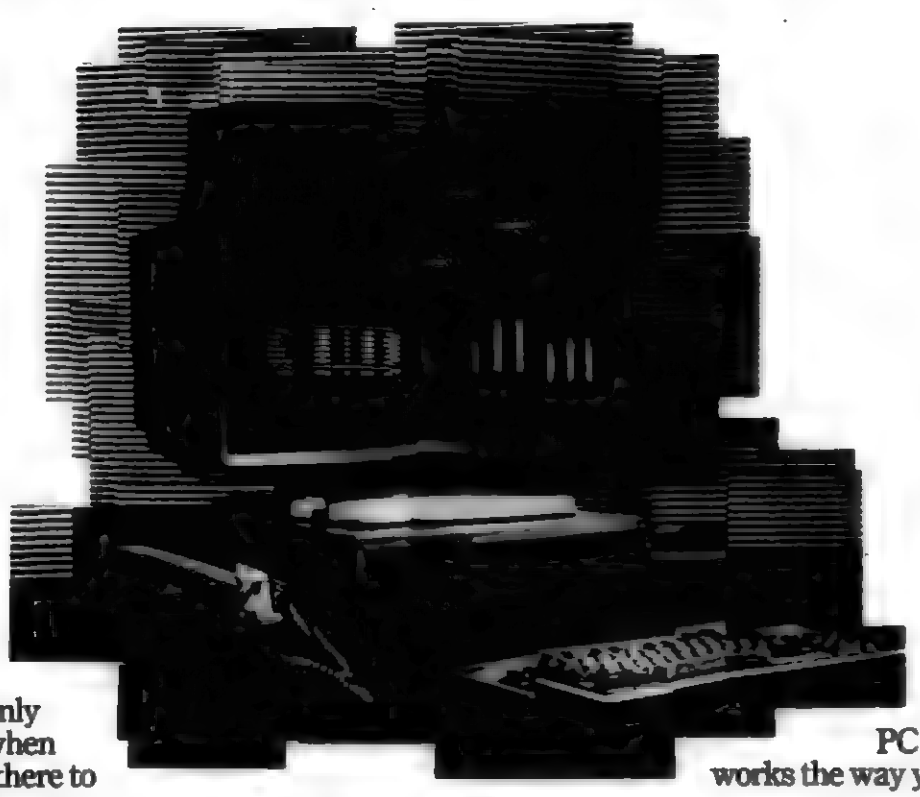
Since people — not machines — have ideas, it is people, in the new office society, who ought to be valued as the economic resource.

Enlightened organizations value their workers. As Harvard Business School Professor Robert H. Hayes suggests in a *New York Times* editorial (April 20, 1986): "In such organizations, everybody is assumed to be responsible for the organization's prosperity. Its success rests on its ability to exploit opportunities as they arise, its ingenuity, its capacity to learn, its determination and its persistence."

Companies often protect capital equipment with maintenance contracts, preventive maintenance programs and even specially developed environments that assure the assets' longevity. Does it make any less

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sense to protect our new economic resource — the people who work for us?

Responsiveness

The introduction of new, faster technology into the workplace has enabled factories to produce more in less time. And as time in the information age becomes multiplexed — as more and more begins happening at once — response time to stimuli becomes critical.

Just as temperature sensors indicate a buildup of heat in a nuclear reactor, so marketing sensors indicate a buildup of heat in the competitive marketplace, and companies need to respond quickly. Cycling memoranda up and back through a dense corporate hierarchy no longer yields answers soon enough when critical deadlines are set in terms of days or minutes instead of months or years.

In response to the quickened pace of technology and decision making, companies have streamlined the corporate ladder and shifted authority to a larger portion of the work force.

Thus, in situations where the office is styled after the factory model, corporations tend to have steep, pyramidal hierarchies.

In contrast, information age companies such as Intel Corp. and Apple Computer and the new artificial intelligence concerns housed in Boston's "AI row" tend to have flat organizational structures.

The desire or the necessity in the new office to process information in parallel to a large degree determines the steepness of the organizational chart. The farther we move away from the factory model, the closer we move toward the empowerment of all employees and the diminution of central authority.

According to Peter F. Drucker, in a column for *The Wall Street Journal*, June 4, 1985: "Traditional organization basically rests on command authority. The flow is from the top down. Information-based organizations rest on responsibility. The flow is circular: from the bottom up and then down again." When one large multinational company organized itself around information, it was able to delete 12 levels of unnecessary management.

Empowerment delegates to employees both responsibility and authority to act in particular circumstances. Employees on the line, in the best position to know what is going on, handle day-to-day decisions effectively and cost-efficiently.

Such delegation frees top management for other managerial chores and accords to jobs at all levels the characteristics cherished by the contemporary labor force: the ability, power and resources to exercise control over their own job responsibilities.

Instruction-directed systems

It may seem that computers are the catalysts in the transformation from the industrial to the information age. That is true — indirectly. But the real engines of change are the instruction-directed systems — the software that drives computers and other equipment.

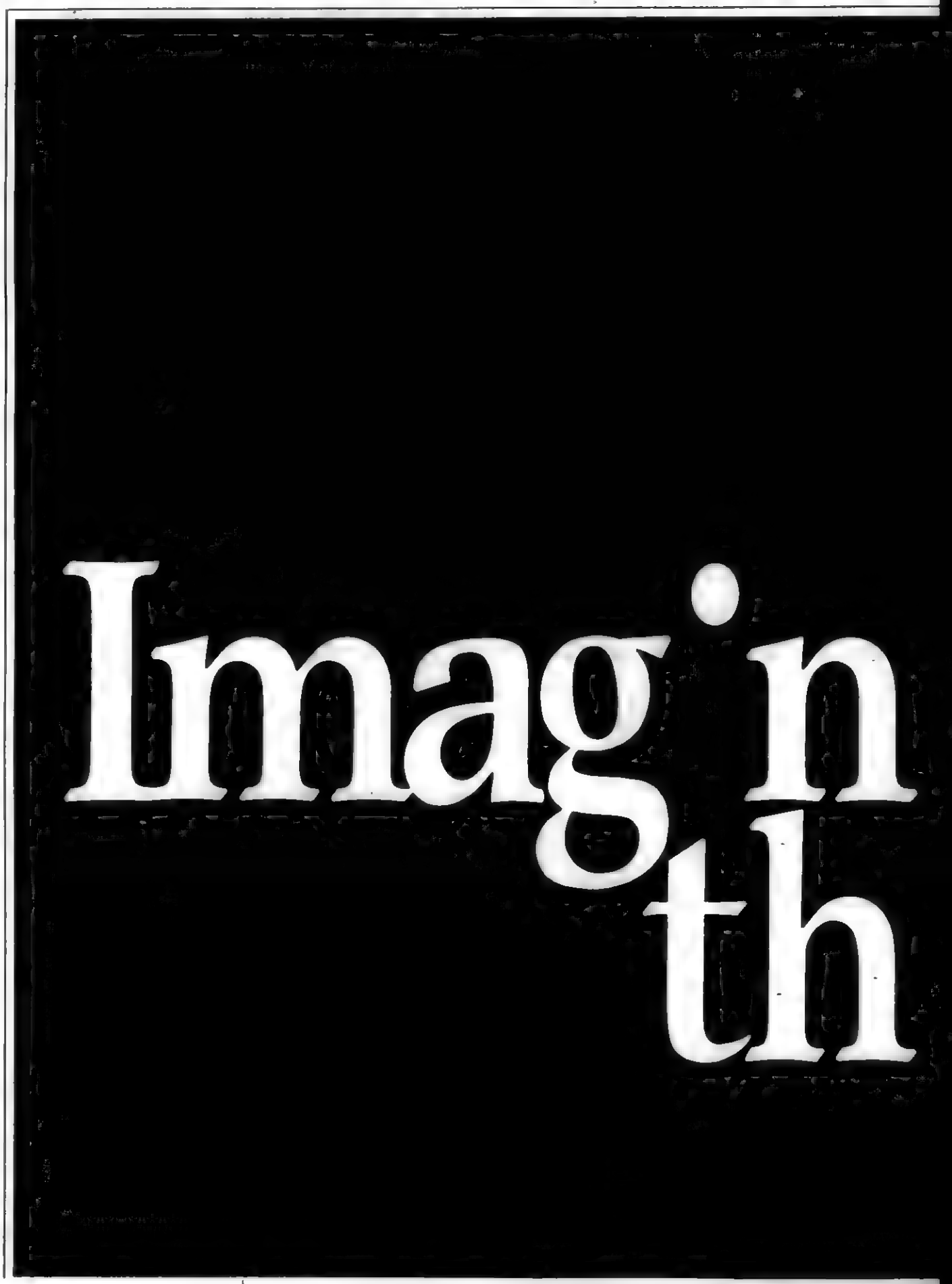
Without software or programs to run, the fastest, state-of-the-art supercomputer serves as little more than a costly silicon or gallium arsenide boat anchor.

But the roots of change reach deeper and wider still.

Two revolutions run parallel in our information age: the computer revolution and the genetic engineering revolution. Many view them as separate, but the basis for each is information.

Many biologists consider

> ***Wall Street politely says the industry is "experiencing a contraction." But the office revolution is not simply slowing down. It seeks a new, firmer footing, one grounded in a new perception of what office work is.***



organisms to be nothing but clothing for naked DNA, the genetic material of all cells. All instructions for developing an organism are contained in the brief genetic code formed from four fundamental nucleic acids.

Ultimately the future may point to the merger of man and machine. At the simplest level, this means that machines may have some intellectual attributes of man — the "thinking machines" expected by scientist Allan Turing by the year 2000.

At the highest level, microchip circuitry may be biologically based. A Dec. 31, 1984, *U.S. News & World Report* article proclaimed: "Visionary researchers are pursuing a tantalizing goal: to devise an electronic chip from organic products." These scientists will try to base new machines on self-replicating computer chips.

Already, research facilities such as AT&T Bell Laboratories seek to employ the structural properties of DNA, RNA and other proteins to serve as memory chips and switching devices for biologically based computer systems.

Science fiction writers envision that a new breed of man will emerge if and when the reverse comes true: Human minds incorporate computer capabilities.

Expert systems

In some ways, we may be ahead of Turing's schedule. Medicine in particular embraces artificial intelligence software, in the form of expert systems, as computerized aides. Because of their utility, expert systems also have invaded the robotized factory, the financial analyst's office and elsewhere.

The value of expert systems is twofold. First, they extend man's memory and speed. Second, artificial intelligence allows machines to work more the way people do. Machines can accommodate man instead of man accommodating machines.

Though the computer is the most recent installment of this marriage of man and machines, it is neither the last nor the most effective. The computer is helping us automate our work, reducing the time and tedium of doing repetitive tasks. It may go further in liberating us, helping us develop mechanical servants that speak, hear and ultimately understand.

This is why the computer plays such a unique and pivotal role in the development of the office and why it has been embraced and heralded as the messenger of a new age.

But in a sense, it is a case of mistaken identity. It is not that the computer is responsible for the new age, but rather that the computer allows us to break with an established and restrictive factory civilization.

We probably would have gone on praising the computer and its impact on the way we work had not the new age stumbled. Wall Street politely says the industry is "experiencing a contraction."

But the office revolution is not simply slowing down. It seeks a new, firmer footing, one grounded in a new perception of what office work is.

Machines that mimic people

In the information age, the computer has become an accessory to people, compared with the industrial age model of people as accessories to the machine. A long-standing conflict between man and machine has been who mimics whom.

With computers, we have some of the first instruments capable of working the way we do. In the office, executives spend more than 90% of their time communicating over the phone or at meetings. With digitized voice recognition and voice synthesis systems, computers, too, can be spoken to and listened to.

And, when artificially intelligent computers become commonplace, computers also will understand and do our bidding — by listening, not by our typing in commands.

In the realm of voice, our need to communicate orally pushed the development of the telephone over the telegraph. Had the telephone not amplified a convenient way of communicating, it would not have spawned a multibillion-dollar industry. People adopted the telephone because the telephone adapted to our way of working.

Currently, many executives will not engage computers productively, because computers do not bend to executives' ways of working. Instead, computers demand obedience to machine rules.

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Factory vs. office: Distinguishing features in work flow and organization

Factory	Office
Serial processing	Parallel processing
Physical space	Conceptual space
Preplanned	Spontaneous
Ordered	Flexible
Linear time	Multiplexed
Depletable resources	Nondepletable resources
Speedy processes	Customized processes
Quantity	Quality
Automated machinery	Intelligent machinery
Durable goods	Disposable goods
Steep pyramid office hierarchy	Flat hierarchy
Workers indistinguishable	Individuality
Central control	Empowerment
Productivity	Effectiveness
Processed energy	Mental energy
Accounting	Valuing
Specialization	Conceptualization

Modern offices are characterized by elements basically different from those of factories, yet many offices continue to function like highly automated paper factories.

the tool, that should be important. Powered by artificial intelligence, computers can become the kind of executive aide about which today's managers dream but generally get along without.

Contrary as it may seem, therefore, the organization of offices and office work is not driven by technology. New technologies will simply allow us to be more of who we are.

Six levels of understanding

What organizes the office then? Information flow.

Examination of office work demonstrates that people, to varying degrees depending upon job function, must be capable and efficient at one of six levels of "apprehension" — not in the sense of fear but in terms of perception of ideas.

A secretary, for example, does not merely answer the phone and take dictation. A secretary screens information: Is this call important? Should the executive be interrupted? Does the manager need this memo to make a decision?

A product manager evaluates a broad number of signals each day to make intelligent decisions. In announcing a new product, for example, a manager must collect information about the competition. What are they offering now and at what price? Can we beat it? What is the maximum number of units to be manufactured based on incomplete market surveys?

As we advance to executive levels, the strain of collecting and evaluating information rises exponentially. How, for example, will the national debt affect interest rates within one week, two months, five years? How does this affect plans for expansion, here and overseas? Will the political unrest in the Middle East jeopardize low oil prices?

In *The Cult of Information* (Pantheon Books, New York, 1986), technology critic Theodore Roszak warns that our fixation with the computer causes us to confuse "data" with "ideas" and "information" with "knowledge." In fact, there is a general confusion about how we apprehend the world and what precisely we do when we "manage information."

Over the centuries, individuals have tried to order human levels of understanding. Futurist Wilford Lewis conceived one such hierarchy, a version of which, shown below, models how work performed in an office — regardless of position or job title — requires processing at one or more of these levels of apprehension:

1. **Data** — unconnected numbers, dates, names and items that flood us daily. They can be seismic readings or even daily Dow Jones figures alone (unconnected to dates). Albany, macaw and 1776 are data.

2. **Facts** — connected data. When we combine daily Dow Jones quotes with dates we can obtain a picture. Albany is the capital of New York, a macaw is a bird and the American Revolution occurred in 1776 are examples of facts.

3. **Knowledge** — a particular assemblage of facts, providing firmer connective tissue among them. Knowledge can be taught; it can be acquired by going to school, where a student gains perspective on a range of issues related to a field of study. However, having knowledge of all parts of an engine does not, for example, guarantee that a mechanic can repair a car.

4. **Experience** — primarily gained from self-directed interactions with the real world. Experience broadens knowledge and gives it a richness unavailable through study alone. Experience internalizes knowledge; it takes time to acquire.

5. **Shared visions** — philosophical and emotional collective understandings founded in our universality, not our individuality. It is the stuff of leaders — people who are able to perceive the common denominator, the universal need. It is the motivating force that galvanizes organizations into action and gives them purpose.

6. **Epiphanies** — a level of apprehension that reaches beyond logic, even beyond intuition. It is an

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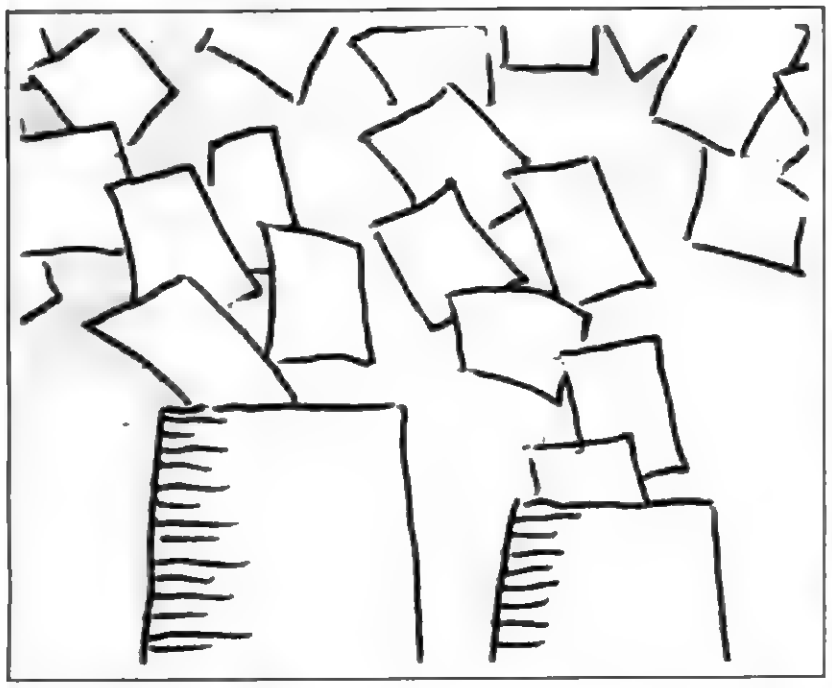
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understanding that comes to an individual rarely and in great flashes — a creative brilliance that sees beyond the immediate boundaries and strikes, as novelist Graham Greene says, "at the heart of the matter."

Moving to a higher level

Each of these levels of apprehension is transformed into a higher level by application of an organizing principle. Data becomes fact with order or association. Facts elevate to knowledge with synthesis. Knowledge transforms into experience with perspective. Shared vision transcends experience by application of a single unifying force or view of underlying principles. Epiphanies demand a supralogic to bring new insights into focus often without appeal to reason.

> ***Powered by AI, computers can become the kind of executive aide about which today's managers dream but generally get along without.***

It is the application of the organizing principle that demonstrates our skill. And it is the level of apprehension exercised at our job that primarily determines our function and status within an organization.

Individuals who collect and key data for medical forms or insurance claims, for example, require a low level of apprehension. Their interactions with other departments are limited, and training levels may be low. At peak times, hourly rated part-time employees may come in to augment the staff with little or no transition time.

On the other hand, individuals with experience bring higher levels of apprehension to the employer. Corporations often purposefully hire experienced individuals away from competitors.

The same is true of corporations. Leveraged buy-outs and purchases of critical suppliers by larger companies exemplify the accumulation of hard-earned, easier bought experience.

It seems the office, like the farm and factory before it, is a microcosm — a laboratory for new ideas and new technologies, for observing and in some cases controlling social, economic and philosophical changes. In the office, we can observe the world in transition.

Often, indications of change show first in our language, which early on accommodates the pressures of new technology. New words include "software," "robots," "expert systems," "RAM chips," even "user-friendly" to indicate machines taking halting steps toward working the way people do.

But most important for us, and for the economic well-being of the nation, the transition from factory to office is starting to reorganize the way we work. What the conflicts and upheavals in the office are suggesting today is that we need a new language to express our new perceptions of the forces at play.

A new language for a new age

Industrialists invented the language of the machine: "rate," "efficiency," "productivity," "specialization," "delegation," "accounting."

Perhaps the new language should eschew concepts such as depreciation that compensate for how much less value our assets represent as time goes on. Instead, we might apply appreciation factors to our real assets — our people — based on years of experience and increased levels of apprehension.

Wilford Lewis suggests alternatives that also reflect the new reorganization of the office. According to Lewis, we should speak not of productivity but of creative synthesis, not of physical space but of conceptual space, not of accounting but of valuing and not of processed energy but of mental energy. In this age of information management, we must redefine our concepts to recognize that a strong mind, not a strong back, rests at the root of our economic power.

People form the core of our economic wealth; they are the means of production. In the industrial age, people aided machines; today machines aid people. This shift is central to the most dramatic change in the history of production.

If we view the strategic and transforming resources of prior ages to be external to man, this is the first time in history that the strategic and transforming resources are internal and nondepletable: the human mind. We are no longer separated from the means of production. We are it.

In this new age, what should be most valued is the uniqueness of our knowledge workers and not the fact that they are replaceable cogs in the wheel of progress. Soon, when the mind is truly valued as the means of production, the boardroom will move to where the office is — wherever there is an active mind. ■

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MANAGEMENT



TAKING CHARGE
Roy N. Freed

Hiring lawyers: Caveat emptor

Businessmen must be alert to promotional legal hype by computer and high-tech lawyers as competition for clients heats up. For example, a lawyer admitted to practice in 1962 is reported to claim 25 years experience as a computer lawyer. Another lawyer is quoted as asserting in 1986 that he has just become "the nation's first information law attorney."

Unfortunately, it is no solution to select such legal help based solely on the prestige of a specific law firm. Lawyers must be chosen individually, with much care. The failure to do a proper job is an abdication of an executive's responsibility to his company.

Companies might need computer lawyers for a variety of matters: structuring sales, leases or licenses of computer equipment or software; establishing ownership of software, which is becoming increasingly valuable; minimizing taxes; and avoiding liability for harm from the use of computers. Poor legal advice on these matters can lead companies to spend money needlessly on avoidable contract disputes, to pay taxes not really due and to cover excessive liabilities or miss such coverage. Companies also might lose valuable property rights to which they are entitled, especially in software.

The legal problems of companies arise largely through a failure to recognize the true nature of transactions and other matters for legal purposes rather than sheer ignorance of the law. Many businessmen and lawyers tend to be-

See HIRING page 113

Freed practices computer law in Boston with the firm of Brown, Rudnick, Freed and Gesmer.

Weyerhaeuser branches out

Wood products giant sells in-house software, services

By David A. Ludlum

TACOMA, Wash. — The Weyerhaeuser Co., struggling against more diversified competitors with lower labor costs, hopes to harvest profits from its information systems unit by selling software and services to others.

Last year, Weyerhaeuser Information Systems (WIS), an in-house operation for 25 years of the wood products giant, began experimenting with outside sales. Since the beginning of this year it has operated as a profit center.

Top managers of the information systems unit have found that the move required something of a cultural revolution, with the importance of technological prowess taking a back seat to market savvy. "It's not necessarily whiz-bang technology but meeting customer needs; that's the change that you have to undergo," said Gary Crowell, the unit's director of marketing and new prodcuts.

So far, the results have been less than expected, but managers say they are still optimistic about the longer term.

WIS is selling minicomputer and mainframe software for manufacturing maintenance and tracking workers' compensation claims, both developed for in-house use, as well as a personal computer program that manages data on truck and rail rates.

WIS also offers disaster-recovery consulting and services, including a hot site with hardware from four vendors for maintaining critical operations. In the Northwest, WIS provides other services such as system planning and building, consulting in various areas, including telecommunications, and educational programs.

Weyerhaeuser, which lost the top spot in the forest products industry to Georgia-Pacific Corp. about 10 years ago, saw its net income fall 11.5% last year to $200.1 million. Revenue dipped to $5.2 billion from $5.5 billion in 1984.

The company, the major player in the wood products industry in the Northwest since 1900, owns six million acres of timberland, an area eight times the size of Rhode Island. In recent years, however, it has lost ground to Southern and Canadian

See WEYERHAEUSER page 112

Putting users to work (for you)

By David A. Ludlum

CAMBRIDGE, Mass. — After studying dispersed computer systems for more than 30 corporate sponsors, a partnership of consulting firms recommends information systems departments become more flexible to accommodate the systems' users.

"They have to adapt to a whole new environment that doesn't necessarily have the information systems function as the center of the computing universe," said Thomas Davenport, managing associate of Index Systems, Inc. in Cambridge, commenting on research his firm did with Hammer and Co., also of Cambridge.

Information systems managers worried about losing influence must look at that influence in new terms, Davenport said. "It's not just how many computers do you own or how many people do you have working for you, but what kind of impact does your presence have on the business," he said.

Through their Partnership for Research in Information Systems Management, the consulting firms studied 20 corporate departmental and work group computer systems put in place at the initiative of the users rather than the central information services unit. Half of the systems were developed in partnership with an information services unit.

The partnership and its research was sponsored by 34 major corporations, including Aetna Life and Casualty Co., Coca-Cola Co., Colgate-Palmolive Co. and Rockwell International Corp. Leaders of the research discussed the results at a press conference.

The study found strong or very strong demand for dispersed computer systems among 80% of the sponsors, with three-

See PUTTING page 114

INSIDE

Managers on the Move: Grumman Data Systems head to succeed corporate president/**106**

Calendar: Conferences, shows, seminars/**110**

INSTANT ANALYSIS

"Progressive information systems managers realized that end-user computing was going to happen with them or without them. And of course the smart thing to do when something is inevitable is not to fight it but to facilitate making it happen and take credit for it."

— James C. Wetherbe, director of the MIS Research Center and professor of MIS at the University of Minnesota

Raider of the lost Mark: Reclaiming a 1950 computer

Million-dollar Mark III was pushed out window

By Eddy Goldberg

BLACKSBURG, Va. — In January 1950, a million-dollar computer made the cover of *Time* magazine with the caption, "Mark III: Can Man Build Superman?" Six years later, the Mark III was unceremoniously dumped out of a second-floor window at the Naval Proving Ground in Dahlgren, Va., sold as scrap for $60 and remained lost to the world for 30 years.

"No one knew what had happened to the Mark III," said Dr. John A. N. Lee, a professor of computer science at Virginia Polytechnic Institute and State University and a vice-president of the Association of Computing Machinery. In early 1985, Lee tracked the computer to a farm near Fredericksburg, Va., by finding the daughter of Bill Slusher, the man who had bought it as scrap. Slusher, a computer operator at the Naval Lab, was an amateur radio and television hobbyist who used some of the parts, sold others and finally dumped the remains down the side of a hill, where they lay until Lee found them last year.

So far, Lee has found magnetic tape drives, two memory drums, relays, vacuum tubes, trays of components and a lot of cabling. He said the components are in surprisingly good condition, considering they have spent roughly 30 years in a ravine. Of a dozen tubes brought to an AT&T lab for identification, eight still work.

The Mark III was the third in a series of four computers built at Harvard University under the guidance of Howard Aiken. Completed in September 1949, it was delivered to the Navy in March 1950 for ballistics calculations. The million-dollar computer combined electronic and electromechanical technology and contained more than 5,000 vacuum tubes and 2,000 relays.

Lee called it a "typical monster that pretty well filled the room" in which it was housed, which was about 50- to 60-feet long and 30- to 40-feet wide. In fact, the Mark III was so big that, during construction of the Naval facility that housed the computer, a wall was left unfinished until after the machine was delivered. Lee said IBM's subsequent insistence that modules for its computers be designed to fit through standard doors and elevators might have arisen from incidents like this.

With a total data storage of 4,350 16-bit numbers, the Mark III had one of the largest memories of its time. It was the first computer to have magnetic drum memory, consisting of ferrous-oxide-coated cylinders that were the forerunners of the magnetic memory disks used today. Lee compared them to Edison's first phonograph, which used cylinders that were later replaced by flat phonograph records.

However, the Mark III reportedly suffered from reliability problems caused by components failing due

See RECLAIMING page 112

MANAGERS ON THE MOVE

John O'Brien, president of the Data Systems Division at Grumman Corp., based in Bethpage, N.Y., has been appointed executive vice-president of Grumman and is expected to become president of the company on Aug. 1.



John O'Brien

O'Brien is expected to succeed Grumman President George M. Skurla, who reaches the mandatory retirement age of 65 in July, the company said in a statement. Securities analysts have speculated O'Brien would then be in line to succeed Grumman Chairman John Bierwirth, who is 62.

O'Brien, 55, joined Grumman as a flight-test analyst in 1964 and was executive vice-president of the company's Grumman Aerospace subsidiary before being appointed president of the Data Systems Division.

In recent years Grumman has become more involved with defense electronics as well as computer services, areas that O'Brien has indicated he would stress. He could not be reached for comment.

In a statement, Bierwirth said that "John O'Brien's extensive experience in the aerospace business and his leadership in setting Data Systems on a path of sales and earnings growth make him well qualified to lead Grumman during the coming years of change and growth."

O'Brien is succeeded by **Robert J. Myers**, senior vice-president and head of Grumman's Services Division, which provides legal and administrative services to the corporation. Myers was previously with Grumman Aerospace.

Grumman Data Systems Division, which began as an internal corporate operation, is a large-scale systems integrator whose specialties include government defense work, engineering and scientific systems and manufacturing.

The Data Systems Division is also involved with data base publishing, systems maintenance and education. It was formed as a subsidiary in 1970 and became a division through a restructuring of the company last year.

With 38 offices nationwide and about 2,800 employees, the Data Systems Division accounted for about $245 million of Grumman's $3 billion in revenue last year. The Data Systems Division is considered profitable and growing.

"It's doing well. It stands out in a sense that it is profitable, whereas many other defense firms' data systems subsidiaries are not," said Wolfgang Demisch, a defense industry analyst with First Boston Corp.



Wayne Glenny

■

Wayne R. Glenny has joined the Bionetics Corp. of Hampton, Va., as vice-president of administrative services. Among other duties, he will be responsible for management information systems. Bionetics and its subsidiary, Mercury Consolidated, Inc., provide a range of technical services to the federal government and private industry.

■

Arthur L. Kern Jr. has been appointed director of management information systems with Philips Industries, Inc. in Dayton, Ohio. Kern previously served in several positions at NL Industries, Inc. in Houston, most recently as manager of consulting services.

■

G. Geoffrey Wood has been named systems development consultant in the data services department of the U.S. branch of Zurich Insurance Co., a member of the Zurich-American Insurance Group of Schaumburg, Ill. Wood is responsible for integrating premium and loss statistical data for management reporting purposes.

■

Tina M. Kern has been promoted to personal computer support specialist at Keller-Crescent Co., an Evansville, Ind., advertising agency.

■

Appleton Papers Inc. of Appleton, Wis., has restructured its information services department. Vice-President John L. Tucker said the change provides for specialization and additional management. It reflects the creation of a new data center and use of a new IBM mainframe, he added.

Richard H. Duchaine, formerly manager of management information systems, has been named director of information services. **Kathleen S. Coles**, formerly staff analyst/programmer, has been promoted to manager of planning and administration. **Dennis L. Riley** has been hired as manager of major systems development. **Daniel L. Kopetsky** has been hired as manager of telecommunications and personal computing. All four report to Tucker.

Also hired was **Calvin A. Frederickson**, manager of computer operations. **Robert T. Reilly**, former manager of developmental systems, and **James C. Novak**, former manager of developmental systems/central applications, have been promoted to managers of systems development and production support.

Bert L. Wiegand, former project leader/technical support, was promoted to manager of data base administration and development support. **Christopher C. Wyman**, former manager of data processing operations, was named operational systems support supervisor.

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CALENDAR

WEEK OF JUNE 22

JUNE 22-27, PHILADELPHIA — **Management Information Systems for Strategic Advantage.** Contact: The Registrar, Office of Executive Education, 200 Vance Hall, The Wharton School of the University of Pennsylvania, Philadelphia, Pa. 19104.

JUNE 23-24, NEW YORK — **Applying Information Technology for Competitive Advantage.** Contact: Frank Lesh, Information Management Perspective, Inc., Suite 208, 5 Elm Row, New Brunswick, N.J. 08901.

JUNE 23-25, ALBUQUERQUE, N.M. — **Integrated Fiber-Optic Technology Training.** Contact: Linda Castle, Optoelectronic System Consultants, P.O. Box 35525, Albuquerque, N.M. 87176.

JUNE 23-25, MIAMI — **Electronic Data Processing Auditors Association 14th Annual International Conference.** Contact: EDPAA, P.O. Box 88180, Carol Stream, Ill. 60188.

JUNE 23-26, BOSTON — **ATE East '86.** Contact: Registrar, Morgan-Grampian Expositions Group, 1060 Commonwealth Ave., Boston, Mass. 02215.

JUNE 23-26, BOSTON — **Pick/Basic Programming Workshop for Beginning Pick Programmers.** Contact: Pick System Educational Series, JES & Associates, P.O. Box 19274, Irvine, Calif. 92713.

JUNE 23-27, AMSTERDAM — **Fourth Annual European Fiber-Optic Communications and Local-Area Networks Exposition.** Contact: Cheryl MacDonald, Information Gatekeepers, 214 Harvard Ave., Boston, Mass. 02134.

JUNE 23-27, CAMBRIDGE, MASS. — **Managerial Planning for the Security and Privacy of Contemporary Computer and Telecommunications Systems.** Contact: Prof. Gary Marx, Department of Urban Studies and Planning, MIT, 77 Massachusetts Ave., Cambridge, Mass. 02139.

JUNE 23-27, CHICAGO — **A/E/C Systems '86: The Computer and Management Show for the Design and Construction Industry.** Contact: Conference Director, A/E/C Systems '86, P.O. Box 11318, Newington, Conn. 06111.

JUNE 24-26, CHICAGO — **Structured Techniques Association III/Structured Techniques in the Eighties: Practice and Prospects.** Contact: Mary Anne Gabriel, Heller Financial Corp., 105 W. Adams St., Chicago, Ill. 60603.

JUNE 24-27, CHICAGO — **Autocad Expo '86.** Contact: William Ryan, Autocad Expo '86, Autodesk, Inc., 2320 Marinship Way, Sausalito, Calif. 94965.

JUNE 24-27, SAUSALITO, CALIF. — **Autocad Expo '86.** Contact: Autocad Expo '86, 2320 Marinship Way, Sausalito, Calif. 94965.

JUNE 25, CHICAGO — **International Facility Management Association's Computer Applications for Facility Management.** Contact: IFMA, Suite 1410, 11 Greenway Plaza, Houston, Texas 77046.

JUNE 25, NEW YORK — **Regression Testing of CICS Applications.** Contact: Teltech CICS Users Group, Telecommunications Technology Corp., 39 Broadway, New York, N.Y. 10006.

JUNE 25, SAN FRANCISCO — **NATA — West.** Contact: Karen Palermo, North American Telecommunications Association, 2000 M St. N.W., Washington. D.C. 20036.

JUNE 25-26, COATESVILLE, PA. — **Chester County Expo '86: CAD/CAM Conference from Micro to Mini.** Contact: Lee Smith, Central Chester County Vocational Technical School, 1635 E. Lincoln Highway, Coatesville, Pa. 19320.

JUNE 25-27, SAN FRANCISCO — **Repositioning Your Company For Success in a Rapidly Changing Marketplace.** Contact: Competitive Telecommunications Association, 120 Maryland Ave. N.E., Washington, D.C. 20002.

JUNE 27, BOSTON — **System Maintenance Workshop for Pick Software Maintenance Personnel.** Contact: Pick System Educational Series, JES & Associates, P.O. Box 19274, Irvine, Calif. 92713

WEEK OF JUNE 29

JULY 2-3, LAS VEGAS — **Fall Meeting of the Design Automation Standards Subcommittee.** Contact: Ron Waxman, Design Automation Standards Subcommitee Co-Chairman, IBM FSD, 9500 Godwin Drive, Manassas, Va. 22110.

WEEK OF JULY 6

JULY 7-9, WASHINGTON, D.C. — **Deregulated Centrex vs. PBX.** Contact: Telestrategies, Suite 100, 1355 Beverly Road, McLean, Va. 22101.

JULY 8-11, COLUMBIA, MD. — **The Technical Manager in a Changing Environment.** Contact: Continuing Education Institute, Suite 102, 21250 Califa St., Woodland Hills, Calif. 91367.

JULY 9-10, NEW YORK — **Online: The Information Connection.** Contact: The Information Systems & Technology Division of the American Management Association, 135 W. 50th St., New York, N.Y. 10020.

JULY 9-11, NEW YORK — **The Fourth Annual PC Expo.** Contact: PC Expo, P.O. Box 1026, Englewood Cliffs, N.J. 07632.

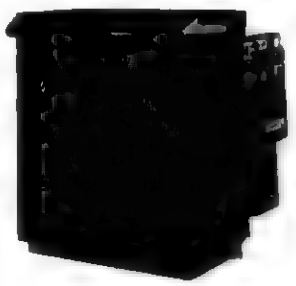
JULY 10-11, LOS ANGELES — **Knowledge Engineering.** Contact: Education Foundation of the Data

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Processing Management Association Seminars, Dept. KE, P.O. Box 3608, 3420 Kashiwa St., Torrance, Calif. 90510.

WEEK OF JULY 13

JULY 13-18, CHICAGO — **Guide 65.** Contact: Guide International Corp., 111 E. Wacker Drive, Chicago, Ill. 60601.

JULY 14-17, BOSTON — **Software Trends for Executive Planning and Strategy.** Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

JULY 16-18, WASHINGTON, D.C. — **SNA Architecture and Implementation Seminar.** Contact: Communications Solutions, Inc., 92 S. Saratoga-Sunnyvale Road, San Jose, Calif. 95129.

JULY 17-18, PALO ALTO, CALIF. — **CD-ROM Product Development: What Does It Take?** Contact: Information Industry Association, Suite 800, 555 New Jersey Ave. N.W., Washington, D.C. 20001.

WEEK OF JULY 20

JULY 20-23, TORONTO — **Directions at Toronto.** Contact: Cincom Systems, Inc., 2300 Montana Ave., Cincinnati, Ohio 45211.

JULY 21-22, SAN JOSE, CALIF. — **Computer-Aided Logistics Support.** Contact: Education Foundation of the Data Processing Management Association Seminars, Dept. CALS, P.O. Box 3608, 3420 Kashiwa St., Torrance, Calif. 90510. Also being held July 24-25 in Los Angeles.

JULY 23-25, BOSTON — **Microtrends '86, Education: Redirecting the Revolution.** Contact: Bobbi Hunt, International Communications Industries Association, 3150 Spring St., Fairfax, Va. 22031.

JULY 23-25, MORRISTOWN, N.J. — **Data Communications: Fundamentals and Beyond.** Contact: The American Institute, Carnegie Building, 55 Main St., Madison, N.J. 07940. Also being held July 30 to August 1 in Los Angeles; August 6-8 in Anchorage, Alaska, and August 13-15 in Boston.

JULY 24-25, ATLANTIC CITY — **Integrated Logistics Support.** Contact: TTS Seminars, c/o Technology Training Corp., Dept. ILS/LSA, P.O. Box 3608, 3420 Kashiwa St., Torrance, Calif. 90510. Also being held July 28-29 in Orlando, Fla., and July 31 to August 1 in Washington, D.C.

JULY 24-25, SAN FRANCISCO — **Advanced Communications Architectures Seminar.** Contact: Communications Solutions, Inc., 992 S. Saratoga-Sunnyvale Road, San Jose, Calif. 95129. Also being held August 19-20 in Washington, D.C.

JULY 24-25, WASHINGTON, D.C. — **EDI Training Session.** Contact: TDCC, 1101 17th St. N.W., Washington, D.C. 20036. Also being held August 21-22 and September 25-26 in Arlington, Va.

WEEK OF JULY 27

JULY 27-30, BOSTON — **Recognition Technologies Users Association Forum '86 Summer Session.** Contact: Recognition Technologies Users Association, P.O. Box 2016, Manchester Center, Vt. 05255.

JULY 27-31, ANAHEIM, CALIF. — **Third Annual Information Center Conference & Exposition.** Contact: Information Center Conference & Exposition, Weingarten Publications, Inc., 38 Chauncy St., Boston, Mass. 02111.

JULY 28-29, AVON, COLO. — **How to Manage Data and Information as a Resource.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

JULY 28-29, BOSTON — **Fast Algorithms Seminar.** Contact: Technology Training Corp. Seminars, Dept. FA, P.O. Box 3608, 3420 Kashiwa St., Torrance, Calif. 90510. Also being held July 31 to August 1 in Orlando, Fla., and August 4-5 in Washington, D.C.

JULY 28-30, RENO, NEV. — **1986 Summer Computer Simulation Conference.** Contact: The Society for Computer Simulation, P.O. Box 17900, San Diego, Calif. 92117.

JULY 28-AUGUST 1, SAN DIEGO — **Mapper Installation, Coordination and Support.** Contact: Compumetrics Training Institute, P.O. Box 58383, Houston, Texas 77258.

JULY 28-AUGUST 1, SEATTLE — **Omnicom Week.** Contact: The Omnicom Institute, Omnicom, Inc., Suite 304, 501 Church St. N.E., Vienna, Va. 22180.

JULY 30-AUGUST 1, AVON, COLO. — **How to Build and Use a Data and Information Resource Directory.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

WEEK OF AUG. 3

AUGUST 4-8, ANN ARBOR, MICH. — **Contemporary Data Communication Networks: Planning, Management and Computer-Based Design.** Contact: Engineering Summer Conferences, 300 Chrysler Center/N. Campus, Ann Arbor, Mich. 48109.

AUGUST 4-8, FORT COLLINS, COLO. — **Topics in Manufacturing Systems Engineering.** Contact: National Technological University, P.O. Box 700, 601 S. Howes St., Fort Collins, Colo. 80522.

WEEK OF AUG. 10

AUGUST 11-14, SNOWMASS, COLO. — **AM/FM International Ninth Annual Conference.** Contact: AM/FM International, Suite 820, 8775 E. Orchard Road, Englewood, Colo. 80111.

AUGUST 11-15, PHILADELPHIA — **AAAI-86 Fifth National Confernece on Artificial Intelligence.** Contact: AAAI-86, The American Association for Artificial Intelligence, 445 Burgess Drive, Menlo Park, Calif. 94025.

AUGUST 14, ATLANTA — **Buying and Selling Rights to Software, Hardware and Services.** Contact: Data-Tech Institute, Lakeview Plaza, P.O. Box 2429, Clifton, N.J. 07015. Also being held August 15 in Philadelphia, August 18 in Boston and August 19 in Chicago.

WEEK OF AUG. 17

AUGUST 18-22, DALLAS — **Thirteenth Annual Conference on Computer Graphics and Interactive Techniques.** Contact: SIGGRAPH '86, Conference Management, Smith, Bucklin & Associates, Inc., 111 E. Wacker Drive, Chicago, Ill. 60601.

AUGUST 18-22, WALTHAM, MASS. — **The Institute on Artificial Intelligence and Expert Systems.** Contact: Joan Merrick, Seminar Coordination Office, Suite 415, 850 Boylston St., Chestnut Hill, Mass. 02167.

AUGUST 19-20, NEW YORK — **DEC: The Next Five Years.** Contact: The Yankee Group, Seminar Division, 14th Floor, 89 Broad St., Boston, Mass. 02110.

AUGUST 19-21, PHILADELPHIA — **Second Annual Physical and Electronic Security Symposium and Exposition.** Contact: Michael C. Otten, Booz, Allen and Hamilton, Inc., 4330 East-West Highway, Bethesda, Md. 20814.

WEEK OF AUG. 24

AUGUST 26-28, SAN MATEO, CALIF. — **Interconnect '86.** Contact: Agnes M. Pavel, Program Director, U.S. Telecommunications Suppliers Association, Suite 1618, 333 N. Michigan Ave., Chicago, Ill. 60601.

See CALENDAR page 112

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CALENDAR from page 111

WEEK OF AUG. 31

SEPTEMBER 1-5, DUBLIN — **International Federation for Information Processing Congress '86.** Contact: International Federation for Information Processing Congress '86, 44 Northumberland Road, Dublin 4, Ireland.

SEPTEMBER 2-5, CHICAGO — **Fourth Annual Office Automation Society International Conference.** Contact: Sue Pickard, OASI, Suite B, 15269 Mimosa Trail, Dumfries, Va. 22026.

SEPTEMBER 3-5, LOS ANGELES — **Telemarketing/West.** Contact: Doug Shreve, The Telemarketing Foundation, Inc., P.O. Box 829, Arnold, Md. 21012.

WEEK OF SEPT. 7

SEPTEMBER 8-10, PHILADELPHIA — **NCC — Telecommunications Conference.** Contact: NCC-Telecommunications, American Federation of Information Processing Societies, 1899 Preston White Drive, Reston, Va. 22091.

SEPTEMBER 8-18, MONTREAL — **43rd FID Conference and Congress.** Contact: FID 43rd Conference and Congress, C.P. 1144, Succursale Place Desjardins, Montreal, Que., Canada H5B 1B3.

SEPTEMBER 9-12, ANTWERP, BELGIUM — Second European Simulation Congress. Contact: The Society for Computer Simulation, c/o Ghislain C. Vansteenkiste, University of Ghent, Coupure Links 653, B-9000 Ghent, Belgium.

Reclaiming the lost Mark III

From page 105

to the repeated heating and cooling when the machine was switched off over the weekend.

In 1956, it was replaced by an IBM Naval Ordinance Research Computer (NORC). The NORC was the supercomputer of its time, according to Lee, who is also on the editorial board of the *Annals of the History of Computing* of the American Federation of Information Processing Societies (AFIPS).

Lee says that the recovery of the Mark III is only partly completed and that he has a problem: The new owner of the property wants to build a house near the Mark III site this coming fall.

"If we don't get it out by fall, it will almost certainly be covered over or hauled off to another dump," he said.

Lee has been joined by two computer science faculty members from nearby Mary Washington College in Fredericksburg, Va., and he has also received a $1,000 grant for his project from AFIPS.

May not be in time

But he is still concerned that doing this time-consuming job on weekends and odd evenings at his own expense will not be fast enough to save the Mark III.

Even if he succeeds, he does not know where he would put the pieces. The Mark I and Mark II are in the Smithsonian Institution, which reportedly cannot take the Mark III but is considering the creation of a display at the site, Lee said.

He also contacted The Computer Museum in Boston, which he said is interested in acquiring some of the parts.



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Issue: August 20 - Closing: July 11

COMPUTERWORLD FOCUS

We put the hottest issues of the day in focus.

Weyerhaeuser branches out

From page 105

operations, many of which have cheaper, nonunion labor.

The move to generate profits from information technology stemmed in part from a drive to improve in-house services through greater local autonomy, according to Frank Guthrie, general manager of WIS.

"We recognized that we had unique skills and resources and that we could do a better job if we were to operate in a business context rather than a staff organization," Guthrie said. The view was shared by the executive vice-president who oversees WIS and other top managers, he added.

The drive for efficiency has resulted in a noticeable reduction in costs, he said. "Now we have to have a customer for everything we do. We have to understand why we are doing something," Guthrie said.

Plans for revenue from outside sales

On the income side, WIS, which charges Weyerhaeuser users, plans to get about 10% of its revenue for this year from outside sales, Guthrie said. That is less than called for in initial projections, which Guthrie now calls overly aggressive. "We are lagging our growth curve, but the growth is there. It's probably at a logical rate, as best as one can expect," he said.

WIS has moved to market-based pricing. "It's hard to get it in your mind that you're not figuring out what it cost," Guthrie said.

The information systems unit, which employs about 400 people, plans to meet its initial goal of breaking even this year or to "go down trying," but it has plans to move well beyond breaking even next year, according to Guthrie.

Looking further ahead, WIS aims to generate 50% of its revenue from outside sales within five years, Guthrie said. He declined to discuss future products except to say that there will be more application packages.

Hiring lawyers: Caveat emptor

From page 105

lieve incorrectly that computer technology creates new legal issues because the technology is novel and complex. That misperception is fostered in part by the technical jargon used by computer specialists.

Actually, computers generally are used to do things people have been doing all along, such as bookkeeping, controlling inventory and processing transactions. Hence, computer functions are not novel for most legal purposes; existing laws apply to them, with wise interpretation. It is diversionary and needlessly costly to advocate new laws tailored specially for computer subject matter; the real challenge for businessmen and lawyers is to see how computer uses and transactions might be covered by existing laws.

That frequently requires the ability to discover broader scopes in some existing laws than were recognized before computers existed. For example, integrated circuit chip elements called "read-only memories" are as copyrightable as books because their functions are similar, not because of the words in a statute.

Businessmen need the same protection for transactions and functions involving computers that they needed for those matters before computers were applied to them. For example, they must get ownership of properties created at their expense, particularly software. That requires an understanding of what the software comprises for legal purposes, which might involve copyrights, trade secrets, patents or items of tangible personal property.

Selecting the correct type of property interest is essential for determining proper tax treatments of expenditures to create or acquire the software and income from marketing it and also possible liabilities to persons who suffer harm from its use.

Liability becomes increasingly significant as computers are used in functions from which harm might result, such as operating factories and machine tools, conducting bank transactions, controlling aircraft and performing medical operations. Businessmen must even know how software can be involved as collateral security for their companies' loans. Again, it is necessary to know exactly what types of property interests are involved.

> ***The real challenge is to see how computer uses and transactions might be covered by existing laws.***

Businessmen must find lawyers who first and foremost can understand the factual aspects of computer transactions and properties for legal purposes. Of course, the lawyers also must have the basic ability to identify the wide variety of applicable questions correctly and to devise and present legal arguments for their clients effectively.

Businessmen should find a way to determine that their lawyers can integrate facts regarding computer uses and transactions with existing legal rules by generalizing to find the real, broadened scopes of those rules within acceptable public policy.

Such a lawyer must be able to cut through the technical complexities that computer specialists present in order to find the real subject matter for legal purposes. Also, lawyers should not insist that the rules of law are out of date for today's technology. They should know how to apply those rules to that technology wisely.

In order to judge the skills of their potential lawyers, businessmen themselves must have some sense of the nature of the factual aspects of computer technology for legal purposes. Articles and books are available to help them get that sense, but they must be able to weed out the few good resources from the many poor ones.

Businessmen should conduct investigations of their potential legal talent not only by patient, searching oral inquiry but also by reviewing the candidate's legal articles and even actual agreements and other pertinent materials prepared for other clients.

In the investigation, the material should be examined for its literary quality. Agreements should be grammatical and understandable. Merely writing articles is not evidence of real understanding. Much legal literature on computer law is seriously deficient. Articles should be professional and accurate both factually and legally.

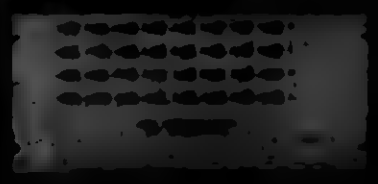
Candidates also should be asked about their participation in professional associations and educational activities that involve computer law, such as the Computer Law Association or the Computer Law Division of the American Bar Association's Section of Science and Technology.

Those organizations and many others conduct continuing professional education programs on the subject. It is appropriate to attend a lecture given by the potential lawyer. It is not unreasonable to subject candidates to a searching review along these lines.

Because computer acquisition and use involve legal questions in practically all fields of law, a good computer lawyer must be a versatile general corporate lawyer. Rarely can individual legal questions involving that technology be handled in isolation.

More often, a number of related questions in various fields arise simultaneously, such as intellectual property, taxes and liability for potential harm, and their answers must be integrated. Hence, such a lawyer must have a working knowledge of apparently diverse legal fields in order to at least identify pertinent questions if not to answer them as well. It turns out that a good computer lawyer must be a superb generalist.

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MANAGEMENT

Putting users to work (for you)

From page 105

fourths of the demand due to a perception of unsatisfactory performance by the central information services organization. The dissatisfaction stemmed from a desire for faster delivery, tailored quality rather than uniform standards and access and control of the system, the research found.

Looking to the future, half the departmental users indicated they would set up their own information services units, and more than one-third said they would take some steps in that direction. "It's getting to be a pretty common thing, kind of a creeping sort of thing," Davenport noted. Spokesmen for slightly more than half the central information services organizations said they expect their organizations to shrink.

"The growth of dispersed systems evoked emotionalism on both sides," said Cyrus F. Gibson, vice-president of Index Systems, Inc. Information services managers were concerned with their ability to carry out management mandates to control systems, he said.

The partnership's recommendations include steps to attune information systems strategy and guidelines to overall corporate goals and the needs of departmental users. Among the steps suggested are the following:

- Formation of a business systems support unit incorporating aims of both the information services organization and departmental users.
- Establishment of policies and procedures that allow users a choice of systems.
- Upgrading skills of information services personnel to improve communication with users. "Most information systems organizations are only dimly aware of the need to develop skills to relate to end users," Gibson noted.

The partnership also reported on a study of expert systems, which found 42% of the sponsors have a serious interest in the systems or have done research on them. However, few of the companies have a concrete strategy for the technology, Davenport said.

> ***'Most information systems organizations are only dimly aware of the need to develop skills to relate to end users.'***
>
> — Cyrus F. Gibson
> Index Systems, Inc.

Furthermore, many of the efforts to exploit expert systems are being pursued outside central information services organizations, generally because would-be users do not want to wait for the information services unit to evaluate the projects, Davenport claimed.

The development efforts typically involve experts from outside the corporation and are characterized by "throwing big bucks at them and saying, 'come back with an application,'" he said.

A great majority of the systems are not tied to independent data bases although users say they plan to integrate the systems with data bases in the future, Davenport said. Some outside consultants developing systems "couldn't care less" about such integration, he added.

Davenport outlined a strategy for developing expert systems, calling for definition of applications to be developed, taking into account their potential value to the business and the company's level of financial commitment.

The development might be pursued through an application pull process, stemming from identified needs, or a technology pull effort, based on opportunities created by technological developments, Davenport said.

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NEW PRODUCTS

MacKinney IBM-based utilities out

MacKinney Systems of Springfield, Mo., has announced software utilities for IBM mainframes.

CICS/FRS is a forward recovery system for CICS. The software is said to update backup files using CICS journals to recover any file data lost or corrupted due to program error, hardware problems, operator error or power loss.

Users control what updates should be applied to the file based on criteria such as date, time, transaction identification and terminal identification. According to the vendor, multiple files can be recovered in a single run. CICS/FRS works with all releases of CICS under DOS/VSE, VSE/SP, OS/VS1 and MVS. It costs $1,295.

Jcopy is a file utility for DOS/VSE or VSE/SP environments. It allows users to write simple programs with as few as five statements. Subroutines to access ICCF libraries, source statement libraries, Panvaler, Librarian and Power queues are included.

Jcopy processes sequential, ISAM, VSAM and DL/1 files, the vendor said. It has built-in functions for table handling, translating EBCDIC to ASCII, scanning for character strings and bit manipulation. It costs $1,995.

Also announced by MacKinney Systems was Release 6.0 of its Listcat Plus program, designed as a replacement for IBM's IDCAMS Listcat. Release 6.0 prints a condensed list of non-VSAM entries on OS or ICF catalogs in addition to the VSAM data set report and volume summary produced by previous releases.

Listcat Plus is priced at $695 for OS and MVS environments and $495 for DOS/VSE and VSE/SP users.

Another utility upgrade recently introduced is Release 3.0 of Power Commander-CICS. The product allows users to enter Power commands from a CICS terminal as if it were an operator console. The response from Power is displayed on the user's screen. Power Commander-CICS costs $495 or $195 per year.

Wang mid-range mini bows

Developed for secure information processing

Wang Laboratories, Inc. of Lowell, Mass., has announced a 32-bit minicomputer designed to meet Nacsim 5100A requirements.

The mid-range system, called the VS65T, is said to support up to 40 workstations. According to the vendor, it was developed for the secure information processing requirements of both government and commercial organizations.

The basic VS65T central processor with 1M byte of main memory, cache memory, a 360K-byte diskette drive, 16 ports, the operating system and assembler is priced at $25,000. It is fully compatible with the larger Wang 7585VST minicomputer at both the operating system and the application software levels, the vendor said.

Features of the VS65T include a single-board central processor with a 200-nsec instruction time that supports the full VS 32-bit instruction set, up to 4M bytes of main memory with 16K bytes of high-speed cache memory, the ability to support up to eight communications lines and six intelligent I/O processors, data processing system software that includes nonprocedural fourth-generation programming tools and office automation functions including Wang Office applications.

Peripherals available for use with the VS65T include the Wang Professional and Advanced Professional Computers, the 76M-byte and 288M-byte removable disk drives and the 75LIS-12VT laser printer. The VS65T also supports Wang fiber-optic connection options including the Fiber Optic Converter and the Fiberway Remote Cluster Switch.

In a related announcement, Wang introduced the 4230-OA/VS-T workstation for combined data and word processing. The 64K-byte modular workstation also meets Nacsim 5100A requirements.

The 4230-OA/VS-T consists of a medium-resolution monochrome monitor with a 12-in. screen, a detachable keyboard and a separate base and electronics unit. The keyboard has 101 keys, including 16 programmable function keys.

Features of the workstation include a keylock for security, a monitor arm, a communications board for workstation use with a Wang Office Information System-based system and an upgrade to a Tempest Wang 75 PC series Professional Computer or 74 XAPC series Advanced Professional Computer.

The 4230-OA/VS-T workstation is priced at $3,900. According to a company spokesman, it will be available in August. The VS65T minicomputer will be available in September.

Mitrol offers External Interface

Mitrol, Inc. of Woburn, Mass., has introduced its External Interface, a software package that allows users of Mitrol's IBM mainframe-based fourth-generation language, Mitrol, to communicate with other IBM-based applications.

According to a company spokesman, External Interface was specifically designed to provide enhanced user accessibility to IBM's DB2 data base applications.

The External Interface is also said to allow users to communicate with other hardware environments. It makes use of the Systems Network Architecture (SNA) LU6.2 standard for advanced program-to-program communication. Use of SNA LU6.2 enables communications with systems from vendors such as Digital Equipment Corp., Tandem Computer, Inc. and Prime Computer, Inc. along with IBM Personal Computers and IBM Mitrol systems, the spoksman claimed.

In addition, the External Interface provides a set of facilities that allows users of other IBM-based applications, such as IMS and DB2, to call Mitrol products as well as to use Mitrol products to call up the other applications.

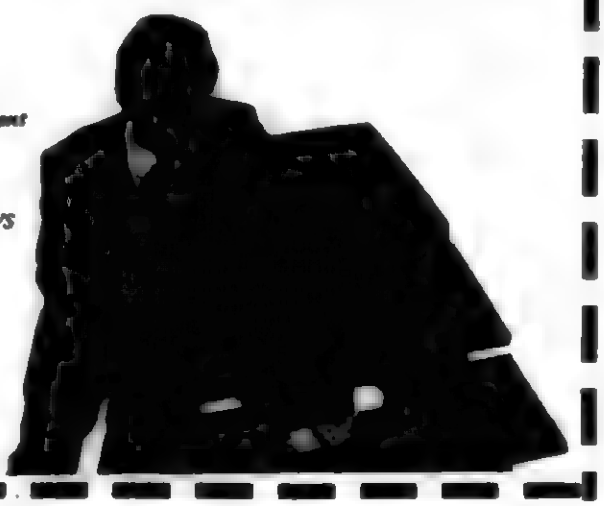
The initial license fee for External Interface is $25,000, the vendor said.

INSIDE

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Computers made to communicate. Both the AT&T PC 6300 line and the AT&T **UNIX**™ PC merge computing with communications. Optional or built-in modems and communications management software make simultaneous voice and data exchanges as simple as a few keystrokes.

And thanks to **UNIX** System V, the entire AT&T 3B Computer family offers integrated and flexible communications for departmental computing solutions.

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NEW PRODUCTS/SOFTWARE & SERVICES

SOFTWARE & SERVICES

Systems software

Gejac, Inc. has announced **Bossman**, a security and control software system for Digital Equipment Corp. VAX/VMS environments.

Bossman is said to tighten operational control of computer users. It associates security control with functions, not users, allowing files access to users instead of users access to files.

The system manager can grant and withhold read, write, execute and delete privileges; allocate and limit function availability; and create and change priorities for different tasks for users.

Bossman is priced from $2,800 to $11,000 per CPU.

Gejac, P.O. Box 188, Riverdale, Md. 20737.

■

CS Laboratories, Inc. has announced **C/Script 36**, a Cobol application development system designed for the IBM System/36.

C/Script 36 is said to generate complete operator control language procedures, display formats and Cobol source and object members for SRT or MRT programs. It also generates programs for file maintenance, inquiry, data entry and reports and allows users to enter custom code at any point during or after generation. It interfaces to any System/36 editor for user-code entry and Help screen definition.

C/Script 36 is priced at $16,000.

CS Laboratories, 459 N. Dean Road, Auburn, Ala. 36830.

■

Logic International, Inc. has announced **DES/36** a data entry system designed for the IBM System/36.

DES/36 is said to be able to replace IBM 129 and 3741 key punch stations. It allows users to format input and includes the ability to separately define field and screen positions. Fields can be edited on-line, and up to 18 fields per record can be defined. Five field types are available, and up to five accumulators may be used.

Features such as autoskip, autodupe, protected fields, justification, auto record advance, constants, range checking and verification are available.

DES/36 costs $5,000.

Logic International, Suite 165, 5775-A Glenridge Drive, Atlanta, Ga. 30328.

Applications packages

National FSI, Inc. has announced the availability of its **Participant Accounting System** (PAS) software package on IBM 3000 and 4300 series mainframe computers.

According to the vendor, key PAS features include daily valuation or fixed cycle processing, full regulatory compliance and up to 30 investment vehicles per plan.

Pricing for PAS starts at $100 and varies with the size of the installation and the type of service.

National FSI, 4501 W. Mockingbird, Dallas, Texas 75209.

■

Data Automation has enhanced its **computer-aided design/computer-aided manufacturing** (CAD/CAM) software package available for Hewlett-Packard Co. Series 200, 300 and 500 computer systems.

New features include a command file capability that allows for interfacing with existing computer-aided engineering graphics software and integrated Data Com capability to transfer data to and from a mainframe computer.

According to the vendor, some functions of the CAD/CAM package include high-speed pan, snap grid and polar coordinates capability.

The package costs $2,495.

Data Automation, Suite 202, 125 W. Mission Ave., Escondido, Calif. 92025.

Utilities

Softouch Systems, Inc. has announced **CICS-FCTD**, an on-line utility for CICS.

CICS-FCTD is said to provide the creation and maintenance of definitions required for the CICS File Control Table. It automatically produces file labels and disk assignments for VSAM, ISAM and BDAM files.

The program also provides automatic deferred open functions. Files can be assigned a particular operational status.

CICS-FCTD is priced at $4,000 for a DOS license and $5,500 for an MVS license.

Softouch Systems, 8217 S. Walker, Oklahoma City, Okla. 73139.

■

Boston Systems Office, Inc. has introduced a relocatable assembler for the Hitachi Ltd. 64180 called the **64180 BSO/Assembler**.

The assembler was designed to operate on Digital Equipment Corp.'s VAX and Microvax. It suports the Hitachi extended I/O arithmetic instruction sets and provides relocation facilities, conditional code and macro capabilities as well as an array of advanced assembly features.

The 64180 BSO/Assembler is written in VAX native code and priced from $3,900.

Boston Systems Office, 128 Technology Center, Waltham, Mass. 02254.

■

Release 3.0 of **VSUM**, a DASD management tool, has bowed from

Continued on page 123



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Concurrent Computer Corporation

Continued from page 120

Software Technologies & Research.

VSUM is said to allow accurate VSAM data set design, analysis, monitoring and tuning in the MVS environment. Version 3.0 features a TSO/ISPF interface that will allow users to design VSAM key-sequenced, AIX and relative record data sets from TSO/ISPF screens.

Users may selectively list VSAM catalog entries based on user-specified selection criteria; request tuning and design recommendations for selected data sets; analyze and back up keyed VSAM data sets and display statistical reports on a terminal; and provide on-line tutorial for all VSUM ISPF functions.

VSUM costs $4,200.

Software Technologies & Research, 160 West St., Cromwell, Conn. 06416.

Data base management systems

Litton Industrial Automation Systems has introduced **Sigen**, a data base management system designed for 16-bit and 32-bit computers such as Digital Equipment Corp. PDP/11 and VAX as well as IBM Series 1 systems.

Sigen is said to offer data integrity and data recovery capabilities. It features special-purpose data base calls, user-modifiable priorities and configurable cache memory.

Prices start at $12,500.

Litton Industrial Automation Systems, 5825 Oberlin Drive, San Diego, Calif. 92121.

■

Enmasse Computer Corp. has announced **Revision 1.3** of the **Enmasse Data Base Management System (E/DBMS)**.

Revision 1.3 is said to offer faster inquiry and report writing facilities that can execute programs without affecting the performance of programs running on other parts of the Enmasse system.

E/DBMS provides integration with the ANSI 74 Cobol compiler. It runs on the Enmasse/Computer System (E/CS), a multiprocessor system for transaction-oriented applications.

Revision 1.3 of E/DBMS costs $4,500. The runtime version costs $2,500. Entry-level E/CS systems start at $60,000.

Enmasse Computer, 125 Nagog Park, Acton, Mass. 01720.

Training software

Software AG of North America, Inc. has anounced **Natural/Elite**, a computer-aided instruction learning system for software training programs.

Natural/Elite is a mainframe-based system that allows students access to self-paced instruction from any authorized terminal or personal computer. It features four components: authoring, presentation, courseware and administration.

Natural/Elite is written in Natural, Software AG's fourth-generation language. The one-time cost of the system is $20,000. Ready-written courses range from $2,000 to $5,000.

Software AG of North America, 11800 Sunrise Valley Drive, Reston, Va. 22091.

MICROCOMPUTERS

Software utilities

Keyword Office Technologies Ltd. has introduced **Commander**, a multiuser window interface said to allow IBM Personal Computer users to gain access to applications and functions with a single keystroke.

Commander software is also said to enable system integrators to configure a user interface that fits a range of customized business requirements.

Commander provides access to up to 253 applications through user-defined keys. Within on-screen windows, users can create menus, submenus and Help files.

Commander is priced at $49.95.

Keyword Office Technologies, 2816 11 St. N.E., Calgary, Alta., Canada T2E 7S7.

■

The **Autocad Drafting Interface** program has been introduced by **Cadtrak Corp.**

The software interfaces the drafting capabilities of Autodesk, Inc.'s Autocad package with the three-dimensional plant design views of Cadtrak's Plant Trak package. It is said to translate an orthogonal or pictoral view from a 3-D Plant Trak model to Autocad for two-dimensional drafting work.

The Autocad interface is compatible with T&W Systems, Inc.'s Versacad and drafting systems and runs on the IBM Personal Computer, Personal Computer XT and AT.

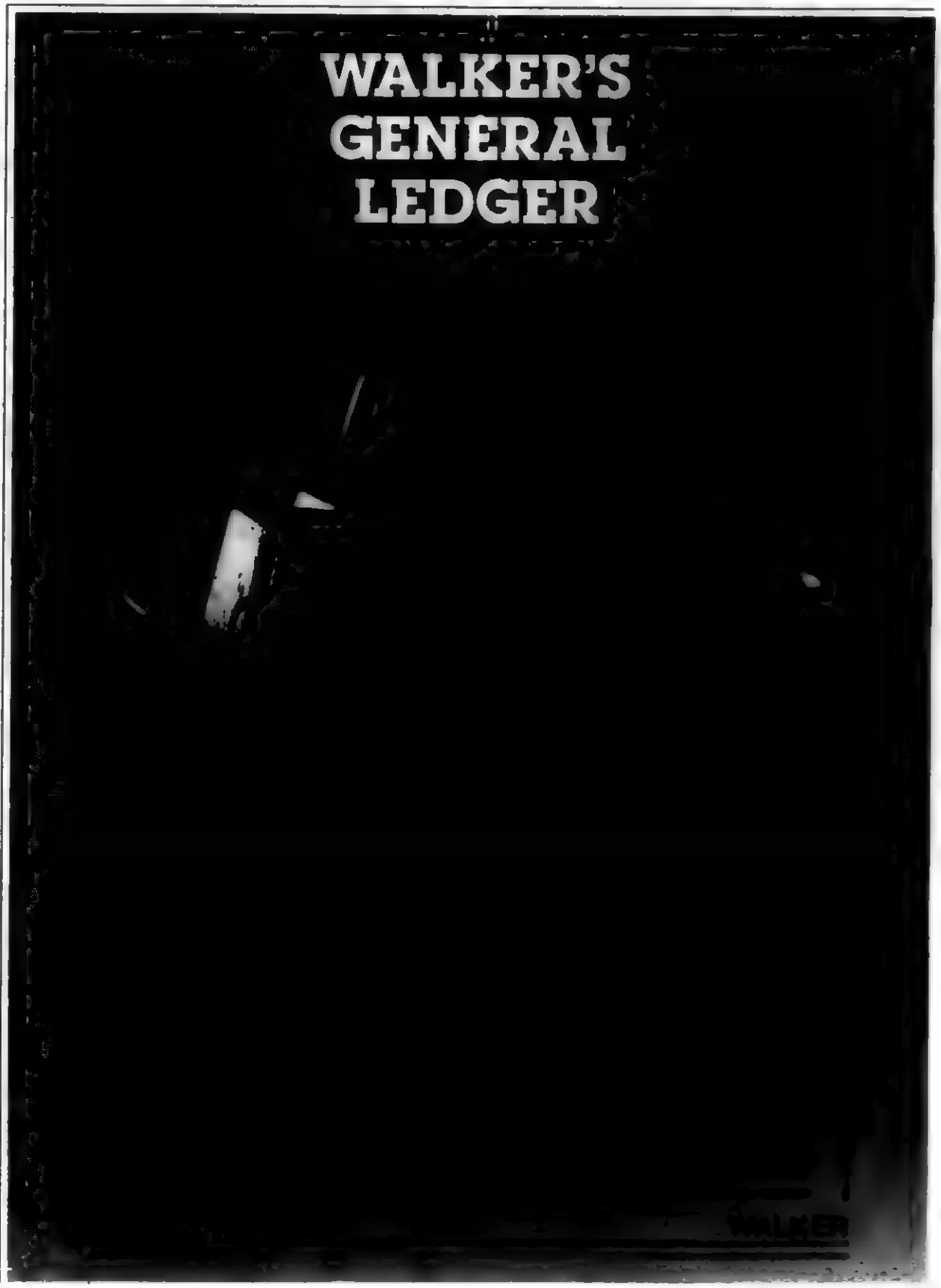
The interface costs $1000.

Cadtrak, 823 Kifer Road, Sunnyvale, Calif. 94086.

■

I. P. Sharp Associates Ltd. has announced **Pricelink**, a software product that allows users to collect on-line pricing data from financial

Continued on page 124



Announcing
Computerworld's
MICRO DIRECT SHOPPER
SEE PAGE 146

NEW PRODUCTS/MICROCOMPUTERS

Continued from page 123

markets worldwide.

Menu-driven Pricelink taps into I.P. Sharp's daily prices for commodities, stocks, option, bonds, currencies, money market rates and interest rates. Users can collect current and historical prices and store the information in a personal computer file for future spreadsheet analysis.

Pricelink costs either $6 or $12 per hour depending on the data transfer rate, plus data base unit charges.

I.P. Sharp, Suite 1900, Two First Canadian Place, Toronto, Ont., Canada M5X 1E3.

Software enhancements

Mega Cadd, Inc. has announced a new version of its **Design Board Professional** software for use in three-dimensional, computer-aided design applications.

The new version offers the ability to create computer models 150% larger than the size possible with the previous version. It requires 640K bytes of memory on an IBM-compatible personal computer. It can share data bases with two-dimensional drafting software packages such as Autodesk, Inc.'s Autocad.

The new Design Board Professional is priced at $2,150. Registered users of previous versions can upgrade for $400.

Mega Cadd, 401 Second Ave. S., Seattle, Wash. 98104.

■

QNE International has announced **Version 4.0** of **Q-Pro 4**, its fourth-generation microcomputer language and data base manager.

Version 4.0 utilizes Ashton-Tate's Dbase III data bases as well as its own data base files. Q-Pro 4 programs using the local-area network runtime provide multiuser facilities with true files and record lock to Dbase III data bases. The Q-Pro 4 local-area network runtime supports both IBM Personal Computer Network and Novell, Inc. Netware.

Q-Pro 4 costs $795 for the local-area network version and $595 for the single-user version. Q-Query, an optional post relational query language, costs $150.

QNE International, 136 Granite Hill Court, Langhorne, Pa. 19047.

■

Opt-Tech Data Processing has released **Version 3.0** of its **Opt-Tech Sort** utility for Microsoft Corp. MS-DOS computers.

Opt-Tech Sort is an Assembler Language sort/merge/select utility used in compilers, data base management system packages and application packages.

Features of Version 3.0 include record selection, record reformatting, comma-delimited files, Ashton-Tate's Dbase III support and dynamic memory allocation.

Opt-Tech Sort costs $149.

Opt-Tech Data Processing, P.O. Box 678, Zephyr Cove, Nev. 89448.

Board-level devices

Definicom Systems, Inc. has announced the **DSI-32** family of 32-bit coprocessor boards for IBM-compatible personal computers.

The DSI-32 boards use very large-scale integration circuits providing a speed of 10 MHz, 64-bit number crunching capabilities and a memory management unit for Microsoft Corp. MS-DOS virtual memory functions.

The basic board features up to 2M bytes of expandable dual-port random-access memory.

Prices for the basic DSI-32 boards start at $1,495. Higher end expandable boards are priced from $2,295.

Definicom Systems, Suite 108, 31324 Via Colinas, Westlake Village, Calif. 91362.

■

Cardco, Inc. has announced **Amega**, a 1M-byte memory expansion board for the Commodore Business Machines, Inc. Amiga computer.

According to the vendor, the Amega board is a full-function add-on. It features pass-through design, full automatic configuration, multitasking random-access memory, no external power requirements and portability.

The Amega board costs $549.95.

Cardco, 300 S. Topeka, Wichita, Kan. 67202.

■

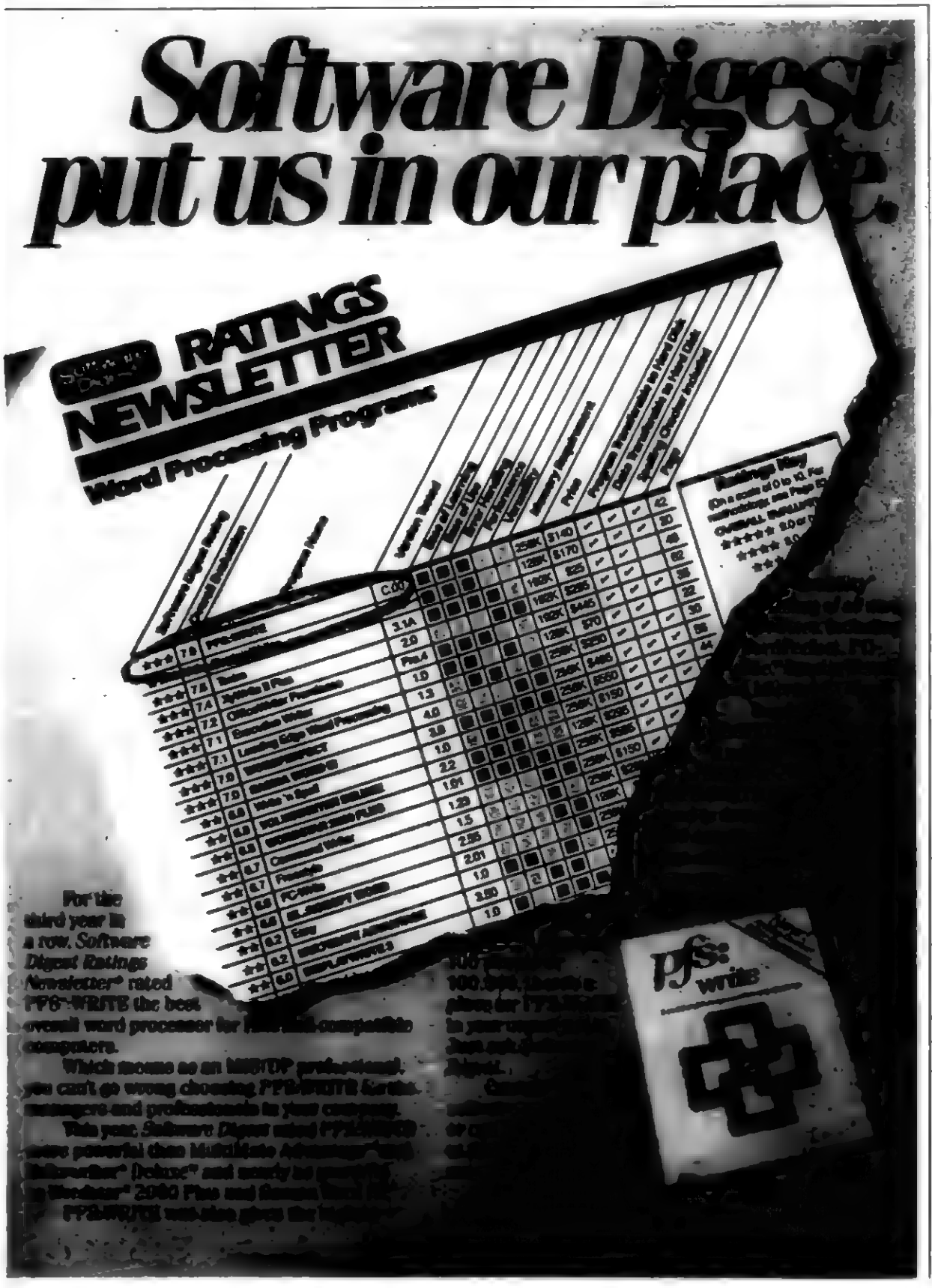
American Computer & Peripheral, Inc. has introduced the **American Turbo** adapter board and the **American Abovefunction Card**, a multifunction memory board, for the American XT, IBM Personal Computer, IBM Personal Computer XT and compatibles.

American Turbo allows users to toggle from 4.77 MHz to 7.37 MHz using a synchronized select switch.

The Abovefunction Card supports up to 2M bytes of expanded memory and provides serial, parallel and game ports.

American Turbo costs $150, and American Abovefunction starts at $380 without random-access memory installed.

American Computer & Peripheral, 2720 Croddy Way, Santa Ana, Calif. 92704.



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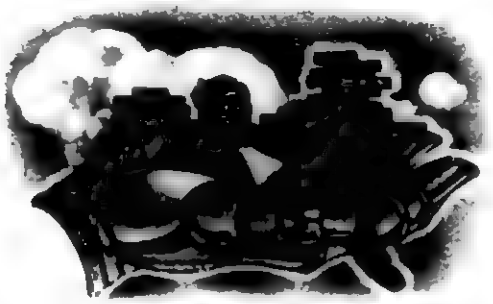
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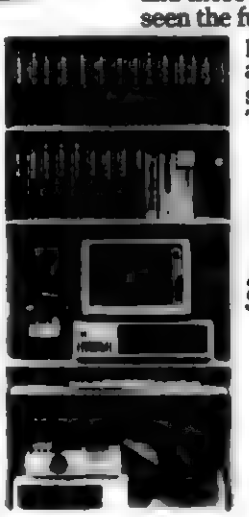
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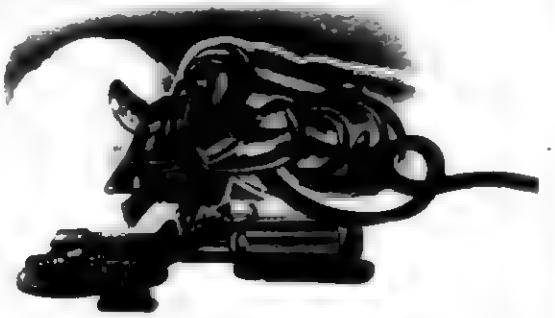


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Auxiliary equipment

The Maxi-Switch Co. has announced its **Memory Pro** keyboard for IBM Personal Computers, Personal Computer XTs, ATs and compatibles.

Memory Pro is said to feature an AT-type keyboard with separate cursor and numeric pads, a Maxi-Mouse providing diagonal cursor movements, fast repeat key to double the autorepeat rate and 10 additional soft user-definable function keys.

Memory Pro costs $195.

Maxi-Switch, 9697 E. River Road, Minneapolis, Minn. 55433.

COMMUNICATIONS

Software

Network Innovations Corp. has ported its **Multiplex** communications software package to the Hewlett-Packard Co. HP 9000 Series 800 Model 840 computer systems.

Multiplex connects applications such as Lotus Development Corp.'s 1-2-3 to data from HP's HPSQL data base. Users of the HP Vectra personal computer, IBM Personal Computer and compatibles can select data from the data base and extract it across a network into an automatically formatted personal computer file.

Multiplex also features file transfer, network file management and terminal emulation capabilities.

Prices start at $695 for single copies on IBM Personal Computer AT host systems.

Network Innovations, 20863 Stevens Creek Blvd., Cupertino, Calif. 95014.

■

Cincom Systems, Inc. has ported **Net/Master**, its network management system, to IBM's DOS/VSE operating system enyironment.

Net/Master is said to provide multiple session support, network security and network and subsystem access; automate network operations; and provide file transfer between distributed sites. Users can access multiple applications concurrently and, according to the vendor, can be insulated from VTAM and CICS.

Net/Master is priced from $15,000.

Announcing
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Cincom Systems, 2300 Montana Ave., Cincinnati, Ohio 45211.

Multiplexers/Modems

Data Comm for Business has announced its **SPL2 statistical multiplexer**.

The SPL2 is said to transfer asynchronous terminal data transparently over a synchronous or asynchronous composite channel at up to 19.2K bit/sec. Each of the two terminal ports can be set for up to 9.6K bit/sec.

The SPL2 operates with leased-line and dial-up modems. Its statistics port displays set-up parameters and activity statistics for the composite channel and the terminal ports. XON/XOFF, CTS busy high or low and Hewlett-Packard Co. ENQ/ACK flow controls are all switch-selectable.

The SPL2 costs $795.

Data Comm for Business, 807 Pioneer, Champaign, Ill. 61820.

Concord Data Systems, Inc. has announced the **CDS 224 X.PC** and the **CDS 224 X.PC Mux**, modems said to support McDonnell Douglas Network Systems Co.'s Tymnet X.PC error-correcting protocol.

The full-duplex, dial-line modems reportedly operate at either 1,200 or 2.4K bit/sec.

According to the vendor, both modems have a two-wire dial interface for connecting to the public-switched telephone network.

The CDS 224 X.PC and the CDS 224 X.PC Mux support CCITT V.22 and feature autodial and autoanswer.

The CDS 224 X.PC Mux is said to permit multiple simultaneous transmissions over the same phone line.

The CDS 224 X.PC is priced at $795.

The CDS X.PC Mux costs $1,295.

Concord Data Systems, 297 Williams St., Marlboro, Mass. 01752.

PRINTERS'



When you see our new Pinwriter™ P6, P7 series dot matrix printers, you'll think you're in a time warp.

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None of which will surprise you if you know NEC printers. Because nobody does more with 24-pin technology than NEC. In fact, we now have more 24-pin printer models than any other manufacturer.

NEC

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Test equipment

Fox Research, Inc. has released **10-Test**, a diagnostic tool for use with the company's 10-Net local-area networking system for IBM Personal Computers and compatibles.

10-Test was designed to pinpoint board, tap-box and wiring problems on the local-area network. It consists of a diagnostic module, a transformer, a diskette with the diagnostic software and an operations manual.

10-Test is priced at $695.

Fox Research, 7016 Corporate Way, Dayton, Ohio 45459.

■

Telenex Corp. has announced the **Autonex MSS-256 Matrix Switch**, part of a matrix switching system for data network test access and system reconfiguration.

The Autonex Matrix Switch is said to offer unlimited bandwidth or line handling capability. It is a true circuit switch with each data channel following a separate physical circuit path. It introduces no speed restrictions, and data rates above 10M bit/sec. can be accommodated.

The system allows user cable distances of up to 1,000 ft end to end.

The Autonex MSS-256 Matrix Switch, which is said to provide a 128-line by 128-line matrix, is priced at about $290 per port.

Telenex, 502 Pleasant Valley Ave., Moorestown, N.J. 08057.

SYSTEMS & PERIPHERALS

Graphics systems

Imaging Technology, Inc. has enhanced its **Series 100** real-time, single-board image processors.

The enhanced version features an expanded frame memory to provide storage of multiple images, an optional resolution of 640 by 512 pixels for acquiring, processing and displaying square pixels, the ability to simultaneously scan different sections of frame memory and pseudo-color output, according to the vendor.

The standard version costs $3,995. Expanded Frame Memory versions cost $4,295 or $4,495.

Imaging Technology, 600 W. Cummings Park, Woburn, Mass. 01801.

Data storage

MDB Systems, Inc. has announced the **MLSI-ESDI-RM** and **MV-ESDI-RM** enhanced small device interface disk controllers for Digital Equipment Corp. Q-bus and Microvax computers, respectively.

The quad-size disk controller has a maximum data transfer rate of 2.45M bit/sec. According to the vendor, it has been certified to operate hard-sectored drives. It features RM03 and RM05 emulation.

The controller supports two physical drives ranging in size from 67M bytes to more than 4G bytes. According to the vendor, other features include direct memory access autothrottle, multilevel interrupts and self-test at power on.

The MLSI-ESDI-RM controller costs $1,671, and the MV-ESDI-RM controller is priced at $1,707.

MDB Systems, 1995 N. Batvia St., Orange, Calif. 92665.

■

Alpha Data, Inc. has released the **Atlas 520**, a 520M-byte Winchester-type disk drive.

The Atlas 520 disk drive houses 76 moving heads and is said to be able to access 2.5M bytes instantly.

The Atlas has a head lifter system that ensures there is no head-to-disk start/stop contact. Also, according to the vendor, Atlas 520 is interface and format compatible with ANSI/ESMD specifications and hardware and software configurations.

The Atlas 520 costs $10,850.

Alpha Data, 20750 Marilla St., Chatsworth, Calif. 91311.

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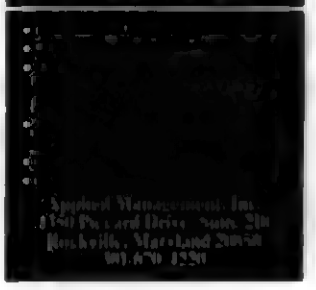


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Printers/Plotters

Genicom Corp. has unveiled the **3410 Quiet** wide-carriage dot matrix printer.

The 3410 Quiet is said to feature multiple-mode printing, high-duty cycle and a noise level of fewer than 55db. It has an 18-wire printhead and offers speeds ranging from 400 char./sec. in draft mode to 120 char./sec. in letter-quality mode.

It offers 18- and 10-pitch printing for 244 and 136 columns, respectively.

Centronics Data Computer Corp. parallel and RS-232C serial ports are standard, as are four character styles. The printer accommodates up to six-part paper via either rear or bottom feeding.

The 3410 Quiet is priced at $2,645.

Genicom, Waynesboro, Va. 22980.

Versatec, Inc. has announced the **CE 3400 series** of electrostatic color plotters.

The plotters are said to offer 400 point/in. resolution. The CE 3424 accommodates 24-in. media widths and the CE 3436 accommodates 36-in. media widths. They are said to produce output on opaque paper or polyester film.

Available in July, the 3424 costs $53,500, and the 3436 costs $69,500.

Versatec, 2710 Walsh Ave., Santa, Clara, Calif. 95051.

■

Versatec, Inc. has announced **Model C2558** of its **Spectrum** electrostatic color plotter series.

Model C2558 is said to provide 400 point/in. resolution.

According to the vendor, an A-size full-color plot with 400 point/in. resolution is produced in 75 seconds and a B-size plot in 90 seconds.

When acting as a page printer, it prints 1,100 line/min.

Spectrum is an 11-in. format electrostatic color plotter.

It reportedly offers 256 predefined colors and an additional 256 user-defined colors from a palette of over 1,000 colors.

The Model C2558 is priced at $14,950.

Versatec, 2710 Walsh Ave., Santa Clara, Calif. 95051.

Power supplies

Kalglo Electronics Co. has added the **Model LS500** to its Aegis line of power conditioning equipment.

The standby uninterruptible power system is said to provide backup power in 120 or 240V, 60 or 50Hz with 500W-VA capacity.

It utilizes pulse-width modulation technology and is furnished with an internal 24-volt sealed rechargeable battery, two voltage-surge-protected AC outlets, audible and visual power failure warning system, test mode indicator and switch and replaceable external fuses.

The Model LS500 is priced at $795.

Kalglo Electronics, Dept. CP, 6584 Ruch Road., E. Allen Tnpk., Bethlehem, Pa. 18017.

Components

Texas Instruments, Inc. has announced its fully qualified 10-MHz **TI32000** 32-bit microprocessor chip set.

The TI32000 chip set consists of the TI32016, a 48-pin central processing unit; the TI32201, a 24-pin timing control unit; the TI32081, a 24-pin floating-point unit; the TI32082, a 48-pin memory management unit; and the TI32202, a 40-pin interrupt control unit.

The five-device chip set is priced at $289 in 100-unit quantities.

Texas Instruments, P.O. Box 809066, Dallas, Texas 75380.

Auxiliary equipment

Buddy Products has introduced the **Number 925** printer stand for its Saver Series product line.

The stand features heavy-gauge tubular steel panel legs with textured steel panels and double-sided plastic laminated tops with an oak or walnut wood-grain finish. It has a shelf below the surface for storing printout paper.

The table measures 30 by 30 by 16½ in. It is priced at $131.55.

Buddy Products, 1350 S. Leavitt St., Chicago, Ill. 60608.

PRICE REDUCTIONS

PC Source has cut the price of its **Standard-286** IBM Personal Computer AT-compatible system.

The machine features an Intel Corp. 80286 processor, optional 80287 coprocessor socket, 8-MHz option, 240K bytes of random-access memory, 1.2M-byte diskette drive, dual diskette, fixed disk drive controller board, 200W power supply and eight expansion slots. It comes with Microsoft Corp. MS-DOS 3.1.

The Standard-286 costs $1,395.

PC Source, 12303-G Technology Blvd., Austin, Texas 78727.

■

Mosaic Software, Inc. has announced a price reduction on its **Twin spreadsheet software** program for IBM Personal Computers and compatibles.

The Twin is said to work like Lotus Development Corp.'s 1-2-3 software. It features presentation graphics and file manager capabilities as well as user-specifiable colors, shadings, fonts, titles, footnotes and labels.

Twin supports hard disk systems, graphics plotters, printers and a math coprocessor. Minimum system requirements are two disk drives and 260K bytes of random-access memory.

The reduced price for Twin is $99.

Mosaic Software, 1972 Massachusetts Ave., Cambridge, Mass. 02140.

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Bjorn Nordemo is Vice President of Data Arts & Sciences, Inc. (DASI), a contract software agency based in Weston, MA. Although they place people in permanent positions, DASI most often places 'contract programming personnel' — consultants who fit special niches for short or long term commitments in corporations in the New England area.

"Our agency specializes in finding computer consultants — designers of systems, evaluators of hardware and software requirements, and computer programmers to mention a few. We recently were introduced to Computerworld as a potential source for finding these consultants," states Bjorn. *"I liked the idea because I know Computerworld has a broad reach — from MIS/DP directors to computer programmers, in multiple industries and multiple markets — and that's what DASI needs."*

"We had four specific positions for MIS/DP consultants that we needed to fill in northern New England. We used the local newspaper on a weekly basis, but people who are willing to move usually aren't reading the local Sunday paper. So, I felt this was a perfect opportunity to try Computerworld," says Bjorn.

According to Bjorn, he's quite satisfied with the results. *"From Computerworld, we filled 75% (3 out of 4) of the positions with the responses from the first week, and the remaining position with the response from the following week. These results alone made my ads in Computerworld worthwhile."*

And Bjorn also recognizes a second benefit to advertising in Computerworld. *"The beauty of using Computerworld is that it's read by people in the computer industry who have a need for consultants, as well as being read by consultants who need to keep up to date on the marketplace,"* says Bjorn. *"So we not only reach qualified candidates to fill our current openings, but we are creating awareness of the services that DASI has to offer,"* says Bjorn.

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COMPUTER INDUSTRY

Section begins on page 174

Building success on foundations of controlled innovation

Directed research key in promoting advances

By Glenn Ritchie

The key to success in today's technology-oriented world of business is to use innovation as the foundation for the attack. So says Richard Foster, director of McKinsey & Co., a leading management consulting firm, in his new book *Innovation: The Attacker's Advantage* (Summit Books, 1986).

According to Foster, innovation can and must be controlled. In too many companies today, top management doesn't believe research can be managed. They think innovation and scientific advance are matters of luck and individual initiative and that developments cannot be anticipated.

Foster recently spoke about how his theories might apply to the traditional mainframe vendors that compete with IBM.

CW: Was it the lack of innovation that created the stagnation in most of the BUNCH companies, or was it simply that IBM was too strong overall?

FOSTER: IBM has a very dynamic sense of their strategy. Every move they take, they take with an eye toward what the move after that will be. They are truly playing a chess game, it seems to me.

What has happened to the BUNCH is that they have come out with innovations with the implicit assumption that it's the 'big bang' innovation that's going to take them forward and going to allow them to beat IBM. But the next thing they know, IBM is counterpunching on that innovation, dropping the price and introducing a new product that has a whole new level of cost/performance.



Richard Foster

By that time, the guys in the BUNCH are out of resources. The BUNCH firms haven't been quite as circumspect as they ought to be about the competitive realities and what they're going to have to do, not only to compete once, but to compete continuously over time.

If they were, they might well decide to skip a generation here and there and put their resources into something that's really going to make a difference — or to at least be on tracks that are going to allow them to compete in individual niches.

IBM is a terrific marketing company. I do not buy the description that they aren't the best technology company in the world because, to me, the best technology is the one that meets the largest group of consumers' needs. That isn't necessarily the most advanced performance at all, but a product which has very high price/performance ratios. IBM is just damn good at that, and they're good at innovation.

CW: What does this mean for IBM's rivals, then? Is it totally hopeless?

FOSTER: I doubt that it's totally hopeless, but it certainly implies that they have to focus, that they have to have a very clear notion of how they're going to fit in and sustain a counter attack from IBM. It means that they have to be very focused on particular technologies, which have more potential than the ones IBM is working on, and they have to be focused on individual market segments.

IBM's very size, which is certainly an asset in many ways, can be a negative because that very size certainly is unlikely to speed decision making and responsiveness, and so it represents a dynamic opportunity for the BUNCH.

CW: Do you think mergers or acquisitions such as Burroughs Corp. and Sperry Corp. can help, or is that sort of a Band-Aid?

FOSTER: If we don't think about mergers but maybe think about alliances, where one company doesn't have all the requisite skills to implement any of the competitive vision that they have, then it could be beneficial in that way. My guess is, from a point of view of consolidating capacity, mergers could be helpful. But unless some creative spark is put into that equation, then that won't be enough.

Only one out of 10 mergers is successful, and so, if you're going to be that one, you've got to have a pretty good idea. You've got to be pretty successful at implementation as well. It's a tough job.

CW: You mentioned in your book that companies need to become attackers rather than just defenders of their markets. It seems that the BUNCH companies along with IBM are older, conservative companies that are slow to move and take advantage of market opportunities. What can they do to address this problem?

FOSTER: Certainly, they have to have a sense of where the business is

See BUILDING page 137



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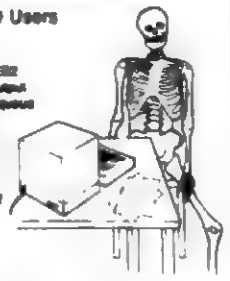
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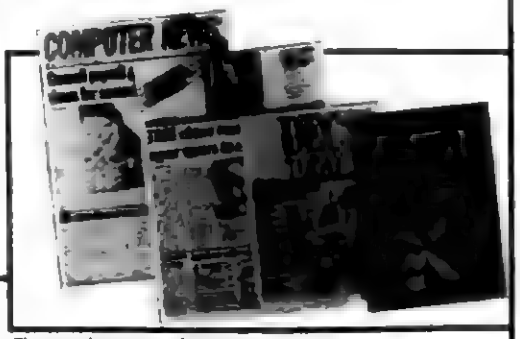
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Japanese vendors urged to move production

Overseas manufacturing may ease trade friction

By Takehiko Kondoh
Computerworld News Service

TOKYO — The new chairman of the Electronic Industries Association of Japan (EIAJ) has urged Japanese electronics vendors to move more of their manufacturing facilities overseas to help the nation ease trade friction with Japan's international partners.

Speaking in his inaugural address to the EIAJ, Shoichi Saba called on the Japanese electronics industry to be "more internationally minded." He said the EIAJ is ready to expand trade dialogue with U.S., European and other foreign electronics trade groups like the American Electronics Association (AEA).

Saba, 67, stepped down as president of Toshiba Corp. in April to succeed Sony Corp. Chairman Akio Morita as leader of the 611-member EIAJ.

Saba, however, said he was concerned whether Japanese electronics manufacturers that shift production outside the country will find suitable components available in their host nations.

"Unlike in the U.S. and Europe, where components for electronics assembly are normally produced by the assemblers themselves, Japanese assemblers need to rely on independent suppliers for the parts they need," he observed. Independent component makers are not easily found in the U.S. or Europe, he maintained.

Saba stressed that cooperation is needed to offset the Japanese industry's "disappointing and significant decline from the outstanding growth of the past." Japanese electronics revenue grew a scant 2% to $105.8 billion in 1985, while electronics products exports dropped 5% to $52.9 billion in 1985, he noted.

Japan's electronics investment abroad, particularly in the U.S., has increased in recent years. In 1983-'84, Japanese production in the U.S. reportedly multiplied 2.5 times.

IBM christens $125 million research center

By Jeffry Beeler

SAN JOSE, Calif. — IBM recently christened a $125 million structure that will serve as the new home for one of the firm's three main research facilities.

Construction of the 486,000 sq-ft Almaden Research Center (ARC) "exemplifies IBM's continuing commitment to innovation," IBM Chairman, President and Chief Executive Officer John F. Akers told approximately 1,000 opening ceremony attendees in a brief prepared statement.

With its 107,000 square feet of lab space, the three-story building replaces IBM's former San Jose Research Laboratory, which for nearly 30 years had coexisted with the company's General Products Division, also based in San Jose.

Late last year, IBM began moving the occupants of its existing laboratory, which the firm had outgrown, to the new space roughly five miles away, according to ARC director Frank Mayadas. Today, with the relocation almost complete, the center houses some 800 scientists and engineers, who, for the first time since 1957, have a facility all their own.

ARC forms part of IBM's Research Division, which also embraces two other such facilities — the Thomas J. Watson Research Center in Yorktown Heights, N.Y., and its counterpart in Zurich.

Scientific investigation

Despite its change of address, ARC will stick to the same avenues of scientific investigation as the laboratory at the recently vacated site. The center currently conducts basic research in six key technical specialties: physical science, polymers, data storage, I/O, manufacturing and computer science.

The West Coast laboratory is probably best known for its development of the relational model for data base management systems. Spearheaded in the late 1970s by E. F. Codd, the work subsequently led to the announcement of IBM's SQL/DS and DB2.

The lab's contributions to the advancement of magnetic disk storage technology are also well known. In the early 1950s, the facility designed and built the IBM 350 Random Access Method of Accounting and Control, reputed to be the world's first commercial disk file product.

Today, ARC's storage-related research continues as the center explores the potential of emerging recording technologies such as optical media and, at the same time, seeks to refine the capabilities of conventional magnetic disks. One of installation's goals, for example, is to maximize recording densities by reducing the flying height between read/write heads and thin-film surfaces.

ARC researchers are also experimenting with alternative manufacturing and product testing techniques that may someday enable the firm to expand its production volumes without forcing it to enlarge its work force or factory floor space.



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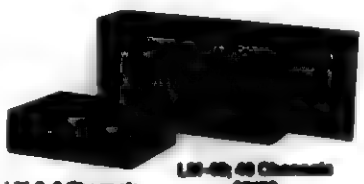
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From page 132

going to go and how they can successfully compete over time in that business. That's first and foremost; a realistic notion of that.

Second, having viewed the castles in the sky, they're going to have to have a way of building them brick by brick, which means entry strategies which will of themselves be successful.

Given those two things, an expansible strategy very much like the Japanese have — where they may take longer for the first generation of the product to come out, but the second comes faster, the third comes even faster, the fourth comes even faster — a notion like that may be enough to help them.

They would have to go through some fairly major organizational changes, and they'll probably end up having groups that are separate from their own.

They may even go to a Corning-like structure, where Corning Glass

Computer industry section begins on page 174.

Works took some of their best ideas, evaluated their strengths and weaknesses and went out and found partners that could meet their weaknesses.

They then set up entirely separate companies with separate boards of directors and were content to keep a minority equity position in the whole thing before they moved ahead.

Maybe radical notions like that are necessary. Minor incremental changes from where they are, given what's happening in hardware and software, is unlikely to get them anything more than what they've already received.

CW: The BUNCH faces the unenviable task of competing against one of the greatest marketing organizations in the history of business. How can they become attackers against such a formidable foe?

FOSTER: The thing about IBM is that it is probably the biggest attacker that we've ever known. To learn the skills of attacking, you have to learn to attack yourself first. IBM really understands that, so they are a very formidable force, there's no doubt about it.

On the other hand, defenses are possible and successful. IBM is a juggernaut but not a uniform juggernaut. I have clients that IBM services that are none too happy with the service that they're getting. There's got to be distribution of those things, there's got to be groups that are less happy than more happy, therefore there have to be niches of opportunity.

The challenge for the BUNCH is to go out and figure out what those are, recognizing that IBM is going to be responding, and get ready for that response. But those are all holding actions.

In the long run, they're probably going to have to do something that has the potential for changing the game, whether that be parallel processing or advanced languages or whatever it is.

Sperry minis win $250 million Army contract

Series 5000 Model 80 beats out Honeywell, IBM for six-year deal

MCLEAN, Va. — Sperry Corp. recently won a U.S. Army contract worth about $250 million for up to 1,800 of its Series 5000 Model 80 Unix minicomputers.

Despite the fact that four companies vied for the quarter-billion-dollar deal, Sperry, in a sense, had an edge on the competition.

One of the other finalists was System Development Corp., a subsidiary of Sperry's proposed merger partner, Burroughs Corp.

The order was won by Sperry's Federal Government Marketing Organization and is one of the largest government contracts ever for Unix-based computer systems, a Sperry spokesman said.

The other two contenders for the contract were Honeywell, Inc. and IBM.

Contract includes software, support

The six-year contract was awarded by the U.S. Army Information Systems Selection and Acquisition Activity in Alexandria, Va., and includes software, technical support and maintenance.

Sperry will supply its Series 5000 Model 80, a 32-bit minicomputer, which runs Unix Release V.2 in a multiprocessor architecture.

The system is manufactured according to Sperry specifications by Arete Systems Corp. of San Jose, Calif.

Requirements not yet defined

According to a government spokesman, no particular requirements for use of the system have been defined yet.

However, the minicomputers are administrative-type systems commonly used for office automation, supply ordering, finance, budget, funding and transaction processing.

— Eddy Goldberg

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No-shows at NCC

From page 174

general-interest trade shows where their presence was de rigueur during the boom years.

But the NCC exhibitor list is only one benchmark on the state of a still-vibrant industry, and retrenchment has produced more creative approaches to the marketplace.

The most daring of all, Burroughs Corp.'s pending $4.44 billion takeover of Sperry Corp., is the most dramatic example of a major vendor choosing a growth path that would have been unthinkable in the days of batch processing and core memory.

Elsewhere in the BUNCH, NCR has repositioned its entire line and targeted the transaction processing market. Honeywell, Inc. is investing new corporate energy and dollars in the recently languid office automation sector.

> ***Major vendors have learned, reluctantly, how to survive (and in some cases thrive) in a slower, more cautious and more demanding MIS marketplace.***

The more traditional strategy of going toe-to-toe with IBM at the high end is obviously a dubious prospect now, especially in the context of the overall slowing of mainframe sales that seems certain to continue.

In the past year, major vendors have learned, reluctantly, how to survive (and in some cases thrive) in a slower, more cautious and more demanding MIS marketplace. From the vantage point of an apparently lackluster NCC in the scorching Nevada desert, the overall growth prospects for the industry still look bleak.

But with the right mix of product niches, vertical markets, international markets, tight fiscal controls and strategic partnerships, large systems vendors can get healthy again. That right mix can be a very elusive goal, but the rewards for those that find it can still rival the profits of earlier, easier times. ■

IBM President, Chief Executive Officer and (as of June 1) Chairman John F. Akers will be honored at a Waldorf-Astoria black tie dinner later this month with the first Iphigene Ochs Sulzberger Award from Barnard College, the women's arm of Columbia University.

The award recognizes Akers' "personal and professional commitment to the advancement of women within the corporate community," but a closer look reveals that the choice of honoree is very close to home. New York City's Sulzberger family also publishes *The New York Times*, whose corporate board includes a director named John Akers.

Prime nets supermini deal with U.S.

NATICK, Mass. — Prime Computer, Inc. recently announced its largest contract ever, an agreement valued at more than $64 million with the U.S. Department of the Interior for the sale of up to 447 superminicomputers.

Under the five-year contract, Prime will provide office-based and computer room systems spanning its product line. Prime will also furnish software, maintenance, training and other services.

The Prime systems will be used to simulate, map and analyze data gathered by satellites and other sources. Typical uses will include forecasting the environmental impact of factors such as acid rain, road construction and prolonged temperature conditions.

The systems will operate in approximately 220 Interior Department field offices in 21 states. They will be linked via an X.25 packet-switching network. The department currently operates 70 Prime computers in the U.S. Geological Survey's Water Resource and Geological divisions.

IBM ASCII terminals:

The case in black and white.

Introducing a somewhat more colorful member of the family.

Meet the IBM 3164 ASCII Color Display Station.

It gives you eight foreground and eight background colors. On a 14" screen.

And because of its 8 x 16 character matrix, the 3164 gives you clear, crisp characters in color.

But is color any reason to buy IBM's 3164? It is, according to studies that indicate the use of color increases productivity, decreases errors and promotes user satisfaction.

Color, of course, is far from the sole reason for choosing the 3164. To appreciate the others, you should get to know the rest of our ASCII family.

Emulation. Another side of the family.

Our ASCII terminals are designed to fit into existing systems. Even if the systems aren't ours.

Emulation Capability	
3161	IBM 3101 Model 801 ADDS Viewpoint* Hazeltine 1500* Lear Siegler ADM-3A* Lear Siegler ADM-5* TeleVideo 910*
3163	IBM 3101 Model 801 DEC VT 52* DEC VT 100* TeleVideo 950*
3164	IBM 3101 Model 881

For example, our basic ASCII Display Station, the IBM 3161, emulates up to six terminals. And the advanced-function 3163 emulates a number of higher level ASCII data streams.

Features	3161	3163	3164
Screen size	12"	12"	14"
Lines x characters	25x80	25x80	25x80
Character matrix	8x16	8x16	8x16
Double-sized characters	No	Yes	Yes
Line drawing characters	24	24	24
Vertical scroll	Jump	Jump/ Smooth	Jump/ Smooth
Definable function keys	24	24	24
Windowing	No	Yes	Yes
Partitioning	Horiz.	Vert./ Horiz.	Vert./ Horiz.
Characters in buffer	1920	7680	7680

What's more, every one of our ASCII terminals can operate in its own function-rich native mode.

Our family is flexible.

Our unique plug-in cartridges allow for considerable flexibility in your operation. For example, simply by switching cartridges you can shift a terminal from one data stream to another.

And, in many countries cartridges are also available that go beyond emulation to let you operate your ASCII terminals in several foreign languages. Appropriate foreign language keyboards are also offered.

Enhanced ergonomics. Another family trait.

All our ASCII terminal keyboards have 102 keys. But that's not all they have in common. Every keyboard also has a low profile, gentle contour and typewriter touch.

And our keyboards have programmable function and editing keys so they can be custom-tailored to fit your application needs. The 3163 and 3164 models also have redefinable and recappable keys.

Superior ergonomic design isn't confined to the keyboard, however. All three displays tilt and swivel for maximum user satisfaction. And, of course, by making the display easy to read, we made it easier on the eyes. In addition to the 8 x 16 character matrix, we gave it an advanced non-glare etched screen, cursors, and character and field attributes like blink, reverse video, underscoring and dual intensity.

High standards. Competitive prices.

Quantity discounts are offered, too. And financing is available through the IBM Credit Corporation. Best of all, each terminal comes with the quality, service and support you'd expect from IBM.

Contact your IBM marketing representative, or call 1 800 IBM-2468, Ext. KC/90, for the IBM Authorized Distributor nearest you. And we'll present more evidence in the case for IBM's ASCII terminals.

It may be all you need to color your view.

*ADDS Viewpoint is a trademark of Applied Digital Data Systems, Inc.; Hazeltine 1500 is a trademark of Hazeltine Corp.; Lear Siegler ADM-3A/ADM-5 are trademarks of Lear Siegler, Inc.; TeleVideo 910/950 are trademarks of TeleVideo Systems, Inc.; DEC VT 52/VT 100 are trademarks of Digital Equipment Corporation.

COMPUTER INDUSTRY

EXECUTIVE CORNER

Don Anselmo, a former AT&T executive, has been named president and chief operating officer of Mitek Systems Corp. A 29-year veteran of AT&T, Anselmo most recently was director of computer-aided design and manufacturing at the firm.

C. Richard Moore has been appointed president, chief executive officer and director of Excelan, Inc. Moore, 51, was previously president and chief operating officer of Valid Logic Systems, Inc. of San Jose, Calif.

■

Connie E. Austin has been named president of Sellectek, Inc., the company that developed Infomaster, a computer-aided retailing system. Austin, 35, was promoted from Sellectek executive vice-president of marketing and sales.

■

William J. Adams has been named vice-president and general manager of Harris Corp.'s Digital Telephone Systems division. Adams succeeds **Donald Green**, who will serve as consultant to the company.

■

Eugene W. Buckley has been promoted to staff vice-president, financial administration, at Sperry Corp. Buckley, who also serves as assistant to Joseph J. Kroger, Sperry's president and chief operating officer, joined the company in 1951.

■

Three executives of Xerox Corp. have been elected corporate vice-presidents: **Addison B. Rand**, vice-president of Xerox's business systems group in Rochester, N.Y., and general manager of its national marketing distribution organization; **John C. Shoemaker**, vice-president of the systems group in El Segundo, Calif., in charge of group operations; and **William J. Spencer**, vice-president, corporate research, at company headquarters in Stanford, Conn.

■

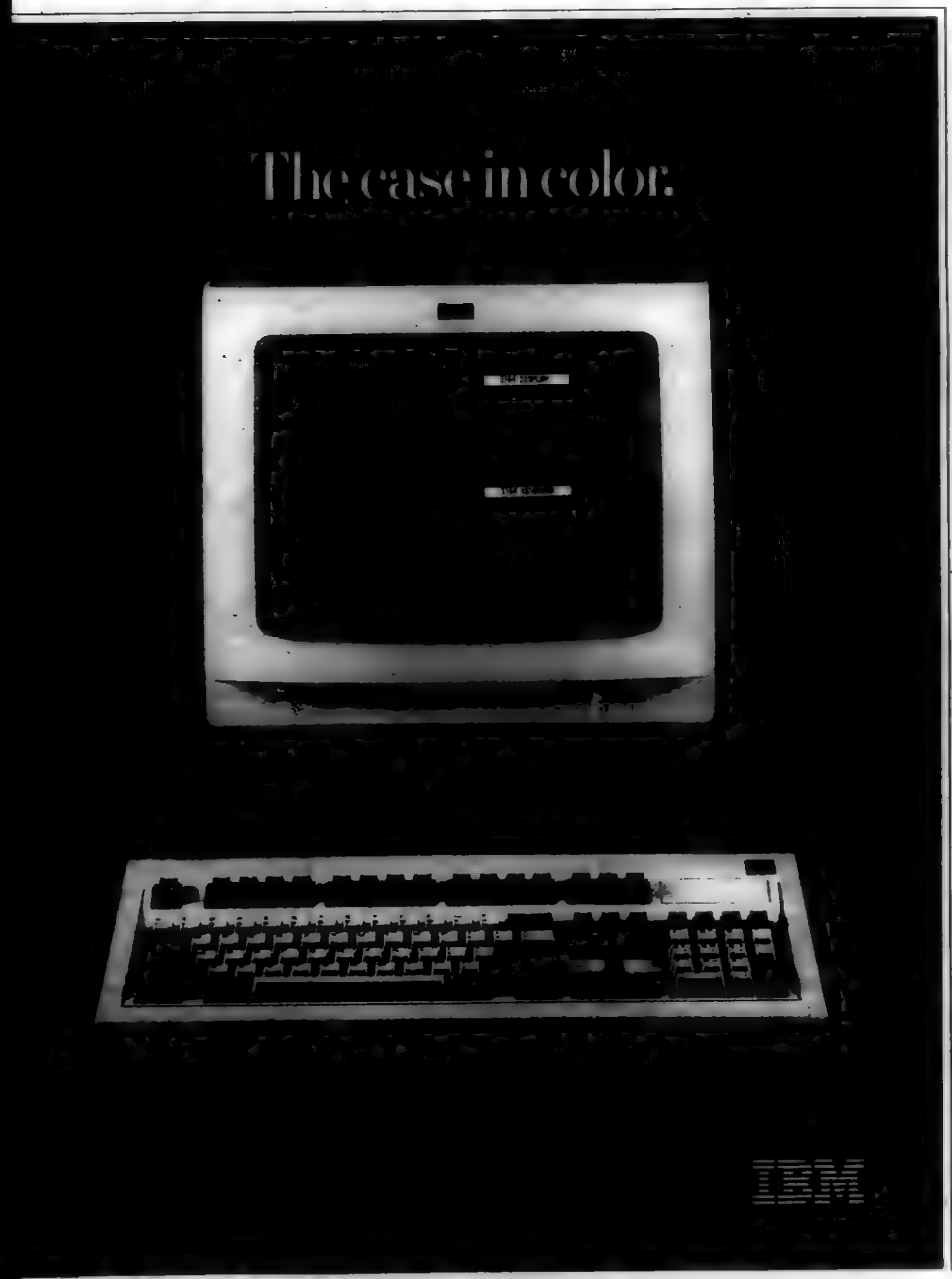
David Caplan, Tolerant Systems, Inc. president, has become the company's chief executive officer on a permanent, full-time basis. For the last 16 months, Caplan has served as a general partner of Adler and Co., the New York-based venture capital firm that is Tolerant's principal investor.

■

Robert Bressler has joined 3Com Corp. as vice-president and general manager of the Application Software Division. Prior to this appointment, he spent more than 13 years at Bolt, Beranek and Newman in Cambridge, Mass.

■

Delphi Systems, Inc. has announced several changes in senior management. **Walter F. Bauer** has been elected chairman of the board and chief executive officer. Bauer founded Informatics General Corp. in 1962. **S. George Nazarian** has resigned his positions as chairman and director to pursue other business interests. **Kenneth W. Bitticks** has resigned as president and chief executive officer but will continue to serve on the board of directors. **Richard R. Janssen**, chief operating officer, has been elected president.





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Wednesday, July 9, 11:00-11:50, Room A
PC EXPO Keynote Address

Wednesday, July 9, 12:00-12:50, Room A
Compatibility Leaps to Enhancement Products

Wednesday, July 9, 12:00-12:50, Room C
Personal Computer Training in Corporate America

Wednesday, July 9, 12:00-12:50, Room D
The Information Center – A Case History

Wednesday, July 9, 12:00-12:50, Room E
Avoiding Computer Nightmares

Wednesday, July 9, 1:00-2:50, Room A
The Licensing Panel

Wednesday, July 9, 1:00-1:50, Room C
Multi-Personal Micro-Systems Challenge Minicomputers

Wednesday, July 9, 1:00-2:50, Room D
The Direct-Sales Dilemma

Wednesday, July 9, 1:00-1:50, Room E
Purchasing Decisions Using LAN Standards and Benchmarks

Wednesday, July 9, 3:30-3:50, Room B
A Technical Presentation by IBM, for Independent Hardware and Software Developers, Concerning IBM PC Products and Enhancements

Wednesday, July 9, 2:00-2:50, Room C
Microcomputer Basics and Beyond

Wednesday, July 9, 3:00-3:50, Room E
Marketing Personal Computing: Who's Who, Where's Who

Wednesday, July 9, 3:00-4:50, Room A
Creative Word Usage, Whole Hand

Wednesday, July 9, 3:00-4:50, Room C
Micro Communications: Long Talk and More Action

Wednesday, July 9, 3:00-3:50, Room D
Choosing a Local Area Network: A Multi-Faceted Decision

Wednesday, July 9, 3:00-4:50, Room E
Types and Alternatives of Micro-to-Mainframe Connection

Thursday, July 10, 10:00-12:50, Room B
A Technical Presentation by IBM (see Wed. July 9, 1:00)

Thursday, July 10, 10:00-11:50, Room A
Portable Computers: Solution Really Improves Productivity?

Thursday, July 10, 11:00-12:50, Room C
The Role of Minicomputers in Expanding Corporate Computing

Thursday, July 10, 12:00-1:50, Room D
Computer Networking: Issues of Compatibility

Thursday, July 10, 12:00-1:50, Room E
Buyer Beware: Tales of Computer Woe

Thursday, July 10, 2:00-3:50, Room A
Project Management Using Microcomputers

Thursday, July 10, 2:00-3:50, Room C
Desktop Communications: Fax, Modems, Networks

Thursday, July 10, 2:00-3:50, Room D
Micro-to-Mainframe Connections: Which Way Is It Going?

Thursday, July 10, 2:00-3:50, Room E
Micro-to-Mainframe Connections: Which Way Is It Going?

Thursday, July 10, 4:00-5:50, Room A
Desktop Publishing: Is It Right for Your Business?

Thursday, July 10, 4:00-5:50, Room C
Micro-to-Mainframe Connections: Which Way Is It Going?

Thursday, July 10, 4:00-5:50, Room D
Micro-to-Mainframe Connections: Which Way Is It Going?

Thursday, July 10, 4:00-5:50, Room E
Micro-to-Mainframe Connections: Which Way Is It Going?

Friday, July 11, 10:00-11:50, Room A
Computers in Word Processing and Database Applications

Friday, July 11, 11:00-12:50, Room C
Presentations on the Style of the Industry

Friday, July 11, 11:00-11:50, Room D
Corporate Training: An Integrated Approach

Friday, July 11, 11:00-11:50, Room E
Office Automation Sees the Golden Up

Friday, July 11, 12:00-12:50, Room A
Computer Outbreaks – Upgrades, Support, and Service

Friday, July 11, 12:00-12:50, Room D
PCs and Expert Systems: Costs/Benefits

Friday, July 11, 12:00-12:50, Room E
Handling Distributed Data Using a Client of Servers

Friday, July 11, 1:00-2:50, Room A
What Makes an Information Center Click?

Friday, July 11, 1:00-1:50, Room C
Computer Security: Is Your System Safe and Sound?

Friday, July 11, 1:00-2:50, Room D
LANs: Assessing User Needs

Friday, July 11, 1:00-2:50, Room E
Micro-to-Minicomputer Communications: An Overview

Friday, July 11, 2:30-4:00, Room A
Beyond Keyboard Entry: Options in Data Input

Friday, July 11, 2:30-4:00, Room C
CAD/CAM, Candidly

Friday, July 11, 2:30-4:00, Room D
Memory Storage: Past Dreams/Future Visions

Friday, July 11, 2:30-4:00, Room E
The Revolution in PC Publishing

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I
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2 ☐ Computer dealer/dist.
3 ☐ Computer OEM
4 ☐ Office products dealer
5 ☐ Service vendor
6 ☐ Software developer
7 ☐ Systems house
8 ☐ Turnkey vendor
9 ☐ Value adder
10 ☐ Other (specify) _____

CORPORATE VOLUME BUYERS—YOUR COMPANY'S MAIN BUSINESS ACTIVITY

II
A ☐ Accounting firm
B ☐ Advertising
C ☐ Banking
D ☐ Communications
E ☐ Construction/Architects
F ☐ Credit
G ☐ Education
H ☐ Engineering
I ☐ Government/Military
J ☐ Hospital
K ☐ Hotel
L ☐ Industrial design
M ☐ Insurance
N ☐ Law office
O ☐ Management consultant
P ☐ Manufacturing
Q ☐ Publishing
R ☐ Real estate
S ☐ Research-Development
T ☐ Retail sales
U ☐ Securities broker
V ☐ Transportation (all)
W ☐ Utility
X ☐ [illegible] sales
Y ☐ Other specify _____

YOUR JOB FUNCTION (Check main one only)

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CC ☐ Consultant
DD ☐ Corporate officer
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FF ☐ Designer (all)
GG ☐ DP/MIS manager operator
HH ☐ Engineer (all)
II ☐ MIS Dir./Mgr
JJ ☐ Programmer
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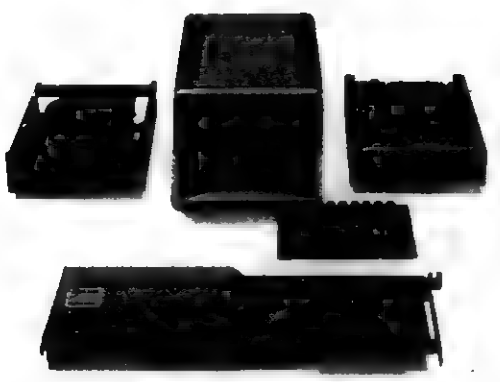
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U.S. vendors find rules different

From page 174

German customers are also very different from U.S. buyers, according to Imai-Alexandra Roehreke, public relations manager at Digital Equipment Corp.'s West German subsidiary. "They need more hand-holding, more pampering," she explains.

Martin Judd, a vice-president at software firm MSA International, Inc., a subsidiary of Management Science America, Inc., noted that in Asia, "You've got to tailor your approach to each market. Unless you realize that committees make decisions, you will be in trouble. Never pressurize an individual, or single him out for special treatment."

British less adventurous

Some U.S. software vendors, Small says, fail to appreciate that British users, besides being less adventurous than their transatlantic cousins, also have less cash to spend than do most U.S. firms.

"American companies selling big banking packages have had problems," he says. "Equivalent American users have computers two or three times as powerful because, unlike the British, they are doing real-time updating. The suppliers have found that UK companies can't afford computers big enough to run their packages," Small says.

The suppliers themselves often must do more with less when it comes to their European marketing campaigns. "The issue is quality vs. quantity in our marketing since budgets are tight," observes Giuseppe Tagliabue, marketing manager at DEC's Italian subsidiary.

In one response to this challenge, DEC supplies computer equipment to Ferrari's racing department, thereby teaming up with one of Italy's best known car manufacturers in a partnership that provides DEC with high visibility at little cost.

Beppe Ugolotti, marketing manager at Apollo Computer, Inc.'s Italian office, notes that print advertising in Italy differs in content from that in the U.S. "In the U.S., you can use dramatic advertisements that set a mood. But in Italy, advertisements must be more conservative, practical and to the point," he says.

Translating software a headache

Modifying software for different markets and translating manuals and screen displays from English is a major headache for many companies. "We have a six-month time lag in the translation of software," says Max Uwe Ferck, marketing communications manager for Wang Laboratories, Inc. in West Germany. "We aren't able to offer a new product right away because we have to translate the literature."

U.S. software developers often forget that their products may find their way to Munich, West Germany, Paris or Madrid. "If you are creating software in the U.S., think international when you're writing it," says Andrew Thorburn, European Group president of U.S.-headquartered Lexitech, Inc., a service firm specializing in the translation and localization of software and documentation.

Some European firms that market OEM U.S. software packages, such as International Computers Ltd. in the UK, are passing translation burdens back to the developers, according to Thorburn.

Use local experts

To untangle the web of foreign particularities, U.S. firms often turn to local agents or distributors. In Italy, some U.S. companies, including Wang and Texas Instruments, Inc., prefer to use Italian public relations firms for all advertising, marketing and press relations, relying on local experts familiar with the national market.

But in Europe, U.S. companies appear to be overcoming most of the cultural hurdles. The UK's trade deficit in computer products, for example, is now running at over $2.5 billion per year, compared with $280 million in 1978. The bulk of imports come from the U.S.

An Wang, chairman of Wang Laboratories, recently predicted that European sales will contribute a third of Wang's total revenue by the middle of the 1990s, up from one-fifth last year.

Televideo breaks even despite low quarterly sales

SAN JOSE, Calif. — Televideo Systems, Inc. continued its struggle in the competitive terminals market, announcing break-even results for the second quarter ended May 2.

Sales during the quarter dropped to $20.8 million from $26 million a year ago. Profits were $19,000, or zero cents per share, compared with a loss of $678,000, or minus two cents a share, for the same period a year ago.

Sales for the year are down 18% from last year, while profits inched up to $322,000, up from an $8.7 million loss of a year ago.

Once a leader in the ASCII terminal market with sales of more than $168 million in 1983, Televideo began losing ground when it diversified its product line and concentrated heavily on producing an IBM Personal Computer clone.

The company lost $19 million on sales of $103 million during fiscal 1985.

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See page 144

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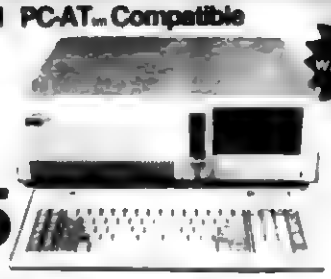
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Word-a-holics unite!

Trying to decide which word processor to buy is like trying to decide which college to go to. The decision will change your life forever, but you may never know if it was the best one. Here are five tried and proven professional packages. They all have spell checkers. None are copy-protected. And hard drives are recommended for all. See PC Magazine 1/28.



MultiMate Advantage 3.6 with Graphlink and On-File $288
Originally designed to emulate the WANG word processor, MultiMate is often referred to as the corporate word processor. It offers sophisticated networking capabilities, and, with two free-for-a-limited-time software programs (Graphlink and On-File), also has built in graphics and database.

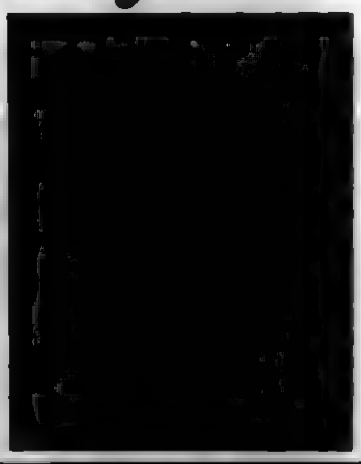
MicroSoft Word 3.0 with Outline $247
With a mouse and a graphics card, MicroSoft Word lets you move words around without touching the keyboard, and see what you got without squinting. Without a mouse or a graphics card it's still a powerful word-processor, with "Style Sheets" that simplify formatting, and a built-in outline program.

WordPerfect 4.1 ..... $239
We have a friend who writes for computer magazines. At one time or another he has used and reviewed virtually every major word processor. He now swears by WordPerfect and swears at all the others. Use this program for a while and you'll be able to touch type most of your commands with your eyes closed and your right hand tied behind your back.

WordStar 2000 Plus Release 2 ..... $295
WordStar has had some trouble shedding its image as the lumbering dinosaur of the microcomputer age. But hundreds of thousands of people use it. There are a lot of programs out there to back it up. And this new version gives it the same advanced features as any top-quality word processor. Even the control keys are starting to make some sense.

Volkswriter 3.0 ..... $147
Solid performance with a reasonable price continues to be Volkswriter's claim to fame. It's fast, and boasts one of the original what-you-see-is-what-you-get screens. With the new version's spell checker and more sophisticated print formatting, it is now able to compete functionally with the other high-end word processors. (Our new low price is pretty persuasive too).

Buy one. Get two.



Hey, got a friend? Don't know? Check your database! What? No database? Have we got a deal for you (and your friend). Until June 30, Microrim will send you a *complete* second copy of R:base 5000 free when you send in your warranty card and a copy of our sales invoice. So you can get together with your friend, split the cost for one and get two! Or, you can keep the extra copy at home, at a branch office, or down the hall. R:base 5000 is easy to learn and operate, and has the custom reporting features most users need. Remember, the two for one offer is only good from April 15 till June 30.

R:base 5000 ..... $359
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Chips

Fully tested, factory fresh 9-chip sets from the leading chip manufacturers, such as TI, Samsung, NEC, Hitachi, Oki, etc. All chips and chip sets come with complete instructions.

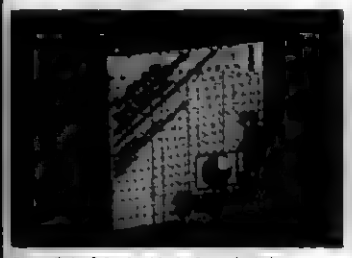
64K (200Ns)	$12 ea. set
64K (150Ns)	$15 ea. set
128k or 256k (150Ns)	$39 ea. set

Bernoulli Berserk!

We've got a problem. The prices we're able to offer on Bernoulli boxes are changing about 10 times faster than we can change this ad. Probably because the machines are selling about 10 times faster than anyone ever dreamed they would. The 20 Meg and 40 Meg versions feature two ½ height drives with removable cartridges. There's a 90 day warranty, and we're an authorized Bernoulli service center—turnaround on repairs is usually 24 hours. Here are our latest up-to-date but probably obsolete by-now prices:

Bernoulli Box 40 Meg $2499
Additional 20 Meg Cartridges $89
Bernoulli Box 20 Meg $1999
Additional 10 Meg cartridges $51
Bernoulli Care Kit $79

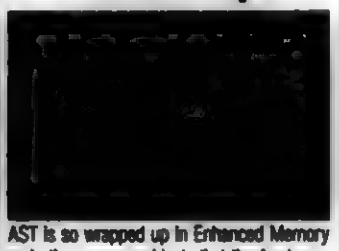
Supercalc ifragilistic!



SuperCalc 3 is the kind of product that you'd be proud to bring home to your mother. Like Lotus 1-2-3 it offers spreadsheet, information management and presentation graphics. But it only needs 128k of RAM, and is not copy-protected. It also is compatible with the Hercules Monochrome Card, as well as the Enhanced Memory (EMS) and Enhanced Graphics (EGA) standards. And you get a free copy of Sideways, the program that lets your printer think horizontal is vertical.

SuperCalc 3 2.1 (with Sideways) .....
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SixPakPlus Minus$!



AST is so wrapped up in Enhanced Memory and other arcane subjects that they've been letting the price slip on their original claim to fame—the AST SixPakPlus, one of the original and best multifunction cards. So if you're just starting in computing, or outfitting a second unit for home, now's a great time to buy this basic piece of hardware. You get a clock calendar, serial port, parallel port, up to 384k of memory, *and* copies of two classic unprotected programs—Sidekick 1.5 and DESQView. A genuine deal.

SixPakPlus 64k $169
SixPakPlus 384k (fully populated) $219

Herculean rebate!

The Hercules monochrome graphics card has saved hundreds of thousands of PC owners from terminal myopia, by supplying crisp clean monochrome graphics. The Hercules color card is the industry standard for color graphics. Both come with a parallel printer port, and a *full two year warranty*. And from May 1 through August 31, Hercules is offering a $50 rebate on either card.

Hercules Monochrome Graphics Card $299
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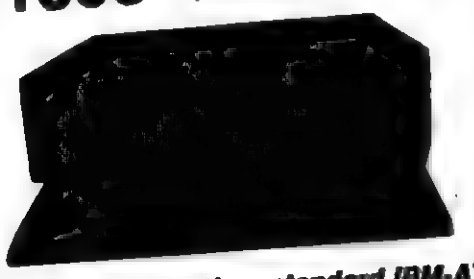
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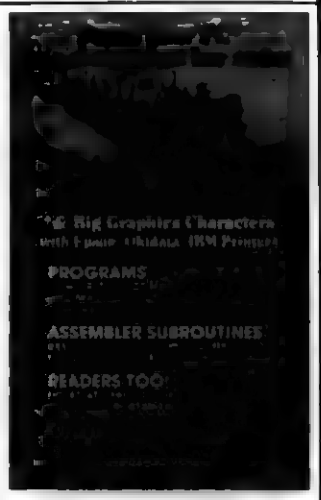
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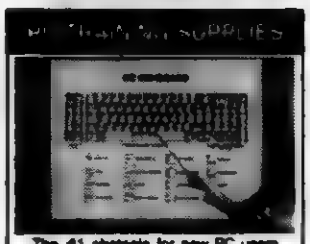
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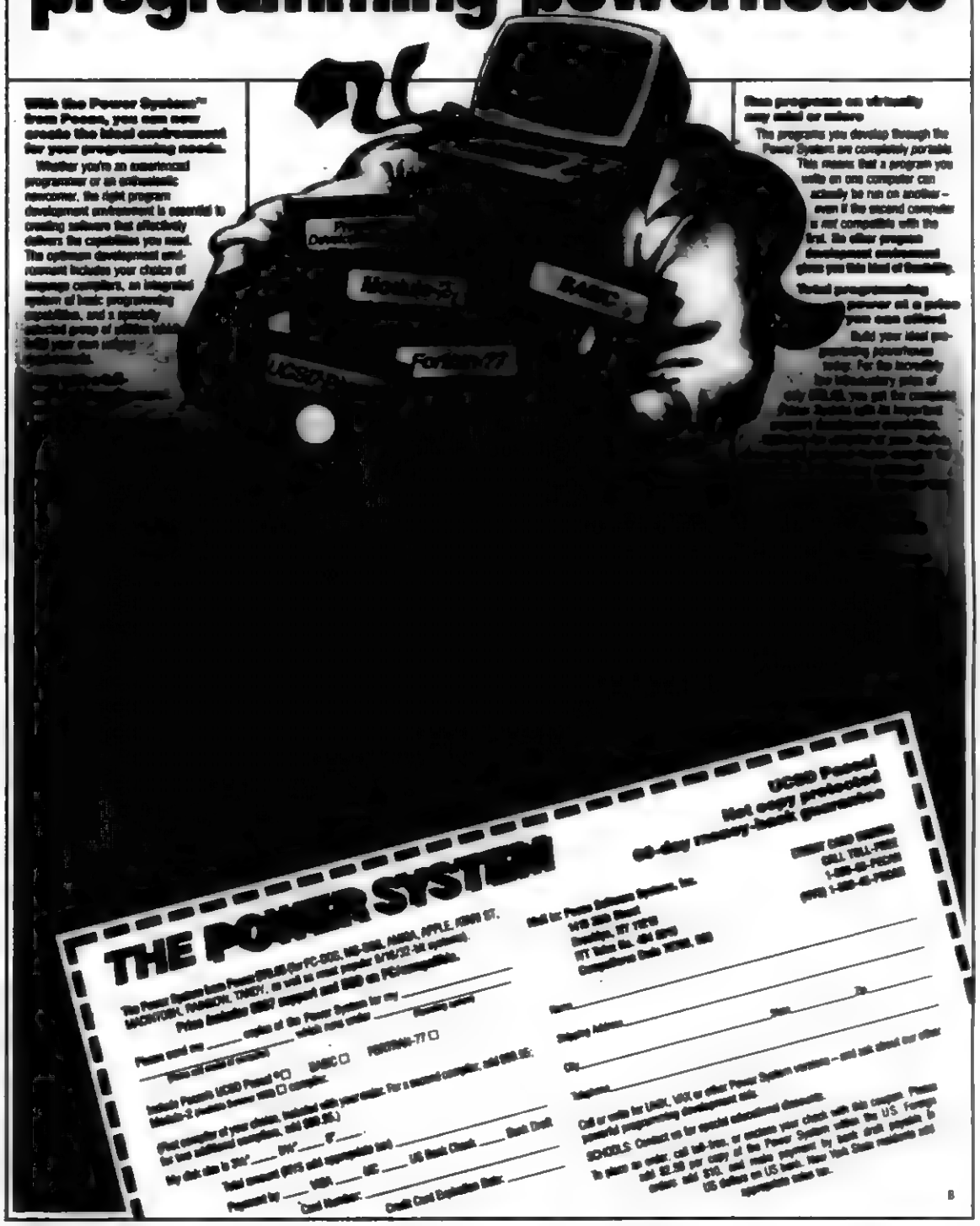
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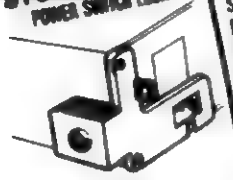
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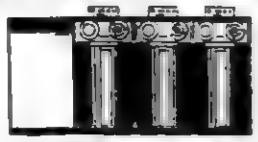
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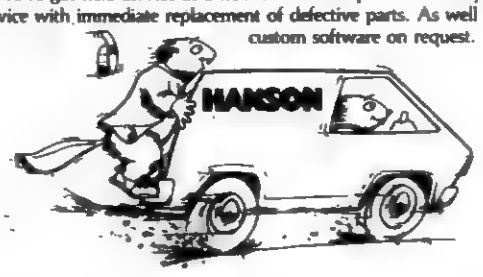
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You will design and transform user requirements into an application program for a data processing system. Working on highly complex projects, you will also be responsible for providing technical leadership to junior personnel. Five years programming experience with four years in systems development using COBOL is required. (Job Code 700-1)

PROGRAMMER ANALYST

You will develop functional requirements and documentation based on accepted user criteria, prepare system test procedures, and work independently on complex projects related to specific phases of application programming. Three years programming experience with two years in systems development using COBOL is required. (Job Code 700-2)

For **Sr. Programmer Analyst and Programmer Analyst** positions, a Bachelor's degree or equivalent in Computer Science, Math, Engineering or Business is preferred. Previous experience with large-scale IBM systems and IMS DB/DC required; experience in distributed data processing systems a plus.

DATA BASE ADMINISTRATION ANALYST

You will design and install IMS data bases for large-scale IBM systems. You must have a minimum of three years experience with two years in systems development and IMS DB/DC experience. Experience preferred in: Monitoring data bases for performance, logical and physical data base design, data base reorganization and recovery procedures and utilities, PSB and DBD creation. **Positions available in Memphis and Colorado Springs.** (Job Code 700-3)

QUALITY ASSURANCE ANALYST

You will participate in the development of a quality assurance function to include such areas as: Change control, system test, monitoring of standards and procedures, implementation of a structured methodology and system design reviews. You must have a minimum of three years data processing experience with two years in systems development using COBOL and strong interpersonal skills. IMS knowledge and experience with systems test, design reviews, change control or structured methodology preferred (Yourdon). **Positions available in Memphis and Colorado Springs.** (Job Code 700-4)

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You will join a new group being formed to support our rapidly expanding distributed network; consult on and design custom communications protocols to support corporate projects; and write system level code to interface intelligent devices to each other, our large IBM SNA network, and our X.25 network. You must have five years recent experience in data processing, including three years in communications software, and experience with design and analysis of communication protocols. Tandem experience a definite advantage. Familiarity with micro-operating systems and knowledge of COBOL, Assembler, IMS, or VTAM a plus. A Bachelor's degree or equivalent in Computer Science preferred. Good communication, organization/planning skills are essential. (Job Code 700-5)

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You will consult and plan configurations and ensure appropriate hardware/software support for our large ACF/VTAM, ACF/NCP network, supporting such products as NCCF, NTO, NPM, and MSNF. You must have five years data processing, including three years experience in system software support and a working knowledge of MVS, VTAM, NCP, Assembler, and communication hardware concepts. COBOL programming skills and knowledge of communication protocols are preferred. (Job Code 700-6)

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You will be responsible for performance analysis of each major system's DASD configuration and improvement recommendations using MICS, SMF/RMF, OMEGAMON, RESOLVE, TESTDATA response time monitor, BEST1, MAP and CMS models. You must have seven years programming experience, including five years in systems programming for large IBM mainframes and demonstrated technical skills in implementing major IBM systems software. A Bachelor's degree or equivalent in a computer related field and experience with the above mentioned tools are preferred. (Job Code 700-7)

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You will be assisting on configuration, performance, space management and all phases of DASD utilization. You must have three years data processing experience with at least one year in DASD management in a large IBM shop. Must be able to use UCC-3, DMS, or HSM. Systems programming experience a plus. Strong JCL skills required. (Job Code 700-8)

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You will maintain and troubleshoot the latest IMS/Fastpath systems software and work with state-of-the-art technology in our **Colorado Springs Data Center.** You must have five years recent work experience in data processing including three years experience in IMS systems programming. Excellent Assembler programming skills, ability to use systems dumps in problem determination and knowledge of IBM hardware and diagnostic techniques are a must. (Job Code 700-9)

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APR

Director Of Administrative Computing Center

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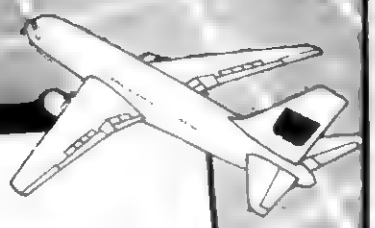
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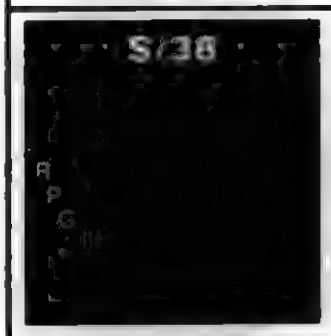
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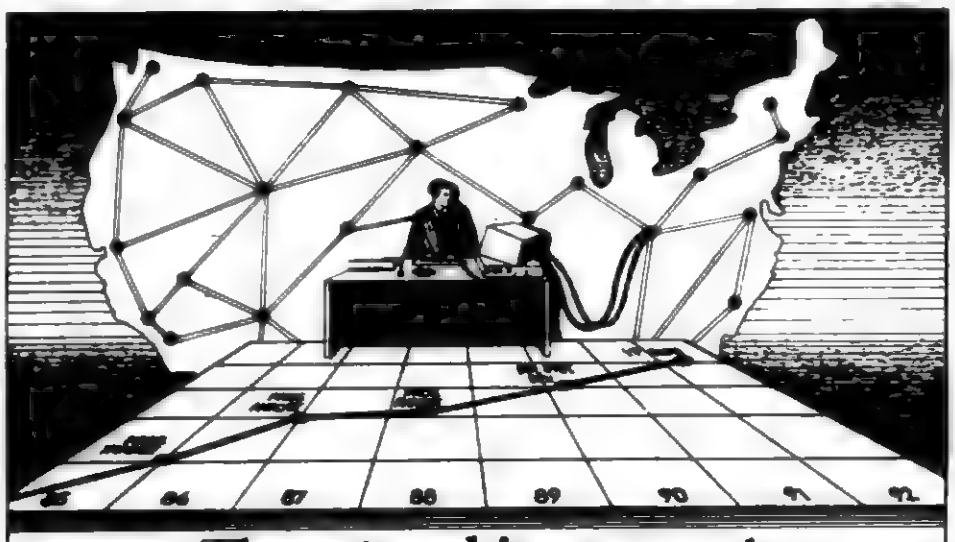
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Computerworld Headquarters: 375 Cochituate Road, P.O. Box 9171, Framingham, MA 01701-9171 Phone: (617) 879-0700, Telex: 95-1153

SALES Vice President, Edward P. Marecki. Manager/Marketing & Sales Operations, Kathy Doyle. National Recruitment Sales Manager, Al DeMille. Display Advertising Manager, Anne Hadley. Senior Coordinator, Carolyn Medeiros. Display Advertising, Maureen Carter, George W. Griffin, Joy Forman. Classified Operations Manager, Cynthia Delaney.

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Foreign Editorial/ Sales Offices

Argentina: Ruben Argento, Computerworld Argentina, Av. Belgrano 406-Piso 9, CP 1092 Buenos Aires. Phone: 34-5583/5584. Telex: 22644.

Asia: Euan Barty, Asia Computerworld Communications Ltd., 701-4 Kam Chung Bldg., 54 Jaffe Road, Wanchai, Hong Kong. Phone: (05) 8L63236. Telex: 72827 (COMWR HX)

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (02) 4395133, Telex: AA74752 COMWOR.

Austria: Dr. Manfred Weiss, CW Publikationen, Verlagsgesellschaft m.b.H., Josefstaedter Strasse 74, A-1080 Wien, Austria, Telex: 115 542 (sch/a).

Brazil: Eric Hippeau, Computerworld do Brazil, Rua Pedroso de Moraes 1553, 05419 Sao Paulo, SP Brazil. Phone: 814-9658-212-8750. Telex: 11 32017 (WORD).

Denmark: Preben Engell, Computerworld/Danmark A/S, Torvegade 52, 1400 Copenhagen K, Denmark. Phone: (01) 955 695. Telex: 31566.

France: Axel LeBlois, Computerworld Communications S.A., 185 Avenue Charles De Gaulle, 92200 Neuilly Sur Seine, France. Phone: 747 1272. Telex: 613234 F.

Hungary: Dezso Futasz, SZT Computerworld, P.O. Box 386, Budapest, 1536, Hungary.

Italy: Daniele Comboni, Computer Publishing Group S.R.L., Viale Restelli 5, 20124 Milano. Phone: (2) 688 9773. Telex: 333436 (GEJIT).

Japan: Mr. Shuji Mizuguchi, Computerworld Japan, 7-4 Shimtomi 1-Chome, Chuo-ku, Tokyo 104. Phone: (03) 551-3882, Telex: 252-4217 (Computerworld Japan only).

Steven Yamada, Tokyo Representative Corp., Sanshin Kogyo Bldg., 2-10 Kando Jimbocho 3F, Chiyoda-ku, Tokyo 101, Japan. Phone: 230-4117, Telex: J26860 (reps for all CWCI publications except Computerworld Japan).

Mexico: Henry Morales, Computerworld Mexico S.A. de C.V., Oaxaca 21-2, Mexico City 7 D.F. Colonia Roma, 06700 Mexico. Phone: (05) 514-4218. Telex: 177 1300 (ACHAME).

The Netherlands: Wout Berends, CW Communications B.V., van Eeghenstraat 84, 1071 GK Amsterdam, The Netherlands. Phone: (020) 64 6651. Telex: 18242 (CWCOM NL).

Norway: Mr. Morton Hansen, CW Norge A/S, Hovinveien 43, P.O. Box 2862, Toyen, 0608 Oslo 6, Norway. Phone: (20) 64 77 25. Telex: 76476 9 (CW NOR N).

People's Republic of China: Chen Mingkun, China Computerworld, 74 Lu Gu Gun Road, P.O. Box 750, Beijng 10039, People's Republic of China. Phone: (47) 814 6174. Telex: 222214 (CCW CN).

Spain: Nell Kelley, Computerworld/Espana, Barquillo 21-3 izda, Madrid-4, Spain. Phone: 231 23 85; 231 23 86; 231 23 88. Telex: 47894 (CW E).

Sweden: CW Communications AB, Sodra Hamnvagen 22, S-115 41 Stockholm, Sweden. Phone: 46 8 67 91 80. Telex: 14904 9 (NOVACW).

Switzerland: Gebhard Osterwalder, CW Publikationen AG, Witikonerstrasse no. 15, CH - 8032 Zurich, Switzerland. Phone: (01) 55 10 77. Telex: 816710.

Taiwan: Grace Tang, ACE Media Agency Ltd., Room 503, 1, Fu Hsin S. Road, Sec. 1, Taipei, 10587, Taiwan, R.O.C. Phone: 751 3636. Telex: 14142 (ACE GROUP). (Representative for all CWCI publications).

United Kingdom: Martin Durham, CW Communications Ltd., 99 Grays Inn Rd., London, WC1 8UT, United Kingdom. Phone: (01) 831-9252, Telex: 262346.

Euan Rose, Bill Dunlop, Barbara Levy, Christine Taylor, Beere Hobson Assoc., 345 Goswell Rd., Islington, London EC1, United Kingdom. Phone: (01) 278 3415. Telex: 311951. (Representatives for CWCI publications).

Venezuela: Kalman von Vajna Nagy, CW Comunicaciones, C.R.L. Torre Maracaibo, Piso 10, Oficina H, Av. Libertador, Caracas, Venezuela. Phone: 72-76-30.

West Germany: Eckhard Utpadel, CW Publikationens GMBH, Friedrichstrasse 31, 8000 Munchen 40, West Germany. Phone: (089) 38172-0. Telex: 5215350.

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INDUSTRY NOTES

DG lays off 400 in two plants

Data General Corp. announced the closing and proposed sale of peripheral assembly plants in Austin, Texas, and Hong Kong, resulting in the layoff of 200 workers in each location. About 50 employees from each plant will be transferred within the company, and DG will record a charge of about $6 million from the action in the current quarter.

DG also announced the formation of a Volume Products Division to include its laptop and desktop computers. The Westboro, Mass.-based mini vendor also consolidated its MIS and DP organization but did not eliminate any jobs in the move.

■

Control Data Corp.'s lead banks last week agreed to the company's plan to repay $375 million in short-term debts on which it had been in default since last fall. CDC paid $26 million and agreed to pay the balance before the end of 1986, pledging the stock of its Arbitron and Commercial Credit Co. units as collateral. CDC last week also issued $350 million worth of public bond offerings to raise cash.

■

Digital Equipment Corp. agreed to pay $9 million in an out-of-court settlement of shareholders' suits filed in 1983. The class-action suits charged that DEC failed to warn stockholders of a 65% earnings decline in its first quarter ended Oct. 1, 1983.

Burroughs Corp. said it will purchase 53% of the 58 million **Sperry Corp.** shares tendered by the June 10 deadline for the agreed price of $76.50 per share, or a total of $2.37 billion.

Sperry named eight new directors designated by Burroughs, including Chairman W. Michael Blumenthal, while four Sperry directors, none of them Sperry executives, resigned.

■

Ashton-Tate reorganized into two units. The software products division, under marketing and strategic planning head Roy E. Folk, will include marketing, R&D and documentation. The systems, service and information division, under sales and international head Ronald S. Posner, will include customer support and micro-mainframe links.

■

AST Research, Inc., reorganized its IBM-related business along market rather than product lines. AST will consist of a personal workstation enhancements unit, a communications unit and an advanced technology group for products such as laser printers and disk subsystems.

■

Lagging behind Symbolics, Inc. in the artificial intelligence workstation field, **Lisp Machines, Inc.** of Andover, Mass., laid off 60 employees, or 25% of its work force.

Order increase may light fire



ACTIVE ISSUES
Kathy Porteus

By many accounts, the technology sector of the stock market will explode with activity when sparked by definite signs of improving domestic orders. "If a couple of computer companies say business has really changed," says Rick Martin, research analyst with Sanford C. Bernstein & Co., "then investors will be willing to bet on the upturn, and money will come pouring back in to technology stocks."

Because computer companies such as IBM are tight-lipped about business conditions, analysts and investors can only guess when such information will be released. Some speculate that IBM will offer an indication of its order rate during a meeting with analysts this week in San Jose, Calif.

"I think investors will take the slightest bit of good news from IBM as being very positive," Martin says. Martin currently recommends purchase of IBM because the stock is "unbelievably cheap."

While waiting for an appreciable turn in capital spending, which may still be months away, technology stocks have generally underperformed the Standard & Poor's Corp. index of 400 stocks. According to the L. F. Rothschild, Unterberg Towbin Technology Index, the S&P 400 has improved 15.2% since the beginning of 1986, whereas L. F. Rothschild's unweighted index of 166 technology stocks showed a 7.6% increase.

The key to playing this type of market successfully, analysts say, is stock selection. Although most technology issues have shown anywhere from a slight decline to moderate improvement, a few firms have racked up substantial price-per-share gains. One of the only technology stocks to have performed well in the past year is Cray Research, Inc. (CYR — 90⅜), which benefits from earnings visibility and its apparent immunity from difficult industry conditions.

Barry Bosak, analyst with Eberstadt Fleming & Co., says small capitalization stocks have tended to perform better than the bigger "cap" companies, of which only "a very select few have done well."

This trend is reflected in the stocks that have jumped more than 50% during this quarter: Apple Computer, Inc. (AAPL — 36), Seagate Technology Corp. (SGAT — 11⅞), Tandon Corp. (TCOR — 6⅜), Computer & Communications Technology Corp.(CCTC — 11⅜), Ashton-Tate (TATE — 32½) and Hogan Systems, Inc. (HOGN — 10⅜). Bosak says he expects stock selectivity to continue, doubting there "will be an overall trend like that in 1982," the year that all areas of technology went wild.

Stephen E. Yoken, L. F. Rothschild's director of technology research and designer of the firm's index, says he expects lackluster performance in technology stocks for the next few months. "The July-August period tends to be the slowest time of year for the computer industry and is always slowest for semiconductor companies," Yoken says. He does not anticipate that dramatic news will stimulate technology stocks as a whole.

According to Yoken, technology stocks will perform better toward the end of summer in anticipation of improved business conditions and favorable seasonal influences. Meanwhile, there is not much downside risk in such stocks unless a major market correction occurs.

Yoken expects companies such as Cray, Computer Sciences Corp. (CSC — 36⅜), Digital Equipment Corp. (DEC — 84¼) and Ashton-Tate to continue doing well during this time.

While no one is comfortable predicting when companies will begin reporting sustainable business improvements, everyone is eager for the news to break. As Sanford's Martin explains, investors know that when capital spending accelerates, technology stocks outperform the market.

Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

Private-label PCs to hit mart

From page 174

exposed to the risks," Compaq's Swavely added. But he said the Computerland product is geared toward competing with lower-cost machines from vendors such as Leading Edge Products, Inc. and AT&T.

Computerland was expected to announce today a private-label modular computer system that can be configured as an IBM Personal Computer XT or AT compatible. The machine is manufactured by Trigem, Inc. of South Korea.

Some major corporations indicate they will stick with systems from IBM and Compaq because of fears of incompatibility. "We have stuck very much with the major brands," said a major financial firm's microsystems consultant, who asked not to be identified.

Others, such as Pacific Gas & Electric Co. (PG&E) of San Francisco, already purchase a variety of compatible machines and consider price and functionality to be the key concerns. "We are very concerned about price," said Thomas J. Buckholtz, office technology project coordinator for PG&E. "We look at cost, ease of maintenance and whether it will run all the software that we want it to."

The basic Computerland configuration, dubbed the BC88, includes the chassis, keyboard and power source for a suggested price of $1,495. With disk drives and a monitor, the Computerland machine is not particularly cheap, analysts said. A similarly configured AT-compatible, the BC286, will sell for $2,895.

Judge OKs new MDS directors

From page 174

come of a June 23 show-cause hearing. But Tutino downplayed the potential effect of that hearing and said the board is proceeding with busi-

"Normally a show-cause hearing is scheduled within three to five days if the judge thinks it's important," Tutino said.

Last week's court action resulted from a bitter management dispute two weeks ago over who should head the operations of MDS Qantel, the company's sole operating unit [CW, June 9].

"It's still up to the judge," Christo said. "We sought both a temporary restraining order and an order to show cause, and we got one of them." Tutino said that the new board will consider major strategic changes even before naming a new president in the next two months. "We're in a dynamic situation, and nothing is sacred," he said.

Harris combines network services, satellite communications divisions

By James A. Martin

MELBOURNE, Fla. — Harris Corp. said last week it combined its satellite communications and network services divisions in order to provide "total integrated communication networks to business users."

The two divisions will be combined immediately to form the Business Communication Systems Division under Harris' communications sector. The new division will market such products as network switches, private branch exchanges, satellite terminals and networks and the Sopho-Net packet-switched networks.

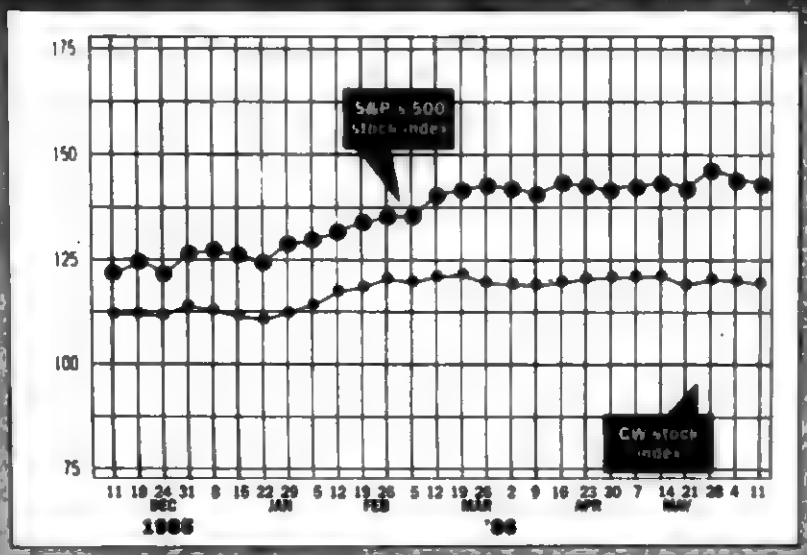
No products offered by the two divisions will be discontinued, a spokesman said, and the company does not plan to eliminate any jobs in the two divisions. Last fall, Harris fired roughly 100 administrative workers when it merged the analog and digital product divisions in its semiconductor sector [CW, Dec. 23].

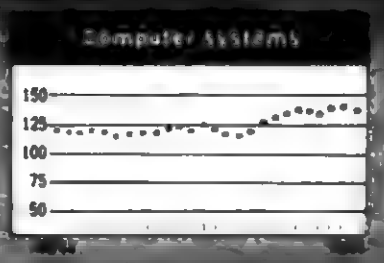
"The business communications market represents a tremendous opportunity for future growth," said Guy W. Numann, senior vice-president of the communications sector.

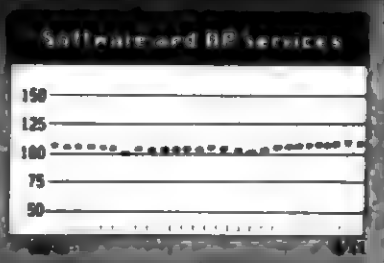
COMPUTER INDUSTRY

MITCHELL J. HAYES

Computerworld stock trading index

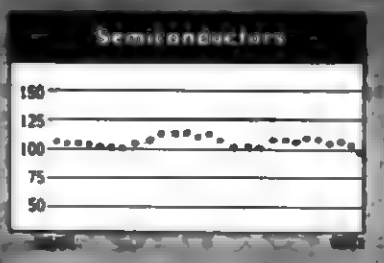














An increase reflects a higher net level of CW on Dec. 31, 1984, and more stock market performance in relation to that level. The CW stock index represents the unweighted average performance of the six groups of computer industry stocks.

	6/4/86	6/11/86
Computer systems	130.9	138.0
Software and DP services	108.7	108.3
Peripherals and subsystems	126.4	134.1
Supplies and accessories	154.9	164.4
Semiconductors	103.2	98.8
Leasing companies	103.8	104.0
CW stock index	120.6	119.0
Standard and Poor's 500 stock index	145.9	144.2

Computerworld stock trading summary

CLOSING PRICES WEDNESDAY, JUNE 11, 1986

COMPUTER SYSTEMS

EXCH		52-WEEK RANGE (1)		CLOSE JUN 11 1986	WEEK NET CHNGE	WEEK PCT CHNGE
O	ALPHA MICROSYSTEMS	5-	9	6 1/4	-1/4	-3.8
O	ALTOS COMPUTER SYST	9-	19	15 7/8	-1/4	-1.5
A	AMDAHL CORP	10-	18	18 1/8	+1	+5.8
O	APOLLO COMPUTER	9-	31	13 3/4	-3/4	-5.1
O	APPLE COMPUTER INC	14-	30	36 1/8	-2 5/8	-6.7
N	AT&T	19-	28	24 3/8	-1/8	-0.5
N	BURROUGHS CORP	52-	71	59 1/4	+7/8	+1.4
O	COMPAQ COMPUTER CP	5-	18	15 1/2	-1	-6.0
O	COMPUTER AUTOMATION	1-	9	3 1/8	-1/8	-3.8
A	COMPUTER CONSOLES	5-	14	11	-1/8	-1.1
N	CONTROL DATA CORP	15-	30	23 1/2	-2	-7.8
O	CONVERGENT TECHNOL	5-	13	7 3/4	-3/4	-8.8
O	CPT CORP	4-	8	4 3/8	-1/8	-2.7
N	CRAY RESEARCH INC	25-	94	91 1/2	-2	-2.1
O	DAISY SYSTEMS CORP	11-	38	12	0	0.0
N	DATA GENERAL CORP	31-	76	39	-1 1/8	-2.8
M	DATAPOINT CORP	5-	22	8 1/4	-1/4	-2.9
N	DIGITAL EQUIPMENT	42-	91	87 1/4	-2 1/2	-2.7
A	EECO INC	13-	30	20	+3/8	+1.9
N	ELECTRONIC ASSOC.	3-	7	5 1/2	-1/8	-2.2
N	FLOATING POINT SYST	18-	42	36 7/8	-1/2	-1.3
N	FOXBORO	22-	31	30 3/8	-1/8	-0.4
N	GOULD INC	20-	38	22 3/4	-1/4	-1.0
N	HARRIS CORP	22-	35	31 5/8	+1/8	+0.3
N	HEWLETT-PACKARD CO	28-	46	42 3/4	-1 1/8	-2.5
N	HONEYWELL INC	54-	87	80	+1 7/8	+2.3
N	IBM	117-	158	149 1/8	-7/8	-0.5
O	IPL SYSTEMS INC	1-	4	3	0	0.0
N	ITT CORP	28-	48	45 1/8	-1 5/8	-3.4
N	M/A-COM INC	13-	24	17 3/8	+1 3/8	+8.5
N	MANAGEMENT ASSIST	2-	28	2 1/2	0	0.0
N	MATSUSHITA ELEC(ADR)	49-	98	89 3/4	+1 3/8	+1.5
O	MENTOR GRAPHICS	13-	30	17 1/4	-5/8	-3.4
N	MODULAR COMPUTER SYS	6-	9	8 7/8	0	0.0
N	MOHAWK DATA SCI	1-	13	3	-1/8	-4.0
N	NBI INC	11-	20	11 1/4	-1/4	-2.1
N	NCR	25-	56	53 1/8	-2 7/8	-5.1
N	PERKIN-ELMER	22-	38	30 1/8	+7/8	+2.9
N	PRIME COMPUTER INC	15-	27	19 1/2	-1/4	-1.2
N	SPERRY CORP	38-	75	74 1/2	-1/4	-0.3
O	STRATUS COMPUTER INC	9-	25	20 3/4	-2 3/4	-11.7
O	TANDEM COMPUTERS INC	13-	34	32 3/4	-3/4	-2.2
N	TANDY CORP	24-	44	40 1/2	-1	-2.4
O	TELEVIDEO SYSTEMS	2-	4	3	-1/4	-7.8
O	TELXON CORP	6-	23	23	0	0.0
N	TEXAS INSTRUMENTS	88-	141	129 1/2	-8	-4.4
A	ULTIMATE CORP	8-	34	30 3/4	-1 1/8	-3.5
O	VECTOR GRAPHICS INC	1-	1	1/8	0	0.0
A	WANG LABS "B"	15-	29	18 1/4	-7/8	-5.1
A	WANG LABS "C"	15-	29	18 7/8	-1 3/8	-7.9
N	XEROX CORP	37-	72	67 1/4	-1 3/8	-2.3

SUPPLIES & ACCESSORIES

N	AMERICAN BUS PRODS	21-	36	32 5/8	-3/8	-1.1
N	BARRY WRIGHT	17-	29	23 5/8	-1/8	-0.5
A	DUPLEX PRODUCTS INC	13-	22	21 1/8	-3/8	-1.7
N	ENNIS BUS. FORMS	14-	28	26 1/4	+1 1/8	+4.4
N	3M COMPANY	74-	107	106 3/4	+1 3/8	+1.3
N	MOORE CORP LTD	15-	27	24 5/8	-3/8	-1.5
O	STANDARD REGISTER	22-	45	39 3/4	0	0.0
N	WALLACE COMP SERVICE	30-	48	46 1/4	-1 7/8	-3.8

SOFTWARE & DP SERVICES

EXCH		52-WEEK RANGE (1)		CLOSE JUN 11 1986	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	2-	6	5 1/4	-3/4	-12.5
N	ADVANCED SYSTEMS INC	9-	20	17 3/4	+1/8	+0.7
N	AGS COMPUTERS INC	10-	25	21	+5/8	+3.0
O	AMERICAN SOFTWARE	9-	15	12 1/2	+1/2	+4.1
N	ANACOMP INC	5-	11	6 1/4	-1	-13.7
O	ANALYSTS INTL CORP	2-	6	5 1/4	-1/8	-2.3
O	ASHTON TATE	6-	34	31 7/8	-1 3/4	-5.2
O	ASK COMPUTER SYSTEMS	7-	25	12 1/4	-3/4	-5.7
B	ASTRADYNE COMP IND	1-	3	1 5/8	0	0.0
N	AUTOMATIC DATA PROC	18-	39	38	-1/2	-1.3
O	COMPUTER NETWORK	5-	9	7 5/8	0	0.0
O	COMPUTER ASSOC INT'L	9-	25	24 1/2	-1/4	-1.0
O	COMPUTER HORIZONS	5-	11	11 1/8	-2 3/4	-19.8
N	COMPUTER SCIENCES	13-	39	38 1/2	+1 5/8	+4.4
O	COMPUTER TASK GROUP	7-	19	17 1/4	-1	-5.4
O	COMPUTER USAGE	1-	3	1 5/8	-1 1/8	-40.9
O	COMPUTONE SYSTEMS	3-	11	3 1/8	-1/2	-13.7
O	COMSERV CORP	1-	6	3 1/2	0	0.0
O	COMSHARE	7-	13	13 1/8	0	0.0
N	CULLINET SOFTWARE	12-	33	15 1/8	-3/4	-4.7
O	CYCARE SYSTEMS INC	13-	27	18	-1	-5.8
O	HOGAN SYSTEM INC	4-	12	11 3/4	+1/4	+2.1
N	GENERAL ELECTRIC CO	56-	81	79 5/8	-1 5/8	-2.0
N	GENL MOTORS E (EDS)	30-	49	47 1/2	-1	-2.0
N	GTE CORP	38-	54	51	+1 3/4	+3.5
O	INFORMATION SCIENCE	1-	5	3 3/8	+1/8	+3.8
O	INFOTRON SYSTEMS CP	13-	24	15	-1 1/2	-9.0
O	KEANE ASSOCIATES	10-	20	14 1/2	+1	+7.4
N	LOGICON	25-	43	35	-7/8	-2.4
O	LOTUS DEVELOPMENT CP	15-	38	37 3/4	-1/2	-1.3
O	MCI COMMUNICATIONS	7-	13	9 3/4	+1/2	+5.4
O	MNGT SCI AMER INC	7-	16	15 1/2	-1/2	-3.1
O	MATHEMATICAL APP GRP	1-	8	1/2	0	0.0
O	MICOM SYSTEMS INC	12-	35	13 3/4	+3/4	+5.7
O	MICROPRO INT'L CP	2-	4	2 1/2	+1/8	+5.2
O	NATIONAL DATA CORP	8-	25	21 3/8	-1 5/8	-7.0
O	ON-LINE SOFTWARE INT	4-	16	15	-1/2	-3.2
N	PANSOPHIC SYSTEMS	14-	35	32 1/4	-3	-8.5
N	PLANNING RESEARCH	11-	23	19 1/2	-1/2	-2.5
O	POLICY MGMT SYSTS CP	18-	35	19	-1 1/4	-6.1
O	PROGRAMMING & SYS	4-	10	10	+1/2	+5.2
O	REYNOLDS & REYNOLD	30-	65	33 3/4	-3/4	-2.1
O	SEI CORP	13-	27	19 3/4	-2 3/4	-12.2
O	SHARED MEDICAL SYST	28-	38	32 1/8	-3 1/8	-8.8
O	SCIENTIFIC COMPUTERS	4-	8	4 3/4	0	0.0
O	SOFTWARE AG	12-	22	19 3/4	0	0.0
N	URS CORP	10-	18	17 3/8	+1/2	+2.9
N	UCCEL	11-	23	21 1/4	-1 1/2	-6.5
O	VM SOFTWARE	17-	31	29 1/4	-2	-6.3

SEMICONDUCTORS

N	ADVANCED MICRO DEV	22-	36	25	+3/8	+1.5
O	ADV'D SEMICONDUCTOR	7-	22	10 1/4	-3/4	-6.8
N	ANALOG DEVICES INC	14-	34	20	-1/2	-2.4
O	ANALOGIC CORP	11-	16	12 1/2	-1/4	-1.9
N	APPLIED MAGNETICS CP	9-	19	17	-1 1/2	-8.1
O	AVANTEK	18-	28	18 1/2	-3/4	-3.8
O	HADCO CORP	3-	7	4 7/8	-1/8	-2.5
O	INTEL CORP	21-	33	24 3/4	-1 1/2	-5.7
O	MICRO MASK INC	9-	12	5 1/4	+1/4	+5.0
N	MOTOROLA INC	28-	48	43 5/8	-2 1/8	-4.6
N	NAT'L SEMICONDUCTOR	10-	15	13 1/4	-1/4	-1.9
N	TERADYNE	17-	33	24	-2 3/4	-10.2

PERIPHERALS & SUBSYSTEMS

EXCH		52-WEEK RANGE (1)		CLOSE JUN 11 1986	WEEK NET CHNGE	WEEK PCT CHNGE
P	AM INTERNATIONAL	3-	8	7 3/4	1/4	3.1
A	ANDERSON JACOBSON	2-	5	2 1/8	1/8	5.5
O	AST RESEARCH INC	7-	33	14 3/8	-1 1/8	-7.2
O	AUTO-TROL TECHNOLOGY	3-	13	4 3/8	0	0.0
O	AVANT-GARDE COMPUTING	3-	21	4	-1/4	5.8
O	BANCTEC INC	6-	13	11 3/4	-3/4	-6.0
O	BEEHIVE INT'L	1-	2	1/8	0	0.0
N	BOLT BERANEK & NEW	20-	48	47 1/2	+1/8	+0.2
O	CAMBEX CORP	1-	3	1 1/2	+1/4	+20.0
N	CENTRONICS DATA COMP	3-	11	8 7/8	1/4	-3.5
A	CETEC CORP	6-	9	7 1/4	+1/8	+1.7
A	COGNITRONICS	4-	7	4	1/8	3.0
N	COMPUGRAPHIC CORP	23-	36	23 5/8	1/8	-0.5
O	COMPUTER TRANSCEIVER	0-	1	3/4	0	0.0
N	COMPUTERVISION CORP	9-	44	15 5/8	1	-6.0
N	COMRAC CORP	12	18	16 5/8	1/8	-0.7
A	DATAPRODUCTS CORP	11-	20	17	1/2	2.8
A	DATARAM CORP	4-	17	12	-2 5/8	-17.9
O	DATA SWITCH CORP	4-	9	7	-3/8	-5.0
O	DATUM INC	5-	9	8 1/4	1/4	3.8
O	DECISION IND CORP	10-	20	14	1/2	-3.4
O	ENDATA INC	2-	8	8 3/4	+1/2	+6.0
O	EVANS & SUTHERLAND	12	27	23 7/8	1 1/2	-5.9
O	GANDALF TECHNOLOGIES	5-	13	7 1/8	+3/4	+11.7
N	GEN'L DATA COMM IND	8-	21	12 5/8	-1 1/4	-8.0
N	HAZELTINE CORP	17	30	16 5/8	7/8	-5.0
O	ICOT CORP	3-	12	10 3/8	3 3/8	-11.7
O	INFORMATION INTL INC	10-	17	15	-1/8	-0.8
O	INTECOM INC	3-	11	5 3/8	-1/4	-4.3
O	MEGADATA CORP	3-	8	3 1/4	-1/8	3.7
A	MSI DATA CORP	7-	14	13 7/8	0	0.0
N	NASHUA CORP	24-	53	51 1/8	1 7/8	-3.5
N	NETWORK SYSTEMS CORP	11-	27	14 1/4	+1/4	+1.7
N	NO AMERICAN PHILIPS	32	47	43 1/8	7/8	1.9
N	NORTHERN TELECOM LTD	28-	41	29 1/8	+1/8	+0.4
O	OMEX	1-	3	1/2	+1/8	+33.3
N	PARADYNE CORP	6-	18	9 3/8	-7/8	-8.5
A	PENRIL CORP	7	14	7 1/2	+1/8	+1.6
N	PLESSEY CO (ADR)	19-	38	32 1/8	+1/8	+0.3
O	PRINTRONIX INC	9-	18	13	-1/4	-1.8
O	QMS INC	6-	16	14 1/4	+3/8	+2.7
O	RAMTEK CORP	2-	7	5 3/4	+1/8	+2.2
N	RECOGNITION EQUIP	9-	17	12 1/2	-1/2	3.8
N	SANDERS ASSOCIATES	29-	44	29	+1/4	+0.8
O	SCAN TRON CORP	8-	22	21 1/4	+1/4	1.1
N	SCIENTIFIC ATLANTA	10-	15	10 1/2	3/8	3.4
O	SEAGATE TECHNOLOGY	5-	13	11 7/8	1	7.7
N	STORAGE TECHNOLOGY	1-	5	3 3/4	-1/4	-6.2
O	SYKES DATATRONICS	0-	2	1/8		14.1
A	T BAR INC	5-	9	6 1/4	+ 3/8	+6.3
A	TAB PRODUCTS CO	9-	15	15	+1	+7.1
O	TANDON CORP	3-	9	7 1/4	+1/2	+7.4
A	TEC INC	5-	13	5 1/8	1/8	-2.3
N	TEKTRONIX INC	47-	68	59 3/4	+1/2	+0.8
N	TELEX	34-	68	59 1/2	-4 5/8	7.2
O	TELEDATA SYSTEMS CP	0-	3	1/2	1/8	27.3
N	TIMEPLEX INC	15-	23	17 1/4	1/4	1.4
N	TITAN CORP	4-	11	9	1/2	5.2
O	VISUAL TECHNOLOGY	1-	3	1/2	0	0.0

LEASING COMPANIES

N	COMDISCO INC	7-	24	21 5/8	+1 3/4	+8.8
N	CONTINENTAL INFO SYS	5-	11	10 5/8	+3/4	+7.5
O	FINALCO GROUP INC	3-	5	3 1/8	0	0.0
O	PHOENIX AMERICAN INC	2-	8	4 1/4	1/4	5.5
O	SELECTERM INC	6-	12	7 1/8	0	0.0
N	U.S. LEASING	32-	46	41 3/8	+1/8	+0.3

EXCH: N—NEW YORK; A—AMERICAN; P—PACIFIC; B—BOSTON; L—NATIONAL; M—MIDWEST; O—OVER-THE-COUNTER

O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Source: Trade Quotes, Inc.

COMPUTER INDUSTRY

INSIDE

Controlled innovation is the key to success in the computer industry, a leading consultant says/**132**

Japanese vendors urged to shift production overseas to ease trade tensions/**134**

Sperry beats Burroughs, two others for a $250 million U.S. Army contract/**137**

Data General closes two peripherals plants, lays off 400/**172**

INSTANT ANALYSIS

"It has been said that a niche market is one in which the Japanese don't compete."

— **Richard D. Skinner, president, Integrated Circuit Engineering Corp.**

Private-label PCs to hit mart

Two major chains will sell IBM clone under own name

By Douglas Barney

The recent decisions by Businessland, Inc. and Computerland Corp. to market their own personal computers have sparked debate over the potential impact on other micro vendors that rely primarily upon the retail market for sales.

Businessland announced last week that it would begin selling a co-labeled IBM Personal Computer AT compatible manufactured by Wyse Technology, Inc. in mid-July. The $3,295 machine, called the Businessland PC286, will be made in Taiwan and will be sold through Businessland's sales force of about 750.

"If those products are going to have good margins, the retail chains are going to push their sales force to sell their own products," said Bruce R. Watts, an analyst with Morgan Keegan, Inc. "Doesn't that inevitably lead to an inventory backup for everybody else's products that they are selling?"

But Businessland and some micro vendors downplay the private-label impact on sales of other IBM compatibles. The Wyse machine will not impact sales of other products because it will be sold primarily to highly price-sensitive markets such as government sales, said Michael S. Swavely, vice-president of marketing for Compaq Computer Corp.

Businessland agrees. "We expect our total market to expand, and this product will generate incremental sales," said Suzanne Crocker, director of communications for Businessland. Crocker did concede, however, that sales of the Wyse product may limit the growth in sales of other AT-compatible products.

"When you commit to the dealer channel, you get the benefits, but you are also

See **PRIVATE-LABEL** page 172

Judge OKs new MDS directors

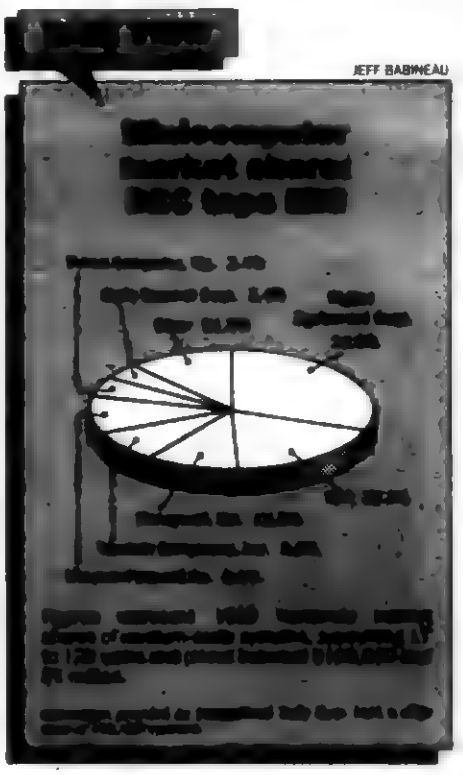
By Clinton Wilder

SAN FRANCISCO — A federal judge last week failed to block the appointments of arbitrageur Asher B. Edelman and New York attorney Michael D. Brown as new directors of Mohawk Data Sciences Corp. (MDS). But former director Thomas K. Christo vowed to continue the legal battle to regain both his seat and that of former director Francis P. Lucier on the three-member board.

Judge Robert F. Peckham refused to grant a temporary restraining order sought by Christo and Lucier against MDS President, Chief Executive Officer and Director Matthew V. Tutino, who replaced the two directors June 6. Edelman, the takeover specialist who controls roughly 10% of MDS' stock, was also named chairman.

Christo said the MDS management situation remains in limbo pending the out-

See **JUDGE** page 172



INDUSTRY INSIGHT
Clinton Wilder

NCC no-shows raise questions

The long list of vendor no-shows for the 1986 National Computer Conference opening today in Las Vegas suggests that this year's show might be dubbed "All Quiet on the Western Front."

The conspicuous absence of Digital Equipment Corp., Data General Corp., Wang Laboratories, Inc., NCR Corp., Control Data Corp. and dozens of other heavyweights is a telling sign of not only the health of trade shows in general, but the state of the computer industry as the summer dog days approach. While things are clearly not as bad as they were during the depths of the industry downturn a year ago, most major vendors continue to experience a frustrating post-slump dormancy.

In 1985, dozens of companies, financially reeling from an unexpected slump that seemed to hit many all at once, pulled out of NCC at the last minute in a frantic effort to trim expenses — or cut losses. Eleven months and thousands of layoffs later, only the most troubled vendors are still operating in the red. But exhibiting at NCC has not come back into fashion — and possibly never will.

Computer firms may be hiring again, but they are watching the bottom line closely. Apple Computer, Inc. (itself a no-show at a recent microcomputer showcase, Comdex/Spring '86) is the most extreme example, with its lowered revenue producing record earnings and stock prices. At Apple and other firms, constricted marketing budgets clearly leave little room for the huge,

See **NO-SHOWS** page 138

Wilder is Computerworld's *senior editor, computer industry.*

U.S. vendors find rules, users different in European market

Patience, local flavor necessary in marketing

FIRST OF THREE PARTS

By John Lamb, Janette Martin and Amiel Kornel
Computerworld News Service

LONDON — When Tandem Computers, Inc. launched its latest VLX computer system at the U.S. Embassy in London's high-rent Grosvenor Square in April, the company made little secret of its transatlantic origins. Journalists were treated to rock'n'roll by the Eagles and served American beer and hamburgers by waitresses wearing stars and stripes.

"We get a bit more razzmatazz into what we are saying than our parent company in Cupertino, Calif.," explains the company's UK marketing manager, Mike Lambert.

But while Tandem, whose UK operation is the firm's largest outside the U.S., is confident enough to make a virtue out of its foreign origins, other U.S. computer firms have to tread lightly on this side of the Atlantic.

British business may speak the same language as its American counterpart, but its ways are very different. U.S. companies working throughout Europe have learned that success in the Old World means unraveling a tangle of local dialects, cultures, laws and customs.

"The marketing needs of Tandem have to be coordinated," Lambert says. "The message has got to be the same in Tokyo, Hong Kong, Frankfurt and London, although we go about saying it in different ways in different places."

"Several flavors of Computerland have to be present even if they are all ice cream," explains Rick Peterson, products and marketing director at Luxembourg-based Computerland Europe.

Setting up 77 franchises in 15 European countries, the international personal computer dealer quickly learned to apply a regional concept, Peterson says. "Don't try to take a typical American package and make it fly in Europe," he warns.

One lesson that U.S. firms quickly learn overseas is patience. "We are more bureaucratic in this country," says Hugh Small, management consultant at Arthur D. Little, Inc.'s London office. "There tends to be a caste of employees in large companies who don't have buying responsibility but have power, because it is they who evaluate new products for a central procurement agency. Suppliers have to be patient and respond to lengthy requests for proposals."

British buyers are unlikely to be impressed by the argument that they can get ahead of rivals by buying the latest technology. "We don't see any evidence of companies aggressively using technology to achieve a commercial advantage," Small says. "Quite the reverse. The principal factor that motivates UK buyers is the desire not to be behind their peers."

See **U.S.** page 143

LOOK OUT FOR THE BEST

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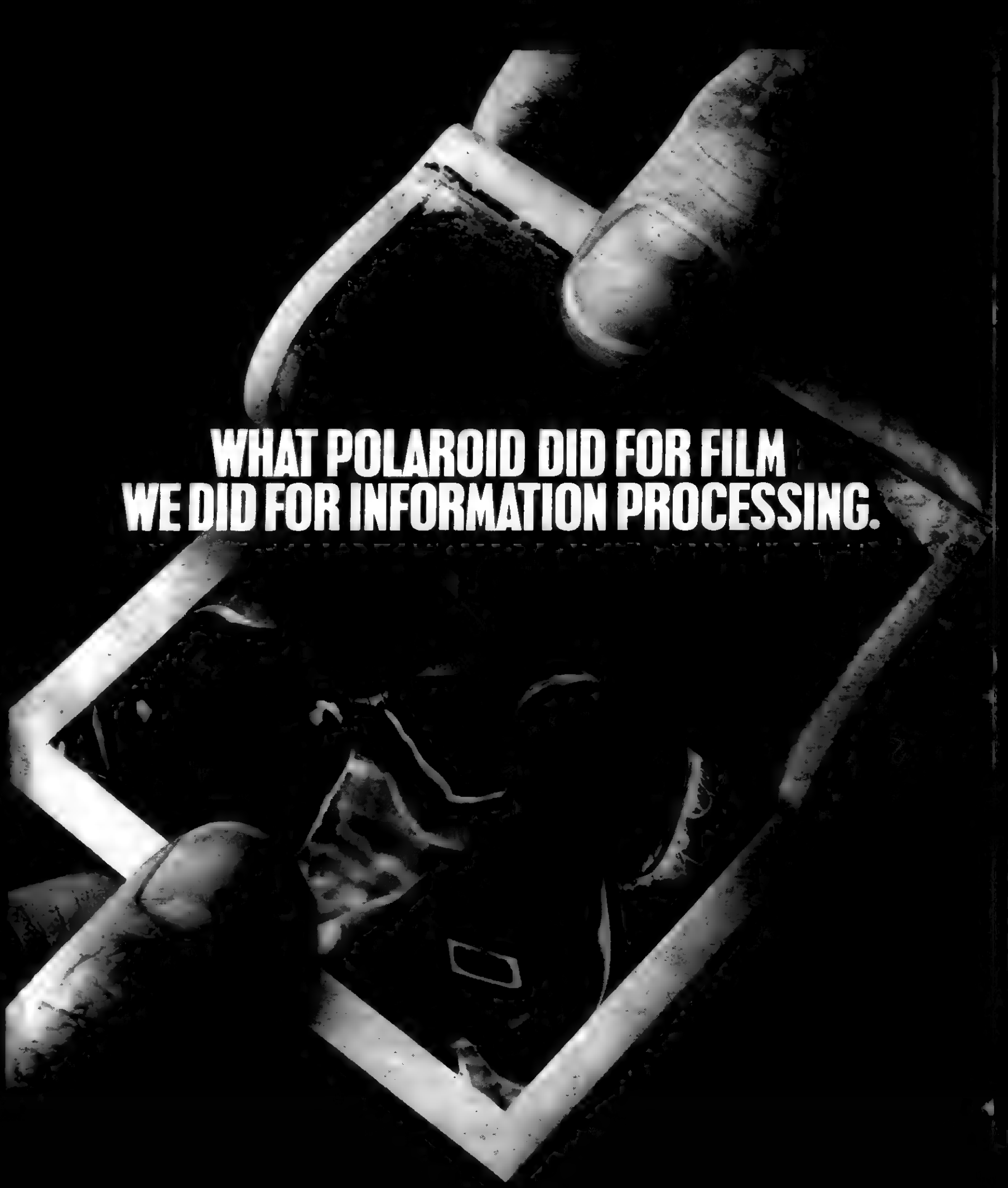
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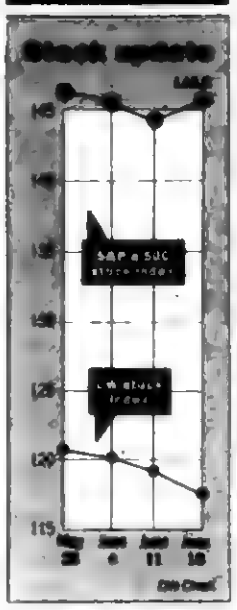
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In Depth
MIS sees a new view of information via digital image systems/**69**

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NEWSPAPER

TOP OF THE NEWS

American Airlines is charged with rigging unfair advantages in its SABRE reservation system. **Page 4.**

■

IBM will likely see its earnings drop in 1986 for the second straight year, according to Chairman John F. Akers. **Page 150.**

■

Britton Lee, Inc. announces an office-scale relational data base server that incorporates an IBM Winchester drive. **Page 2.**

■

The High Sierra Group, an association of 13 major vendors, sets standards for CD-ROM technology. **Page 12.**

■

Motorola Computer Systems rolls out a line of 68020-based supermicros running Unix. **Page 37.**

■

MCI Communications and Western Union cut rates and introduce services to compete with AT&T. **Page 19.**

■

Lotus is developing data pipelines to link mainframes and real-time sources to its 1-2-3 spreadsheet package. **Page 49.**

■

Wang Laboratories last week upgraded its WP Plus high-end word processing software, adding line drawing, image integration, automatic hyphenation, line numbering and integration with Wang Office and other software. Footnoting, repagination and spelling verification also were enhanced, the company said. WP Plus 2.0 for VS systems, available immediately, is priced between $4,000 and $12,000. Releases for Office Information System and Alliance models will be delivered in August and September, respectively, and will cost $2,000.

■

IBM may alter its sales organization to have its representatives focus more on specific product areas, IBM Chairman John F. Akers suggested last week. "We can do better merchandising of our software and other parts of the product

See **NEWS** page 4

Lean NCC has up side

Overly broad focus blamed for light attendance figures

By Elisabeth Horwitt

LAS VEGAS — Attendance was spotty, exhibits sparse and product introductions few (with the exception of IBM's avalanche) at the 1986 National Computer Conference held last week. And yet, vendor and attendee reactions to the show were not universally negative.

While some vendors reported sluggish booth activity, others said the number of new sales leads exceeded expectations. Attendees who said they came to NCC for a general overview of the current state of computer technology claimed they were not disappointed.

See **LEAN** page 2

Ford setting up $300M OA pact

By Alan Alper

DEARBORN, Mich. — IBM, Digital Equipment Corp. and Wang Laboratories, Inc. are bidding on a contract potentially worth between $300 million and $500 million to supply office automation and communications equipment to Ford Motor Co. over the next couple of years, *Computerworld* has learned.

Ford, concerned about retaining a competitive edge, is said to be seeking a wide range of departmental processors and communications gear to effectively route key corporate data throughout its North American operations.

See **FORD** page 6

IBM reworks mid-range product lines

By James Connolly

In what may have been the company's most comprehensive product introduction in two decades, IBM last week replaced most of its System/36 and System/38 product lines and took steps to tie those minicomputer systems together.

The announcements, made in New York and in Las Vegas, site of the 1986 National Computer Conference, covered 125 IBM products and product enhancements.

IBM may have stopped short of an actual merger of the System/36 and 38 lines, but it did offer new versions of the two machines' operating systems that will support advanced peer-to-peer networking and will enable System/36 users to log on to System/38s and run System/38 applications.

Powerful new members of the two minicomputer families, connectivity tools and a communications controller were the major products unveiled.

The key announcements included the following:

- Six models that represent a top-to-bottom replacement of the existing System/38s, each with twice the memory of its predecessor.
- Three models of the System/36, including a high-end version with more than three times the memory capacity of the earlier Model 5360.
- New versions of the System/38's CPF and System/36's SSP operating systems, with support for APPN and a pass-through facility to allow System/36 users access to System/38 applications.
- Enhanced Connectivity Facilities software, which IBM bills as its most comprehensive micro-to-mainframe link.
- Two disk drives for the System/38, high-end System/36 models and the OEM

See **IBM** page 6

CW SPECIAL REPORT

AT compatibles: System vendors push to give single-source option

By David Bright

Systems vendors that lost out by not meeting customer demands for IBM Personal Computer-compatible workstations are not about to repeat the experience with IBM's popular Personal Computer AT.

While most large-systems vendors were slow in meeting their customers' needs for IBM PC-compatible workstations, they are learning faster with the PC AT. Within a year of the AT's introduction in August 1984, at least half of the 12 largest systems vendors had announced PC AT-class machines or had machines in the works.

Rapidly becoming the workstation of choice in large corporations, an estimated 350,000 PC AT units had been installed by the end of 1985, according to one market report. The same report says that another 100,000 clone models had been sold during the same period.



James Nanton

The determination of system vendors to keep up with users' desktop demands has presented computer managers with an option they did not have in the early days of the PC — that of purchasing AT compatibles that link directly into the non-IBM systems upon which they have based their information systems.

One manager who at least partially achieving the single-source ideal is James Nanton, director of office systems at Citicorp Industrial Credit, Inc. Based in Harrison, N.Y., Citicorp Industrial Credit is in the process of installing 1,000 of Hewlett-Packard Co.'s PC AT-compatible Vectra workstations for connection to a series of HP 3000 minicomputers acting as departmental servers.

Nanton's entire headquarters staff will use the Vectras for general-purpose office applications, electronic mail and access to corporate and external data bases. The HP 3000s will be hooked through X.25 links to IBM mainframes. Although Citicorp Industrial

See **AT** page 14

Sun announces coprocessor board, file access software

PC AT-compatible runs MS-DOS under Unix

By Rosemary Hamilton

MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc. plans to announce two microcomputer-related products tomorrow, a step that two of its workstation competitors have already taken.

Sun is scheduled to announce an IBM Personal Computer AT-compatible coprocessor board for its workstations and a software package that will allow IBM Personal Computers and compatibles to communicate over its Network File System (NFS), software that allows users to transparently access files on a multivendor system.

The RT Personal Computer, IBM's engineering and technical workstation, was announced earlier this year with an optional PC AT coprocessor board. And when Apollo Computer, Inc. announced its new workstations in February, the vendor said it would offer a PC AT-compatible coprocessor board later this year. Sun's coprocessor is scheduled for shipment in the third quarter of this year.

The Sun Integrated Personal Computer will allow Sun workstations to run Microsoft Corp. MS-DOS applications in a window under the University of California at Berkeley's Unix Version 4.2, Sun's operating system.

Based on an Intel Corp. 80286 microprocessor, the coprocessor has 1M byte of memory and can execute either color or monochrome applications that require the IBM PC AT color graphics adapter or the Hercules Computer Technology, Inc. monochrome adapter. It sells for $2,390 and includes Microsoft's MS-DOS 3.1 and GW-Basic, transparent file sharing software for NFS and utilities to convert ASCII files between MS-DOS and the Sun operating system.

PC-NFS, which is available within 30 days of order, provides PC users with transparent access to files among other PCs, Sun workstations or any computer running NFS. In quantities of 100, PC-NFS sells for $306 per unit. A package with an Ethernet interface and documentation is also available and sells for $955 per unit in quantities of 100.

Lean NCC has up side

From page 1

"We're opening up a branch on the West Coast soon and want to see the technology," a representative of a Japanese software firm said.

"The show is pretty good," another corporate attendee said. "Smaller than Chicago [NCC '85], but useful." The attendee added that he and his colleague had come "not to look at any one type of product but to keep up with the technology."

NCC sponsor, the American Federation of Information Processing Societies (AFIPS), denied rumors that this year's conference lost money for the first time in its 14-year history. However, the organization is clearly taking seriously the third year of declining attendance. By the show's third day, registration was placed by AFIPS at 41,000 — approximately one-third fewer than the number of attendees originally projected by the show sponsor.

A combination of factors

AFIPS spokeswoman Marty Byrne blamed the poor showing on "a combination of location, time of year, the industry slump and fierce competition from other shows." She added that an AFIPS board meeting during show week concentrated on the high-priority topic of "how do we adjust our focus, and what resources do we have to do it?"

AFIPS sent staff members to the show floor to ask attendees what they did and did not like about the show, Byrne said. AFIPS is also trying to persuade vendors that have dropped out over the past two years to return by using such devices as assisting with advertising and offering classes on "boothmanship."

Vendors that did exhibit at NCC '86 gave this year's show mixed reviews. "Attendance is lousy," said Oracle Corp. Marketing Director Ken Cohen, hastening to add that the company's sales leads were 30% to 50% greater than at NCC '85. An opposing view was offered by William Carrico, president of network vendor Bridge Communications, Inc., who said the show had generated fewer leads than at any of the three NCCs at which his company had exhibited.

One of the most frequent complaints, both from this year's exhibitors and from companies that decided not to exhibit, was that NCC's appeal is too general and that trade shows targeting vertical markets were far more fruitful. Tony Romano, a spokesman for GTE Spacenet Corp., said that while his company was able to generate sufficient leads on the first day alone to justify its exhibit, "Our biggest show is International Communications Association."

The wide focus of this year's show was reflected in the types of products found on the floor. Attendees were offered an abundance of disk and tape drives, printers and miscellaneous items such as display screen cleaners and acoustical enclosures. But with one or two exceptions, the industry's heavy hitters were conspicuously absent.

While IBM was very much present, releasing a flood of announcements aimed directly at its networking and minicomputer competitors, most of those competitors were not around to hear the news. AT&T exhibited the new Unix System V Release 3.0 as well as a digital multiplexed interface that links the company's 3B5 minicomputer to System 75 and 85 digital private branch exchanges. But Data General Corp., Digital Equipment Corp. and Hewlett-Packard Co. chose not to attend.

Of communications vendors, local-

See LEAN page 4

In this issue

NEWS

Britton Lee introduces its second office-scale relational data base system at NCC/ **4**

American Airlines' SABRE reservations system came under fire with a charge of bias filed by Delta Air Lines/ **4**

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IBM gives RT Personal Computer network links, added software/ **6**

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Britton Lee unveils second relational system

Office-scale data server uses IBM disk drive

By James Connolly

LAS VEGAS — Seeking to increase the power available to users of its office integration scale systems, Britton Lee, Inc. last week announced the second member of its RS300 family of relational data base servers.

Introduced at the 1986 National Computer Conference, the RS350 includes the processor of Britton Lee's earlier office scale system, the RS310, as well as an enhanced data management system and new disk and tape drives.

The new disk drive is a 400M-byte, 8-in. 9332 Winchester disk drive, which was announced by IBM last week and sold to Britton Lee under a rare IBM OEM agreement. The system can support two of the IBM drives, which feature self-contained diagnostics and an error correction and control feature, or two 86M-byte disk drives produced by Fujitsu Ltd. or Control Data Corp.

The RS350 was designed to work in tandem with IBM Personal Computers and Microsoft Corp. MS-DOS-based PCs, as well as superminis such as Digital Equipment Corp.'s VAX family and the Data General Corp. Eclipse MV series.

Britton Lee President David L. Britton said the RS350 will provide performance gains over the RS310, which can be field upgraded to the new machine. He also said that where the RS310 provided performance ranging from 15 to 30 transactions per second, the RS350 performs 25 to 40 transactions per second.

"The RS310 originally was intended to go to the office integration-oriented marketplace and value-added reseller arena. The RS350 is simply an extension of how far we can go in the market," Britton said.

Unlike Britton Lee's high-end products, the IDM 500 series, the RS350 is not intended to be connected directly to an IBM mainframe. Instead, it uses a small computer systems interface bus and is available with an optional Ethernet local-area network interface.

The RS350 includes 1M byte of direct-access memory and was designed to support 10 simultaneous queries, data bases of more than 900M bytes and 50 active users in an office environment.

Lean NCC has up side

From page 2

area network (LAN) companies were most in evidence at the show. The rash of new communications products and enhancements introduced by IBM appeared to rock more than one LAN representative.

IBM's announcement at the show of an asynchronous interface option and a Token-Ring network interface for its new 3174 controller came as a blow to Bridge Communications, which had just introduced the CS/1-TR, an asynchronous communications server for the Token-Ring. "The effectiveness of the 3174's asynchronous support depends on whether it provides full screen functionality for asynchronous terminals," a Bridge executive vice-president said cautiously. An IBM spokesman confirmed that the 3174 does, in fact, support full-screen displays.

A Nestar Systems, Inc. spokesman called IBM's connectivity announcements "not revolutionary, but certainly earthshaking," adding that even with the new System/36 and 38 products, IBM does not threaten Nestar's market niche. Nestar's forte is supplying powerful data base servers to large network installations.

Delta alleges SABRE biased

By James A. Martin

WASHINGTON, D.C. — American Airlines' celebrated SABRE computer reservation system came under fire last week when a Delta Air Lines complaint alleged that American flight schedules have been falsified in the system in order to gain a competitive advantage.

According to the Delta complaint, filed with the U.S. Department of Transportation, Dallas-based American Airlines has continued to bias its computer reservation system by listing "sham schedules containing faster elapsed flight times in many markets than American intends to achieve in its day-to-day operations."

The complaint further charges American with maintaining one schedule for the public and another for its computer reservation system. The shorter flight times would reportedly enable American's flights to be listed ahead of competitors' in the SABRE system.

A spokesman for American said there was no foundation to Delta's allegations and that the discrepancies in flight schedules and actual arrival times are due to normal delays.

Delta's complaint was the latest charge of bias against SABRE, the country's dominant reservation system. American's computer reservation system is used by some 50,000 travel agents in the U.S. and reportedly handled 45% of all airline reservations made last year.

In 1984, the Civil Aeronautics Board (CAB) ordered American, United Airlines and Trans World Airlines to remove biases from their systems. At that time, American flights were automatically displayed on SABRE screens first, ahead of those of competing airlines.

More recently, the U.S. Department of Justice accused American and United of providing travel agents with an automatic bypass feature that showed a second display on the computer reservation system favoring whichever airline owned the system. The airlines subsequently agreed to discontinue the practice (CW, April 8, 1985).

American's "scheme" to favor its flights in the computer reservation system "began before the ink was dry" on the CAB ruling, Delta claimed. In addition, the Atlanta-based airline asked the Transportation Department to assess American with civil penalties, estimating that it had lost $120 million a year as a result of American's "sham schedules."

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TOP OF THE NEWS

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line," Akers told securities analysts. "Unless you can deal with your product line in pieces, you risk losing to competitors with a narrower focus." Akers said IBM will add 3,000 to 3,500 new sales reps this year.

■

GTE Telenet Communications Corp. and U.S. Telecom, Inc. signed and filed with the Federal Communications Commission last Monday the papers for a definitive agreement to merge. The filing was approved by the FCC Tuesday, but the Department of Justice still has not passed it, a GTE Telenet spokeswoman said. The two firms hope to begin operations as U.S. Sprint Communications Co. by July 1.

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Computerworld News Service
[illegible]
Edward Warner, Editor

Main Editorial Office
Box 9171, 375 Cochituate Road,
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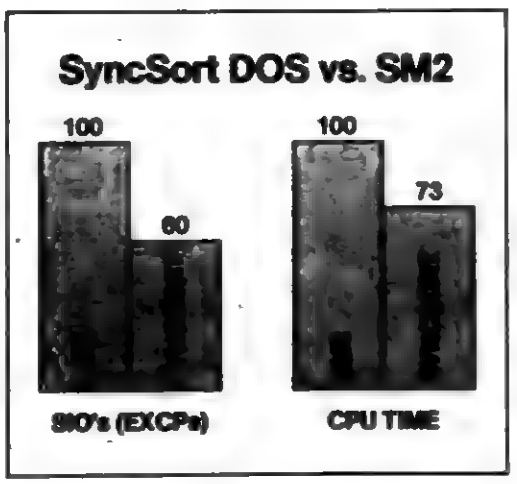
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IBM rewraps mid-range lines

From page 1

market, featuring capacities ranging from 200M bytes to 856M bytes.

• The 3174 Subsystem Controller, which acts as a replacement for the workhorse 3274 controller (see story page 8).

• Ethernet capabilities for the IBM RT Personal Computer (see story below).

• Software that allows the Rolm Corp. Central Branch Exchange to link asynchronous devices to the System/36 and System/38.

In addition to supporting improved communications among IBM's diverse systems, these announcements, according to some observers, seem to convey a message to users of both the System/36 and the System/38.

That message, delivered in part through the power boosts for both minicomputers, is that neither the System/36 nor the System/38 is about to be abandoned.

Ford setting up $300M OA pact

From page 1

The No. 2 automaker, which in April reportedly imposed a moratorium on computer equipment procurement, is now looking for a strategic partner — akin to General Motors Corp.'s relationship with Electronic Data Systems Corp. — to help formulate an integrated computer and communications strategy. Ford hopes such a relationship would rectify what sources said has been the firm's hodgepodge approach to OA.

"Ford bought so much equipment over the years, but recently they found themselves suffering from a technology glut," a source close to the bidding said. "They're now attempting to learn how to use technology to be more competitive."

For example, Ford is not only requesting that the winning bidder supply leading-edge computer and communications technology, it is also stipulating that the victor remedy existing problems, including an overwhelming amount of systems incompatibility throughout the firm.

The three computer companies made technical and management proposals to Ford during the first week of June, sources close to the bidding said. A decision is expected around July 2, the sources added.

"It's a real horse race," one source said. "It's not clear who has the edge."

Ford spokesman Jim Trainor declined comment on the impending award. "The situation is under review, and it is something we can't talk about at this time."

IBM, DEC and Wang each have existing relationships with Ford. IBM not only supplies the firm's data processing hardware and software, but earlier this year agreed to jointly develop a factory automation networking scheme. DEC supplies engineering workstations to Ford, while Wang sells departmental minicomputers to the firm.

IBM bolsters mid range with System/36s, 38s

System/38, high-end 36 get disk drives; gap to 4381 bridged

By James Connolly

LAS VEGAS — The heart of IBM's mid-range processor line was shaken up last week with the addition of nine CPUs to the System/36 and System/38 minicomputer families and two new disk drives.

The announcements, which greeted 1986 National Computer Conference attendees as they arrived at the conference, were rolled into an IBM blitz of 125 product introductions that included communications controllers, micro-to-mainframe links and an Ethernet adapter for the IBM RT Personal Computer (see story below).

The mid-range restructuring included the announcement of a high-end model and two other System/36 processors, a total replacement of the System/38 product line and new disk drives for the System/38 and high-end System/36 models.

The high-end models for each system family had been expected for several months.

IBM officials claimed that the performance boosts for the System/36, including the addition of a high-end 5360 Model D with more than three times the memory of its predecessor, will allow greater support for office automation.

In addition, industry observers noted that the top-end and entry-level System/38 announcements mean IBM is providing a performance bridge extending from the System/36 up to the 4381 mainframe.

Looking at the multifaceted announcement, International Data Corp. analyst Frank Gens noted, "If there is a disappointment, it is that tighter links for the System/36 and System/38 were not announced. But in a subtle way, they laid the groundwork for low-end networking, which will eventually make the System/36 and System/38 more competitive with Digital Equipment Corp. and Data General Corp. systems."

He noted that IBM attained performance gains for both systems without making major technological changes.

The System/38 announcements included a renumbering of the product line. The six new systems, ranging from the entry-level Model 100 to the Model 700, replace the existing Models 4, 6, 18, 20 and 40. Those earlier models will be discontinued in September but can be upgraded to new models.

The Model 100 is the only new model to which current systems may not be field upgraded. The new Models 100, 200, 300, 400, 600 and 700 will be available in August, according to IBM.

The Model 700 reportedly features a maximum main memory of 32M bytes, which is double the memory of the Model 40. As with other new models of the System/36 and System/38, the Model 700 uses IBM's 1M-bit memory chip.

The Models 400, 600 and 700 also support more disk storage than their predecessors, a maximum of 14G bytes, compared with 6.2G bytes on earlier models. That storage capacity was increased through use of the new, denser direct-access storage devices (DASD) and with the ability of the CPF operating system's Version 8 to support four, rather than two, strings of DASD.

The Model 700 ranges in price from $252,500 to $385,490.

The low end

At the low end, the Model 100 costs from $37,500 to $47,500, which is a price range that overlaps the new high-end System/36 5360 Model D. The Model 100, according to IBM officials, provides 30% more power than the Model 4 at 30% lower cost. The Model 100 will be available with 2M to 4M bytes of memory.

"The restructuring of the System/38 line seems the most significant part of the announcement by far. The fact that they are renumbering them is real interesting, because they were kind of tied down by their modeling scheme before. It was hard for anyone to perceive that there was anything significant about changes before," said Christopher Herron, president of Fusion Products International, a third-party software development firm specializing in System/36 and System/38 products.

Herron noted that the increased disk capacity and the ability to connect the System/38 to more types of systems will help that machine gain in the corporate market.

Happy user

At NCC, an information systems director for a manufacturing company was happy to see the performance boosts for the System/36 and System/38. "This shows that that family will not soon become obsolete. This gives the systems a longer life and increases the amount of work you can actually process on them," said the manager, who asked not to be identified.

IBM claimed a 50% internal throughput gain in the new System/36 5360 Model D in comparison with the earlier 5360s. The memory in the 5360 was increased from 2M bytes to 7M bytes. Field upgrades are available. Prices for the Model D range from $67,850 to $106,850, depending largely upon the memory configuration.

At the low end of the System/36 line, IBM announced the ability to add more terminals to the System/36 personal computer, the 5364.

IBM also announced the mid-range System/36 5362 Models B and C. Those systems range in price from $17,625 to $27,625. The basic difference between the two is the ability of the Model C to support the newly announced 9332 disk drive. Combined with integrated disk systems, the 9332 provides the Model C with up to 520M bytes of storage.

The 9332, an 8-in. disk drive providing 200M or 400M bytes of storage, was announced, along with the 14-in. 9335, which offers 856M bytes of storage. IBM officials emphasized that both devices contain intelligence to off-load some data management tasks from the CPU.

The 9332, costing $8,500 with 200M bytes of storage or $14,000 with 400M bytes, is available in rack-mounted and stand-alone versions.

The 9335 Model A01 includes a device function controller that allows attachment of up to four B01 devices.

RT PC linked to Ethernet, Token-Ring nets

By Douglas Barney

Amid last week's avalanche of IBM product announcements were three adapter cards that allow the IBM RT Personal Computer to tie into the IBM Token-Ring local-area network and Ethernet-based networks. IBM also announced several program enhancements for the RT PC.

"People have been screaming for token rings," noted Andrew C. Russell, manager of information activities for IBM's Information Systems Division. The IBM RT PC Token-Ring Network Adapter sells for $1,095 and will be available this month.

Much of IBM's emphasis on networking is aimed at dulling Digital Equipment Corp.'s thrusts into IBM's marketplace.

"IBM is getting very aggressive," said Marty Gruhn, vice-president of the Sierra Group, a Tempe, Ariz.-based research firm. "It is bad news for their competitors across the board.

"It is part of the continuing connectivity story that IBM is telling. They are actually starting to connect everything together. Overall, if you look at the announcements, they are delivering more and more connectivity," Gruhn added.

IBM's embrace of Ethernet with the RT PC is an unusual move, according to Gruhn. "IBM realizes that there are a lot of Ethernet installations out there, a lot of them in the engineering communities that they would like to reach with the RT PC. They realize they have to provide that connectivity, because if they don't, someone else will," Gruhn said.

IBM apparently agrees. "The engineering and scientific folks want an Ethernet attachment, and now we are providing that," Russell said. The IBM RT PC Baseband Adapter for use with Ethernet sells for $850 and will be available in September.

In addition, IBM introduced the $850 IBM RT PC Multi-Protocol Communications Adapter, which allows a variety of communications equipment to attach to the RT PC.

IBM also unveiled program enhancements for the RT PC. The RT's AIE operating system was enhanced to speed performance and add functionality.

IBM said it moved the graphics device drivers in its IBM RT PC Computer Graphics Toolkit to the AIX operating system. The tool kit will be available for $800 in September.

IBM strikes back at DEC, Wang with multiple rollouts

Introductions shore up mid-range, office lines

By James Connolly and Charles Babcock

LAS VEGAS — After several years of serving as the target of competitors such as Digital Equipment Corp., IBM has begun to fight back in the mid-range market, according to observers present for IBM's announcement of new System/36 and System/38 processors and connectivity tools last week.

ANALYSIS

The announcement of 125 products was the broadest based IBM introduction in more than a decade, company officials said. But the majority of those products were concentrated in the mid-range and office markets, where companies like DEC and Wang Laboratories, Inc. have focused on IBM's shortcomings.

Analysts noted that the connectivity tools are an IBM effort to answer its minicomputer rivals' claims of single-architecture product lines.

In addition to the connectivity capabilities, the observers noted how the price ranges for the two minicomputer lines now overlap with the addition of a high-end System/36 and an entry-level System/38.

"The entire set of announcements was clearly aimed against DEC and its success in the office market. They clearly have felt pressure from DEC," commented Bob Djurdjevic of Annex Research in Phoenix. Djurdjevic singled out the addition of Ethernet capabilities for IBM's RT Personal Computer as evidence that IBM is recognizing the power of DEC, which emphasizes Ethernet over IBM's Token-Ring network scheme.

Melding to continue

Several observers said they were surprised that IBM did not move the System/36 and System/38 even closer together than they did, although those IBM watchers note that the melding of the systems will continue.

IBM will continue to modify the operating systems on the System/36 and System/38 until it has produced versions that allow System/36 applications to run on the System/38, predicts an independent developer of System/36 and System/38 manufacturing control applications.

Such a move would result in a de facto merger of the two mid-range machines, despite their currently incompatible architectures, said David E. Alcala, executive vice-president of MRM, Inc. in Milwaukee.

The System/36's SSP operating system works with 16-bit technology that provides ease-of-use features to small businesses. The System/38, with its CPF operating system, "is clearly the superstar for IBM" with 64-bit technology and a data base management system built into the operating system, Alcala said.

One of those who expected closer ties between the systems was International Data Corp. analyst Frank Gens. "As far as real tools, like an RPG compiler, putting the System/38 on the Token-Ring and a common data base query, they are just not there," Gens said.

"I was surprised that they didn't make as strong a statement as I thought they would about how the System/38 lives. But they did turn the screws a little bit to get more performance, like more users. That has been at the top of the user's wish list for both the System/36 and the System/38 for a long time," Gens added.

Some observers who had earlier predicted that IBM would bring its SSP operating system under CPF as a guest stood by those predictions after the announcement.

"I was surprised by the lack of a CPF host announcement. But I think that is temporary. IBM has clearly indicated that they are going to let you run System/38 code on the System/36," said third-party software developer Christopher Herron, president of Fusion Products International.

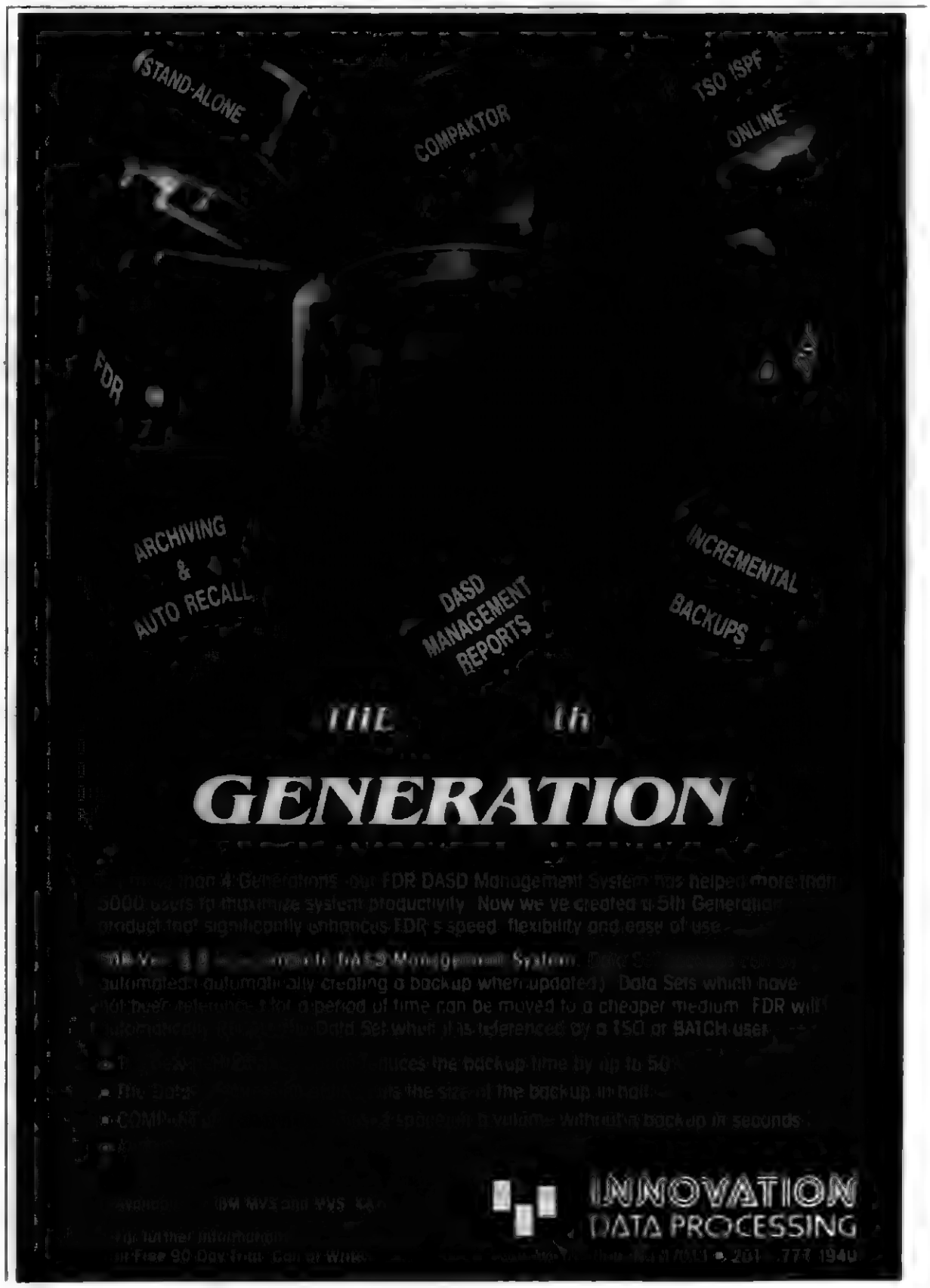
Users interviewed outside the IBM booth at NCC welcomed the mid-range enhancements. "We've been looking for a sign that IBM would continue to support the System/36. These announcements seem to confirm that," said Vince Greene, DP manager for R. A. Homes, a Tucson, Ariz., construction company.

"We're nowhere near maxed out on our current system. If it meant that we would need a new processor, we wouldn't do it anyway," Greene added when asked if he would consider migrating from his year-old System/36 to one of the new systems.

Both Alcala and a System/36 value-added reseller who asked to not be identified observed that IBM's announcement was notable not only for the new features it highlighted but also for things that it did not address.

IBM is believed to have under development a more advanced version of the System/36 than anything it announced, the two sources said, and Alcala noted the Advanced Peer-to-Peer Networking and Distributed Data Management capabilities lacked the channel-speed capabilities needed to take advantage of the new connectivity.

Staff members David Bright and Alan Alper contributed to this report.



Comprehensive PC-to-370 link announced

Software allows micro to access mainframe printers, disk space

By Eric Hindin

"IBM's most comprehensive PC-to-370 link," and closer connections between the Personal Computer and the System/36 and System/38, were introduced by IBM last week.

IBM's Enhanced Connectivity Facilities software reportedly gives micro users access to host mainframe files, disk space and printing facilities. Additionally, menu-driven programs permit PC and 3270 Personal Computer users to query and extract data from hosts, transfer files between hosts and micros and issue commands from micros, IBM said.

The connectivity software offered for MVS/XA TSO/E and VM/SP hosts will permit users to access DB2 and SQL relational data bases, extracted DL/1 data and VSAM, CMS and sequential files. Data then can be automatically reformatted for micro applications, including Lotus Development Corp.'s 1-2-3 and other third-party packages.

Access to all data

For the first time, "you can get access to all the data you have on those systems," said Mary Patterson, director of cooperative processing at IBM Entry Systems Division in White Plains, N.Y. She also stated that the family's "virtual file" feature represents a new kind of function for IBM. "This gives you the capability to get a record at a time in a virtual format for PC applications," rather than requiring transfer of an entire file.

Industry analysts and consultants generally gave positive early reviews to IBM's move. "Clearly they needed to bring some sort of order to a number of different micro-to-mainframe products they'd brought to market," said Lee Doyle, senior communications analyst with International Data Corp. based in Framingham, Mass. "This gives a uniform architecture for micro-to-mainframe requests."

David Ferris, president of Ferrin Corp., a San Francisco micro consulting firm, also gave an initial thumbs-up, saying the announcement underlined IBM's recognition of the strategic importance of linking micros to corporate data bases. "Information centers should like it; IBM is creating facilities which allow PC users to talk directly to DB2," he added But he pointed out that there were no mentions of hooks into IMS and CICS.

"It's a beginning step into cooperative processing," commented John McCarthy, research manager at Forrester Research, Inc. in Cambridge, Mass. "The question becomes, Who will take advantage of it? People are really on the fence, wondering if they should go micro-to-mainframe or micro-to-departmental system."

Enhanced Connectivity Facilities products divide into PC-based "requesters" of data and services, "routers" of data and services located on PC and host and "servers" located on the mainframe. Set for third-quarter 1987 delivery, the micro requester software will cost $450.

The PC router functions will be provided in new releases of previously announced but not yet shipped packages — either the PC 3270 Emulation Program Version 3.0, available in January 1987 for $475, or the 3270-PC Control Program Version 3.0, available next month for $450.

The mainframe router functions are both scheduled for September delivery. They will be included in TSO/E Release 3 for MVS/XA, which will cost $655 in monthly license fees, and VM/SP Release 4, which has a monthly license fee of $443.

Available in third-quarter 1987, TSO/E server software will cost $1,350 per month, and CMS server software will be priced at $850 per month. Each includes host data access and virtual services, consolidating many functions found in existing IBM PC-to-370 products.

As a keystone for the new connectivity family, IBM also unveiled the Server-Requester Programming Interface (SRPI), a program-to-program interface for interconnected host and personal computer applications. SRPI employs LU2 protocols over Systems Network Architecture, the IBM Token-Ring network and IBM PC Network and from micros linked to hosts through 3274 and the new 3174 controllers.

Although IBM's PC requester and server components are not scheduled for delivery for more than a year, customers can begin writing applications to the SRPI this September, according to Patterson.

SRPI's capabilities are a subset of IBM's Advanced Program-to-Program Communications architecture. IBM intends to extend LU6.2 capabilities to programs based on SRPI in selected environments. Currently, CMS and TSO/E support only LU2, Patterson pointed out, and she emphasized that shifting to LU6.2 will not require customers to alter code written to SRPI.

Closer links with PC

Also last week, both System/36 and System/38 mid-range systems received closer links with the PC.

Among these, IBM upgraded the PC Support/36 program to offer improved virtual printer support, the Join function for the transfer facility, a "Shared Folders" function that uses System/36 folder management support to handle PC files and documents and the PC Support/36 Organizer, which lets a single-user interface invoke both PC and System/36 applications.

The PC Support/36 Expansion Feature, which doubles the number of concurrent PC Support/36 users, also was introduced. Versions for the System/36 Models 5360 and 5362 will cost $360 and ship in the fourth quarter, while a package for the System/36 PC will be priced at $140 and be delivered next January.

IBM also made some parallel offerings for the System/38, including PC Support/38 Release 8 for the 5381 and 5382 models, which features improved virtual printer support, transfer facility support with Distributed Data Management and support for Personal Services/PC 1.2 distribution and library services.

The PC Support/38 Expansion feature, which doubles the number of concurrent PC Support/38 users, will cost $350 and be available in the fourth quarter.

Successor to 3274 features Token-Ring link

By Elisabeth Horwitt

LAS VEGAS — IBM's seemingly immortal workhorse, the 3274 controller, was officially put out to pasture last week as the company unveiled a successor designed to provide greater power, flexibility and connectivity — including connectivity to the IBM Token-Ring network.

The new unit, called the 3174 Subsystem Control Unit, supersedes the 3274 line. The 3174 offers two firsts in IBM controller-based connectivity, according to product manager Edward Scharmer.

One is an interface that ties the IBM Token-Ring network directly to the 370 mainframe channel. Previously, the only available host channel-to-Token-Ring connection was through the 3720 and 3725 communications processors, noted Richard Imershein, Gartner Group, Inc. corporate vice-president.

The second new connectivity feature is an optional protocol conversion program that enables ASCII hosts and terminals attached to the controller through a telecommunications link to communicate with IBM terminals and hosts.

"The 3174 is a very powerful device and probably offers the improved performance and ease of customization users are looking for," Imershein said. "Also, customized additions that have been made to the 3274 at users' request over the years have been moved over to the 3174."

Standard 1M-byte control storage, very large-scale integration and additional control microcode makes the 3174 more powerful and upgradable than the 3274, Scharmer said. He added that IBM could provide no figures measuring 3274 vs. 3174 throughput: "It all depends on the type of data stream."

The 3174 Large Cluster Models 1L, 1R, 2R and 3R support up to 32 3270 terminals and provide direct channel, transaction processing and Token-Ring attachments. Small Cluster Models 51R, 52R and 53R support up to 16 3270 terminals. They support the transaction processing and Token-Ring connections but no direct channel connection.

Shipments begin in July. Prices start at $9,960 for the Large Cluster models and at $6,900 for the Small Cluster models.

IBM also announced the 3299 Model 3, a version of its terminal multiplexer that enables 3270 terminals to be hooked up to 3174 and 3274 controllers using telephone twisted-pair wire instead of 3270 coaxial cable.

IBM enhances peer-to-peer networking

By Charles Babcock

LAS VEGAS — IBM announced at last week's 1986 National Computer Conference that it had increased the ability of the System/36 and 38 to communicate with each other. The announcement was made in conjunction with the release of new versions of each computer's operating system and enhancements to other software running on the two machines.

The enhancements did not yield immediate praise from System/36 and 38 users at NCC because few users said they seek to operate their machines in a mixed environment. Nevertheless, several said the announcements give IBM the beginning of a mid-range processor strategy and offer customers the option of teaming the machines.

Release 5 of SSP, the System/36 operating system, incorporates Advanced Peer-to-Peer Networking (APPN), which allows System/36 users to communicate across a network of interconnected System/36s without an intervening host. APPN is available on the high-end 5360 and 5362 System/36 models.

Prior to APPN, a System/36 user "needed to access another System/36 system via a mainframe running Systems Network Architecture," said Chuck Haggerty, vice-president of development and manufacturing staff for IBM's Systems Product Division in White Plains, N.Y.

APPN controls the flow of information through a network that may be tied together by leased telephone lines, X.25 networks or IBM Token-Ring networks. APPN detects congestion on the network and automatically reduces data flow if needed, IBM spokesmen maintained.

A new layer of software on top of the System/36 operating system, Distributed Data Management Architecture Level 1.0, permits programs running on a System/36 under IBM's CICS/VS to access files on another System/36, a 38 or a member of the 370 family also using CICS/VS.

In the same vein, System/38 programs can access files residing on a System/36, Haggerty said. The System/38 Distributed Data Management Architecture is supported by Release 8.0 of CPF, the new version of the System/38 operating system.

A third major enhancement to System/36 and 38 communications is the "pass-through" facility added to the 5250 Display Station. With this facility, a user may pass through a System/36 to sign on to a System/38 and attach to a System/38 application. Similarly, a System/38 user may pass through to sign on to a System/36 and attach to an application, Haggerty explained.

A spokesman for a Fortune 500 company with 150 System/36s installed said his firm is relieved to see a growth path from the System/36 to the 38. "We've been looking for a sign that IBM would continue to support the System/36. These announcements seem to confirm that," Vince Greene, data processing manager for R. A. Homes of Tucson, Ariz., said.

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NCC serves as springboard for hardware announcements

Memorex, NEC, Toshiba, Emulex release products

By Donna Raimondi

LAS VEGAS — The 1986 National Computer Conference opened last week with a barrage of new product announcements. In addition to IBM's Monday morning introductions of 125 products, several other hardware vendors used the annual show as the staging ground for new or enhanced systems and peripheral products.

Memorex Corp. announced Toughshell, a tape cartridge similar to IBM's 3480 tape cartridge, becoming the first plug-compatible manufacturer to do so. However, Memorex's cartridge storage and transport system will not be available until the third quarter of this year, and pricing information was not released.

The company did demonstrate its cartridge storage and transport systems, and it will be immediately selling the IBM-compatible tape cartridges for $14. At this point, Memorex has not announced a 3480-type drive.

Charles River Data Systems released a family of 32-bit supermicrocomputers that use Motorola, Inc. 68020 and 68000 microprocessors. The Universe 200, 400 and 600 models cost from $8,000 to $35,000. They range in power from 1 million instructions per second (MIPS) to 3.5 MIPS. The Model 200 supports a few users, and the Model 600 supports as many as 96. All units run under Unix versions derived from AT&T's Unix System V.

Toshiba Ltd. unveiled its T1100 Plus enhanced version of the T1100 portable personal computer. This version comes with two 3.½-in. 720K-byte diskette drives, parallel and serial ports and either 256K bytes of memory, for $1,999, or 640K bytes of memory, for $2,399. The unit will replace the T1100.

NEC Information Systems, Inc. introduced its Astra XL/32 AT&T Unix-based system. The system can be used as a multiuser host, a network file server and an applications processor in computers and communications integration, a NEC spokesman said.

Based on a Motorola 68020 processor, the system includes 16K bytes of cache memory, a Motorola 68461 paged memory management unit, a 68881 floating-point math coprocessor and an eight-port intelligent multiline communications processor. The base unit costs about $25,000.

Emulex Corp. unleashed a Digital Equipment Corp. Unibus host adapter, the UC14. The device, which connects DEC's PDP-11 and VAX-11 series machines to the small computer systems interface, is said to give the Unibus CPU expanded storage and backup capabilities. Users can choose from a variety of 5¼-in. Winchester disk drives or ¼-in. cartridge tape drives.

The system features optical disk drive support, a small computer systems interface protocol controller, a 20K-byte data buffer and 18-bit addressing. It also includes adaptive direct memory access, which releases the bus to other devices with a lower priority based on bus requests. It sells for $2,200.

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IBM display stations debut

By James Connolly

LAS VEGAS — In addition to offering new models of the System/36 and System/38 and connection tools for those minicomputers, IBM unveiled at the 1986 National Computer Conference last week a series of terminals for use with those and other systems.

The 3191 display station is a member of the 3270 display system family and reportedly features a 12-in. monochrome screen. It costs $1,295 and was designed for use with IBM 4300, 3030, 3080 and 3090 systems.

The 3196 was designed to provide users of the System/36 and 38 the same capabilities as the 3191. It also sells for $1,295.

The 3194 color display station is said to be a high-function workstation for on-line transaction processing on a host computer. It costs $2,895.

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Jul 10, Aug 6
Newport Beach ..... Jul 15
San Diego ..... Jun 17, Aug 7
San Francisco .... Jun 19, Aug 5
Sunnyvale .. Jun 10, Jul 8, Aug 7
CO Denver ..... Jun 17, Jul 17
CT Hartford ..... Jul 16
New Haven ..... Aug 20
FL Jacksonville ..... Aug 5
Tampa ..... Aug 6
GA Atlanta ..... Jul 15
IA Des Moines ..... Jun 25, Aug 27
ID Boise ..... Jul 31
IL Chicago ... Jun 12, Jul 8, Aug 14
IN Indianapolis ..... Jun 17, Aug 19
KY Louisville ..... Aug 7
LA New Orleans ..... Jul 11
MA Boston ..... Jun 19, Jul 16
Burlington ..... Aug 12
MD Bethesda ..... Jun 12
Jul 9, 23, Aug 7
ME Bangor ..... Jul 3
MI Detroit .... Jun 10, Jul 15, Aug 19
Grand Rapids ..... Jun 13
MN Minneapolis ..... Jun 26, Jul 22
MO St.Louis ..... Jun 11, Jul 30
NE Omaha ..... Jul 9
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Standards let CD-ROM disks run across multiple systems

Multivendor panel defines structure

By Maura McEnaney and Edward Warner

LAS VEGAS — Compact disk/read-only memory (CD-ROM)technology received a boost at the 1986 National Computer Conference last week with the Tuesday announcement of standards that will let CD-ROM disks run across multiple operating systems.

CD-ROM technology allows massive amounts of data to be stored on a single compact disk. Although the technology has received much attention up until now, there has not been a standard way to define the logical file structure or layout of the information on the disk.

The logical file format standards announced last week define a volume table of contents and directory structure for CD-ROM. The standards are the work of the High Sierra Group, a consortium of 13 major vendors involved in selling CD-ROM technology. First formed in October, the High Sierra Group includes among its members 3M Corp., Apple Computer, Inc., Digital Equipment Corp., Philips Subsystems & Peripherals, Inc. and Sony Corp.

Intent of standards

According to High Sierra Group Chairman John Einberger, director of software products for Reference Technology, Inc., a manufacturer of CD-ROM drives, the standards do not address either the content of the specific files or the data structures used within those files. The intent, he said, was to allow applications to read data from a CD-ROM without regard to the operating system. The standards also allow CD-ROM to address multiple characters sets for different languages.

"The standards guarantee interchangeability of disks across different hardware," Einberger told *Computerworld*. "One logical format allows all disks made for this format to play on all computers."

The High Sierra Group standards have been forwarded to the National Information Standards Organization and the European Computer Manufacturers Association for final approval.

Some firms not involved in the High Sierra meetings criticized the proposal. CD-ROM logical format standards were not necessary, according to Harvey Martens, director of sales for Reteaco, Inc. of Willowdale, Ontario.

Reteaco translates existing data bases into CD-ROM disks.

According to Martens, "The whole discussion about standards has created a confusion that didn't need to be there."

CD-ROM: The selling of a miracle

For the past six months, users have been bombarded with stories about the endless possibilities of compact disk/read-only memory (CD-ROM) technology. With a single disk capable of holding up to 600M bytes of information, users can store reams of information that otherwise would have taken up valuable shelf or direct-access storage device space.

"It's a very tantalizing technology," says Robert Moea, Philips Subsystems & Peripherals, Inc.'s director of marketing. And, he says, the biggest challenge facing the industry is selling the idea to users.

A quick check of 1986 National Computer Conference exhibitors however, told a story of plenty of existing hardware but little software to support it. CD-ROM drives are being exhibited at the Philips and Hitachi Corp. booths.

"Right now CD-ROMs are mostly in vertical niches where the drives are sold to go with the data," notes Philips' CD-ROM marketing manager Robert Van Eijk.

— Maura McEnaney

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Rising business use of PC hasn't pushed out 3270 terminal

L.A. water district micros run mixed applications; 3270s do dedicated jobs

By Jeffry Beeler
and David Bright

LAS VEGAS — Although IBM Personal Computers continue to make inroads into the world of big business, they are by no means entirely displacing traditional 3270 terminals, a spot survey of 1986 National Computer Conference attendees suggested last week.

On the contrary, PCs and 3270s appear to coexist peacefully inside most user organizations, with each product category filling a different application niche, according to MIS executives at the show.

Micros do, however, appear to be finding their way into large organizations at a significantly faster pace than conventional dumb terminals.

Typifying last week's user responses was that of Ronald Kennedy, assistant director of administrative services at the Metropolitan Water District in Los Angeles. Most companies still "have room for both kinds of equipment" and will probably continue to do so for some time to come, Kennedy said.

Micros for business pros

At the Metropolitan Water District, an estimated 150 terminals connect to the organization's central IBM 4381 and are used mainly for dedicated production jobs like data entry, accounts payable and financial analysis. The firm's micros, in contrast, have found their way primarily into the hands of business professionals and support mixed applications as well as enable their users to make queries against their mainframe data base, Kennedy said.

"When we first obtained our PCs, we did so with the understanding that we would eventually connect them to our 4381," he said. But exactly how they intend to accomplish that feat has yet to be completely decided. "We probably don't have any clearer idea of how we're going to link our personal computers to our mainframe than anybody else does," Kennedy conceded.

In the realm of micro-to-mainframe links, the Metropolitan Water District currently finds itself in pretty much the same boat as Eaton Corp.'s AIL Division in Deer Park, N.Y. Of the approximately 225 PCs the division has installed thus far, only about a dozen connect — through 3270 emulation — to the firm's host processor. Half of that total resides in the organization's information center.

But despite the reliance on 3270 emulation, "we haven't completely solved the problem of micro-to-mainframe links, either," said Mark Wiesenberg, manager of the Eaton division's information technology.

Still favoring 3270s

Like the Metropolitan Water District, Wiesenberg's employer uses a combination of intelligent micros and dumb IBM terminals. For transaction processing and other mainframe applications, the firm still favors 3270s. "The price/performance of PCs hasn't yet reached the point where we can afford to put intelligent devices on every user's desk," Wiesenberg said.

At the moment, the company still uses about twice as many terminals as it does PCs. But the balance of installations is rapidly shifting in favor of the latter. "We're definitely installing PCs faster than we're installing 3270s," Wiesenberg said.

A mixture of PCs and 3270s is also the rule of the day at Airborne Express Corp., where terminals are unlikely to soon give way completely to microcomputers, according to David Griffing, the firm's senior technical consultant. Terminals remain firmly entrenched at Airborne in the area of customer service, a dedicated application that requires no accounting or spreadsheets.

"Airborne is a lean company," Griffing said. "We don't like to put technology in the field where there's no clear need for it." To date, the company's tactic has helped it to minimize costs. But if micros drop to the same price level as 3270s, Griffing said, the firm will consider acquiring PCs rather than terminals.

In at least a few companies, however, 3270s are slowly being replaced by PCs. One such firm is the Rand Corp., a Santa Monica, Calif.-based think tank. Until recently, the research and development group had been buying some 200 of the IBM terminals per year. Now, however, the situation is changing dramatically.

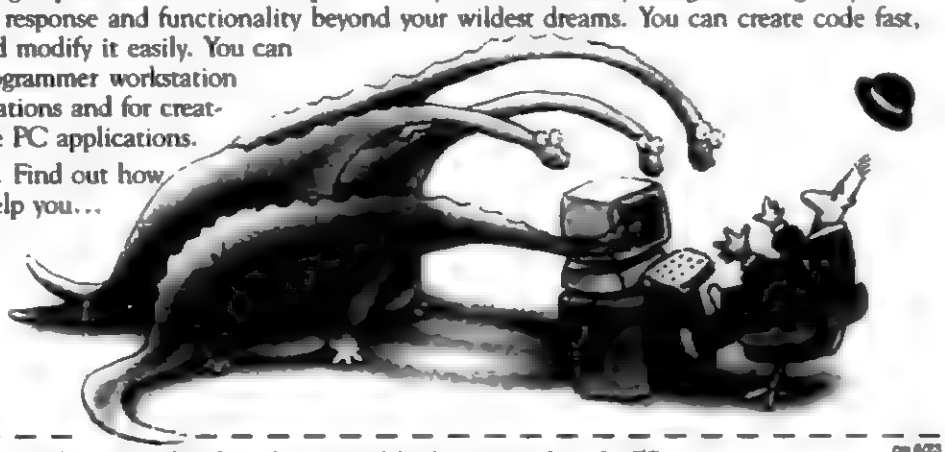
"This year, there are zero terminals in our budget," said Ron Shell, manager of Rand's computation center.

The reason for the abrupt shift in purchasing patterns is that the firm began obtaining PCs that support 3270 emulation. During the past 2½ years, Rand's micro base has swollen from 20 to about 400, primarily because the machines outperform terminals in the company's main application — text processing, according to Shell.

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AT compatibles: Vendor options

From page 1

Credit already had some PC ATs installed, Nanton explains, the Vectra was selected because of the users' need to be integrated with the HP 3000s.

In addition to HP, other major systems vendors that offer PC AT-class machines of varying degrees of compatibility include AT&T, Honeywell, Inc.'s Information Systems Division, NCR Corp., Sperry Corp., Tandem Computers, Inc. and Wang Laboratories, Inc.

Meanwhile, Data General Corp., Digital Equipment Corp., Prime Computer, Inc. and, perhaps, Burroughs Corp. are all believed to have IBM PC AT compatibles in the works, according to company and industry sources.

In getting existing systems customers to purchase its IBM PC AT compatibles, HP has been the most successful of the major systems vendors, says Jan Lewis, president of the Palo Alto Research Group. She estimates that 30% of HP's installed minicomputer base has chosen the Vectra over other models.

About 25,000 Vectras were installed during the machine's three months on the market last year, according to figures from International Data Corp. (IDC), a market research firm based in Framingham, Mass. Lewis says the micro-to-mini software uniformity, coupled with its compatibility, is a big plus for the Vectra.

Waiting may not hurt vendors

Though DEC and some of the other systems vendors may seem to be dragging their feet on PC AT compatibility, it may not hurt them too much in the long run, predicts Ralph Gilman, senior vice-president of market research company Infocorp.

By waiting, the vendors will be able to incorporate the latest technology into their machines, such as a multitasking version of Microsoft Corp.'s MS-DOS, which is expected later this year. "Everybody obviously has them [AT compatibles] waiting in the wings," Gilman says. "They're waiting for the right timing. It gives them a little more flexibility."

Underscoring the importance of connectivity to the host system, the State of Ohio Bureau of Workman's Compensation filled its IBM PC AT-compatible needs with NCR's PC8 systems.

The bureau chose the NCR models over IBM's because they could be better integrated with the NCR host mainframe, explains Lou Pieper, communications coordinator. "Nobody disregards IBM. Had they been able to communicate easily with our mainframe, they certainly would have been considered," he says.

While many of the systems vendors have an excellent chance of solidifying their customer bases — as well as bringing in extra revenue — with PC AT-compatible machines, some seem to be approaching the issue with less zeal than others.

"We are not in the PC game," says Gene Manno, group vice-president of Honeywell's Small Computer and Office Systems Group. "We are bringing the workstation of choice to our own market."

Honeywell's IBM PC AT-compatible AP systems are built by NCR. However, Manno says that Honeywell's overall strategy involves a high degree of compatibility, "seamless" communications with Honeywell hosts and extra "goodies" such as proprietary coprocessors. "Not too brilliant, but it sounds like it'll work," Manno comments.

Tandem's AT-compatible workstation

That general sentiment is echoed at Tandem. Responding to customer requests, the maker of fault-tolerant computer systems introduced last month the 6AT IBM PC AT-compatible workstation.

While the workstations offer slightly richer features — like a 40M-byte hard disk drive compared with the IBM PC AT's 30M-byte drive — for a slightly lower price, Tandem plans to sell them only to existing customers and has no plans for fancy innovations, says Jim Pawlik, product marketing manager for intelligent workstations.

Instead, "we are going to let technology call us," Pawlik says. "With a product like the 6AT, we are not going to go out and innovate."

DEC's VAX-Mate AT-compatible system, already being beta-tested, should be announced soon [CW, June 16]. This will be DEC's second attempt at capturing the desk. Its 4-year-old Rainbow microcomputer did not catch on as hoped, partly because it was not IBM PC AT-compatible, but also, says Lewis, because it was not part of the VAX family.

Running proprietary operating systems, DEC's higher priced Professional microcomputer systems are designed for a limited, more technical audience.

Since the Rainbow's introduction, however, DEC has been steadily extending the VAX family downward. The VAX-Mate should offer IBM PC AT compatibility as well as the ability to tie in closely with VAX systems. Backing into compatibility this way should turn out to be a smart strategy for DEC, Lewis says.

To "stay in tune" with the industry, DG is at last readying an IBM PC AT-compatible system, hints Jeffrey Joy, product manager for intelligent workstations. DG has been later than most systems vendors in jumping on the PC AT bandwagon. Previously, much of the company's efforts in the PC AT area were focused on laptops.

Last year, with its Dasher/One IBM PC AT-like model, DG took its first big step toward integrating desktop PC ATs in its total environment.

"The one CPU user concept is not going to go away," Joy acknowledges. Although the Dasher/One

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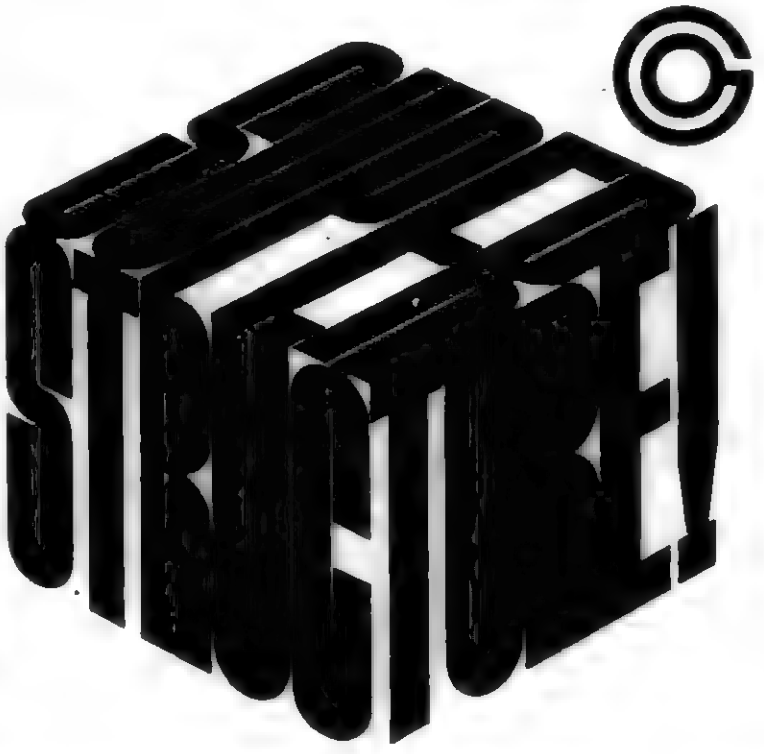
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runs MS-DOS, it is not truly PC AT-compatible. It uses 3½-in. disk drives instead of 5¼-in. drives — although IBM recently introduced 3½-in. disk drive options for its systems — and it will accept only DG-supplied add-in boards.

It is uncertain whether DG's PC AT-class machine will also be somewhat less than IBM compatible.

Burroughs also appears to be realizing the need for some degree of IBM PC AT compatibility. Although Burroughs has been successful with its B25 family of workstations (at least 56,000 units installed, according to IDC figures), which run the company's proprietary BTOS multitasking operating system, it may also be gearing up for some sort of IBM PC AT-class device, hints Jim Smith, product marketing manager for workstations.

It is not clear whether the device will come as a stand-alone unit or as an expansion box for the B25, but it likely will not be incorporated within the B25. Smith does not deny that Burroughs is planning for IBM PC AT compatibility. "Anything is possible," he says.

Designed by Convergent Technologies, Inc. and now manufactured by Burroughs, the B25 runs MS-DOS as a task under BTOS. Unlike some systems vendors, such as Honeywell and Tandem, that sell workstations primarily to their customer bases, approximately 50% of the B25 units sold annually go to accounts with IBM hosts, says Smith.

Burroughs contracts with U-Haul

Burroughs recently signed a $10 million contract with U-Haul International, Inc. for 4,000 B27 workstations, which are part of the B25 family.

The units will be installed in U-Haul's 1,200 rental offices in the U.S. and Canada and linked via telephone lines to two NAS9000 IBM plug-compatible mainframes at the company's Phoenix headquarters.

Speed, multitasking and clustering capabilities and a large, 15-in. screen were the chief reasons the workstations were chosen from roughly 30 bids, says Lawson Roberts, U-Haul's chief administrator and director. When the selection process began, however, the IBM PC AT was not yet on the market.

Despite other requirements a customer may have, price is often the overriding factor in some situations. Most systems vendors with PC AT compatibles take care to make their prices competitive with IBM's, but such caution is not always enough.

At one U.S. Army installation where IBM PC AT compatibles were needed to connect to both remote and future on-site Wang VS minicomputers, Zenith's Z248 system won out over the preferred Wang APC because of a huge price differential.

Taking advantage of the opportunity to tap into an Air Force contract with Zenith, the Army unit ordered 100 of the Zenith systems, and only three out of the 30 Wang APCs that were originally planned have been received, says the Army MIS officer, who asked not to be identified.

Although the Zenith systems should cost well under $3,000, compared with nearly $7,000 for similarly equipped Wang APCs, the officer says he would rather have the Wang systems. "Nothing will tie in to the Wang VS system as good as the Wangs," he notes.

"While many systems vendors have an excellent chance of solidifying their customer bases — as well as bringing in extra revenue — with PC AT-compatible machines, some seem to be approaching the issue with less zeal than others.

While the officer prefers the APCs, he is irked by their lack of high compatibility.

"A lot of the really nice-to-have software — all the new developments — go to the IBM and the IBM compatibles," he says. "Wang is definitely behind the power curve on that." He adds that it is difficult to find third-party hardware for the Wang systems.

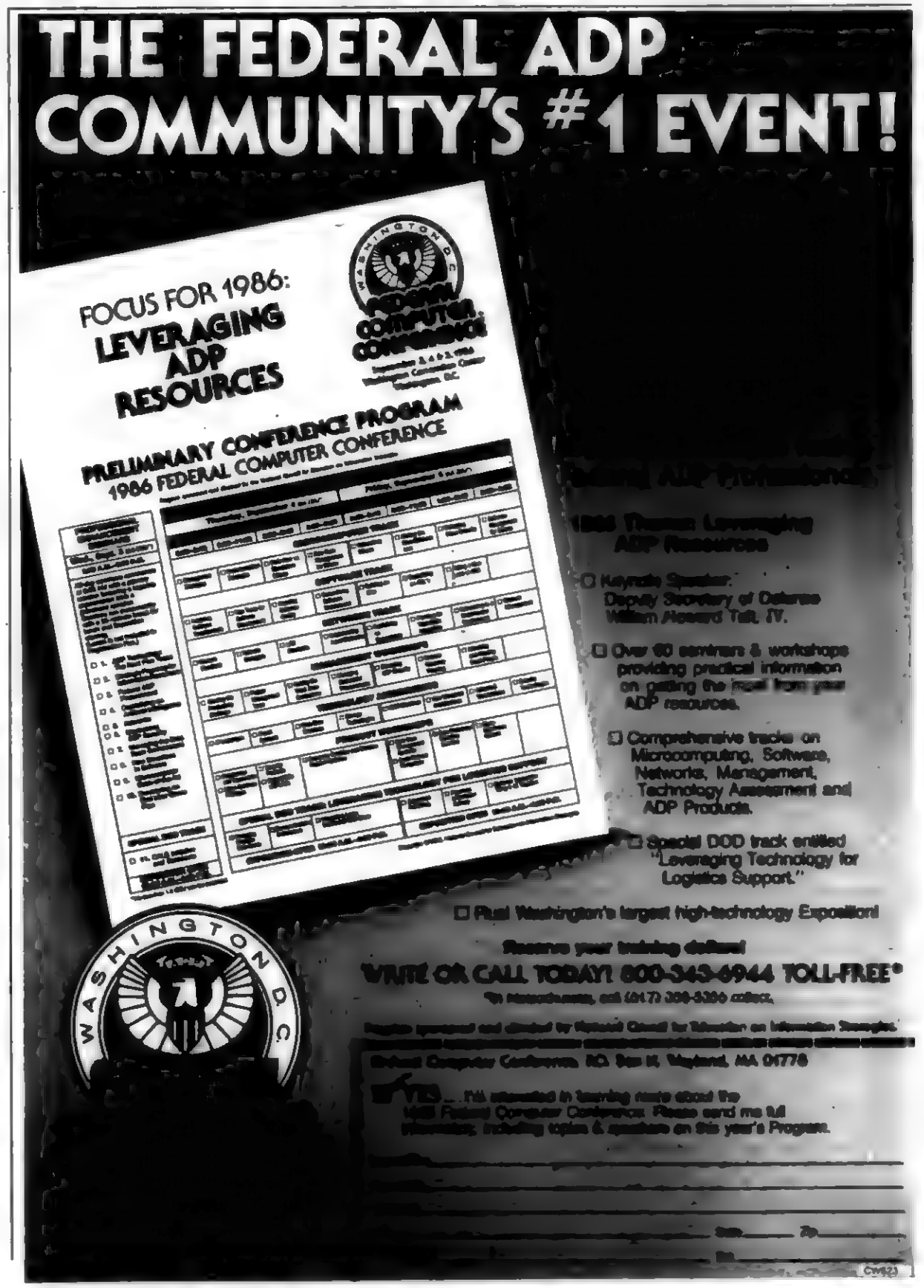
Introduced last summer, the Wang APC runs approximately 85% of off-the-shelf IBM PC AT applications, says product manager Michael Guerette. He stresses that Wang has always given high priority to terminal emulation.

"We have put a lot of effort into integrating our personal computers with our VS minicomputers. We were perhaps one of the first vendors to have a very high-speed link from our PC to our VS," he said.

Wang has also added several ease-of-use features, such as an expanded keyboard and a menu interface for user control of MS-DOS. A 67M-byte hard disk and a tape backup — features not found on the IBM PC AT — are optional.

Lewis of the Palo Alto Research Group expects IBM to keep the PC AT imitators on their toes by doing such things as changing its read-only memory BIOS more frequently. As IBM keeps moving, maintaining compatibility promises to be a "constant struggle," she notes.

Nevertheless, IDC research indicates that shipments of Intel Corp. 80286- and 80386-based compatibles should surpass IBM PC AT shipments in 1987, tallying 972,000 units vs. IBM's 910,000.



VIEWPOINT

EDITORIAL

Connections the IBM way

It was a start. IBM did not merge its System/36 and System/38 product lines last week, but at least its dramatic 125-product mega-announcement at this year's National Computer Conference did appear to signal recognition of the importance of having the System/36 and 38 talk to each other. This was in apparent reaction to extensive user surveys and sharply articulated demands, as reported in this space two weeks ago.

Conversely, it was also evident from last week's announcements that IBM will presently forgo the concept of running a single hardware architecture and operating system for all mid-range machines.

This is noteworthy given that the single-architecture approach — from desktop to host — is popular among IBM's competitors in the superminicomputer field and has been enthusiastically embraced by their customers. Thus, even though IBM is not linking systems to the extent found at Digital Equipment Corp. and Data General Corp., it has gone further than ever before to establish some degree of commonality.

Meanwhile, IBM appears to have made it easier, through a series of communications tools, for large users to link networks of System/36s and 38s for accessing data and applications on multiple computers. IBM also seemingly eased the migration path for smaller users moving from the System/36 to the System/38, not by allowing direct porting of applications to a System/38 but by letting the users overlap the removal of a System/36 and installation of a System/38.

The ideal, of course, would be for IBM to establish application transparency among all its systems, and one excellent step in that direction might be the oft-predicted shift of the System/36's operating system under the System/38. That said, we must pay heed to IBM's rebuttal point: that it does not need a single architecture, that the company has such a broad user base that it is unreasonable to think that IBM could ever design a single system to optimally support engineers, banks, clerical workers and manufacturers.

Smaller companies, with a more narrow user base and more limited product line, can deal with such situations more forthrightly. A corporate monolith like IBM must continue groping for the sound, responsible middle ground — and continue to listen to its users.

Notes & observations

The real news from this year's NCC is that its sponsoring organization, the American Federation of Information Processing Societies, has not been adhering to basic business principles in the packaging, promotion and administration of this trade show. We must confess to having a soft spot in our hearts for this, the precursor of all computer trade shows and still the leading MIS-oriented computer conference. For NCC to succeed, however, AFIPS must move immediately to preserve its existing (though rapidly dwindling) exhibitor/client base, conduct professional marketing surveys to learn what real and potential attendees are seeking and then package the whole with a coherent marketing strategy. If AFIPS does not act quickly, we may have seen the last NCC.



LETTERS TO THE EDITOR

Part-time work offers DP stability

The last 10 years have been a time of transition for data processing. The amount of work and people involved has multiplied exponentially; women now occupy many of the positions that used to be open only to men. Data processing itself has expanded from scientific calculations and printing paychecks in a few businesses to every area of every type of business.

With this change have come new challenges, not the least of which is finding and retaining qualified personnel. Data processing folks seem to lack the company loyalty of other professionals, jumping from one company to another. Colleges cannot seem to produce computer graduates fast enough; even so, these new faces need a great deal of training for environments that grow ever more complex. The quantity of systems being produced has generated a great need for employee retention. Many solutions have been proposed, with limited success. One option that needs to be eyed seriously is allowing part-time workers.

Most companies shy away from this. Part-timers have been associated with low-skill, temporary work. Their loyalty is often nonexistent; their quality of work is low. These observations, however, represent the past experiences of people who have seen this in unskilled positions; these part-time folks use jobs for financing a transition to "greater things."

There has arisen a new need in DP, however. This is best expressed by the many women (often new to the profession) who become pregnant and wish to spend time raising their children. The scenario goes as follows: A woman gets pregnant. Around the time of childbirth, maternity leave is arranged. The woman, desiring to raise her child, asks for a change in status from full time to part time. This is refused for "company policy" reasons.

The baby comes, and the woman goes on leave. After the leave, one of two inevitable events occurs. The first is that the woman makes arrangements with a day-care center and the second is that she returns only for a short period of time, or not at all. In the end, both parties lose.

A similar case happens with an individual who has a bachelor's degree and desires to proceed to master's work. This can be achieved in one to three years full-time, depending on the program. Part-time school means three to eight years, along with sacrificing time with spouse and child. Also, work never ends "at work"; long days for work, class and studies become a point of contention between student and family. Long hours over a long period of time also lead to an unproductive worker. Again, both parties lose.

A solution would be to allow these people, temporarily or permanently, to work part time. The many hours of training invested would not be lost; full-time status could restored (under agreed-upon conditions); most of all, employees could be retained.

This is obviously not a universal panacea; part-time folks could not be used in certain stages of a new development project. These folks would probably fit in maintenance situations and development groups that are ready to design and code their programs. The key, though, is that valuable personnel would be retained and useful.

Tom Pella
San Diego, Calif.

Hopper's retirement regrettable

I was somewhat appalled to hear of Captain Grace Hopper's forced retirement [CW, May 26]. I had the opportunity to hear her speak at a users conference. Captain Hopper is effervescent, warm and humorous and has an energy level that many people half her age do not have. I wish her well in her retirement and in all her future endeavors. She is an asset to our country and has much to offer to the computing community.

Steven Steinbrecher
Fort Lauderdale, Fla.

SDI reliability debate worthwhile

Professor Hertz' article "SDI demands trillions of instructions, 99.9999999% reliability" [CW, June 2], raises some good hard questions over the reliability of the Strategic Defense Initiative or Star Wars.

As computer professionals and as citizens, we all need to ask these hard questions before the Strategic Defense Initiative becomes embedded in our economy and lulls us with a false sense of security.

Thanks to *Computerworld* for providing a forum for debating SDI.

Susan Lee Price
San Jose, CA

VIEWPOINT

Vendors, users just can't see eye to eye on copy protection

You are a crook.

You work with computers, don't you? And you need software to run computers don't you? That software can be copied, and you probably are bright enough to do the copying. In light of this fact, you probably should not be allowed access to corporate computer systems. Right? Of course that's right.

The way that certain software vendors are screaming about more and more regulation, the above statements might as well be true for anyone who ever sat in front of a VDT. Because an irritating number of software vendors are now selling their packages first and foremost with the idea of how to make sure no one makes off with an illicit copy of this product, the emphasis is no longer on how well the product performs to specifications or whether it meets the user's needs.

Protection becomes most important

No, the important thing in bringing a software product to market is to include a little facility that makes sure those scheming weasels disguised as users don't find a way to copy it.

Newquist writes and consults on artificial intelligence and other advanced high-technology topics from his office in Scottsdale, Ariz.

There's a little-used adage that says the customer is always right. In many software houses of the 1980s, not only is the customer not always right, but he is always a swindler.

Just imagine how many dollars are lost by these poor companies. Try. Actually, don't bother trying, because these companies can tell you down to the dollar how much money they have lost in revenues from illegal copying. If that's the case, have them round up each of the copies that accounts for this dollar figure.



By HARVEY P. NEWQUIST

As the vendors shift blame and accusation on to the individual, it becomes almost inevitable that they expect individual users to have their foreheads stamped with their software registration number.

The idea of software protection becomes almost as pressing an issue as government security clearances and facilities access. The latter is a fascinating realm of technology, and if certain software vendors want to invest in the technology, it sure beats planting destructive little worms into a user's computing systems.

To be fair — and nobody said that life was — a number of companies are already dropping their copy protection schemes at the insistence of large users. And as each week goes by, other vendors are finding that irritable customers are not always repeat customers.

Now, if that irritability stems from hassles with copy protection, and irritability prevents customers from buying more software, doesn't it stand to reason that copy protection is standing in the way of more sales? Why, gosh yes, it does! Isn't it amazing how these things work? As software vendors reach this higher plane of enlightenment, a better bottom line starts to take shape out of the mist. Miraculously, those nasty little protection schemes are dropped. And you thought that vendors weren't concerned about the needs of the customer.

It is a fact of life that there are keys, codes and commands that every company in every industry uses for protection. But take for example one of the newest, most efficient means of making sure that only the proper people have access to certain facilities (for software purposes, translate this as "one disk, one user").

Called the Eyedentification System, this product recognizes users by something far more advanced than their registration numbers or even fingerprints. It uses the retinal eye pattern of the inside of a person's eye to verify identity.

A potential user has his eye scanned by an instrument using infrared light that records and stores the pattern of blood vessels.

Pattern must match to gain access

Then, to gain access — or to get telephone technical support — this same user looks into a device which scans the eye again, matching the retinal pattern to the one stored in memory.

Since very few people are willing to permanently alter the insides of their eyeballs or are born with the exact same biometric features, the chances of false access are a mere 0.0001%. Maybe one of these devices ought to be included whenever you shell out $495 for a piece of personal computer software.

Will the software industry go this far to protect profits? Highly doubtful. But something needs to be done to put the sale of software back into perspective, something that puts mutual benefit ahead of mutual distrust. It's certainly overdue, and you don't even have to ask people if it's out of control.

Because you can see it in their eyes.

Strategic planning tempers data management with business judgment

READER'S PLATFORM

By BOB DJURDJEVIC

"A manager without a plan is like Moses wandering in the desert for 40 years," wrote one of our client executives to his staff. "If he [Moses] had had a plan," the letter continued, "he would have turned left at the Dead Sea, and the Jews would own all the oil in Saudi Arabia."

Such a zealous sales approach in stating the importance of strategic plans is seldom needed anymore in the North American computer industry. Our business schools and the computer vendors have combined to make strategic plans axiomatic even in smaller companies. The former spewed out the manpower, while the latter provided the processing power. The results are the millions of spreadsheets without which businesses could no longer run. Or could they?

You see, the reason the time may have come to pause and reassess the real value of today's strategic plans is that the pendulum may have swung too far toward our reliance on technology. Such a trend may have dangerous consequences if seasoned business executives begin to forfeit the judgment calls they used to make to their staff or the computers. Here is what can happen if one confuses judgment with the legwork which most computers or the MBAs so competently perform.

Djurdjevic is a computer industry analyst and president of Annex Research, a Phoenix-based computer research and consulting firm.

A very bright young analyst (with a master's degree in business administration to boot), employed by one of the nation's well-known market research and consulting firms, was asked by a client to explain why some of the numbers in a particular product forecast turned out the way they did. Without batting an eyelash, the young man reportedly responded, "Because our model said so." The almighty model.

The extent to which such attitudes may typify the planning processes in our industry is the extent of the danger that senior executives will face when delegating the planning responsibilities down the line. Let's face it — many of the senior corporate executives are still intimidated by computers, and are (unjustifiably) in awe of them. Consequently, many hire young computer "whizzes" to run them instead of making an effort to master the new technology themselves. By doing so, however, these executives deprive their companies of their judgment and experience.

Those among the senior managers who do take the trouble to learn how to use computers quickly realize that even the most advanced computer technology or some of the business schools' brightest graduates simply don't measure up when faced with the complexity of the task at hand — crystal ball gazing.

That's because developing strategic plans has always been a combination of art and science. Too much art, and the plans go awry because insufficient data was considered. Too much science, and one can no longer see the forest for the trees, as they say. So, where does one draw the line?

Even the answer to the preceding question requires judgment. This opinion, by the way, comes from a person who has breathed, thought and, at times, even dreamed computers for a better part of the last two decades.

Effective planning is a game in which senior executives engage in "computer wars" with their aides, challenging the young upstarts' computer models all the way. That, of course, requires a certain amount of computer literacy on the part of the executives. And that, in turn, precipitates a change in attitudes, a willingness to get their hands dirty again.

Take IBM, for example. It is hard to imagine another company with either more brain power or computing power at its disposal. Nevertheless, all that didn't prevent it from making at least two major strategic "misguesses."

The first one took place in the late 1970s, when IBM underestimated the impact that lower prices would have in creating additional demand for its products. The second is still in progress. This time, the company overestimated the demand at current prices. How do these errors happen?

Monetarily rich, spiritually washed out

One can't be sure. An important factor, however, is that somewhere along their climb of the corporate ladder, leaders of such large companies lose their feel for the business. Perhaps they begin to depend too much on their staff and on technology rather than on the instinct that got them started up the ladder in the first place. Whatever the reasons, many arrive at the executive suite — monetarily rich but spiritually washed out.

Take somebody like Buck Rodgers, for example, IBM's self-professed quintessential sales executive. In his book *The IBM Way*, Rodgers writes that "when IBM's commitment to being the best service organization in the world bar none ... was announced to the employees, the spirit within the company soared."

Fat chance! Executives like Rodgers just help reinforce impressions that many large company leaders indeed live in a dream world.

Someone once said that "too many people use strategic planning the way a drunk uses a lamppost — to lean on rather than shed light." The executives who get involved, who make strategic planning a source of light and not just a prop on the executive ladder, are likely to be our CEOs of the future.

VIEWPOINT

TURNAROUND TIME

Larry Long

***Q** I report to the director of corporate information systems. She hired me six months ago to be the manager of programming. At about the same time, she became absorbed with the idea of creating an MIS plan and assigned a senior analyst to devote half of his time to planning. Unfortunately, the resulting plan emphasizes hardware acquisition instead of systems development.*

Half of my programmers are working on "hurry up" projects, and the other half have no idea what they will be working on next month. Since I've been here, the priorities have changed from week to week. My former employer compiled an MIS plan that provided some direction for the programming effort. My boss is very proud of her new plan, but it does not address current or future systems projects.

Without causing undue tension, how do I ask her to enhance the plan so that we have some order and purpose to our work? All of us would feel much more comfortable with a set of priorities that would enable us to at least finish what we start.

Tell her in the way of a status report. The report would, of course, include your concern about managing in reaction mode and your desire for better short- and long-term direction. Mention that you need this direction to effectively schedule and use the resources within your realm of responsibility.

A good MIS strategic plan is driven by information and processing needs, not by hardware needs. If, during the course of the conversation, it becomes apparent that she doesn't recognize this very basic planning maxim, you may need to hint that she consider a more integrated plan.

You will probably be putting out fires for the rest of your days if your boss refuses to broaden the scope of her planning activity. If so, I wish you the best of luck in your next job.

***Q** The work that I did in automating certain plant operations resulted in the elimination of five jobs. Ultimately, 25 jobs will be eliminated. After that, we have no definite plans for further automation.*

We don't anticipate any people being laid off. Nevertheless, rumors are flying that most of our 250 workers will be replaced by robots. This simply is not true, but nothing I say seems to convince them otherwise. Do you have any suggestions?

Our society is becoming an information society. The question is not whether we automate but when and how much we automate. This is a time when management and labor must be open and frank with one another.

I would suggest that you invite a labor representative to serve on the team evaluating any future proposals to automate plant operations. This gesture implies that labor will be fully informed of and involved in any future automation, from conception to implementation.

This may not be what plant personnel want to hear, but it may provide some small comfort. Tell them that during the next decade more jobs will be lost because of a lack of automation than an implementation of automation.

***Q** Currently three marketing/advertising professionals and two secretaries report to me, and I have authorization to fill an empty position with another professional.*

The job description calls for someone with experience or a degree in marketing, but what I need is someone with a solid computer background and an interest in marketing. The personnel department refuses to change the job description for all the product marketing managers.

My group is paving the road for other product groups in the area of microcomputer applications. However, we're beginning to get in over our heads and need help to progress any further. A couple of DP programmers have been helpful, but the time they can devote to our microcomputer needs is very limited.

Everyone in marketing, including my boss, is very impressed with what we have done, but they don't know enough about computers to understand that we are on the verge of making some serious productivity gains.

How do I convince my boss and the people in personnel that we need a micro specialist?

Tell your boss that within five years, more computer specialists will work in the user areas than in centralized MIS departments.

Then ask your boss if your company can afford the luxury of bucking this trend, considering that the company will miss out on opportunities for productivity gains and, possibly, opportunities to gain a competitive advantage.

Those companies that refuse to change policy or revise the organizational structure to accommodate the trend of moving technical expertise closer to the user should be preparing to play catch-up during the next few years.

Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, P.O. Box 9171, Framingham, Mass. 01701-9171.

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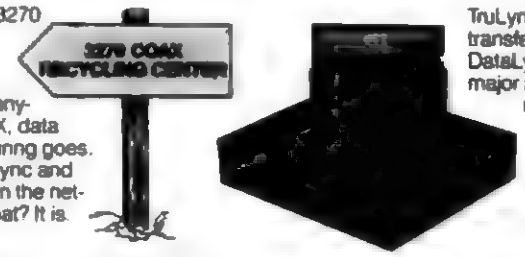
A Fresno (CA) hospital uses DataLynx to bring nine DEC VT-100 terminals on line with a BSC host 200 miles away at Blue Cross offices in Los Angeles.

The hospital transfers confidential patient and medicare data to Blue Cross using inexpensive async modems. Administrative productivity is increased through better patient account control and cash flow problems are solved with faster insurance compensation payments.

InterLynx/3287 attaches virtually any low cost ASCII printer anyplace you can plug in a 3287, allowing a major department store to access their IBM 4381 with a Texas Instruments 850. This provides an efficient and inexpensive method of printing bridal registry service announcements. The credit department also uses the TI850 for efficient printing of records and reports.



Convert your 3270 coax devices to RS-232 today. Then place your coax terminals anywhere your PABX, data switch or LAN wiring goes. Mix or match Async and Coax terminals in the network. Sound great? It is.



TruLynx PC software provides fast easy file transfer to IBM host programs through DataLynx Protocol Converters. In one major application company executives update financial planning databases from PC's at home and in the office. In another application source code for large mainframe application programs is transferred to and from PC's for demonstration, test and editing.





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Customers of a restaurant supply house in Denver dial an IBM/36 host through a DataLynx/5251, check inventory levels, current pricing and perform their own order entry.

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One customer in Hawaii using Prime and Microdata computers for account receivable and payroll data entry, accesses a payroll/service bureau IBM 4300 host with DataLynx/3780.





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COMMUNICATIONS

DATA STREAM
Elisabeth Horwitt

Ku-band dearth around the bend

Talk about tragic ironies. A year ago, when a transponder glut was keeping satellite bandwidth prices at rock bottom, satellite-based network vendors were struggling to make their sales.

This year, just as many American businesses are waking up to the advantages of Ku-band satellite-based communications, a Ku-bandwidth shortage looms.

The reason: National Aeronautics Space Administration shuttle disasters have cut off the supply of new transponders in space, at least temporarily.

And the problem is not limited to NASA. There was a recent shuttle blowup at Ariane, the European Space Agency's satellite launching facility in French Guiana.

Ariane is the only other launching pad currently available to commercial satellite companies.

According to a recent report on the very small aperture terminal (VSAT) market by the New York-based research company Link Resources Corp., at least 22 Ku-band transponders will remain on the ground this year because of shuttle failures.

The report further states that demand for Ku-band capacity is increasing. VSAT network hardware and services revenue was $99 million, according to Link; in 1990, revenue should climb to $765 million, the report claims.

GTE Spacenet Corp. spokesman David Dines claims Ariane will not have another launch for three to six months,

See KU-BAND page 25

Horwitt is Computerworld's senior editor, communications.

Rate cuts aimed at AT&T

MCI, Western Union offer WATS-like services

By Elisabeth Horwitt

Continuing to chip away at AT&T's dominant position in the business telecommunications market, Western Union Telegraph Co. and MCI Communications Corp. recently announced rate cuts and new telecommunications services that directly compete with AT&T offerings.

MCI announced Prism III, a WATS-type service that targets the same business customer as AT&T's direct-dial Pro America service, according to MCI Communications President Bert C. Roberts Jr. Pro America is a discount plan for small, dial-up business customers. Prism III targets business customers with long-distance bills of between $500 and $2,000 per month, a segment constituting 40% of the $7.5 billion WATS-type service market, according to Roberts.

Offering nondiscount rates ranging from 10 cents to 28 cents per minute, Prism III is priced 5% to 15% below AT&T WATS and 25% to 35% below AT&T direct dial rates, according to MCI. The service offers volume discounts, 6-sec. billing, accounting codes and distance-sensitive pricing. This differs from the traditional WATS offering that charges a set rate for all calls, based on costs for transmitting to one geographical region or "band."

"AT&T initially offered banded services because they make it easier to predict and control costs," said Daniel Rosenbaum, editor of "Wiretap," a Morristown, N.J.-based industry newsletter. However, AT&T may soon be phasing out banded services, he added. Megacom, for example, is a "more or less distance-sensitive form of WATS."

The Prism III offering is made possible by the fact that local telephone companies are in the process of implementing equal access on their central office facilities, Roberts noted.

MCI already offers Prism I service, targeting customers spending more than $10,000 a month for long-distance services, and Prism II, which is cost-effective for customers with monthly bills of $2,000 to $10,000. Unlike some MCI offerings, the Prism services do not charge higher rates

See RATE page 22

IBM boosts 8100's connectivity

By Rosemary Hamilton

RYE BROOK, N.Y. — Software enhancements recently announced by IBM will allow applications running on IBM 8100 Information Systems to be accessed by workstation clusters on the IBM Token-Ring Network, the PC Network and the System/36, the company said. The enhancements are available now at no extra charge with Release 3 of the DPPX operating system.

The enhancements enable IBM Personal Computers emulating either an IBM 3278 Model 2 or 3279 Display and connected to a Token-Ring or PC Network to access DPPX or 370 applications via the DPPX Router.

This is accomplished by the network controller running either the entry-level version or Version 2 of the IBM 3270 Personal Computer Emulation Program. Version 2 also supports file transfer between the 8100 and individual PCs on the PC Network. File transfer is evoked at the PC via PC commands. It can not be initiated from DPPX.

System/36 users can also access DPPX applications via the Router. The System/36 must be emulating a 3274 controller and the terminals attached to it must be defined as 3277 Displays.

The new DPPX Workstation Support (DWSS) capability offers an expanded file/retrieve application interface that allows users to send, receive or delete documents in the DWSS folder. According to the vendor, this enhances the user's control over the storing of Displaywriter, IBM PC or DPPX-generated documents and also of document distribution over a Systems Network Architecture Distribution Services (SNADS) network.

See IBM page 22

INSIDE

Bellcore tests show the capacity of existing copper lines can be increased to handle ISDN requirements/22

NEW THIS WEEK

- Network Software Associates enhances its family of PC-to-PC communications software
- For more on this and other new products, see pp. 93-117.

INSTANT ANALYSIS

"At least when IBM says a computer architecture's day is done, it gives the product a last boost to give users time to adjust to the situation."

— David Terrie, president, Newport Consulting, on the fate of the IBM 8100.

Siemens, Fujitsu each announce modular PBX offerings

Users can start small, grow with upgrades

By Stanley Gibson

Two new entries in the private branch exchange (PBX) market, both modular and expandable, were recently introduced by Siemens Information Systems, Inc. and Fujitsu Business Communications. Both systems will allow a company to start with a 40-line PBX and gradually increase its size by adding standard boards and cabinets. Both systems offer, among other features, least-cost routing, automatic call distribution and a T1 interface.

The Fujitsu Focus 960 can handle networks ranging from 40 to 2,000 lines, at prices ranging from $600 to $700 per line. The Focus 960 replaces the Focus Elite PBX, introduced in the early 1980s, which could handle 40 to 500 lines. An Elite PBX can be upgraded to a 960 system with minor software and hardware changes, a Fujitsu spokesman said.

The Siemens Saturn IIE PBX is designed for users with 40 to 600 lines, at prices ranging from $400 to $1,000 per line, depending on the configuration and installation requirements. The new product fills a gap between the Saturn II, which handles 40 to 200 lines and the Saturn III, which is designed for 150 to 864 lines.

The Saturn IIE has twice the capacity in the same cabinet size as other Saturn models and, in smaller configurations, it has about 25% to 30% better price/performance than the Saturn III, according to a Siemens spokesman. The Saturn IIE can also be upgraded to a Saturn III by adding hardware, the spokesman said.

The modular approach is part of vendors' strategy for establishing a customer base of small companies that will require network upgrades and enhancements over time, noted T. Doane Perry, a telecommunications consultant with International Data Corp., in Framingham, Mass.

"Companies are trying to have a one-upsmanship of types of modularity," said Perry, pointing out that there are in fact two kinds of modularity, one of size and the other of applications, such as the voice mail and automated attendant add-on packages.

Shared tenant services (so-called smart buildings) constitute one major target market for modular PBXs, according to Perry. An incremental strategy is an important way to compete in such a market, he noted.

"It's a service business. Having an incremental strategy is part of it," Perry said. In the shared tenant market, especially, modular PBXs are likely to face a resurgence in competing Centrex services that are based on telephone companies' central office switches, Perry predicted. Centrex services can be expanded to meet a building's requirements and can also be tailored to meet several clients' specific needs, he pointed out.

Perry said that while companies

See SIEMENS page 25

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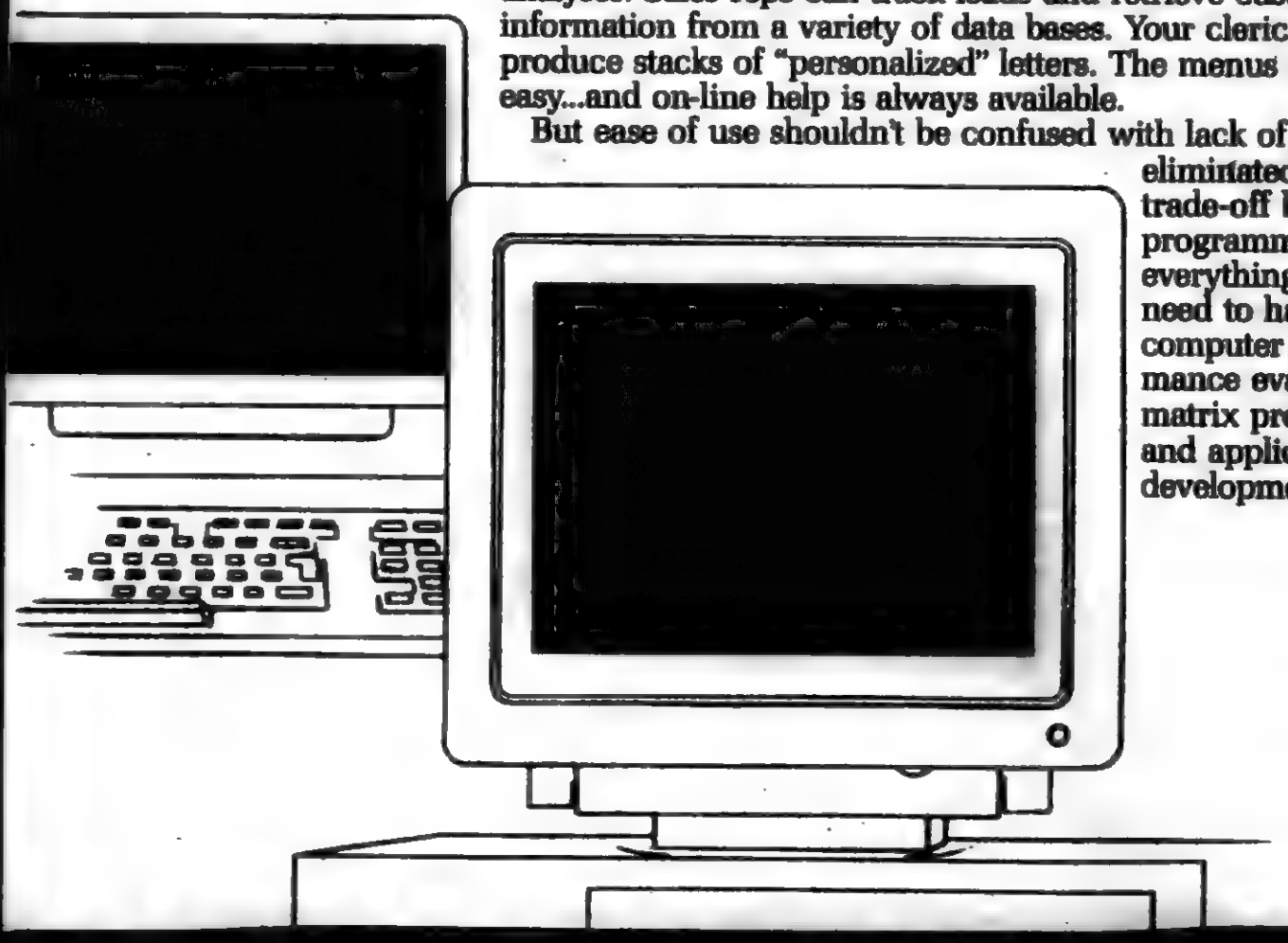
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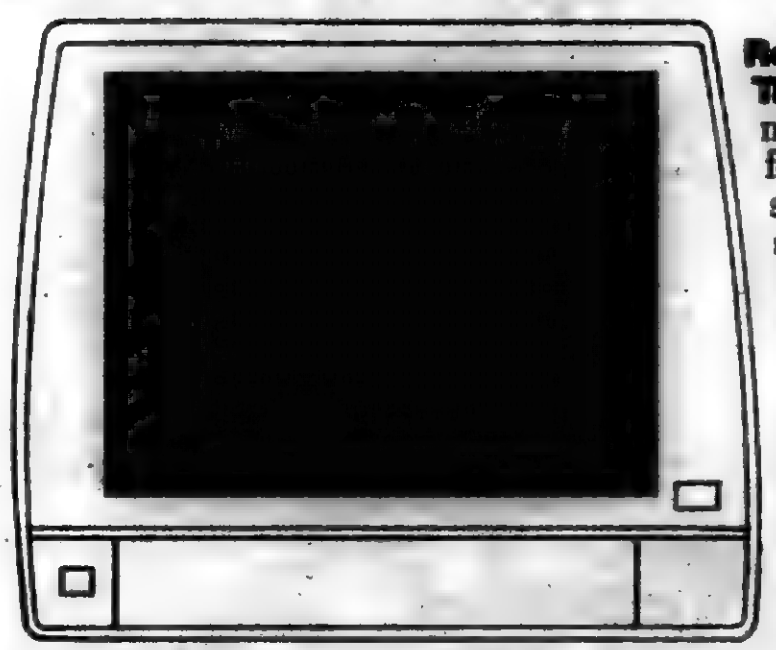


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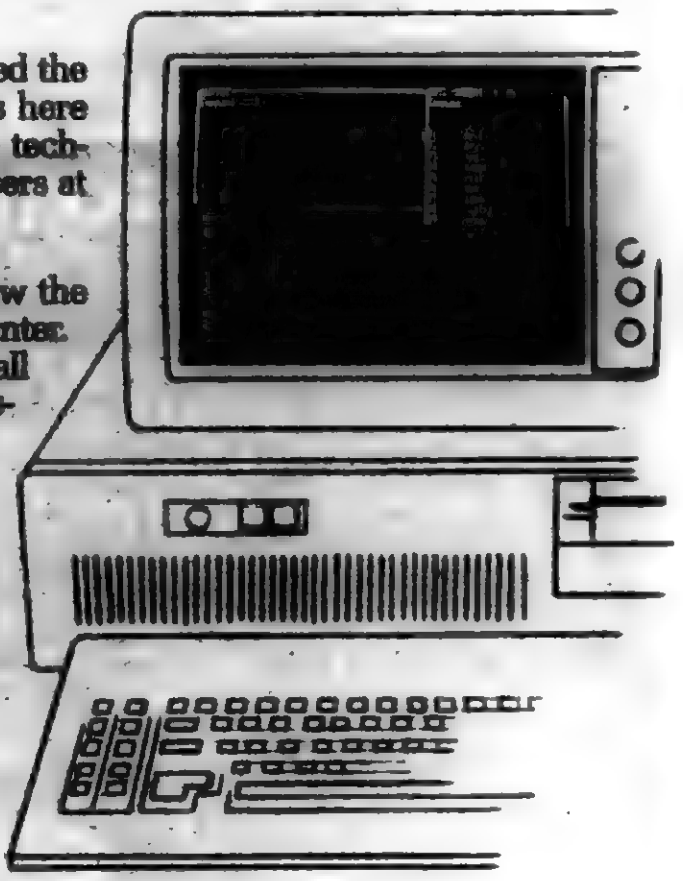


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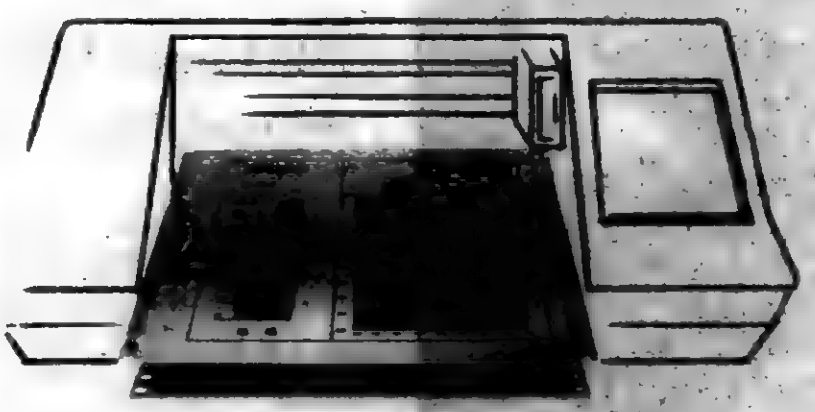
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Bellcore field test reveals ISDN one step closer to U.S. reality

Existing copper lines withstand increased rate

LIVINGSTON, N.J. — A technology that would enable most existing copper subscriber lines to support the Integrated Services Digital Network (ISDN) Basic rates was successfully tested by Bell Communications Research Corp. (Bellcore) recently.

The trial represents a "major milestone in making ISDN a reality in the U.S.," according to Richard A. McDonald, district manager of distribution characterization and engineering at Bellcore.

The digital system tested will carry information at 160K bit/sec. in each direction on a standard copper subscriber line, compared with the usual top rate of 9.6K bit/sec. for conventional analog technology. The 160K bit/sec. rate can support the ISDN Basic connection that defines two 64K bit/sec. B channels plus a separate 16K bit/sec. D channel that carries signaling and packet-switched data. The remaining 16K line is for overhead, McDonald added.

McDonald said the 160K bit/sec. rate is sufficient capacity to simultaneously handle typical predicted ISDN line use, such as a high-quality voice connection, high-speed data service and several lower speed services such as a home security alarm and meter reading.

Bellcore is hoping to find a line code that will work over virtually all loops shorter than 18,000 feet, which would include most subscriber lines in the areas where ISDN will initially be implemented, he added.

The technology being tested is one of several being proposed as a digital subscriber loop transmission standard to the T1D1.3 group of the T1 Committee of the Exchange Carrier Standards Association.

The trial tested a line code, which is a method of translating a signal so that it can travel on a copper-based ISDN local loop between the subscriber's customer-premise equipment and the telephone company central office switch.

The line code used in the field trial is called 4B3T because it translates four binary bits into three ternary symbols. This permits more information to be squeezed into a line with a lower bandwidth requirement, according to McDonald.

The 4B3T standard was jointly proposed by ITT Telecom and Siemens AG. Also under consideration by the T1D1.3 group are three other line code standards proposed by AT&T and Northern Telecom Corp., British Telecom and British company Stantel. The T1D1.3 group is seeking a consensus on a line code standard by October, McDonald said.

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Rate cuts aimed at AT&T WATS

From page 19

to customers in areas not directly served by the carrier's communications lines.

"Prism III nicely rounds out MCI's Prism line," Rosenbaum said. Prism III is available for immediate installation with the installation fee waived through August 29.

Western Union announced plans for an 800 Optimized In-WATS service, which currently is only available from AT&T, according to a Western Union spokesman. The 800 Optimized In-WATS service enables customers to dial out on the same lines used for incoming toll-free 800-number calls. Like MCI's Prism, Western Union's 800 Optimized In-WATS service employs a distance-sensitive rate structure rather than traditional band-based billing.

The company also announced discounts of 15%, 20% and 25% for fixed-term subscriptions of one, two and three years, respectively, for its private line and medium- and high-speed data services.

Western Union further revealed that it has designated 118 additional cities as "on-network locations" directly served by the carrier.

IBM ups 8100's connectivity

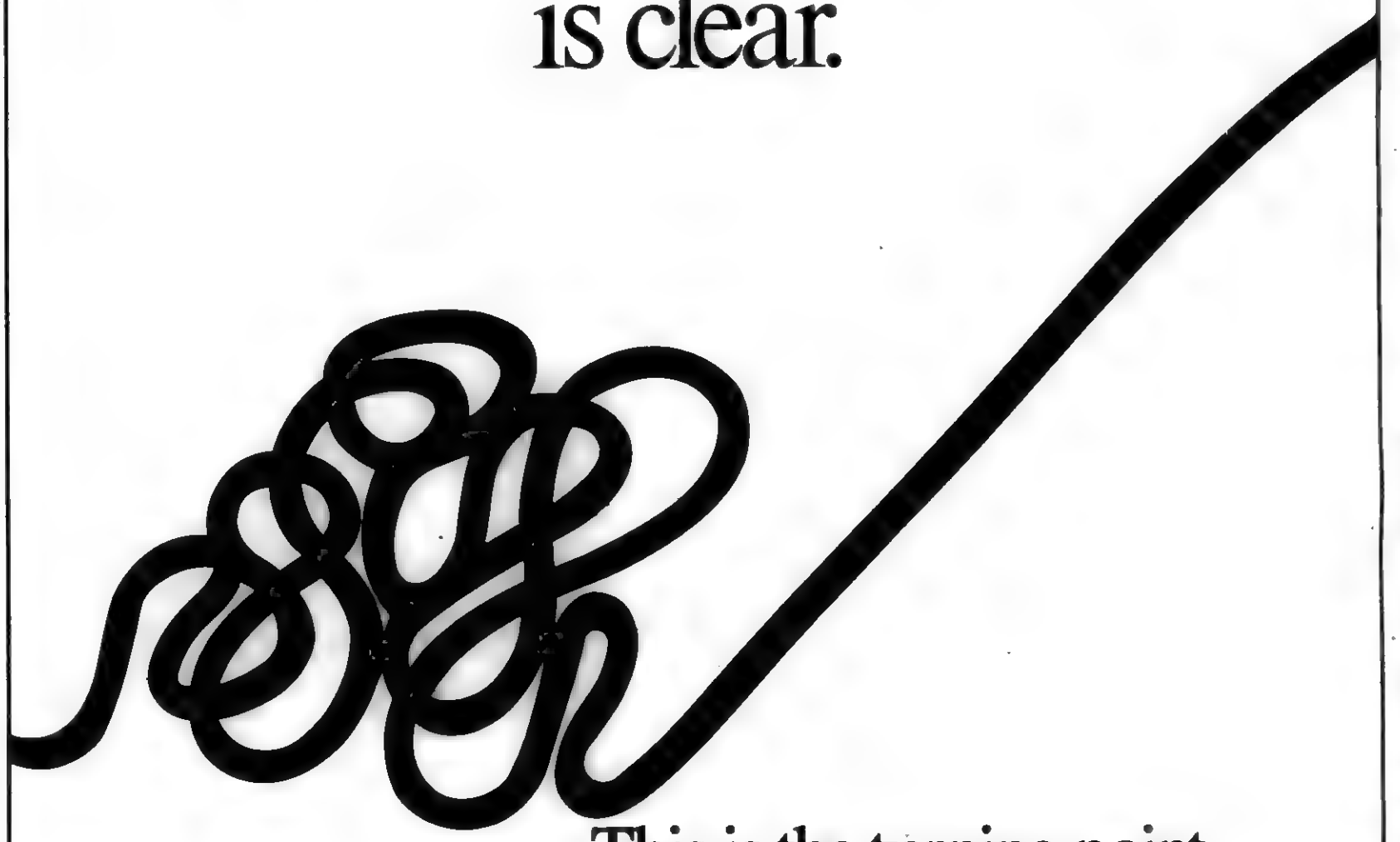
From page 19

While IBM has confirmed that it will introduce no more functional enhancements for either the 8100 computer or DPCX, its other 8100 operating system, the company emphasized that it is still committed to DPPX, which may be moved to a 370-based system.

According to David Terrie, president of Newport Consulting in Boston, "This announcement gives 8100 users more time to figure out what to do by allowing them to link the computer to more strategic IBM products such as the System/36 and the Token-Ring.

"It allows the 8100 to die a little more gracefully," the consultant added.

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Ku-band dearth around the bend

From page 19

and NASA will delay launches until 1987. "There is a transponder glut right now, but the recent disasters have put the cost of launching out of sight, and obtaining insurance close to impossible."

According to Dines, GTE is sitting pretty up there in space, with four satellites' worth of Ku-band transponders.

"We'll be in good shape if this problem continues," he enthuses. "In a year, satellite prices are likely to really go up, so it would be a good idea for businesses to sign up now for long-term contracts."

While this sounds suspiciously like a sales pitch, there may still be some useful advice here for telecommunications managers who are vainly trying to keep up with their companies' exploding communications needs.

The next twelve months may be the best time to seriously consider the trade-offs of terrestrial vs. satellite links — while there is still time to reserve satellite bandwidth at bargain prices.

Satellite-based networking has two main drawbacks. First, wet weather can interfere with transmissions. Second, propagation delays resulting from the round trip into space make the technology unsuitable for some data protocols, bi-synchronous in particular, and, according to some terrestrial network vendors, for high-speed transmissions as well.

Satellite vendors will tell you they have solved the propagation delay problem in various ways. However, weather-related troubles are still an issue, especially for companies that place a high priority on network reliability.

E. F. Hutton & Co., for instance, currently broadcasts stock information on the C-band, which reportedly is less vulnerable to bad weather than the Ku-band.

On the plus side, a new satellite terminal can be installed in a matter of days or even hours, while it can take several months to install a leased line.

The second satellite advantage is cost. As satellite companies will tell you, leased-line prices have been soaring since the divestiture.

However, the emergence of Ku-band satellite transmission and VSATs, small, inexpensive satellite dishes often designed to support Ku-band transmission, has significantly lowered the cost of entry-level satellite networks.

Frequency above microwave/radar

Unlike the C-band, which has been the predominant commercial satellite bandwidth until recently, the Ku-band is a high-enough frequency to not interfere with ground-level transmissions such as microwave and radar. This means a Ku-band dish can be installed without a Federal Communications Commission license.

A typical Ku-band satellite network provides either one-way or full duplex communications between VSATs installed at a large number of remote branch offices and a larger earth dish or "hub" installed at a central site. Each VSAT costs anywhere from several thousand dollars for receive-only dishes to $9,000 or more for interactive dishes, while the hub costs between $500,000 and $1.5 million.

Companies such as Tymnet/McDonnell Douglas Network Systems Co. and AT&T Communications offer shared-hub services to customers. Transponder space is generally leased: a tenth of a transponder can be leased for $13,000 to $15,000 per month, which will support a 120-to-150 node full duplex network, according to Comsat Communications Corp.

The break-even point between satellite and terrestrial network costs is highly debatable. One vendor claims that the satellite network is cheaper for any installation greater than 50 remote sites; another puts the number at 200.

Some industry experts say satellite networks are most cost-effective over distances of 200 miles or more, but at least one vendor claims to offer price benefits for a cross town network.

Clearly, there is no universal equation for figuring the satellite vs. terrestial trade-off; each company must decide on the basis of its own communications needs.

The point is that satellite links offer enough potential benefits to deserve a place in many businesses' networking calculations. Bearing in mind the looming transponder shortage, it might be a good idea to reserve a place soon on the Ku-band-wagon.

Siemens, Fujitsu announce PBXs

From page 19

such as Siemens and Fujitsu are seeking market share by designing their products in a modular fashion, others are simply trying to buy their way into the market by pricing their products below cost.

Once market shares are established, vendors will try to sell numerous add-on products to users, he added.

Siemens and Fujitsu are reportedly both discussing the possibility of selling their equipment through GTE Communications Corp. GTE would sell Siemens' central office equipment and Fujitsu's PBXs, Perry said.

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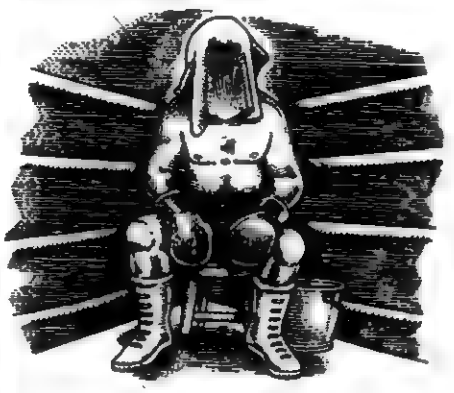
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SOFTWARE & SERVICES

SOFTALK
Wilton H. Inmon

One analyst is better than two

The recent arrival of the programmer and programmer analyst workbenches on the data processing scene has given birth to the single-analyst project.

The single-analyst project is a project that is taken from inception to final testing and acceptance — from requirements gathering to the completed construction of the system — by a single analyst. The advent of the single-analyst project signals the shift from the age of the specialist to that of the generalist in the development of systems.

A very powerful case can be made for the productivity gains that are possible in the single-analyst approach to the development of systems. When a single analyst builds a system, there is automatic continuity from one phase of the project to the next. When the project is passed from hand to hand in the traditional project development life cycle, a certain amount of energy is expended to maintain the momentum and continuity of the project.

When a single analyst carries a project through the different phases of development, there is a minimal learning curve that is incurred. The single analyst formulates the solution to the requirements just once. But when a project is passed from one hand to the next in the traditional fashion, the learning and reformulation curve must be re-

See ONE page 30

Inmon is a senior principal with American Management Systems in Lakewood, Colo., an author on the subject of data base design and a regular contributor to Softalk.

Social security down under

Aussies use on-line 4GL, DBMS to run department

By Charles Babcock

In Australia, where the natural order of things frequently seems upside down, a fourth-generation language and data base management system run the Department of Social Security's largest production system.

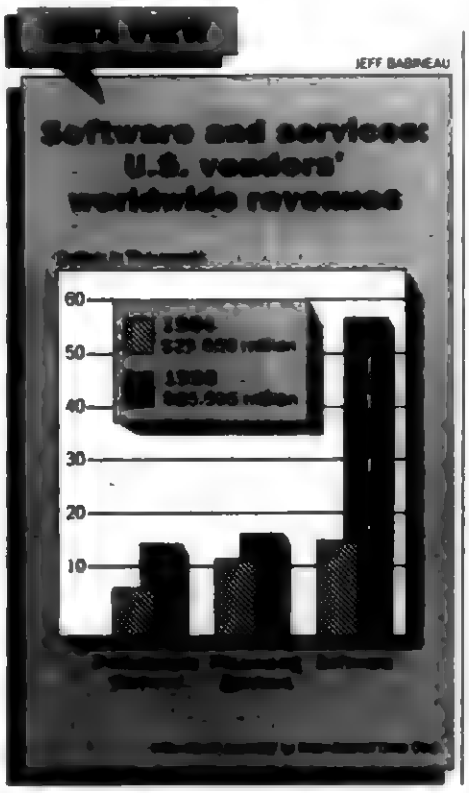
It is the relational properties of the data base that allow the system to work, said Data Base Administrator Tony Bolt in a telephone interview from his office in Canberra.

The social security system down under is the equivalent of the U.S. unemployment office, welfare agency and retirement pension system rolled into one. The data base is actually broken down by states, but the largest of these, in New South Wales, lists 700,000 pensioners, 750,000 family allowance beneficiaries and 250,000 unemployed.

Routine payments to these recipients are made through Cobol batch programs, but providing answers to questions about the status of clients and payments in each benefit program is the task of the department's on-line inquiry system. It has been fashioned from the User fourth-generation language and Model 204 data base management system, both products of the Computer Corporation of America (CCA) in Cambridge, Mass.

The batch processing has been organized to serve benefit programs located in the same proximity on the disk storage system, speeding updates. But the on-line inquiry system is organized logically around recipients' names, without regard

See SOCIAL page 34



Sales reps' data targets prospects

By Mitch Betts

Organizations as divergent as Detroit Edison Co., an electric utility in Michigan, and Scandinavian Airlines System (SAS), the world's 15th largest airline, are discovering they can get competitive benefits from building a data base of market intelligence gathered by their sales representatives.

The goal of both organizations is to have sales agents provide information about prospective and current clients and to implement this into a data base for management to use for planning marketing and sales strategies.

SAS, for instance, finds that when sales agents provide a detailed customer profile, the firm can generate mailing lists for very targeted direct mail campaigns, according to Alice Hegedus, SAS' manager of marketing promotions in Jamaica, N.Y.

Using the account profiles, Hegedus can identify specific segments of the market,

See SALES page 33

INSIDE

Software International Corp. adds an accounts receivable package to its Masterpiece series of finance packages/**33**

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- Syncsort upgrades its Syncsort DOS sort-and-merge program
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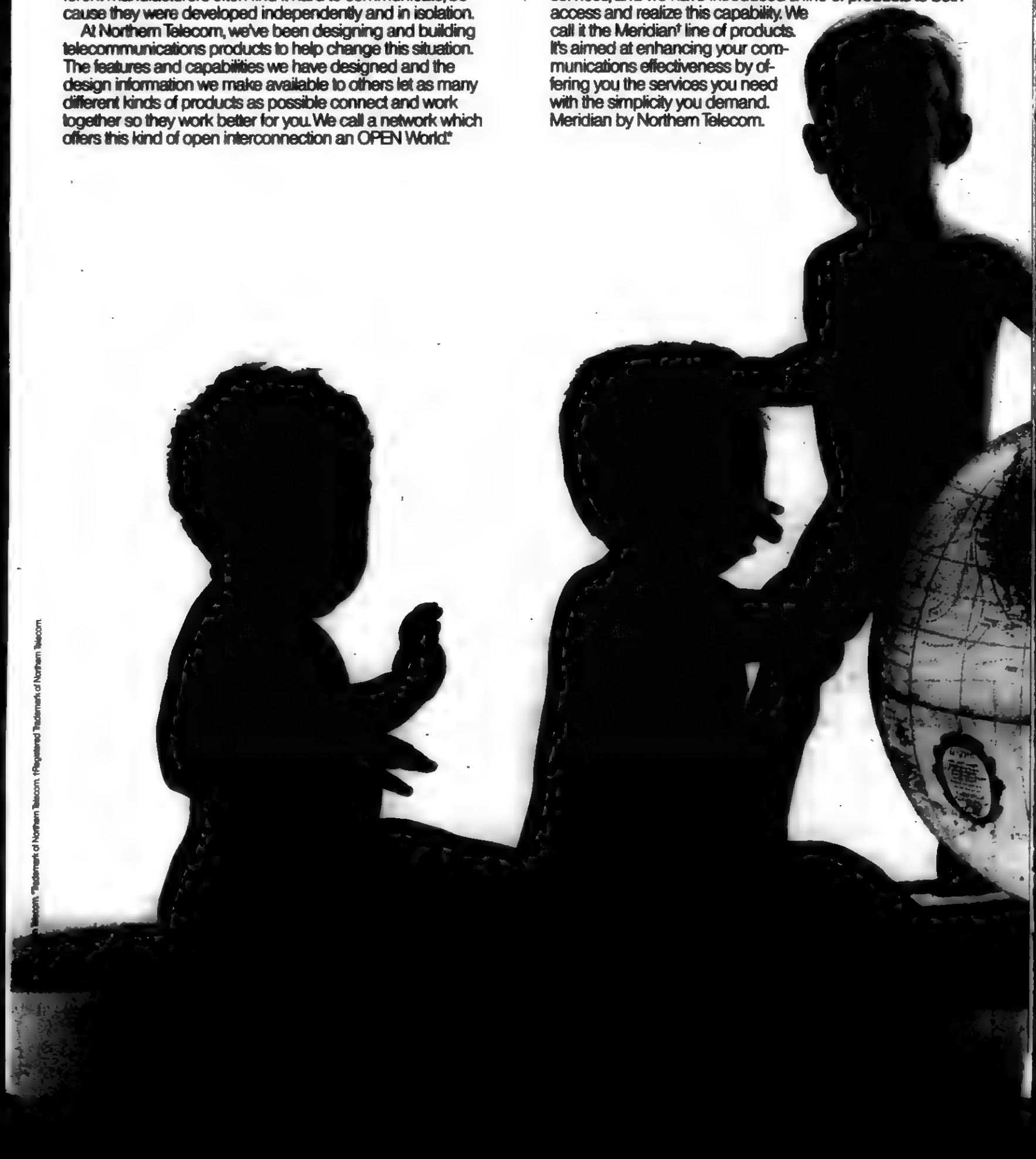
INTEGRATED—People in different parts of the world have different customs and speak different languages. That's because they were relatively isolated, and their cultures developed independently before the days of radio, television, telephones and fast, easy transportation. Sometimes, it's hard to communicate.

Similarly, computers and other equipment made by different manufacturers often find it hard to communicate, because they were developed independently and in isolation.

At Northern Telecom, we've been designing and building telecommunications products to help change this situation. The features and capabilities we have designed and the design information we make available to others let as many different kinds of products as possible connect and work together so they work better for you. We call a network which offers this kind of open interconnection an OPEN World.*

SERVICES—You don't need to understand what makes a telecommunications network tick to use it. For you, the network is just the communications services you need. And of course, the actual telephone or terminal you use is one means of accessing such services.

At Northern Telecom, we have defined and are building into the network a tremendous capability for the provision of services, and we have introduced a line of products to both access and realize this capability. We call it the Meridian† line of products. It's aimed at enhancing your communications effectiveness by offering you the services you need with the simplicity you demand. Meridian by Northern Telecom.



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DIGITAL—Most people find that the best approach to solving a problem is the simplest approach. In telecommunications, the simplest way of carrying information is to convert it to a series of 1's and 0's—a digital bit stream.

A digital bit stream can mean anything—it can be your voice, a letter, a television picture, or the manufacturing diagrams for a new car.

At Northern Telecom, we've been designing and building telecommunications products based on the simple digital bit stream for two decades. We call a network that handles all information in digital form a Digital World.*

NETWORKS—In sports, a winning team starts with a good game plan, and adapts it in real time based on the changing flow of the game.

Up to now, telecommunications networks have followed a very static game plan. They were built mostly of separate elements to handle predictable changes in needs on a long-term basis. There was almost no way of controlling them in real time, so they provided little current information about overloads or breakdowns or anything.

At Northern Telecom, we have developed a new way of designing and controlling telecommunications networks. It's a game plan for public or private network architects who want to design and run their whole network like a winning team. It also lets networks carry different kinds of information more easily and economically and thereby provide the basis for supporting new services and capabilities for you.

We call it Dynamic Network Architecture.*

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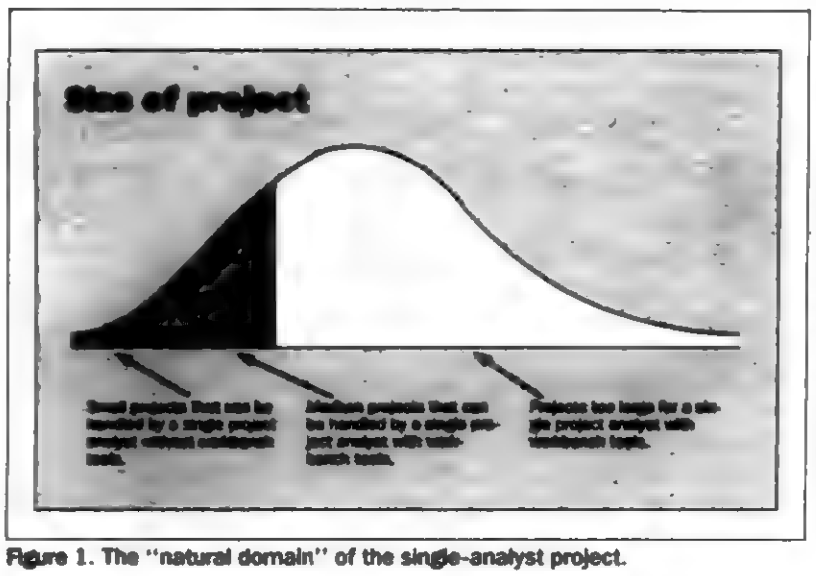


Figure 1. The "natural domain" of the single-analyst project.

One analyst is better than two

From page 27

peated for as many hands as handle the project.

When a single analyst is responsible for a project from inception to completion, there is a minimum scheduling impact. The single analyst performs the different functions of development in the order the development functions are required.

Wearing different hats throughout the life of the project, the single analyst molds his time to the flow of the project. But when multiple parties are involved in the development of a project, the project flows no faster than the collective schedule of the development parties involved. And it is likely that the organization does not optimize the overall scheduling of development around the one project being done by the single analyst.

When a project is built by the single analyst, there is an absolute minimum breakdown of communication (as the analyst does not need to communicate with himself). But in the traditional development life cycle, every time a project changes hands, there is an opportunity for miscommunication.

Single-project analysts, then, have great potential for a level of productivity, especially when the analyst is aided by the powerful tools of the workbench that are becoming available more frequently every day. The coupling of the single analyst with workbench tools has the exciting prospect of a level of productivity previously unachieved in systems development.

Recent workbench software productivity tools have included process analysis and decomposition aids, high-level data modeling aids, I/O verification aids, automatic code generation aids, automated dictionary interfaces and so forth.

Fig. 1 illustrates what can be termed the "natural domain" of the single-analyst project.

Fig. 1 shows that very small- to small-size projects can be handled by the single analyst with no automated workbench tools. Once the analyst begins to use workbench tools, the scope of the projects that can be handled by the single analyst increases considerably. With workbench tools providing much clerical support, the analyst can handle projects of up to moderate size.

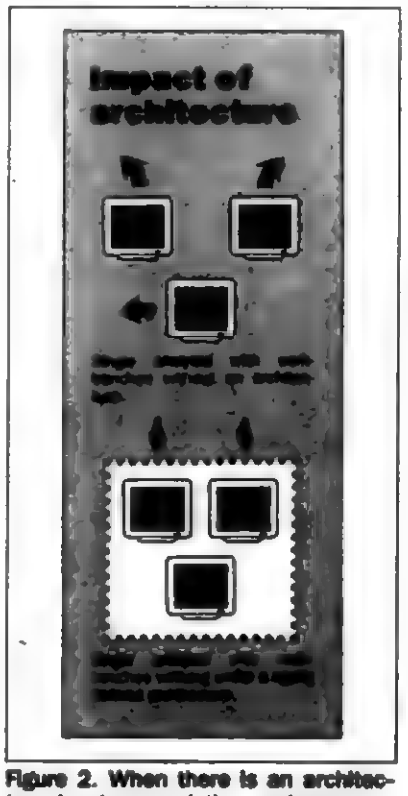


Figure 2. When there is an architecture in place and the analysts conform to it, the analysts work in tandem.

The question then becomes, Can't the tremendous productivity leverage that is possible with a single analyst with workbench tools be applied to larger projects? The answer is yes, under the right circumstances.

The productivity potential of the

See ONE page 31

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One analyst is better than two

From page 30

single analyst using workbench tools can be enjoyed for multianalyst projects of considerable size, if the following hold true:

- There is an architecture under which all analysts work.
- There is discipline in the conformance to the architecture.

The architecture that serves to tie different single-project analysts together successfully should, at the least, exhibit the following characteristics:

- The scope of the architecture is clearly defined.
- There is a conscious separation of primitive and derived data.
- There is support for different levels of conceptual modeling, and those levels of modeling are kept distinct.
- There is a formal recognition and support of the "system of record."
- The orientation of the operational is toward the major subjects of the enterprise.
- The end-user extraction and derivation algorithms are formally outlined.

The failure to create a sound architecture and thus have the organizational commitment and discipline to conform to the architecture results in many problems:

- On-line performance difficulties.
- Redundancy of code and data, which can result in massive diseconomies in the consolidation of system development and maintenance.
- Inconsistent processing and processing algorithms.

Working in concert

In short, without a soundly constructed architecture, single-project analysts working on a large project may stumble onto many kinds of problems. The great productivity potential that is made possible by the single-project analyst's use of workbench tools can be short-circuited if the analysts do not work in concert.

However, when the architecture is properly constructed and there is widespread conformance to the architecture, the full benefits of productivity can be carried over from the single-analyst project to much larger projects with individual analysts working on the project.

Fig. 2 (page 30) shows two groups of single analysts using workbench products. In a case in which there is no architecture, the analysts are not working in concert with each other. Indeed, they are probably working at cross-purposes, and the very power of the workbench tools allows this conflict to accelerate at a rapid pace.

But when there is an architecture in place and the analysts conform to the architecture, then the analysts work in tandem with each other, enjoying unprecedented productivity. The architectural conformance of the analysts is the analogical equivalent of harnessing a team of horses. When the horses are harnessed and working together, the team is capable of hauling quite a load. But when the team is not harnessed and each horse pulls its separate way, only small loads can be handled.

The establishment of an architecture is the first objective in the face of single-project analysts working together on a large project. But once the architecture is established, what is meant by conformance to the architecture? Conformance to the architecture means, at the least, the following:

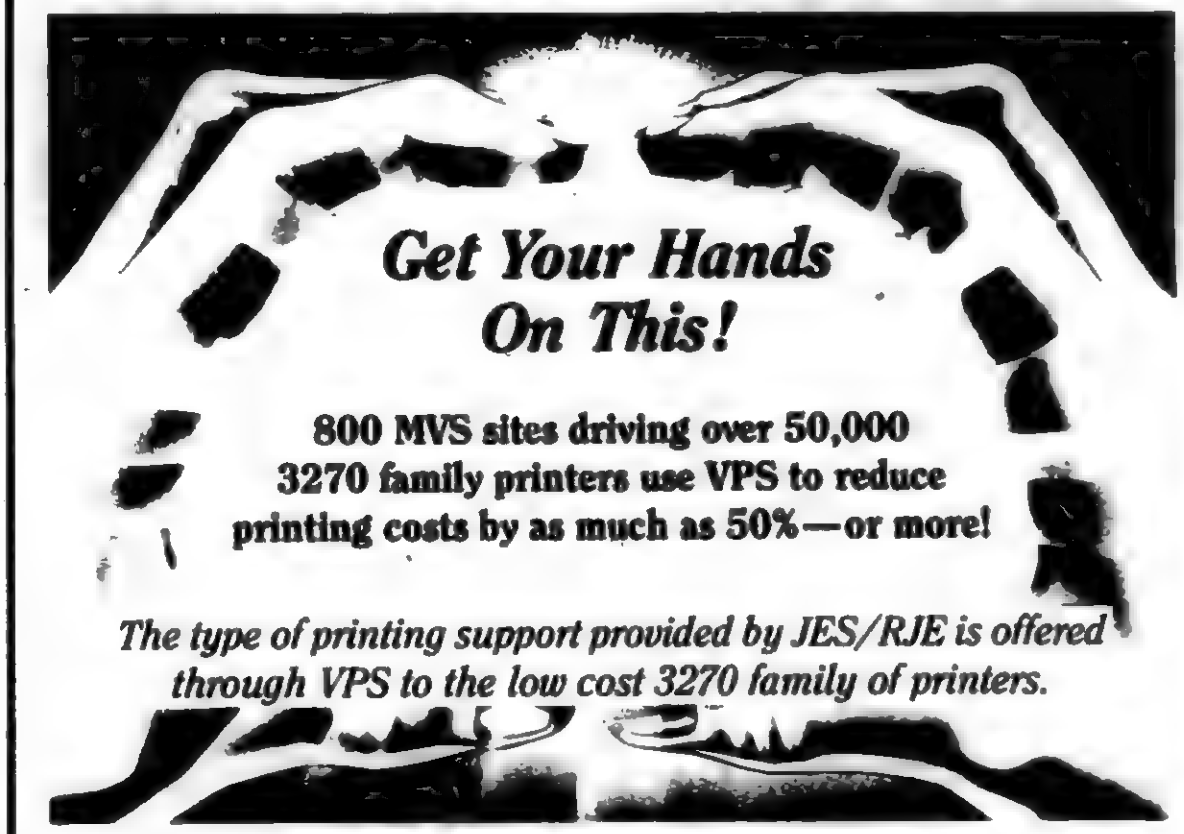
- Deliberate use of existing code.
- Deliberate non-re-creation of existing code or data.
- Conscious preparation of code not just for immediate requirements but for future requirements as well.
- Semantic discipline in the transformation of data and data structures throughout the different levels of the data architecture.
- Strict separation of primitive and derived data.
- Discipline in the extraction and derivation of end-user data.

The establishment of an architecture is the first necessary step in channeling the energies of single analysts into the same path. But conformance to the architecture is a second necessary step.

> ***The establishment of an architecture is the first necessary step in channeling the energies of single analysts into the same path. But conformance to the architecture is a second necessary step.***

In summary, the single-project analyst using workbench tools offers great prospects for productivity both from the standpoint of using the automated tools of the workbench and from the economies of generalization that can be achieved. But even in the face of tremendous productivity potential, the single-analyst project is limited to projects of limited size.

To use workbench technology to address large projects requires that multiple single analysts be involved. But the successful involvement of multiple analysts requires that an architecture be in place and that the architecture be conformed to with a high degree of discipline.



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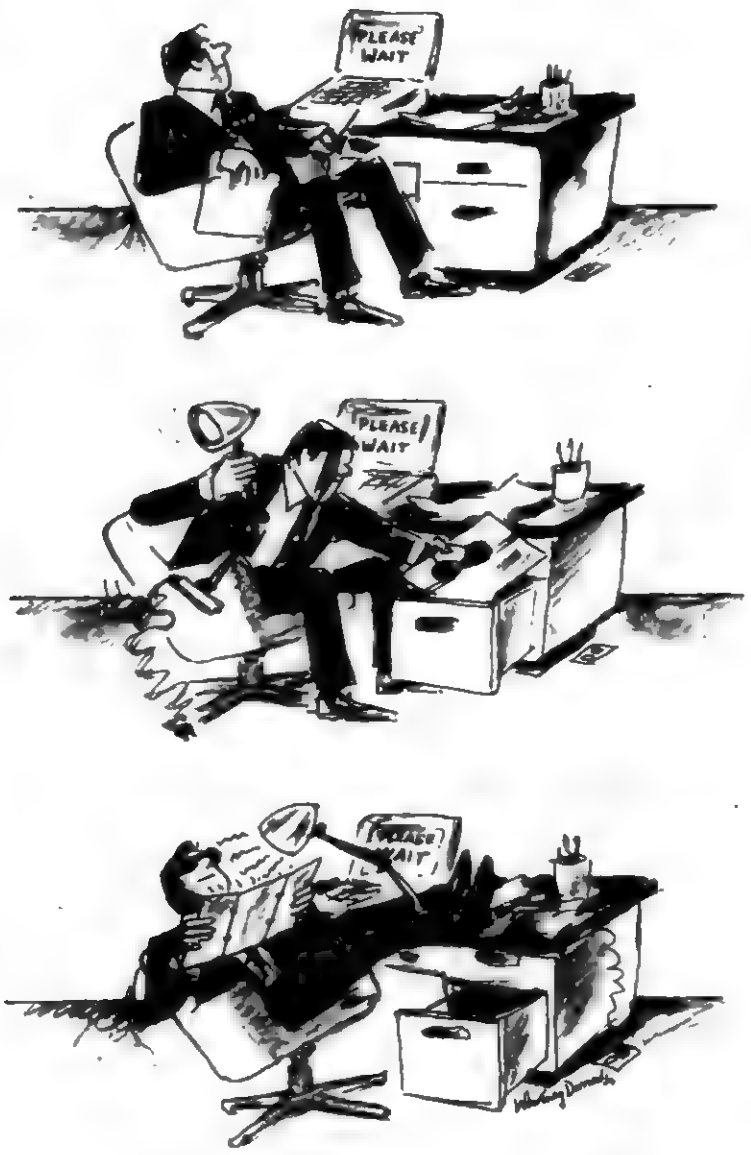
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Sales reps' data targets prospects

From page 27

such as Washington, D.C.-area travel agents who handle the kind of business travel that SAS covets. "I don't want to send a $1.50 brochure about SAS business travel to a travel agent who specializes in tours," she says.

By sending out 100 targeted brochures rather than 1,200 in scattershot fashion, Hegedus says, she saves enough money to pay for the Marketing Information and Communication System (MICS), custom-developed by Integrated Marketing Corp. of Rockville, Md.

Integrated Marketing recently began to market the MICS software as a commercial product for use on IBM System/36 minicomputers as a distributed processing system.

The vendor's president, Brian Keedwell, says the MICS software provides a highly structured format for sales representatives to create a data base of information gleaned from their sales calls.

After visiting prospective clients, sales representatives fill out an account profile card. Data from the cards is keyed into a microcomputer at the local sales office and then transmitted to the minicomputer for editing and batch processing, which updates the data base.

The data on customer needs and buying practices can be retrieved for planning, market analysis and targeted mailings or downloaded to a micro for spreadsheet graphics, Keedwell explains.

He says the "knowledge base" is an important precursor to the eventual creation of an expert system for sales and marketing.

After visiting prospective clients, sales representatives fill out an account profile card. Data from the cards is keyed into a microcomputer at the local sales office and then transmitted to the minicomputer for editing and batch processing, which updates the data base.

At Detroit Edison, the utility's marketing department is installing MICS as a pilot program. The utility finds that it is facing increasing competition from oil and natural gas dealers for business customers and must beef up its marketing force, according to J. James Roosen, a division manager.

"We need something to monitor and guide employees on where they should spend their time," according to Roosen. Furthermore, the marketing engineers using MICS will be able to report such intelligence as, he says, "What energy decisions are being made, who is making them and what is the time frame? How seriously are prospects considering our competition?"

The big challenge for SAS and Detroit Edison, as well as Integrated Marketing, is to overcome resistance from some traditional sales representatives. Officials acknowledge that it is difficult to get some employees to participate in the MICS, because some sales agents dislike using computers and filing reports.

Resistance to the system diminishes once employees see how the marketing information helps them to find good sales prospects, the marketing officials say.

A pilot program for MICS costs $5,000 to $20,000, depending on the size of the client and the modifications made to the software modules; actual operating costs for a licensed system range from $2,000 to $3,000 per sales representative per year, the vendor says.

Masterpiece gets third package

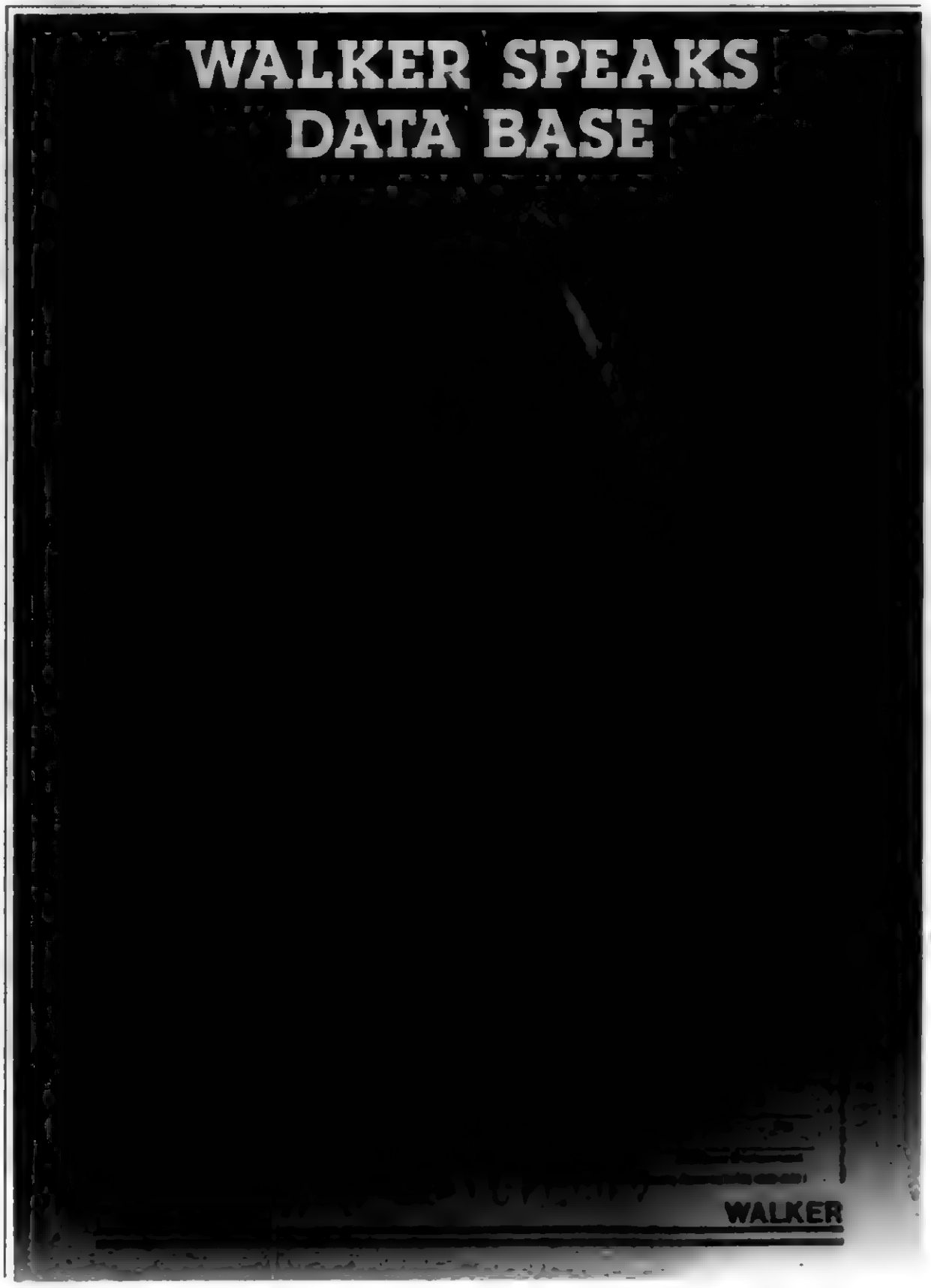
ANDOVER, Mass. — Software International Corp., the software division of General Electric Co., introduced the Accounts Receivable package as the third in its Masterpiece series of financial accounting packages.

General Ledger & Financial Reporting and Fixed Assets packages are already available in the integrated series, with the Accounts Payable and Purchase Order packages to be added later this year, said Frederick J. Lizza, manager of product marketing.

The Andover, Mass., vendor introduced the Masterpiece series in 1985. It was designed to run on IBM 3080 and 4300 mainframes and on the IBM System/38. The packages share a common on-line environment and system manager, as well as several user-oriented facilities, such as Masterquery, a fourth-generation inquiry and reporting tool, and on-line Help, according to company spokesmen.

The Navigation facility allows users to move freely from screen to screen, either within an application or between applications.

The mainframe version of the Accounts Receivable package retails for $70,000 and is available immediately.



Social security down under

From page 27

to what benefits they receive.

Dependent children, for example, are listed by name with their parents in the on-line system even though the parents as a group are listed in different or sometimes overlapping benefit programs, Bolt said.

In New South Wales, the inquiry system processes six transactions a second from 700 terminal users, searching records of a total of 1.7 million clients. The number of users is expected to grow to 1,500 by the end of the year, but Bolt says the system is currently overconfigured with three copies of the Model 204 and will be able to absorb the growth.

Bolt's office ran a test of the on-line system using IBM's Teleprocessing Network Simulator and two of the department's 5880 Amdahl Corp. mainframes. With one mainframe generating transactions from the equivalent of 400 users, the second was able to process them at a sustainable rate of 8 transactions per second using one Model 204, Bolt said.

The on-line system "uses the relational qualities of Model 204. Our records don't contain pointers to other records," Bolt said. The system arranged in a logical rather than hierarchical or networked fashion.

Bolt quickly concedes that the Model 204's transaction processing and quick response times result in part from the design of the data base itself. The department is managing a limited amount of information, and the inquiry system files contain redundant information found in the batch program files.

The files of the inquiry system were designed as a superset of all the identification information in the batch files so that client information could be located with a variety of identifiers, Bolt said.

Once a client has been identified, the terminal user can use the keys in the on-line system to gain access to updated information in the batch files, he added.

Bolt said the Social Security Department system lacked some relational features. A system with referential integrity would check for the names of parents of dependent children before creating a new file on dependent children. Under E. F. Codd's (of the "Relational Institute") model, this kind of foreign key validation would happen automatically, but under the Model 204, it must be programmed manually into the system, he said.

> ***'Our primary concern right at the start was design. If we did the design wrong, we wouldn't be able to find people quickly.'***
>
> — Tony Bolt
> Australia Department of Social Security

Also, because of the simplicity of its design, the on-line system requires few I/O transactions, which speeds the overall transaction rate, according to Bolt.

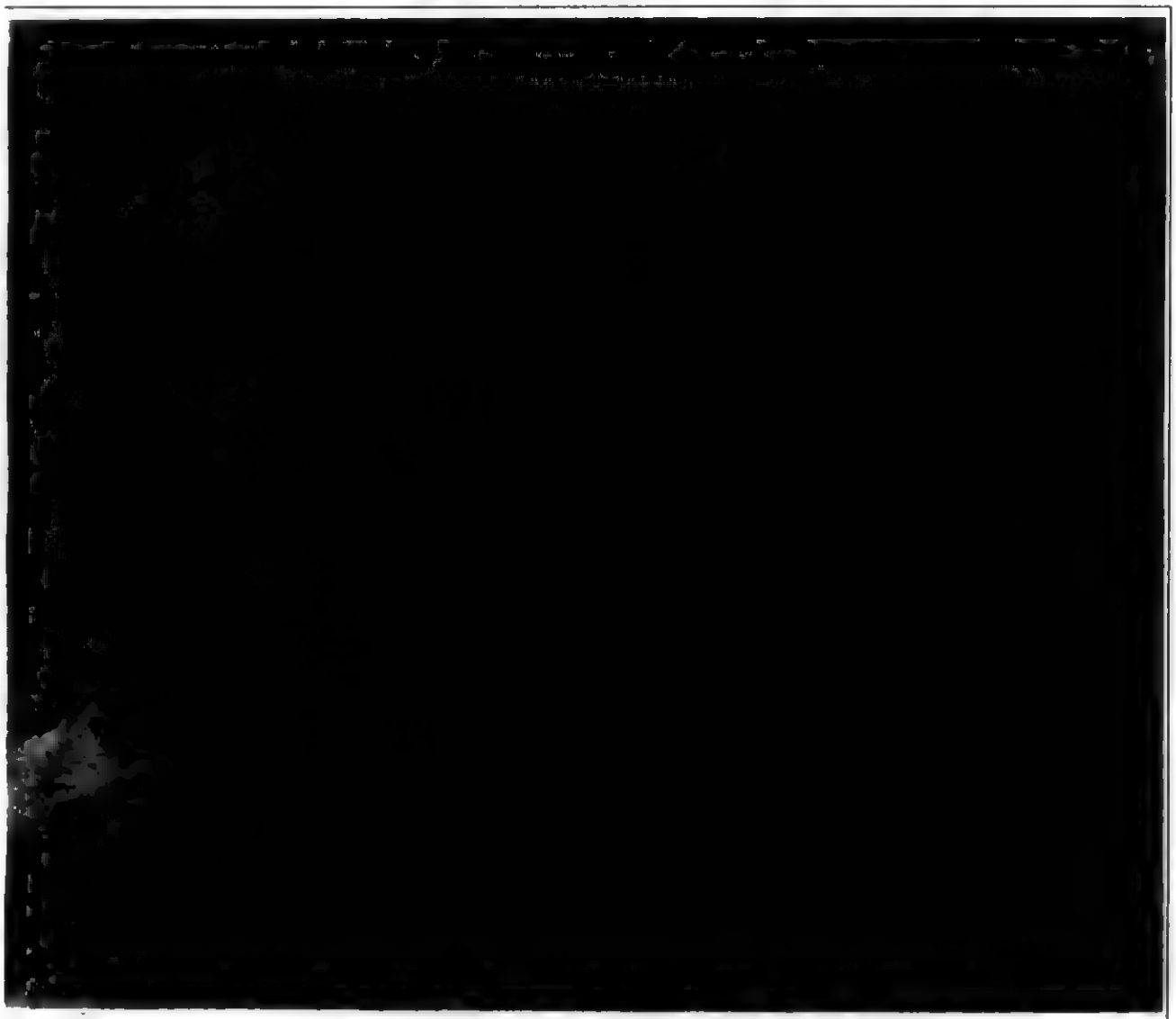
"Our primary concern right at the start was design. If we did the design wrong, we wouldn't be able to find people quickly," he said.

Quicker than Cobol

Bolt said about 60 of the department's 400 programmers have been trained to use CCA's User fourth-generation language and that they code programs in it much more quickly than in Cobol. But he added that the design of a program is more important than the coding and takes just as long.

Bolt noted that User commands are embedded in the Model 204 nucleus and that the Model 204 has its own VTAM interface, eliminating the need for a teleprocessing monitor or CICS. With these features, programmers using User "access the data base very easily" and can develop programs using the Model 204's editor and other development facilities.

Bolt plans to bring additional functions on-line, including a client registration system that would prevent cheating by recipients who register for benefits at different locations in the same day. Eventually, Bolt said, he would like to see on-line benefits processing.



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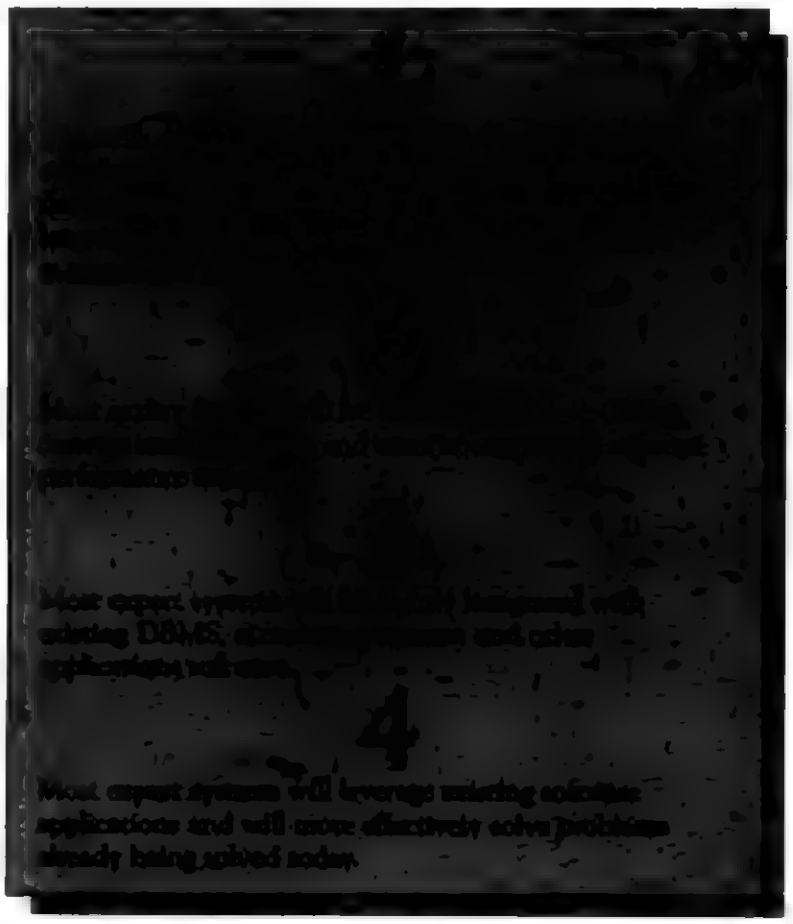
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SYSTEMS & PERIPHERALS

HARD TALK
Donna Raimondi

How large can the 3090 grow?

IBM's largest commercial system, the 3090, is without doubt the box of the decade. IBM says so.

The Blue giant will not sell a bigger, fancier system until sometime in the 1990s, it says, despite speculation by IBM-watchers that there is a next-generation Summit system due sometime in 1988 or 1989. It will not have to release a new system — because the 3090 has within it all the space it needs to grow and change, an IBM manager says.

IBM is predictable in high-end systems announcements. It introduces changes of primary importance in the fourth quarter and ones of secondary importance at the end of the first quarter. These announcements coincide with factors like customer budgeting cycles and tax credit benefits. This has been true for the past seven years, and people inside IBM who should know say it will continue to be true in the future.

Customers can assume a 15% to 20% improvement each year in price/performance on the 3090. Many of the factors that allow such improvements were built in before the system was introduced.

"We announce conservatively. We couldn't stand to have it not perform as advertised," is the way one IBMer puts it. "Then we make it more powerful, more reliable. For example, in February of '86 we took a 10% pricing action on the 3090," he says. "We don't like to take a 10% action. We should have taken 7%, but last year was not a great year for IBM." Even Big Blue has to

See **HOW** page 44

Raimondi is a Computerworld senior writer.

Motorola unveils line of Unix, VMEbus-based supermicros

By David Bright

SCHAUMBERG, Ill. — Aiming to provide "maximum flexibility" for business customers, Motorola Computer Systems recently announced a line of supermicrocomputers using two industry standards: the Unix operating system and Motorola's VMEbus.

Both systems are built around parent company Motorola, Inc.'s 68020 microprocessor. The Vision/32 system hosts up to eight users, and the System 8000 supports up to 32 users.

"These new products will provide maximum flexibility and confidence for customers frustrated by proprietary computer systems that lock buyers into single vendors," declared John Mitchell, president of Motorola. "They also address the needs of customers who have found that tying together stand-alone workstations can be difficult and expensive."

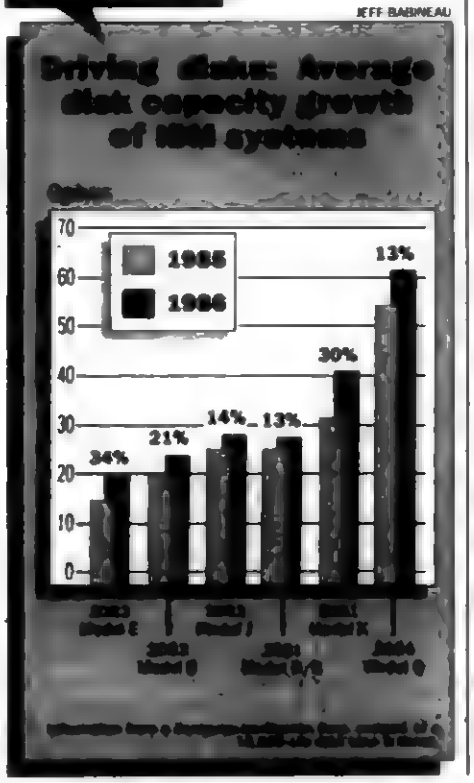
Despite Motorola's enthusiasm, analysts do not expect the two new systems to make big waves. Unix paired with the VMEbus is "not a particularly unique combination," said Elizabeth Levy, who tracks supermicrocomputers at Dataquest, Inc., a San Jose, Calif.-based market research firm.

She offers Alpha Microsystems, Inc.'s new 68020-based AM-2000 supermicrocomputer as a recent example. Introduced in April, that system uses both the VMEbus and Unix. (Although Alpha Microsys-

See **MOTOROLA** page 40

DATA VIEW

JEFF BARINEAU



Alliant offers bundled FX/1 configurations

By Donna Raimondi

Alliant Computer Systems Corp. has started to bundle configurations of its FX/1 minisupercomputer.

Two configurations of the system are available. They cost $99,500 for an eight-user version and $130,500 for a 16-user system.

"We are targeting these packaged systems to the senior scientist who wants his own system," said David Burns, a spokesman for Alliant. They are geared to Fortune 500 companies' research laboratories, university professors and government labs.

"This is for people with their own $100,000-or-so budget who are frustrated with having to share computer resources," Burns added.

"The FX/1 for under $100,000 is a pretty low entry-level cost," said Tom Henkel,

See **ALLIANT** page 40

INSIDE

Advanced Control Technology, Inc. optimizes a multiple processor, VMEbus-based system for real-time applications/**40**

NEW THIS WEEK

- Plexus Computers, Inc. introduces its Advanced Communications Processor board

For more on this and other new products, see pp. 93-117.

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TOWER SYSTEMS INTERNATIONAL

Cray Research, Convex agree to exchange hardware patents

'Routine' procedure could help both firms

By Donna Raimondi

Cray Research, Inc., the supercomputer company, and Convex Computer Corp., which makes what has been referred to as a Crayette minisupercomputer, have signed an agreement under which each company will exchange all of its issued and pending patents.

"Cray has followed our development and has always been interested to see what we have done so they could detect patent infringements," said William C. Bock, chief financial officer and vice-president of finance at Convex. "We have had a good relationship, and we don't see each other as competition. This agreement will be in both our interests and protect us from patent infringement possibilities," he said.

A Cray spokesman said it was a routine cross-licensing procedure that will protect Cray in the future. Cray and Convex agreed to license only their existing hardware patents. "The fact that we allowed infringement on our patents in the past would hurt us in the future if we tried to protect ourselves. So by giving today's technology away, we protect later technology," he said.

The agreement does not open up any future developments for either party, said supercomputer analyst Jeffry Canin at Hambrecht & Quist in San Francisco. Canin said Convex marketing efforts will benefit the most from association with Cray.

"Convex has quietly filed for public offering, but I do not expect to see the stock issue take place until the third quarter. Convex will clearly benefit from the publicity."

No fees, royalties involved

The agreement involves no fees or royalties, Bock said. Convex is interested in being the low-end supercomputer supplier associated with Cray, he added. At Technologic, Inc.'s recent financial outlook seminar, Advanced Computer Systems: The Financial Outlook, held in Boston, Convex President and Chief Executive Officer Robert Paluck indicated he had received assurances from Cray that it would not develop entry-level systems that might compete with Convex.

However, people should not read into this statement that Cray considers Convex to be its low-end supplier, Canin said. "Cray set its product development cycle in stone long ago. It absolutely will stay independent. Cray won't come out with a low end, and it won't condone one particular vendor's system as a low end, either," Canin said.

Cray will get immediate access to Convex patents and vice versa. "We believe we have significant technological value for Cray. Cray has basic supercomputer technology patents, and Convex has extended many of the Cray-like technologies into more sophisticated versions of certain functions," Bock said.



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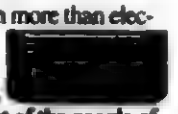
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Eye scanner security bows

By Donna Raimondi

BEAVERTON, Ore.— Eyedentify, Inc. has announced a retinal scanning biometric security device said to provide positive identification for persons seeking access to secured areas.

The Eyenet System 8600 allows an individual to enter his personal identification number on a reader keypad, at which time a waveform representing the real-time eye scan is matched with a stored-eye signature. Upon recognition, the system automatically activates the type of security mechanism used and the person is granted access.

"We use the Eye [7.5 Eyedentify, an earlier model of the 8600] at the guard door, the most important door in our place," said Frank Campbell, president of One Safe Place in Dallas. The firm has safety deposit boxes, media and art vaults and is doubly secured by a proximity card system and an Eyedentify retinal scanner.

The Eye eliminates the need for photographic identification, Campbell said.

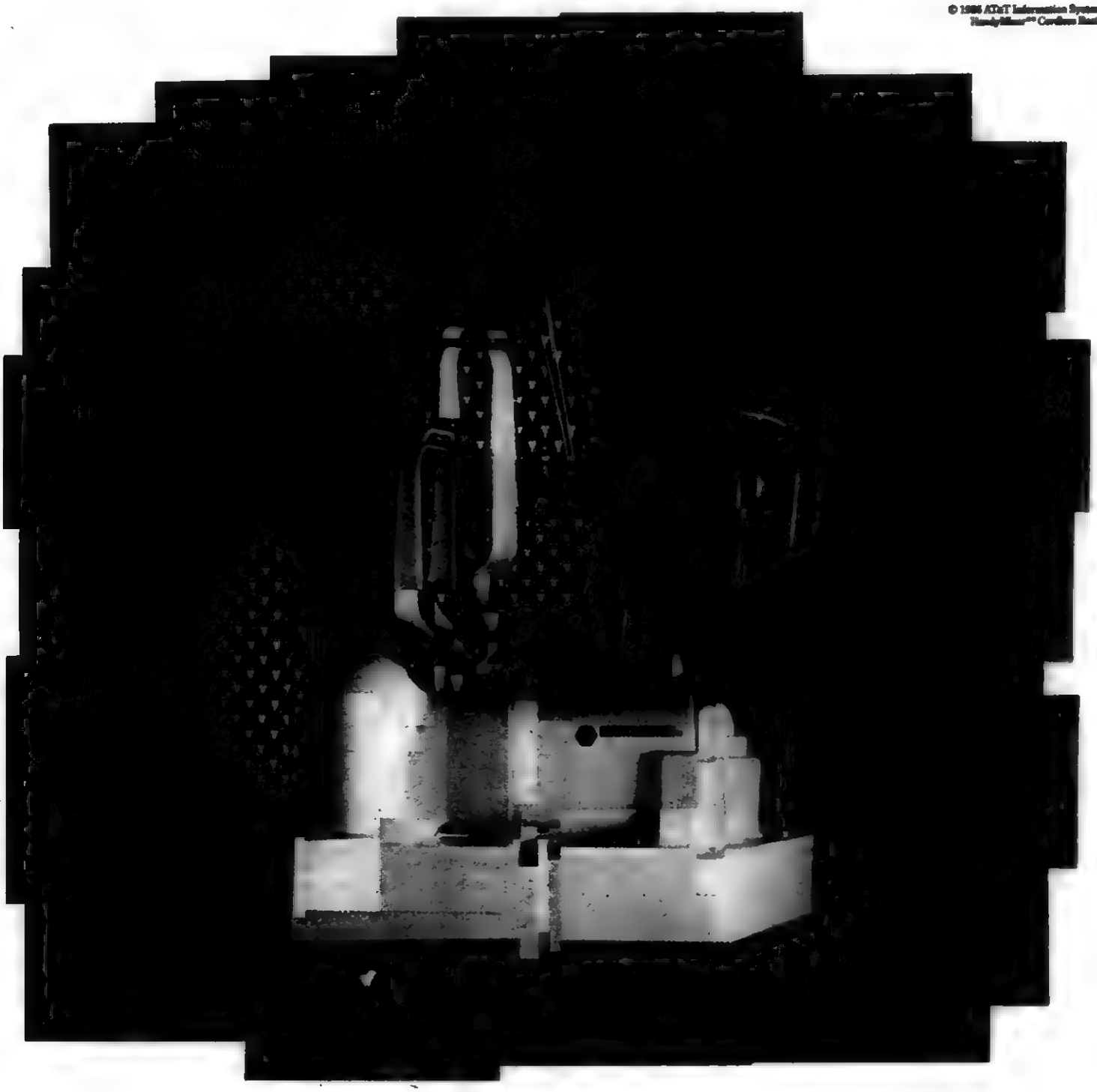
"With photos, a man can grow a beard or mustache and a woman can dye her hair or come in with curlers and a scarf, and few people can positively identify them. But the retinal scanner is more accurate than fingerprints," he said.

The Eyenet system 8600 consists of a controller, which costs $9,995, and up to 32 readers, costing $5,995 each, that can be connected to the controller via a dual-looped RS-422 network.

The readers can be placed up to 1,000 feet apart. Campbell uses only one reader on his older system that currently controls access for approximately 1,000 customers. When a system exceeds 1,200 users, he said, a personal computer needs to be added to extend its capabilities.

The system controller contains 1M bit of bubble memory and allows storage of up to 1,800 eye signatures.

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MPS-10 aimed at high-throughput applications

By David Bright

IVYLAND, Pa. — Targeting scientific, real-time applications that require high throughput, Advanced Control Technology, Inc. has introduced a system using as many as eight Motorola, Inc. 68010 processors.

The VMEbus-based MPS-10 is intended for such applications as process control, robotics control and signal processing as well as program development.

According to Vice-President Kenneth Grob, the chief competition for the $30,000 system comes from VMEbus-based machines from General Micro Systems, Inc. and Motorola as well as Digital Equipment Corp.'s Microvax. The MPS-10 uses the Microware Systems, Inc. OS9/68K operating system and network package.

High throughput on processing intensive tasks is gained by breaking each task into pieces and assigning them to individual processors, each of which runs a copy of the operating system, Grob explained.

Each processor board contains a 12-MHz 68010, 512K bytes of dual-ported random-access memory, two serial ports, 128K bytes of erasable programmable read-only memory and an optional floating-point processor.

One processor acts as a system controller, keeping track of the other processors' activities and handling disk I/O.



Alliant offers FX/1 models

From page 37

analyst at the Yankee Group in Boston.

The only serious competition Alliant faces in its market is Convex Computer Corp., Henkel said, even though Alliant claims that Digital Equipment Corp. is its competition. The entry-level cost of either Convex's or DEC's similarly configured systems is significantly higher — starting at about $400,000 — than the Alliant package's cost, he said.

The $99,500 model contains vector and scalar processors, a 138M-byte 5¼-in. Winchester disk, a 5¼-in. streaming cartridge tape, an eight-line communications controller, an Ethernet controller, a video terminal and keyboard, a dot matrix slave printer for the master console, an eight-user Alliant Concentrix license and an FX/Fortran license. Previously, Alliant sold its computers in components; this package would cost about $137,000 if sold that way.

The $130,500 version adds an expansion cabinet, a Storage Module Drive disk controller, a 268M-byte 8-in. Winchester disk and a 16-user operating system license.

Motorola unveils line

From page 37

tems offers Unix, it pushes its proprietary AMOS operating system more strongly.) Motorola's new systems seem to be "just another endorsement for Unix," Levy stated.

"The 68020 systems are really starting to roll out now," added Rich Mikita, an analyst with market research firm International Data Corp. of Framingham, Mass.

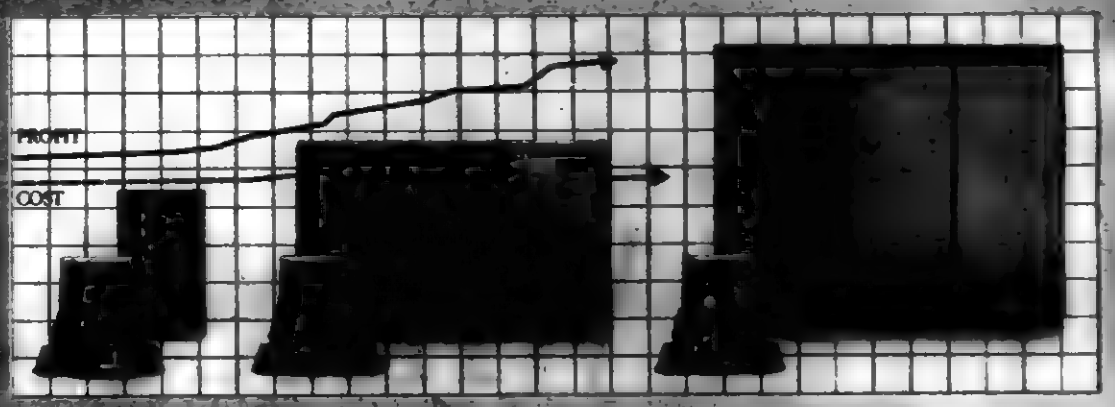
For example, one of the latest Unix-based 68020 systems, the P/55 16-user model, was introduced by Plexus Computers, Inc. just last month.

The System 8000 is targeted at general office systems users and value-added resellers.

Prices start at $15,690 for the eight-user Model 200 and at $22,335 for the 32-user Model 400.

Optimized for on-line transaction processing applications, the eight-user Vision/32 system is primarily intended for Motorola's installed base of customers who are running the company's on-line transaction processing software. Prices begin at $17,195.

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How large can the 3090 be?

From page 37

boost sales sometimes.

The fourth quarter of this year, then, will not see a big price cut on the 3090. It will see a performance change that, combined with the previous 10% price cut, will lead to the predictable 15% to 20% price/performance enhancement.

Hints abound as to where performance increases can be made. "You can only enhance uniprocessors 20% to 22% per year," is one message from Big Blue that points to more multiprocessor systems in the coming years. Another clue has to do with reliability. IBM is aware that customers are expecting 99.5% reliability on the 3090 now and will soon demand total fault tolerance.

The company is working on 4M-bit chips using the thermal conduction module (TCM) method that could conceivably vastly increase the power of the 3090.

These chips are likely to be ready in about six months, an IBM spokesman implies. One might note that there is room in the system's design for another nine-module TCM unit. When the 3090 was designed, its faster cycle time came from switching the transistor-to-transistor logic to emitter-coupled logic. But that logic change accounts for only 30% of the speed-up. The other 70% comes from changes in the design of the system itself, the spokesman says.

Vector processing is one feature to watch, people inside IBM say. Vector processing needs machines with the internal capacity to move huge amounts of data along lots of multiple paths, and the 3080 system was path-poor. The 3090 has parallel paths at least 64-bits wide already, the spokesman says.

Speaking of being parallel, the 3090's execution and instruction elements are just that; that is, they work simultaneously. The system control element has three lines, compared with one line in the 3080.

Although the operating systems were designed to handle only single instruction streams, the 3090 hardware can handle a five-way pipeline, leading to pretty good guesses as to where some of the improvements will come from in the next few years. Rumors say that a third-quarter MVS/XA announcement this year could unlock some of that potential.

The 3090 channel controller, a reduced instruction set computer, has its own preprogrammed microprocessors. Doing microcode on these microprocessors opens the possibility of changing speed and function as needed during customer migrations.

High-speed buffer

The 3090's high-speed buffer, which is the same size as the 3080's at 64K, may be more than adequate for now. But it may be dramatically different in its next incarnation, because IBM has left plenty of room around it for improvements.

Another potential performance increase of perhaps six or seven times could come from dumping larger and larger amounts of storage into the system's memory chips. This will provide faster-than-cache speeds at cache-like costs.

The power of the expanded storage facilities written into XA will allow users to address 16 trillion bytes of data; at this time, most large customers do not need more than 2 trillion. But the potential for moving whole or working data sets into the memory is there.

New versions of MVS/XA will remove fundamental constraints on growth, IBM says. XA has the capability of supporting 256 channels: IBM has to this point released 96 channels. It can support 16 processors: IBM has so far come up with a maximum of four. It can support 2G bytes of real storage: IBM now offers 128M bytes. Draw your own conclusions as to what 3090 will look like by 1990.

The 3090 is the machine for the decade. It has built-in capacities that can only be hinted at now. But living with the full-blown box when it does come out will not be so easy. How does one adjust from a 15-million-instructions-per-second (MIPS) machine to a 90-MIPS machine? How does one program a box with more microcode than has ever been commercially available before? It will be radically different, IBM says.

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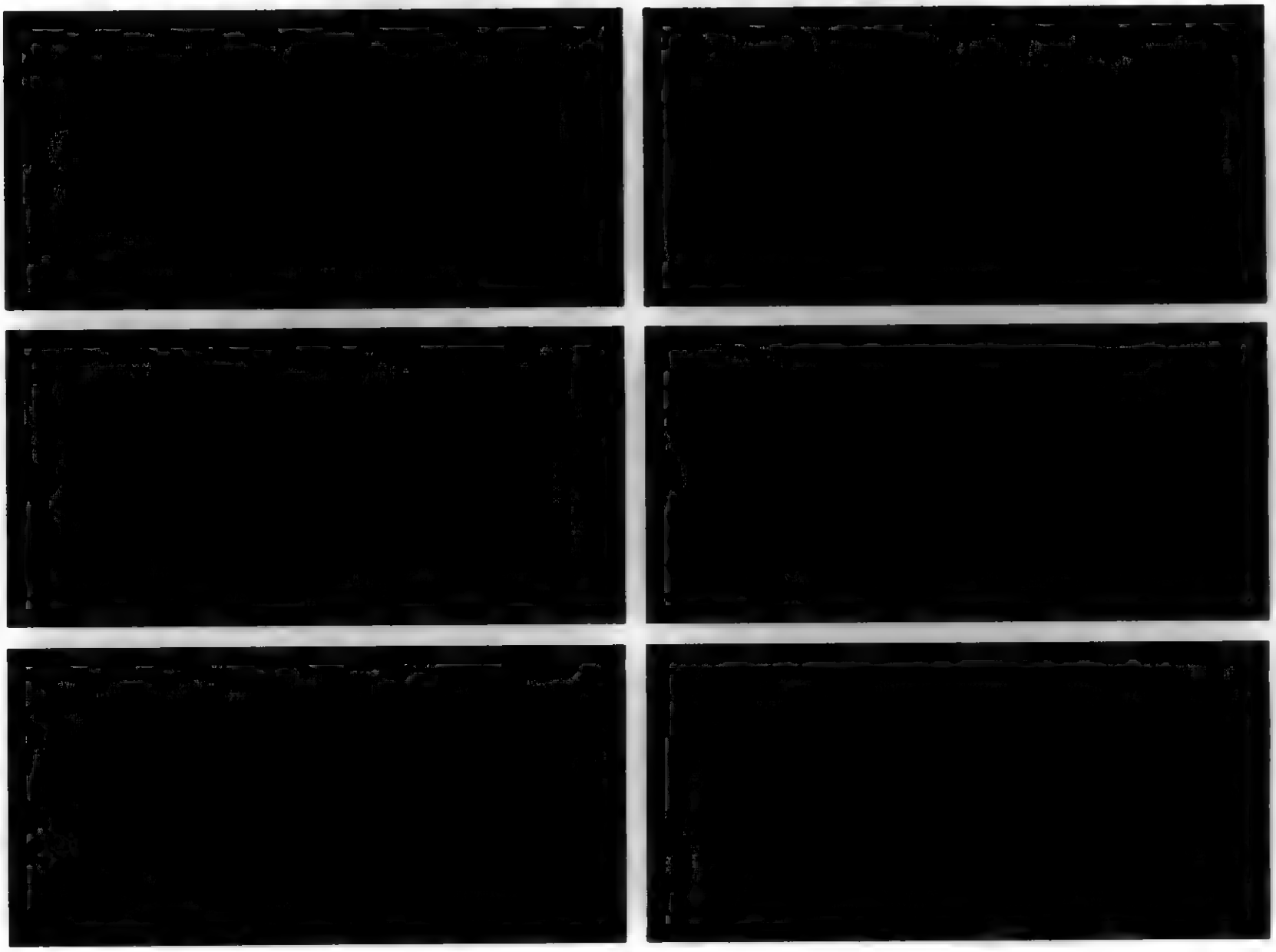
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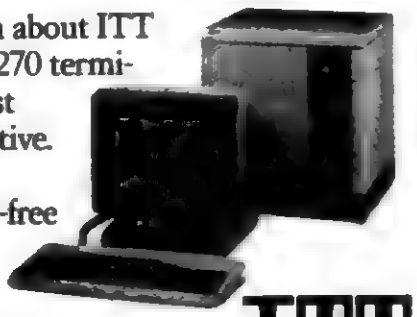
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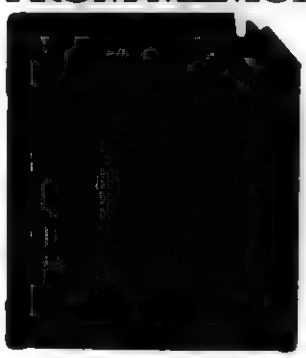


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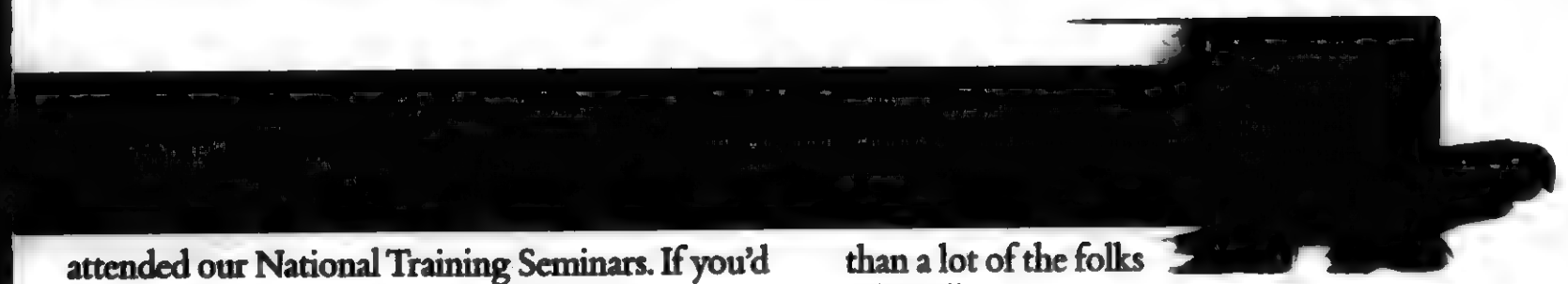
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MICROCOMPUTERS

SMALL TALK
Peggy Watt

Pagemaker put through paces

Hours spent over a hot light table, splicing and pasting crucial slivers of type, painstakingly fumbling with a T square and impatiently counting out and resizing headlines.

These images came to mind when I heard about desktop publishing. Imagine letting a computer handle the measuring and pasting and me keeping wax off my hands and ditching my razor-sharp knife for good.

Oh, large newspapers like *Computerworld* have electronic composing rooms with dedicated terminals hooked up to the reporters' CRTs. But for smaller publications, or free-lancers, electronic publishing has been out of reach.

So the chance to sample the page layout package Pagemaker from Aldus Corp. of Seattle with an Apple Computer, Inc. Macintosh Plus was a welcome introduction to the modern world of publishing. And having done a few company newsletters, I could appreciate the needs and desires of the in-house corporate job shop evaluating desktop equipment.

First, however, I got a lesson in new-user frustration. I wasn't a newcomer to the "computer for the rest of us," but we had to iron out some differences. Maybe Microsoft Corp. MS-DOS isn't as friendly, but when you're used to it, menu-driven-everything can drive you crazy. Anyway, the Mac eventually won and I had to learn patience.

I'm one of those "RYFM" users the dealers growl about (those who don't "read your flippin' manual"). But I was flipping through the manual searching for answers to my page-layout puzzles.

To the credit of both the Macintosh and Pagemaker, someone more familiar with graphic arts and common page design procedures than with the specif-

See PAGEMAKER page 53

Watt is a Computerworld *West Coast bureau correspondent.*

'Data pipelines' link 1-2-3 to mainframe, real-time sources

By Eric Bender

CAMBRIDGE, Mass. — A few years ago Donald McLagan was executive vice-president of Data Resources, Inc., a large information services firm, and his customers kept telling him they wanted to use the IBM Personal Computer and Lotus Development Corp.'s 1-2-3 package.


McLagan

McLagan replied with Data Resources' reasons why clients actually needed time-sharing services, like the lack of good ways to get timely data into the micro. "They listened dutifully and began to do more work on PCs with 1-2-3," he recalls wryly.

Then the customers would begin struggling to move all that data into 1-2-3. "This problem had been created by Lotus, and Lotus had done nothing to fix it," McLagan remarks.

Now, as vice-president and general manager of Lotus' new Information Services Division, McLagan has been given the charter to do something about it — building cleaner data highways into Lotus' star analysis package, not only for financial data but for data stored on mainframes and in many other places. The effort will be crucial to Lotus and crucial to future spreadsheet design, he says.

"We want to develop an application pipeline for data to flow into spreadsheets, so it begins to appear in cells and ranges," McLagan explains. Beyond 1-2-3's standard WKS file format, "you need a data exchange capability that comes along with the spreadsheet that is much more specific in terms of where the data is coming from and going to, and that knows about mainframes and knows about real-time data."

This approach would allow data to pop up smoothly and exactly where the user wanted it within a spreadsheet. "You'd obviate the need to deal with files and Microsoft Corp. MS-DOS, which is everybody's nemesis," McLagan says. "You could use it with the Intel Corp. 8088 with 1-2-3, and you wouldn't have to wait for a new operating system."

Microsoft aims to position its Windows

See PIPELINES page 56

Hercules graphics card to debut

Successor to popular board supports new mode for text

By David Bright

BERKELEY, Calif. — Hoping to duplicate the huge success of its Hercules Graphics Card, Hercules Computer Technology, Inc. today is expected to introduce a successor to the card.

Called the Hercules Graphics Card Plus, the $299 add-in board for the IBM Personal Computer family uses Hercules-supplied device drivers to enhance Lotus Development Corp.'s 1-2-3 and Symphony, Ashton-Tate's Framework and Microsoft Corp.'s Word. The board reportedly enables a 1-2-3 spreadsheet to be overlayed with a graphics window.

Hercules also slashed the price of its original Graphics Card from $499 to $299. An additional $50 rebate will be offered on that board through August.

The primary added uses for the Hercules Graphics Card Plus will be mixing text and graphics on the same screen and speeding up displays of various fonts and special characters.

Hercules President Kevin Jenkins said that the card's advances are largly due to Hercules' new Ramfont mode, which allows the storage of a greater number of text fonts and patterns in memory. He predicted that this product will set a new standard, much as the Hercules Graphics Card did.

"We want all text mode software to eventually be written for Ramfont," Jenkins declared.

In addition to Lotus, Ashton-Tate and Microsoft, more than 20 other software developers have committed to supporting the Hercules Graphics Card Plus, Jenkins said. While the drivers for the programs written by the three largest independent software vendors will come with the card, other

See HERCULES page 52

INSIDE

Audio Visual Laboratories announces a turnkey graphics system based on the IBM PC AT/52

NEW THIS WEEK

- Autodesk, Inc. introduces a version of Autocad for IBM 3270 ATs
- Pick Systems releases Mainlink software package
- For more on these and other new products, see pp. 93-117.

INSTANT ANALYSIS

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— Donald McLagan, vice-president and general manager, Lotus Development Corp.'s Information Services Division

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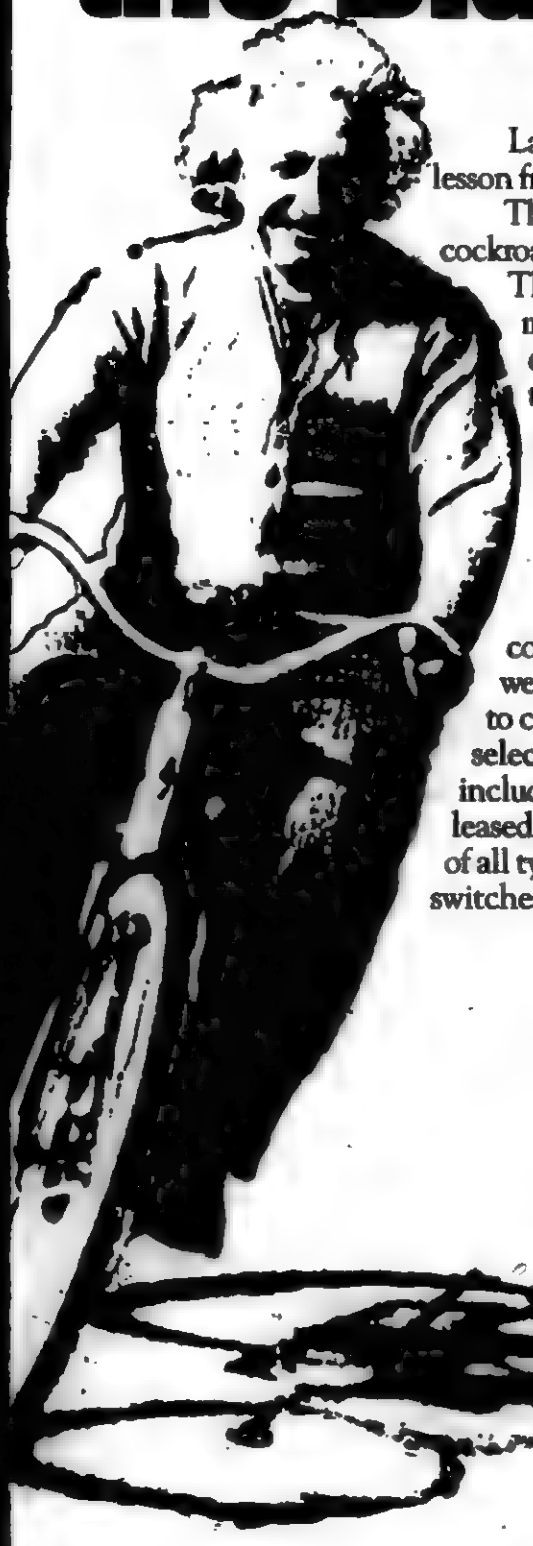
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MOTOROLA

AVL releases PC AT-based Starburst+ graphics system

Turnkey package creates slides, charts and text

By Douglas Barney

TINTON FALLS, N.J. — Audio Visual Laboratories, Inc. (AVL) has unveiled Starburst+, a $32,500 computer graphics and slide creation system based on the IBM Personal Computer AT.

Starburst+ is an integrated turnkey system for creating and producing free-form art slides, charts and text. The system is aimed at audiovisual, marketing and training departments within large corporations and organizations. Key customers include the government, publishers, universities, medical institutions and advertising agencies, the firm said.

One key attribute of Starburst+ is its ability to produce and control multiple images, AVL President Raymond Sozzi said. Multi-image systems can control multiple slide projectors and are most often used for presentations at annual meetings, he added.

According to Sozzi, Starburst+ is a highly flexible system. "We have a text program where you can do text at a local level with any word processing program, and then you offload it to a Starburst+ and enhance the slides that you shoot," he said.

Another advantage, Sozzi claimed, is the system's simplicity. "In a couple of days, the user can literally be up to 80% utility on the system."

AVL's original Starburst package was based on computer systems technology that was licensed from Eagle Computer, Inc. and produced by AVL. Users of the existing Starburst systems can upgrade to Starburst+ for $12,000, which includes new hardware and software.

The main advantage of using an IBM PC AT as the product's base is the increase in speed and the influence of the IBM name upon customers. "It is much faster. It is a performance issue. And certainly in terms of corporate America, which is our target market, the name IBM is very important," Sozzi pointed out.

Although AVL sells mainly turnkey systems, the vendor may sell just the software under special circumstances. "If we go into an environment where there are multiple systems involved, and they already have ATs, we would consider providing everything but the AT itself," Sozzi said.

Starburst+ consists of an 8-MHz PC AT with 512K bytes of random-access memory, a 30M-byte hard disk, a 1.2M-byte floppy disk, a 13-in. color monitor with 720- by 512-line resolution and a digitizing pad. The addition of a film recorder and high-quality thermal and laser printers could push the price of the system up to approximately $70,000, Sozzi said.

Hercules graphics card to debut

From page 49

suppliers will provide drivers for their programs.

Introduced in 1982, the Hercules Graphics Card provides high-resolution monochrome graphics for approximately 200 applications programs. After Lotus' 1-2-3 came out, sales of the Hercules Graphics Card took off, reaching 500,000 in 1985, according to Jenkins. Next to IBM, Hercules is second in the video driver market with an 18% share, according to research from Infocorp.

Lotus officials declined comment on the new board. At Microsoft, however, Charles Stevens, group product manager for word processing, said the Hercules Graphics Card Plus enables Microsoft Word to display sharply defined characters and to run more quickly than any other word processing program.

This is because the system does not have to create graphics characters on the fly; instead, italics, boldface and other font types can be stored on board.

"I think it will be extremely popular with Word users because of its capabilities and the fact that it's very, very fast," Stevens said. According to Stevens, the extra cost of the card should be justified for users who spend at least 80% of their microcomputing time on word processing.

Chip uses 12-bit coding scheme

The Hercules Graphics Card Plus is built around a proprietary video processor chip that uses a 12-bit coding scheme, instead of the more common 8-bit scheme

The scheme reportedly allows up to 3,072 characters to be defined and displayed vs. 256 characters with standard text. Up to 24 full fonts can be displayed simultaneously.

With Ramfont, character size can range from four to 16 pixels high and from eight to nine pixels wide. In text or Ramfont modes, the board supports 720- by 350-pixel resolution; in graphics mode, the resolution supported is 720 by 348 pixels.

In addition to the drivers, the Hercules Graphics Card Plus comes with 25 sample fonts as well as programs for creating and editing fonts and setting character sizes. The card should be available in July.

Catch Forte's new



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Pagemaker put through paces

From page 49

ic hardware and software tools could produce an electronic page layout with minimal reference to the documentation.

But when the page wouldn't print out and I had exhausted my documentation references, I picked up the phone for technical support. The hardware people from Apple declared the problem was the software. The software people from Aldus suggested the problem was the hardware.

Initial denials aside, an Aldus technical support rep helped me install the Macintosh's newest system and finder software on my copy of Pagemaker 1.0, so the program would communicate with all aspects of the Macintosh Plus. (I'm told the problem has since been solved permanently with release of Pagemaker 1.2.)

Hardware and software problem

Further printer problems were solved by swapping printers — it turns out the problem had been *both* a hardware and software one.

And since every page design project, including mine, is done under deadlines, I can assure prospective users that my page layout experiment passed that most important test.

I produced the final, camera-ready copy on an Apple Laserwriter at Laserwrite of Palo Alto, Calif., one of the high-tech job shops springing up since the appearance of the Mac/Laserwriter/Pagemaker team.

A dozen Macintoshes networked to Laserwriters line the walls of the shop; customers pay by the hour (usually a fraction) and by the laser-printed page. That copy goes to the printer.

For corporate use, the $15,000 cost of setting up shop with a Macintosh, Laserwriter and software should pay for itself in designing forms alone. Those who pick up a couple more Macs can be even more efficient.

Obviously, printing can be done either on contract, from laser-printed camera-ready copy, or in-house by more complete job shops.

The pressmen will be delighted to not have to photographically opaque out the lines that invariably appear in cut-and-paste jobs.

Anyone involved with a publication knows the value of having the luxury of making last-minute changes.

Typesetting your own copy has been a lifesaver in the past; being able to make changes on the screen yourself is even better. Changing font size with a few mouse-clicks delights this user.

And despite the threats and promises of IBM Personal Computer publishing software, it's still a Macintosh world at the low end.

Unique interface

The Macintosh's unique interface can be either blessing or curse, and its value depends on your needs. But between simple or practiced graphics produced by Macpaint and Macdraw and the clip-art available from several sources, many basic graphics needs are handsomely met with the Macintosh.

While such graphics interfaces as Microsoft Windows and Digital Research, Inc.'s Graphics Environment Manager attempt to transplant the best of the Mac interface onto the personal computer, the added requirements of memory, mouse, graphics adapter and still-awaited MS-DOS page layout programs are built into the Macintosh. These make it the machine of choice.

There are still some limits. Pagemaker seems to retain some idiosyncracies even in Release 1.2. Despite my command to change fonts in "type specs," the program frequently and stubbornly reverted to its previous settings.

WYSIWYG principle

I'd also swear that the "what-you-see-is-what-you-get" principle doesn't hold true from all viewing angles. Pagemaker offers several: actual size, 70%, 50%, 200% and "fit in window" (for viewing full layouts). Sometimes stuff that I *knew* was straight was out of kilter on the screen, and the proof was in the printing.

And the practiced eye of my pressman friend, presented with the camera-ready copy, could tell quickly that the print was not typeset. The 300 by 300 dot/in. resolution is a far cry from the 1,500-plus dot/in. resolution provided by most typesetters.

While desktop pubishing zealots argue that only the experts can tell, that's not the point: The finished product is grayer than the eye expects, whether the reader realizes it or not.

So while I can't imagine the nation's daily newspapers sweeping out their dedicated minicomputer systems in favor of Macintoshes, there is at least a finite, ready market in corporate job shops and print shops.

And there's one more thing to say for the Mac method: It's here.

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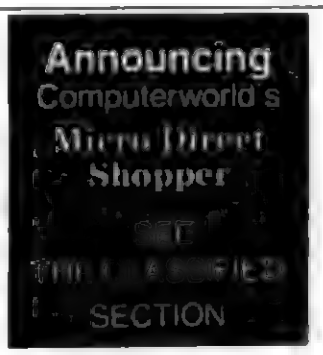


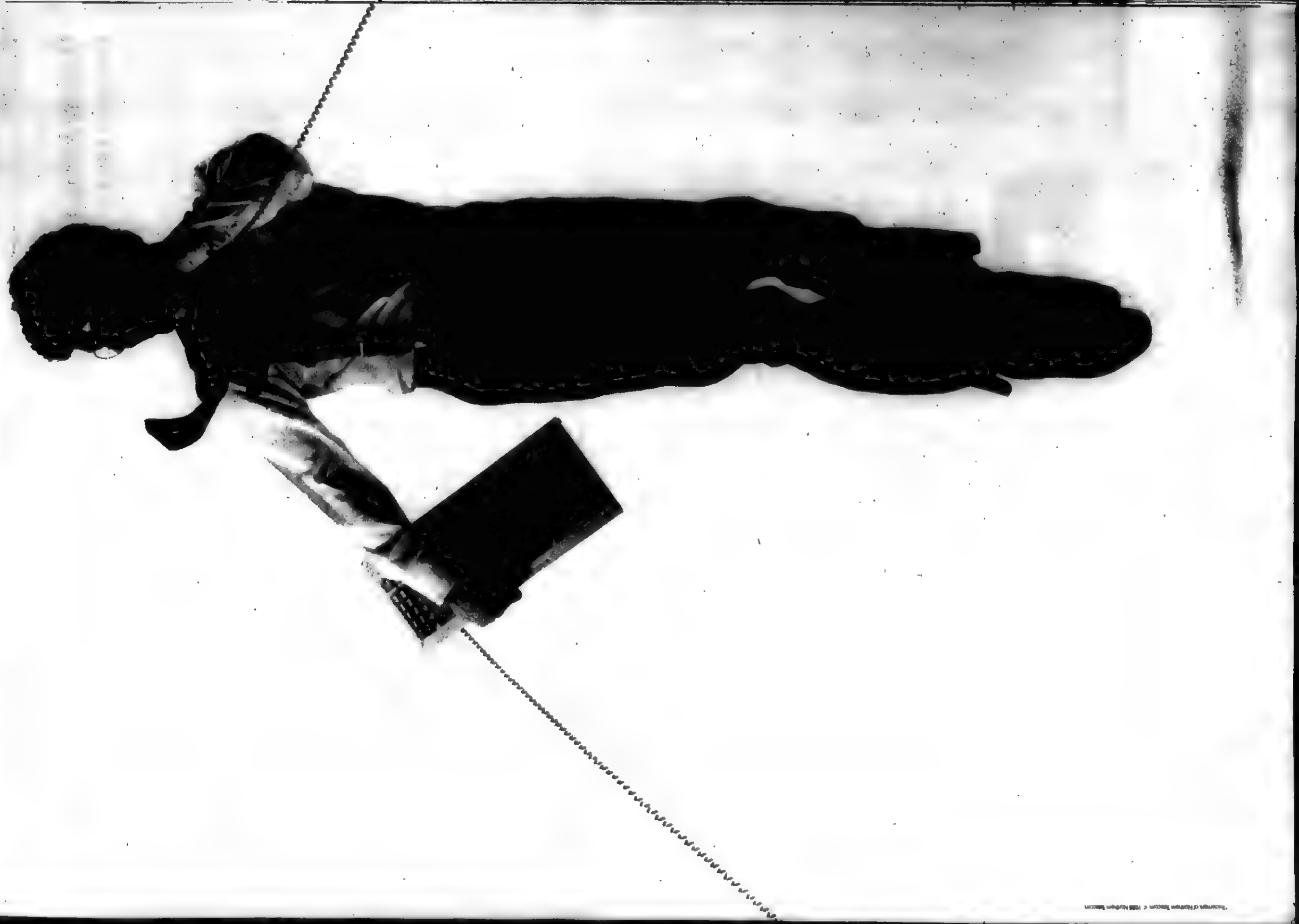
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NETWORKING

Pipelines to link 1-2-3, mainframe

From page 49

operating environment as a key for data transfer, and in some cases Lotus will exploit Windows. "But we think you shouldn't have to go to Windows to move data into spreadsheets, and you shouldn't have to get an IBM PC AT," McLagan says. "Microsoft needs a very good way to bring in all sorts of data from all sorts of applications to other applications. We don't have that problem."

Instead, the problem for the largest independent software vendor is to leverage what Lotus describes as a $64 billion user investment in 1-2-3. "That's what we run up against when we introduce a new product or try to upgrade the product," he emphasizes. "The longevity of 1-2-3 has been underestimated by everyone, including Lotus."

Lotus' major highway between 1-2-3 and mainframe data will be based on the Ilink data access package. When the company acquired the product from Infocenter Software, Inc. last winter, the entry into mainframe software raised some eyebrows, McLagan admits. "But we're taking a step that I think you'll see a lot of other people take, over time — not necessarily to be in the mainframe business but rather to make resources available to PC users."

First introduced in 1984, Ilink aims to tie together micros into multiple fourth-generation language mainframe environments. Lotus currently is building bridges into other environments and drastically revising the micro software, according to McLagan. (Among other reasons, "it had a garish red screen — not Lotus' style.") Revised, renamed and given an optional general-transport mechanism, Ilink will ship commercially this year.

Additionally, Lotus will continue to sell Symphony Link, which debuted a year ago as "the backbone of our entire [IBM] 3270 environment strategy," President Jim Manzi declared at the time.

Symphony Link ties a personal computer equipped with Digital Communications Associates, Inc.'s Irma board to a mainframe running VM/CMS or MVS/TSO. "It complements Ilink — it gets you transfer, gets you scripting," McLagan says. "But we learned we had to solve a bigger part of the problem . . . and we can't be device dependent."

Nor does Lotus want to embrace specific mainframe applications too closely, after last year's codevelopment effort with Cullinet Software, Inc. fell apart. Such joint efforts between mainframe and micro software houses generally collapse because "the business is too dynamic, everyone wants too much of it, and it's not clear who's going to win in the long run," McLagan remarks.

Signal and Isys

Lotus' two financial service products — the Signal real-time market quote system and the Isys collection of historical company data — face many of the same development hurdles as Ilink and hint at how the mainframe data access tools will evolve.

Signal took an unusual twist by treating the real-time link resources as if they were a WKS file. The transfer mechanism "looked great last fall," McLagan says. "But it looks horrible now. . . . It's a long way from what we can do."

In one sense, Signal's real-time nature represents the "biggest challenge to the data pipeline," he says. Importing 200 transactions per second starts to push recalculation limits, which is one reason Lotus Chairman Mitchell Kapor has underlined quicker recalculation as a high priority for 1-2-3 development.

Isys, on the other hand, features large but relatively static data bases. It raises different issues, including data compaction and new options in storage hardware. "I think you'll hear a lot from us in compact disk read-only memory," McLagan notes. "Isys is a natural." Lotus also is looking at write-once read-many (WORM) devices. "We don't know where we're going to come out on WORM."

McLagan expects to really begin to grab customers by combining the two financial services offerings, which Lotus has promised for this summer.

"You have to replicate both the breadth and the timeliness that you had with time sharing." He also points out that financial services represents "a $700 million market — bigger than the PC spreadsheet market today. . . . We could achieve all the goals for the division without leaving that marketplace."

Division goals

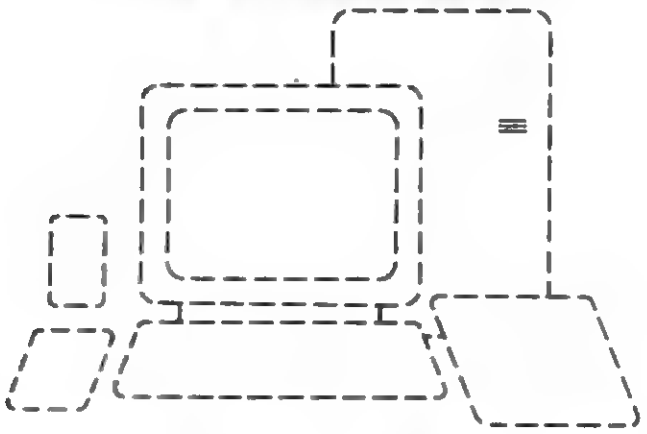
McLagan had known Kapor since the Lotus founder's days at M.I.T.'s Sloan School of Business. Last year when McLagan was in between jobs, the two bumped into each other while on vacation, and the ex-Data Resources executive ended up joining the software firm in October.

Lotus had then completed the acquisition of Dataspeed, Inc., which furnished the Signal technology. But the deals with Infocenter and Isys and the formation of the division were still in the future.

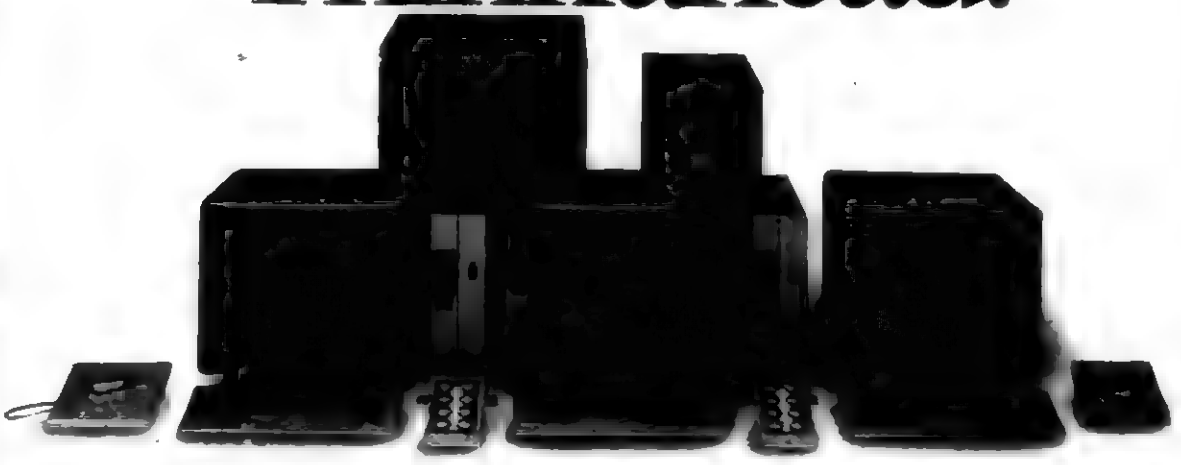
"I'm not looking for building blocks at this point; I was when I got here," McLagan says. A fourth Information Services group, started internally, aims at marketing electronic mail products by the year's end.

The division's components posted more than $5 million in sales last year, by public figures, but the work force is somewhat larger than those figures would indicate. McLagan predicts that next year the division will no longer run at a loss, but the real payoff lies further down the road. "We're a five-year bet," he sums up.

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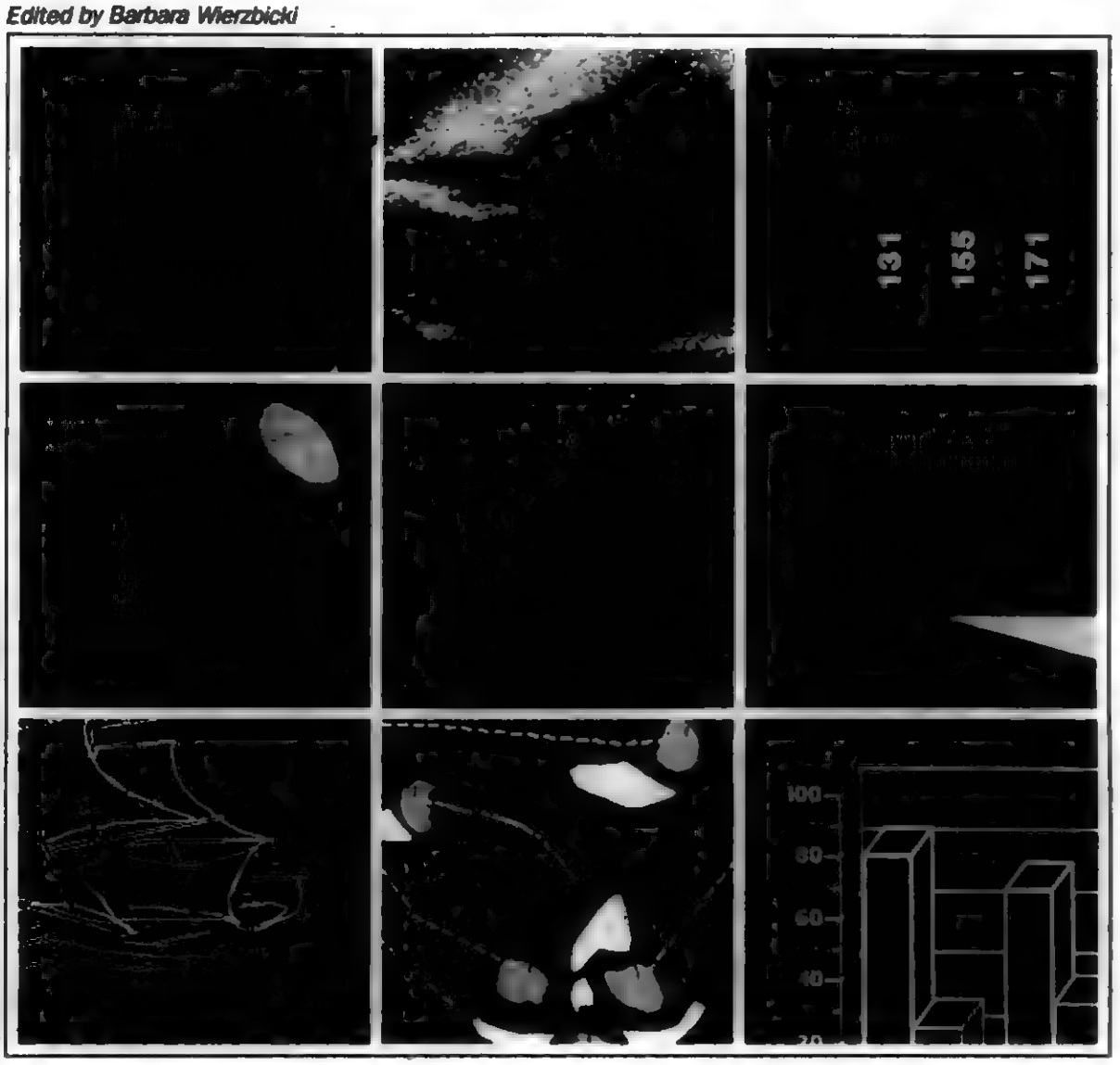
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Product Spotlight

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Presentation graphics

Giving end users the power of the palette

By EDWARD F. HEITE

Long ago, in a job printing establishment far, far away, there was a shop foreman who refused to set up any page with more than three styles of type. Confronted with copy that violated the industry's rigid design canons, he would bellow, "Send it back. There's been a mistake!" Junior professional staff and apprentice printers soon learned the rules.

Presentation graphics, where professional finish is at least as important as factual content, traditionally lies in the province of professional design studios. However, thanks to recent hardware and software developments, almost any personal computer now can produce at least middling-to-good presentation graphics on 2- by 2-in. slides. The user's skill and taste remain the only variables.

In today's market, the umbrella term "graphics" covers products ranging from a Visicalc spreadsheet from Lotus Development Corp. to an Allied Linotype Co. typesetting machine. Between these extremes lurks a bewildering array of choices. But do not be lured into a game of one-upmanship, in which the graphics package touting the most number of features wins. The far more judicious approach to program selection involves taking stock of your level of graphics skill and training, the length of your deadlines and, most important, the amount of office staff time that can be spared for graphics output.

As consumer-controlled PC graphics systems mature, technological shortcomings surely will diminish, and user demands will become more sophisticated.

It is no longer sufficient to display PC graphics in color; screen colors must routinely shift to accommodate the Polaroid Corp. Palette. A graphics program today would be unacceptable if it could not print a perfectly round circle, even on a desktop printer. Yet a few years ago, any vaguely round shape that came out of a dot matrix printer was called a circle.

Personal computer graphics packages began with spreadsheet enhancements and grew to include tools for professional artists and designers. Until recently there were two kinds of graphics presentations: low-budget amateur and high-budget professional. Today there is a middle category:

Turnaround time, confidentiality and cost savings justify moving the graphics function onto the end user's desktop.

Heite teaches business information systems at the University of Delaware. He has managed both letterpress and offset printing establishments and is a practicing professional archaeologist.

Giving end users the power of the palette

Continued from previous page

low-budget user-generated computer graphics. Graphics technologies that formerly were too expensive and too complicated for everyday office workers are now relatively cheap, simple, quick and accessible.

The change can be traced to two developments: increased graphics capabilities on personal computers and simplified user interfaces that allow nonspecialists to control graphic output.

Personal computer graphics programs have become consumer products, moving out of the specialist area and into the mass market, just as word processors and relational data bases did before them.

All graphics systems share one attribute: None is able to do everything. A Microsoft Corp. MS-DOS-based personal computer is not inherently a graphics system. These machines require extensive add-ons in order to provide users with truly useful capabilities. Given the wide choices among software programs, boards, mice, plotters, monitors, printers and so on, there can never be a "standard" MS-DOS graphics hardware/software mix.

For that reason, all MS-DOS-based graphics software — as well as those programs under development — are limited by the need to accommodate a babel of existing hardware and software requirements.

Newer personal computers, designed around sophisticated graphics subsystems, offer a closer to seamless graphics user interface than do older MS-DOS systems. The Apple Computer, Inc. Macintosh, for example, provides a coherent environment in which you can easily enhance a spreadsheet with such various graphics functions as sketches, clip art or typesetting.

Currently, Macintosh graphics software such as Macpaint and Macdraw offer the neophyte the highest degree of user friendliness and flexibility available. These programs cater to more sophisticated needs as well, providing advanced capabilities such as laser printer, plotter, slide and typesetter options.

As with other systems, no single Macintosh product is likely to meet everyone's graphics needs. However, the cost of a Mac, as opposed to upgrading an existing MS-DOS system to accommodate graphics, may actually be less. A 512K-byte Mac now sells for $999. Outfitting a standard IBM Personal Computer with a color graphics board and a high-resolution monitor costs anywhere from $700 to $1,200.

A user's overriding concern is time. Outputting graphics can become vastly more time consuming than the generation of standard text or tables of numbers. If a straight spreadsheet-produced bar graph from a dot matrix printer will meet your needs, don't complicate the procedure. Adding a plotter to produce premium-quality output may stretch the time to print a single page from a few seconds to a half hour.

Microcomputer-based graphics packages range in order of difficulty and man-hours from casual to full-time. Some of the less complicated programs, appropriate for occasional office use — such as Chartmaster from Decision Resources, Inc. — may lack the slick sophistication of professional products like Mirage from Zenographics, Inc. that mimic mainframe systems in product quality and complexity. For most users, however, ease of use commands a higher priority than exotic features.

The least demanding business graphics consumers are the stereotypical managers and accountants who made Lotus 1-2-3 a market leader in graphics-generating software. These folks flash a Lotus graph on the wall and call it "business graphics." Their graphics

Continued on page 60

Expert's Opinion

Cooperative processing lets PC users access mini and mainframe graphics

By ALAN PALLER

The continued annual 20% to 30% revenue growth in mainframe and minicomputer graphics, combined with the surge of personal computers onto desktops, has caused information processing managers to search for ways to combine the strengths of the PC with those of the minicomputer or mainframe. The goal is cooperative processing, in which each machine performs the functions for which it is best suited. These executives see the PC as one part of a continuum of platforms ranging from the PC through workstation, departmental computer and mainframe. They want each platform to work with the others, not compete against them.

Initially, the microcomputer served either as a stand-alone charting system or a graphics terminal, often emulating one of the popular Tektronix, Inc. computers. Recently, however, the PC has taken on more significant roles in the partnership. It has become a device-independent chart distributor, a chart previewing tool, a graphics editing station and even an automatic graphics program generator.

When graphics terminals cost $7,000 to $20,000, a personal computer offered a lower cost solution. Today, as the cost of graphics terminals drops and as increasing user demands for quality push up the price of graphics on PCs, the direct cost differences are not as great as they once were. It is a much larger trend that fuels the demand for graphics terminal emulation. Personal computer users are running out of capability and need to access the mainframe or mini. They are the driving force behind the growth in cooperative graphics processing.

It is these same PC users — frustrated by limited graphics software and slow, hand-fed graphics hard-copy equipment — who are pressuring vendors to expand their terminal emulation software. They are asking for an expanding array of capabilities to enhance their own productivity and to make graphics emulation compatible with the options they have purchased for their PCs.

The following description of a large industrial company's attempt to provide micro-to-mainframe graphics connections provides an educational case study in how requirements continue to expand.

The user is a large manufacturing company with more than 2,000 personal computers plus IBM mainframes and Digital Equipment Corp. VAX departmental computers.

In 1983, users requested that the information systems department provide terminal emulation software that would turn their PCs into graphics terminals. The department responded with a PC package that worked with the standard IBM graphics card and over standard asynchronous (RS-232) communications lines. The PC graphics resolution was not as good as users wanted, but it was acceptable for previewing charts. Then IBM announced Enhanced Graphics Adapter capabilities for its PC, greatly improving the resolution.



> "We can look forward to environments that will put all mini and mainframe graphics hardware and software at the call of every PC user."
>
> — Alan Paller

By the next year, those same users had acquired plotters and other graphics printers. Now they needed more than terminal emulation; they needed a way to preview a chart on their PCs and then send that same chart to a plotter without asking the mini or mainframe to redraw the chart. Information systems responded by adding graphics device-independent support on the PC to send charts to the plotter.

The communications protocol created a problem, because complex graphics involve extensive communications. Although DEC VAX and Prime Computer, Inc. computer graphics applications ran fast enough on asynchronous communications lines, most IBM mainframes limited asynchronous communications to a sluggish 1,200 bit/sec. IBM users wanted synchronous communications. In particular, they wanted support of Digital Communications Associates, Inc.'s Irma communications cards in their PCs. Once Irma compatibility was added, productivity for IBM mainframe users increased by a factor of four or more.

A recent challenge came from Lotus Development Corp. 1-2-3 users who liked 1-2-3 but did not like the charts it produced. Either they were frustrated with the quality and flexibility of the graphics they were getting, or they did not want to dedicate their PC to the sole purpose of supporting a plotter. These users recognized that they already had high-speed, high-quality graphics hard-copy equipment available on their mainframe or minicomputer network. They needed to preview charts in Lotus, then pass them through the network to the higher quality equipment.

The solution was an automatic command generator that translated Lotus 1-2-3 work sheets into commands that graphics software running on the VAX and IBM computers could read and process. Users can now get high-quality charts from any plotter, graphics laser printer, thermal transfer printer, ink-jet or film recorder connected to the mainframe or minicomputer network.

The future of micro-mainframe links in computer graphics is likely to be an extension of the cooperative processing represented in the Lotus enhancement link. But new products will go much further. Some will allow charts created on the mini or mainframe to be edited on the PC and returned to the mainframe for distribution to graphics hard-copy devices or to other users. Others will offer capabilities that allow any logo or diagram produced on the PC to be integrated with charts created on the larger machines.

Among the most important of the changes will be smoother integration between programs running on cooperating machines. In the near future, we can look forward to environments that will put all the graphics hardware and software of minis and mainframes at the call of every PC user — with the touch of a button. Access will become so transparent that the user will not even know what computer is doing the work. ■

Paller is president of All Data Graphics/Inco, a Washington, D.C.-based firm specializing in computer graphics and visual information systems consulting and training, and a director of the National Computer Graphics Association.

In-house systems combine speed, quality output

By MICHAEL SULLIVAN-TRAINOR

Rather than pay rush charges to outside service companies for the thousands of charts and slides they need, major corporations as diverse as AT&T, Chemical Bank, LTV Aerospace, Inc. and *USA Today* use in-house systems to produce large volumes of high-quality graphics quickly.

The finance division of Chemical Bank uses Zenographics, Inc.'s PC-based Mirage and Ego graphics software programs to meet its need for quick presentation development.

"Our main cost in preparing high-quality visuals is the frequency of the changes made to text or graphics, sometimes right up to the last minute," according to Martin Schwimmer, assistant vice-president of the New York-based corporation.

The finance division runs the Zenographics' packages on an IBM Personal Computer AT with a Number Nine Computer Corp. graphics card, a Mitsubishi Electronics America, Inc. color monitor, a Kurta Corp. digitizing tablet and a Matrix Instruments, Inc. PCR high-resolution film recorder.

With the system command files, Schwimmer's department has created specified row and column alignments and commonly used geometric shapes such as three-dimensional bar graphs. "Using the command files, we have been able to align new material quickly and accurately down to the pixel level," he says.

Though operating in a very different environment, Dallas-based LTV Aerospace, a commercial and military aircraft and rocket subcontractor, also uses the Zenographics Mirage program.

The manufacturing controls department produces more than 1,000 charts a week using an IBM PC AT and data downloaded from a mainframe, according to Fred Goodman, a specialist in LTV's Industrial Modernization Division. Once the data is brought up on the PC, Mirage and Ego are used to create charts for presentations to management.

Instead of a slide production system, LTV uses General Parametrics Corp.'s Videoshow presentation device, which allows the user to present the charts on a large screen projector. The system reads the charts off a floppy disk transferred from the PC.

The Mirage package also includes a command file capability that permits certain chart formats to be built into the system. This feature enables LTV's manufacturing controls department to "build a file that allows them to use new data for the same chart format without having to recreate the charts," Goodman says.

There are approximately 35 users of graphics systems within the 15,000-employee LTV Aerospace location. All major departments use PCs with Mirage or an equivalent package and access to a Videoshow presentation system.

Meanwhile, at *USA Today*, the graphics department creates newspaper art with Microsoft Corp.'s Chart or Cricket Software, Inc.'s Cricket Graph packages on 19 Apple Computer, Inc. Macintosh computers. The graphics are used to highlight stories as well as provide instant information concerning national trends, according to Buzzy Albert, *USA Today*'s graphics editor.

"We use the charts as a way to make editorial judgments on figures. It's especially useful for editors who can't visualize well. In five minutes we can produce a chart presenting the numbers for the editor to look at," Albert says.

Both Microsoft Chart and Cricket Graph are used to transfer charts to Apple's Macdraw software for editing, and then the final work is produced on an Apple Laserwriter that is connected to the Macintoshes through an Appletalk network.

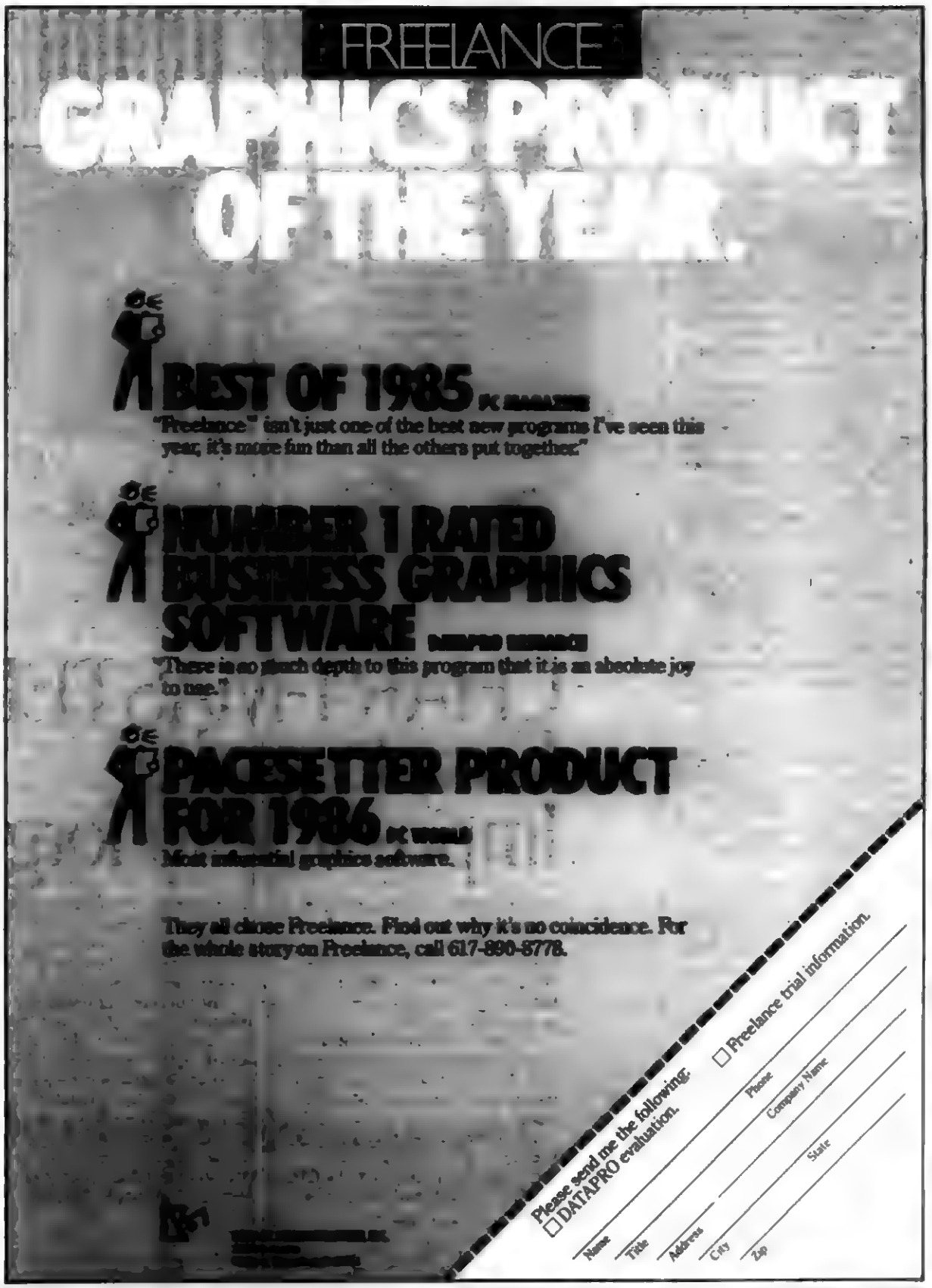
"We started with Macintoshes about two years ago with the 128K-byte machines. It was an experiment in a new electronic graphics system. Now there are Macintoshes throughout Gannett Co. newspapers from Vermont to Guam," he says.

With nationwide sales and marketing divisions, AT&T Communications also has an extensive need for graphics presentations. Its Western Region Marketing and Sales division generates some 6,000 slides a year.

"We do a large volume of slides, and almost all of them are custom made. With an outside service company, that's $20 a slide. When you're talking thousands of slides, it doesn't take long for an in-house system to pay for itself," says Bruce Decker, audio/visual manager for the division.

To fill the bill, the company acquired an Audio Visual Laboratories, Inc. (AVL) Starburst system, which runs AVL's Textgraphics, Artgraphics and Chartgraphics software. One of the advantages of the system is that graphs developed on Textgraphics can be transmitted using a modem to remote locations, allowing sales or marketing managers to make comments without traveling to Decker's San Francisco location to view the presentation. ■

Sullivan-Trainor is a Computerworld senior writer.



Continued from page 58

requirements — elegant and limited — allow them to create perfectly appropriate color transparencies or report illustrations with a pen plotter.

Graphics add-ons for spreadsheets met a market demand that emerged during the first five years of the spreadsheet era. The earliest Visicalc version, then owned by Visicorp, could assemble crude bar graphs of asterisks and print them.

Visicorp then bought the marketing rights to Multisoft Corp.'s Stretchcalc, a program that added graphics commands to Visicalc. Subsequent spreadsheet releases, most notably from Lotus, have contained progressively more sophisticated graphics outputs.

Preformatted bar, line, pie, area and scatter charts are today routine features of spreadsheet packages. Some packages, such as Open Access from Software Products International, contain a slightly higher level of graphics sophistication with such options as three-dimensional bar graphs.

To go beyond a spreadsheet's capabilities, you need a spreadsheet enhancer. The Chartmaster graphics package is such an enhancement, since it illustrates tabular numerical data in standard graphics formats.

Programs like Chartmaster can take IBM's Data Interchange Format (DIF) or Microsoft's Sylk format files from a spreadsheet and represent them graphically. Inside Chartmaster, a user can edit the data and select parts of the DIF file to be displayed.

Similar capabilities, with 12 graph options, are available with Cricket Software, Inc.'s Cricket Graph, which interprets numerical files in the Sylk format or statistical data from the same manufacturer's Statworks software.

Even though real statisticians may not do pie charts, there are statistical graphics applications such as the creation of symbols and maps that go beyond what a spreadsheet or spreadsheet-based integrated package can offer.

For such applications there are symbol manipulation programs and packages with freehand drawing capabilities.

Symbol manipulators allow you to combine lettering, pictures and symbols. Some graphics program vendors have blunted the artistic challenge by providing so many packaged options that unskilled users need not innovate.

Computer Support Corp.'s Diagraph program, for example, comes with 2,200 symbols, including full screen perspective drawings and chart symbols.

The pictorial material is predrawn; the user merely manipulates and labels it. Diagraph offers no built-in method for users to create their own symbols, but the publisher offers digitizing services for a fee. If he sticks with the graphics palette that is provided with the package, a Diagraph user's mistakes should be nothing worse than an occasional pink cactus or a blue utility pole.

The Sound Presentations package, from Communication Dynamics, Inc., enables users to create files of clip art from geometric shapes.

Symbol manipulation packages typically contain several disks full of swipe files, much like the popular series of advertising clip art books.

Symbol libraries are bulky. The Diagraph program comes on six disks, without all the symbols. Sound Presentations is contained on 10 diskettes. The sheer bulk of files makes a hard disk an attractive option.

Both Diagraph and Sound Presentations are documented for the benefit of nontechnical end users. The Sound Presentations manual begins with a "How to set up your equipment" section that features a picture of a plotter, a printer and a personal computer. With such documentation, new users can start from any skill level.

At the third level of sophistication, users want to create their own images either from scratch or by altering images from the swipe files. Drawing and painting systems provide an electronic medium for freehand painting, drawing and

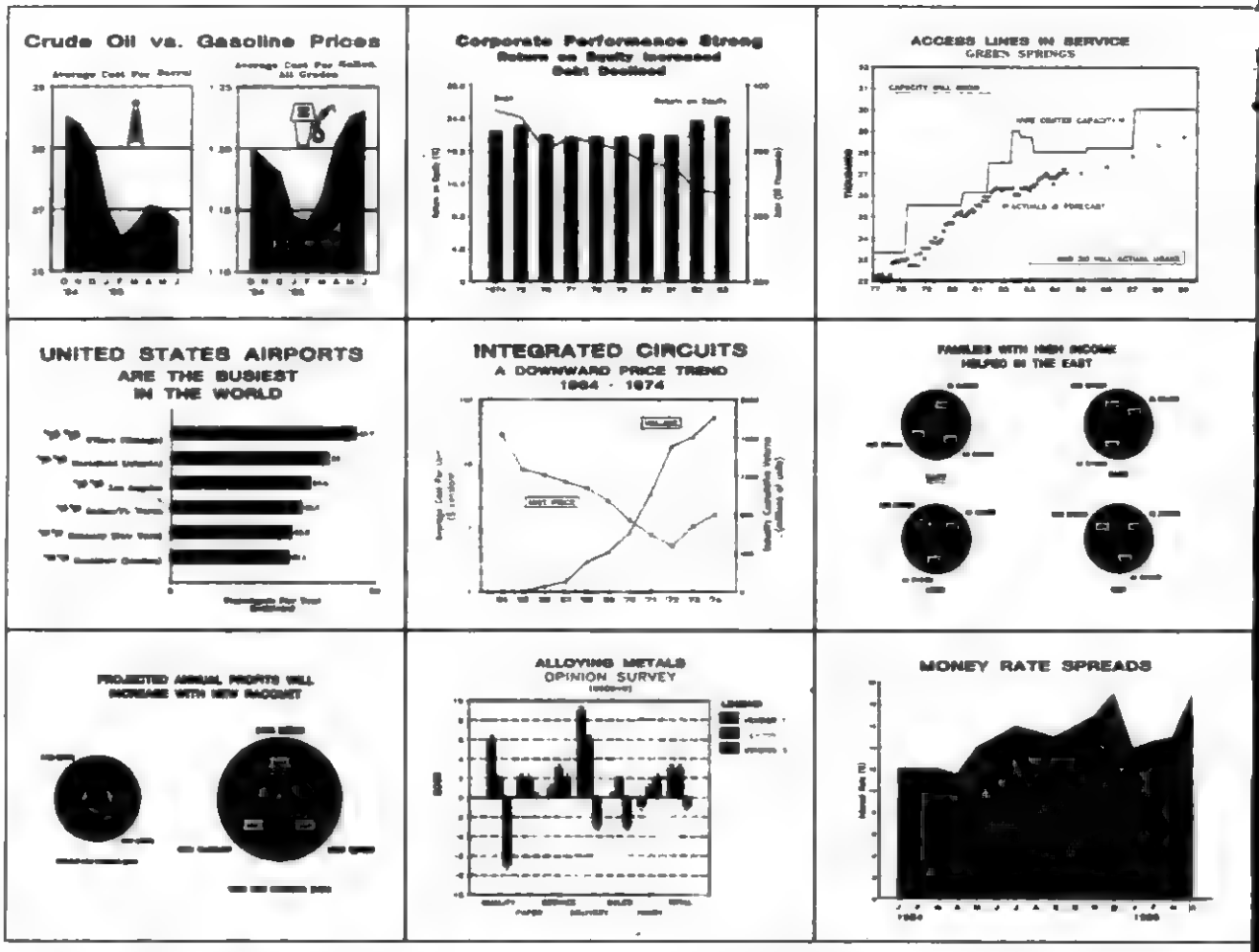


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The #1 rated business graphics package. For the past two years, *Software Digest* has rated CHART-MASTER the #1 business graphics package in the PC market. It also was the only product to receive a top rating in all five categories of power and ease-of-use. And for some very good reasons.

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Automatically format and preview charts. After you answer a few simple prompts like which months, how many sales and what titles, CHART-MASTER can automatically create virtually any chart you request — bar, line, area, mixed, double Y-axis, up to four pie charts on a page. Plot with up to 600 data points. Change text and fonts. Add symbols. You can even preview your data in as many chart configurations as you wish before printing. So you never have to

sketching. The options are either paint or draw programs running on the Macintosh or an operating environment like Graphics Environment Manager (GEM) from Digital Research, Inc.

Paint and draw programs differ in the way they handle graphics. Paint programs store pictures as bit images, whereas draw packages store drawing instructions that can be reinterpreted by different output devices, adjusting resolution to output capabilities.

A drawn image is therefore much more useful for scaled technical graphics, while painting is preferred for stippled artwork or halftones.

Macpaint allows hand retouching of any bit-mapped screen image, pixel by pixel, with the "fat-bits" facility. A standard chart created by a spreadsheet or spreadsheet enhancer can be reworked in Macpaint.

Since Macintosh graphics are interchangeable among programs, paste-in artwork clips can be swiped and altered, creating endless opportunities for aesthetic abuse or creativity. A Macpaint user can scan or customize virtually any graphics resource and add it to the library, building a personalized repertoire of individualized artwork.

Program offerings in each of the categories — spreadsheet enhancers, symbol manipulators and drawing/painting systems — are intended to be complete production tools, each designed to work in a particular way. A package that provides spreadsheet graphing, clip art, freehand drawing and scaled drafting must therefore be more complex than a single-purpose program. The point here is that the intended user is far more important than the product.

Energraphics 2.0 from Enertronics Research, Inc. is a combined graphics MS-DOS package targeted at beginners. It can function as a spreadsheet enhancer, making standard graphs in a variety of standard formats. From its symbol library, it can import graphics elements that can be altered by the program. A user can also edit and create symbols at the pixel-by-pixel fat-bits level or with a digitizing pad or mouse.

In spite of its wide range of capabilities, Energraphics is accurately aimed at and packaged for nontechnical users. Using the separately bound, well-written and easily understandable "Beginner's Guide" and the overview booklet, novices or occasional users can begin to use the Energraphics package before ever opening the somewhat forbidding, thick, loose-leaf reference manual.

The professional or full-time user, on the other hand, might consider Zenographics' Mirage, a program that mimics on a PC the complexity and capabilities of mainframe packages. Mirage is strictly a technician's tool, with ponderous documentation and extensive capabilities. The operator's guide contains more than 600 pages of dense technical detail divided into about 15 separately numbered sections.

Another Zenographics program, Autumn, starts from the symbol manipulation point of view, allowing the user to select from over 100 different predesigned formats.

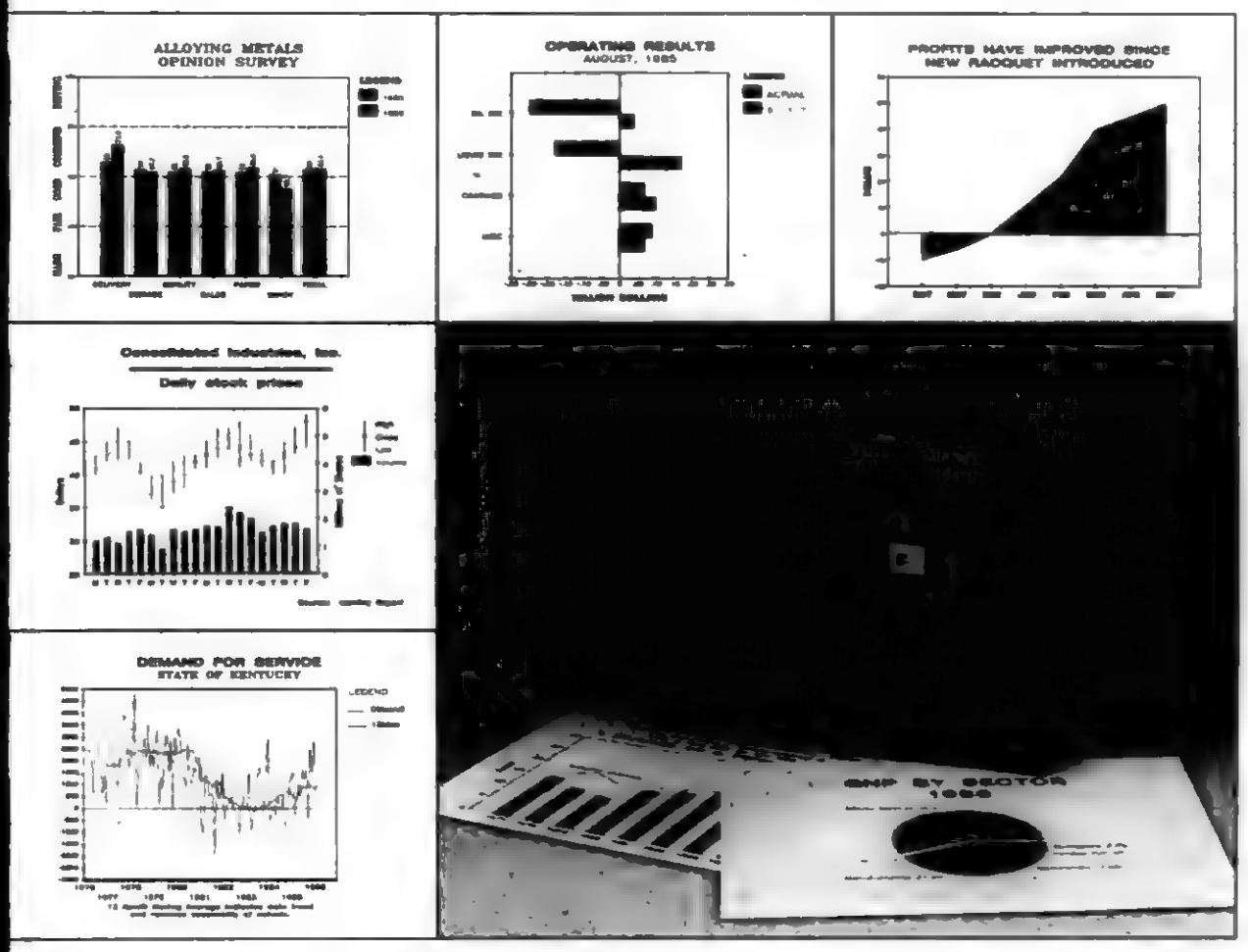
Despite advertising claims to the contrary, Autumn hardly qualifies as a package for the "computer novice, casual graphics user or manager."

More appropriately used as a subset of Mirage, this symbol manipulation program — with its 300 pages of documentation — is too advanced for beginners. Both Mirage and Autumn are solid products — if appropriately placed in the hands of seasoned graphics users.

For microcomputer graphics packages, user interfaces are at least as important as the potential output capabilities. The explosion in computer graphics has happened only since input became much easier for ordinary users. Seasoned computer jockeys may be accustomed to keyboard input and hundreds of memorized command strings, but the noncomputing public is sold on the convenience of pointing devices.

Pointing devices, notably the mouse, have become a

Continued on page 63



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symbol of user friendliness and creative capacity. Among the graphics software covered here, mouse input is actually necessary only in the drawing and painting packages, but it is also characteristic of the more consumer-oriented software.

Spreadsheet enhancers like Chartmaster can draw their data from DIF or Sylk files or as numerical input from the keyboard. Symbol manipulation packages require an interactive environment, but not necessarily a mouse or a pointer environment. Sound Presentations supports an optional mouse as well as graphics tablets, but all the program's features are accessible from the keyboard. Energraphics 2.0 is strictly keyboard driven.

Diagraph does not currently support the mouse or any other pointing device in its IBM versions, but a pointing interface is being developed. The older Hewlett-Packard Co. 150 version includes a touch screen.

Painting and drawing programs need some kind of pointing or drawing input device. With scanners starting at about $200 and graphics tablets starting at $300, those who need such input can get it, at least in a minimum configuration. The Macdraw and Macdraft programs let the user draw with the mouse, with dimensional control provided by built-in scaling features. GEM Draw for computers using the Digital Research GEM environment has similar features, but the mouse is optional.

Today's microcomputer can send graphics output to inexpensive but high-quality devices that only a few years ago were beyond the reach of any but the specialists who had large machines, large budgets and the luxury of time to learn arcane commands.

Since the options are multiplying constantly, the prudent buyer will check a package's list of supported hardware, which is not always prominently displayed in the documentation.

Desktop plotters and low-end laser printers have become the favored output devices for overheads and handouts, while off-screen color photography rules the roost for slides. Slide systems, such as HP and Polaroid color film recorders, have reduced both turnaround time and equipment costs.

Macintosh business output is almost by definition Apple Laserwriter output. Although Macintosh color is available through third-party products and the system can drive plotters or daisywheels, the monochrome Laserwriter remains one of the industry's best-selling printers.

Most MS-DOS graphics packages and integrated programs support plotters. Lotus 1-2-3 and Chartmaster, for instance, can be interfaced to a multiple-pen plotter to produce a multicolored overhead in about half an hour. While plotters are relatively slow output devices, their results and turnaround time are at least equal to a draftsman's best effort.

Justifications for buying a microcomputer graphics system are similar to the justifications for buying microcomputers in the first place. While PC-based graphics packages offer nothing that has not been available on larger machines, the following are good reasons for moving the graphics function onto the end user's desktop:

> ***The explosion in computer graphics has happened only since input became much easier for ordinary users. Seasoned computer jockeys may be accustomed to keyboard input and memorized command strings, but the noncomputing public is sold on the convenience of pointing devices.***

Turnaround time. Laser printers and plotters controlled by the originator's microcomputer can "drop everything" and do the job, which is not always the case with separate art departments and drafting rooms that have their own priorities.

Control. An end user seated at his own console, using his own software, does not need to delegate or explain anything to anyone.

Confidentiality. An art shop, typesetter or blueprint house is not the most secure place in the world. In-house artwork and composition systems can keep the lid on confidential moves by keeping critical information physically in-house.

Cost. Revision and proofing, one of the biggest elements in the cost of printing and artwork, is eliminated when the artist and the customer are the same person.

The recent history of personal computer graphics systems confirms Professor T. G. Lewis' fifth law of personal computing: "Knowledge costs more than software and hardware: The usefulness of personal computers increases in inverse proportion to how much people must know in order to use them." As Lewis points out, "Any consumer product that is successful must be simple." Now that computer graphics systems are becoming simple, they must inevitably become more successful. ■

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PRESENTATION GRAPHICS SOFTWARE

Company	Product	Recommended Memory (in bytes)	Types of Charts: Bar	Line	Pie	Text	3-D	Scatter	Organization	Gantt	Presentation Features: Number of Font Styles	Number of Colors	Display Multiple Charts on Screen	Edit Chart and Text on Same Screen	Symbol/Picture Library	Create 35mm Slides	File Format Support: ASCII	DIF	Lotus 1-2-3	Price
Advanced Graphics Software, Inc. Suite 106, 333 Waverly Ave. Sunnyvale, Calif. 94086	*Slidewrite*	192K	No	No	No	Yes	No	No	No	No	5	7	No	Yes	No	Yes	Yes	No	No	$225
Advanced Graphics Software	*Slidewrite Plus*	256K	Yes	Yes	Yes	Yes	No	Yes	Yes	No	6	7	No	Yes	Yes	Yes	Yes	No	Yes	$345
Advanced Technology Center, Inc. Suite 230 8711 Sawyer Ave. Culver City, Calif. 90230	*Plotit*	512K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	5	10	Yes	Yes	Yes	Yes	Yes	No	Yes	$550
Analytical Software, Inc. 10839 McCree Road Dallas, Texas 75238	*Boardroom Graphics*	128K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	2	4	Yes	Yes	No	Yes	Yes	Yes	Yes	$150
Autodesk, Inc. 2320 Marinship Way Sausalito, Calif. 94965	*Autocad*	512K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	4	256	Yes	Yes	No	No	Yes	No	Yes	$300
Autographix, Inc. 100 Fifth Ave. Waltham, Mass. 02154	*Autographix III*	246K	Yes	Yes	Yes	Yes	No	No	Yes	No	5	64	Yes	Yes	Yes	Yes	No	No	Yes	$895
Autographix	*Slide Expert*	246K	Yes	Yes	Yes	Yes	No	No	Yes	No	5	64	Yes	Yes	Yes	Yes	No	No	Yes	$199
Brightbill-Roberts & Co. 120 E. Washington St. Syracuse, N.Y. 13202	*Graphic Partner*	128K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	20	16	Yes	Yes	Yes	Yes	Yes	Yes	Yes	$89
Brightbill-Roberts	*Show Partner*	128K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	20	16	Yes	Yes	Yes	Yes	Yes	Yes	Yes	$79
Business and Professional Software, Inc. 143 Binney St. Cambridge, Mass. 02142	*BPS Business Graphics*	128K	Yes	Yes	Yes	No	No	Yes	No	No	1	16	No	No	No	No	No	No	Yes	$350
Business and Professional Software	*Overhead Express*	192K	No	No	No	Yes	No	No	No	No	4	8	No	No	Yes	No	Yes	No	No	$195
Business and Professional Software	*35mm Express*	256K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	3	63	Yes	Yes	Yes	Yes	No	No	Yes	$695
Chorus Data Systems, Inc. P.O. Box 370 Continental Blvd. Merrimack, N.H. 03054	*Insight*	512K	Yes	Yes	Yes	Yes	No	No	Yes	No	6	16	Yes	Yes	No	Yes	Yes	Yes	Yes	$295
Chorus Data Systems	*Insight Plus*	512K	Yes	Yes	Yes	Yes	No	No	Yes	No	6	256	Yes	Yes	No	Yes	Yes	Yes	Yes	$795
Communication Dynamics, Inc. 8532 S.W. St. Helen's Drive Wilsonville, Ore. 97070	*Sound Presentations*	256K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	7	8	Yes	Yes	Yes	Yes	No	No	Yes	$300
Computer Graphics Group, Inc. 3340 14th St. N.W. Atlanta, Ga. 30318	*PC Illustrator*	192K	Yes	Yes	Yes	Yes	Yes	No	Yes	No	8	8	Yes	Yes	Yes	Yes	No	No	No	$95
Computer Graphics Group	*Pregraf*	192K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	8	Yes	Yes	Yes	Yes	Yes	Yes	No	$149
Computer Support Corp. 2215 Midway Road Carrollton, Texas 75006	*Picture Perfect*	384K	Yes	Yes	Yes	No	No	Yes	No	No	13	9	Yes	No	No	Yes	Yes	Yes	Yes	$295
Computer Support	*Diagraph*	384K	No	No	No	Yes	Yes	No	Yes	Yes	13	9	No	No	Yes	Yes	No	No	No	$395
Cricket Software, Inc. Suite 206, 3508 Market St. Philadelphia, Pa. 19104	*Cricket Graph*	512K	Yes	Yes	Yes	Yes	Yes	Yes	No		Unlimited	8	Yes	Yes	Yes	Yes	Yes	Yes	Yes	$195
Data Business Vision, Inc. Suite B, 3510 Dunhill St. San Diego, Calif. 92121	*Graffhopper*	256K	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	2	16	Yes	Yes	No	No	Yes	Yes	No	$295
Data Business Vision	*Graphic Decision Support System*	320K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	5	16	Yes	Yes	No	Yes	Yes	Yes	No	$795
Data Business Vision	*Private Eye*	320K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	5	16	Yes	Yes	No	Yes	Yes	Yes	No	$99
Decision Resources, Inc. 26 Sylvan Road S. Westport, Conn. 06880	*Signmaster*	320K	No	No	No	Yes	No	No	No	No	8	8	Yes	Yes	Yes	Yes	No	No	No	$245

The companies included in this chart responded to a recent telephone survey conducted by *Computerworld*. Further product information is available from the vendors.

Bill Ulrich compiled by Christie Swan

Product Spotlight/PC Presentation Graphics Software

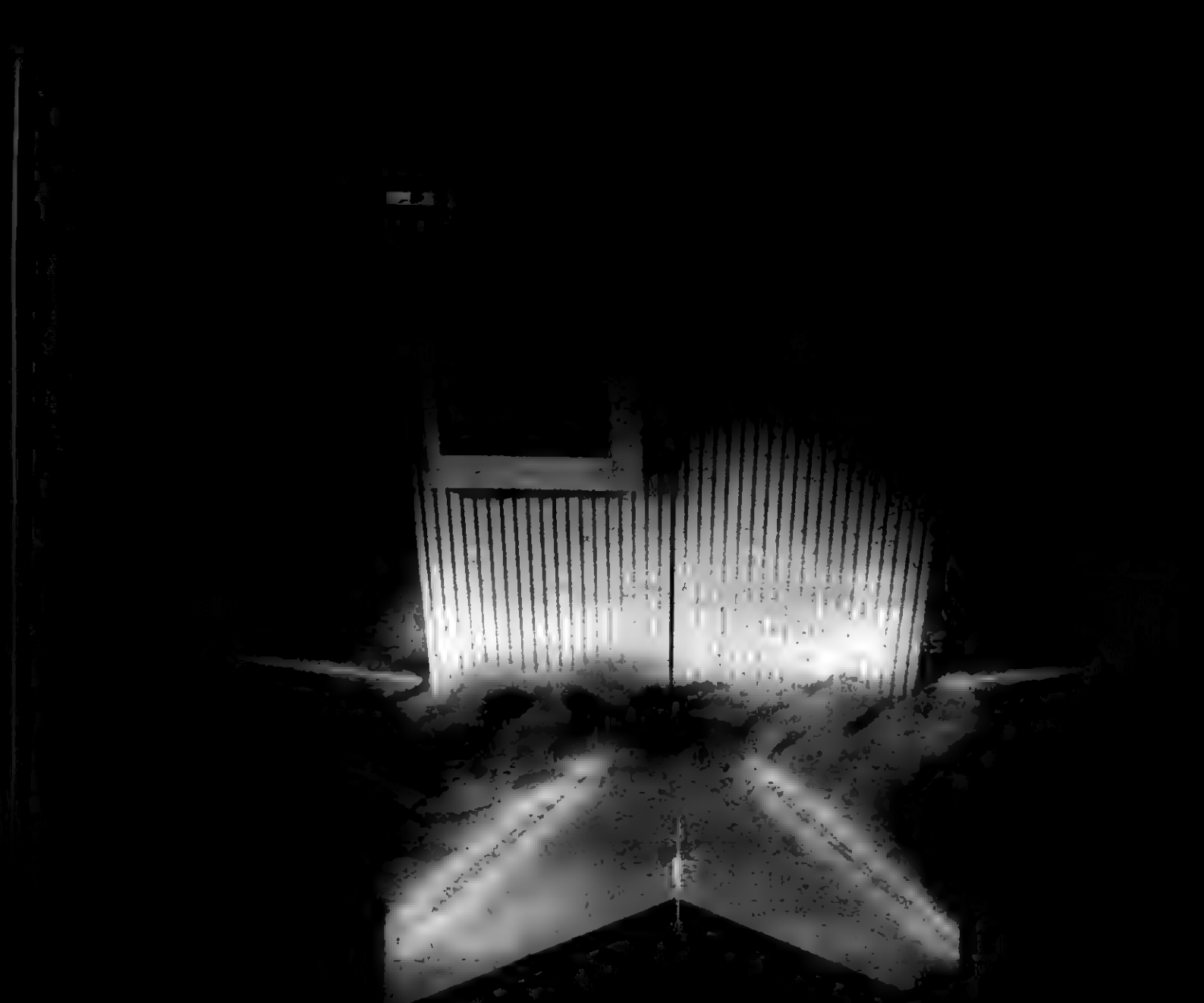
			Types of Charts								Presentation Features						File Format Support			
Company	Product	Recommended Memory (in bytes)	Bar	Line	Pie	Text	3-D	Scatter	Organization	Gantt	Number of Font Styles	Number of Colors	Display Multiple Charts on Screen	Edit Chart and Text on Same Screen	Symbol/Picture Library	Create 35mm Slides	ASCII	DIF	Lotus 1-2-3	Price
Decision Resources	*Chartmaster*	320K	Yes	Yes	Yes	Yes	No	Yes	No	No	8	8	Yes	Yes	Yes	Yes	Yes	Yes	Yes	$375
Decision Resources	*Diagram-master*	512K	Yes	Yes	No	Yes	Yes	No	Yes	Yes	8	8	Yes	Yes	Yes	Yes	No	No	No	$345
Decision Resources	*Mapmaster*	512K	No	No	No	No	No	No	No	No	8	8	Yes	Yes	Yes	Yes	Yes	Yes	Yes	$395
Digital Research, Inc. 60 Garden Court Monterey, Calif. 93942	*GEM Graph*	640K	Yes	Yes	Yes	Yes	Yes	No	Yes	No	2	16	Yes	Yes	No	Yes	Yes	No	Yes	$249
Digital Research	*GEM Draw*	640K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	2	16	Yes	Yes	Yes	Yes	Yes	No	Yes	$249
Digital Research	*GEM Collection*	640K	Yes	Yes	Yes	Yes	Yes	No	Yes	No	2	16	Yes	Yes	No	Yes	Yes	No	Yes	$198
Duncan-Atwell Computerized Technologies, Inc. 1200 Salem Ave. Hillside, N.J. 07205	*Lenpen/XT*	250K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Un-limited	Un-limited	Yes	Yes	Yes	Yes	Yes	Yes	Yes	$695
Electronic Cottage, Inc. 1842 Union St. San Francisco, Calif. 94123	*Image Management System Release 4.3*	512K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8	1,000	Yes	Yes	No	Yes	Yes	Yes	Yes	$995
Enertronics Research, Inc. #5 Station Plaza 1910 Pine St. St. Louis, Mo. 63103	*Energraphics 2.0*	512K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	8	16	Yes	Yes	Yes	Yes	Yes	Yes	Yes	$595
Enertronics Research	*Enercharts 2.0*	384K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	8	16	Yes	Yes	Yes	Yes	Yes	Yes	Yes	$395
EOS Corp. 6204 Brentwood Industrial Drive St. Louis, Mo. 63144	*MVP Micro Visual Productions*	256K	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	8	64	Yes	Yes	No	Yes	No	No	No	$195
Execucom Systems Corp. 3410 Far West Blvd. Austin, Texas 78731	*Impressionist*	512K	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	8	Un-limited	Yes	Yes	No	Yes	Yes	Yes	Yes	$995
Fox & Geller, Inc. 604 Market St. Elmwood Park, N.J. 07407	*Xgraph*	256K	Yes	Yes	Yes	Yes	No	No	No	No	1	4	No	Yes	No	No	Yes	No	No	$195
Fox & Geller	*Grafox*	256K	Yes	Yes	Yes	Yes	No	No	No	No	1	4	No	Yes	No	No	Yes	No	No	$99
Fox & Geller	*Xgraph 3*	256K	Yes	Yes	Yes	Yes	No	No	No	No	1	4	No	Yes	No	No	Yes	No	No	$295
General Parametrics Corp. 1505 Solano Ave. Berkeley, Calif. 94707	*Picture It! Version 2*	320K	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	24	1,000	Yes	Yes	No	No	Yes	Yes	No	$700
Graphpaks Corp. P.O. Box 591 4806 W. Taft Road Liverpool, N.Y. 13088	*Graftime*	320K	Yes	Yes	Yes	Yes	No	No	Yes	No	4	16	No	Yes	No	Yes	Yes	No	No	$395
Graphic Communications, Inc. 200 Fifth Ave. Waltham, Mass. 02254	*Graphwriter*	256K	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	15	Un-limited	No	No	No	Yes	No	Yes	No	$395-$595
Graphic Communications	*Freelance*	640K	No	No	No	Yes	No	No	No	No	25	Un-limited	Yes	Yes	Yes	Yes	Yes	No	Yes	$395
Graphic Software Systems, Inc. 6000 S.W. Garnet Drive Beaverton, Ore. 97005	*GSS-Chart*	512K	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	5	Un-limited	Yes	Yes	Yes	Yes	Yes	Yes	Yes	$295
Graphware, Inc. P.O. Box 373 Middletown, Ohio 45042	*Charts Unlimited*	256K	Yes	Yes	No	Yes	No	No	Yes	Yes	1	0	Yes	Yes	Yes	No	Yes	No	Yes	$295
Golden Software P.O. Box 281 Golden, Colo. 80402	*Grapher*	256K	Yes	Yes	No	No	Yes	Yes	Yes	No	15	16	Yes	Yes	No	Yes	Yes	No	Yes	$199
Golden Software	*Golden Graphics System*	128K	Yes	Yes	Yes	Yes	Yes	No	No	No	15	0	Yes	No	No	Yes	Yes	No	No	$299
Hewlett-Packard Co. 3410 Central Expwy. Santa Clara, Calif. 95051	*The Graphics Gallery Collection*	384K	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	17	8	Yes	Yes	Yes	Yes	Yes	Yes	Yes	$695
Hypergraphics Corp. 306 Carroll Blvd. Denton, Texas 76201	*The Business Presentation Graphics System*	256K	Yes	Yes	Yes	Yes	Yes	No	No	No	4	16	Yes	Yes	Yes	Yes	Yes	Yes	Yes	$475

Product Spotlight/PC Presentation Graphics Software

Company	Product	Recommended Memory (in bytes)	Types of Charts: Bar	Line	Pie	Text	3-D	Scatter	Organization	Gantt	Presentation Features: Number of Font Styles	Number of Colors	Display Multiple Charts on Screen	Edit Chart and Text on Same Screen	Symbol/Picture Library	Create 35mm Slides	File Format Support: ASCII	DIF	Lotus 1-2-3	Price
Ansalia Corp. Suite 101 20833 Stevens Creek Blvd. Cupertino, Calif. 95014	*PC Presents*	256K	Yes	Yes	Yes	Yes	No	Yes	No	Yes	2	40	No	Yes	No	Yes	Yes	No	Yes	$495
Infographics, Inc. 17961 Cowan Ave. Irvine, Calif. 92714	*Choice*	128K	Yes	Yes	Yes	No	No	No	No	No	1	7	Yes	No	No	Yes	Yes	Yes	Yes	$395
Innovative Software, Inc. 9875 Widmer Road Lenexa, Kan. 66215	*Fast Graphs*	128K	Yes	Yes	Yes	No	No	No	No	No	8	16	No	Yes	No	No	Yes	No	No	$140
Innovative Software	*Smart Software System*	256K	Yes	Yes	Yes	Yes	Yes	Yes	No	No	8	16	No	Yes	No	Yes	Yes	No	Yes	$895
International Electronic Machinery, Inc. P.O. Box 1869 Fort Collins, Colo. 80522	*Plott 77*	512K	No	Yes	No	Yes	No	Yes	Yes	No	1	16	Yes	No	Yes	No	No	No	No	$395
Interchart Software, Inc. 104 Carnegie Center Princeton, N.J. 08540	*Chartbuster/ PC*	512K	Yes	Yes	Yes	Yes	Yes	Yes	No	No	8	III	Yes	No	Yes	Yes	Yes	No	Yes	$750
Jandel Scientific 2656 Bridgeway Sausalito, Calif. 94965	*Sigma Plot*	256K	Yes	Yes	No	Yes	No	Yes	No	No	1	16	No	No	No	No	Yes	Yes	No	$350
Jandel Scientific	*Digital Paintbrush*	256K	Yes	Yes	Yes	Yes	Yes	No	No	No	50	4	Yes	Yes	Yes	Yes	No	No	No	$395
Konix Technologies Corp. 269 Mt. Herman Road Scotts Valley, Calif. 95066	*Executive Presentation Kit*	192K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	II	Yes	Yes	Yes	Yes	Yes	Yes	Yes	$116
Martin Marietta Data Systems P.O. Box 2292 Princeton, N.J. 08540	*Showit*	128K	Yes	Yes	Yes	Yes	Yes	No	No	No	1	18	No	No	No	Yes	Yes	Yes	No	$250
Media Cybernetics, Inc. 7050 Carroll Ave. Takoma Park, Md. 20912	*Nimbus*	512K	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	18	256	Yes	No	No	Yes	Yes	Yes	Yes	$195
Metasoft Corp. 6509 W. Frye Road Chandler, Ariz. 85224	*The Benchmark Graphics*	384K	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	15	Un-limited	Yes	Yes	No	Yes	Yes	Yes	Yes	$199
Micrografx, Inc. 1820 N. Greenville Richardson, Texas 75081	*Window It Draw*	320K	No	No	Yes	Yes	No	No	Yes	No	III	16	Yes	Yes	Yes	Yes	Yes	Yes	Yes	$199
Micrografx	*PC Draw*	256K	No	No	No	Yes	No	No	Yes	No	3	8	Yes	Yes	Yes	Yes	Yes	No	No	$395
Micrografx	*In-A-Vision*	320K	No	No	Yes	Yes	No	No	Yes	No	9	16	Yes	Yes	Yes	Yes	Yes	Yes	No	$495
Micropro International Corp. 33 San Pablo Ave. San Rafael, Calif. 94903	Chartstar	192K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9	II	Yes	No	No	No	Yes	Yes	Yes	$295
Microsoft Corp. P.O. Box 97017 16011 Northeast 36 Way Redmond, Wash. 98073	*Microsoft Chart 2.0*	256K	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	6	16	Yes	Yes	No	Yes	Yes	Yes	Yes	$295
Omicron Software Suite 590 57 Executive Park Atlanta, Ga. 30329	*Plotrax*	256K	Yes	Yes	Yes	No	Yes	Yes	No	No	1	1	No	Yes	No	No	Yes	Yes	Yes	$349
Pal Software Corp. Suite 131 1560 N. La Brea Ave. Los Angeles, Calif. 90028	*Hotpak Presentation System, 2.10*	256K	Yes	Yes	Yes	Yes	No	No	Yes	Yes	39	4	Yes	Yes	Yes	Yes	Yes	No	Yes	$350
Paperback Software International 2830 9th St. Berkeley, Calif. 94710	*Draw-It*	256K	Yes	Yes	Yes	Yes	No	Yes	No	No	2	17	No	Yes	Yes	No	Yes	No	No	$29.95
PC Software #418 9120 Gramercy Drive San Diego, Calif. 92123	*Executive Picture Show*	256K	Yes	Yes	Yes	Yes	Yes	No	Yes	No	13	II	Yes	Yes	Yes	Yes	No	No	Yes	$245
Peachtree Software, Inc. 4355 International Blvd. Norcross, Ga. 30093	*Business Graphics System*	128K	Yes	Yes	Yes	Yes	Yes	Yes	No	No	7	8	Yes	Yes	No	No	Yes	No	No	$49

Product Spotlight/PC Presentation Graphics Software

Company	Product	Recommended Memory (in bytes)	Types of Charts: Bar	Line	Pie	Text	3-D	Scatter	Organization	Gantt	Presentation Features: Number of Font Styles	Number of Colors	Display Multiple Charts on Screen	Mix Chart and Text on Same Screen	Symbol/Picture Library	Create Slides	File Format Support: ASCII	DIF	Lotus 1-2-3	Price
Pyxel Applications 2917 Mohawk Drive Richmond, Va. 23235	*Pyxel Visuals*	192K	No	No	No	Yes	No	No	No	No	2	14	No	Yes	No	Yes	Yes	No	No	$98
Redding Group, Ltd. 109 Danbury Road Ridgefield, Conn. 06877	*Graftalk 4.0*	256K	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	5	16	Yes	Yes	No	Yes	Yes	No	Yes	$695-$795
Samna Corp. 2700 N.E. Expwy. Atlanta, Ga. 30345	*Samna Decision Graphics*	256K	Yes	Yes	Yes	Yes	Yes	Yes	No	No	5	16	Yes	Yes	Yes	Yes	Yes	Yes	Yes	$450
SSI Enterprises Corp. P.O. Box 582221 Tulsa, Okla. 74158	*Lighthouse*	256K	Yes	Yes	Yes	No	Yes	No	No	No	1	3	No	No	No	Yes	Yes	Yes	No	$495
Softel, Inc. 25 Maple Lane East Hampton, N.Y. 11937	*Videogram*	640K	No	No	No	Yes	No	No	No	No	43	64	Yes	Yes	Yes	Yes	No	No	No	$75
Software Publishing Corp. P.O. Box 7210 1901 Landings Drive Mountain View, Calif. 94039	*Harvard Presentation Graphics*	384K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	5	16	Yes	Yes	No	Yes	Yes	No	Yes	$395
Spectrum Holobyte, Inc. Suite 325, 1050 Walnut Boulder, Colo. 80302	*The Executive Picture Show Version 3*	256K	Yes	Yes	Yes	Yes	Yes	No	Yes	No	12	3	Yes	Yes	Yes	Yes	No	No	No	$245
Stolfo Systems, Inc. 10430 S. DeAnza Blvd. Cupertino, Calif. 95014	*Sysm*	256K	Yes	Yes	Yes	No	No	No	No	No	2	8	No	Yes	Yes	Yes	Yes	Yes	Yes	$199
STSC, Inc. 2115 E. Jefferson St. Rockville, Md. 20852	*Statgraphics*	640K	Yes	Yes	Yes	Yes	Yes	Yes	No	No	1	16	No	Yes	Yes	Yes	Yes	Yes	Yes	$795
Ventura Software 16200 Ventura Blvd. Encino, Calif. 91436	*Botticelline Graf*	256K	Yes	Yes	Yes	Yes	No	No	No	No	1	7	No	No	No	No	Yes	No	No	$99
Visible Systems Corp. 336 Baker Ave. Concord, Mass. 01742	*Visible Analyst*	384K	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	7	12	No	Yes	Yes	No	Yes	No	Yes	$595
Visual Communications Network, Inc. 238 Main St. Cambridge, Mass. 02142	*Executalk*	256K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	11	16	Yes	Yes	Optional	Yes	No	Optional	No	$395
Visual Communications Network	*VCN Concorde*	640K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	15	64	Yes	Yes	Yes	Yes	No	Yes	Yes	$695
Zenographics, Inc. Suite 250 19752 MacArthur Blvd., Irvine, Calif. 92715	*Mirage*	512K	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	60	Un-limited	Yes	Yes	Yes	Yes	Yes	Yes	No	$895
Zenographics	*Autumn*	512K	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	60	Un-limited	Yes	Yes	Yes	Yes	No	No	No	$595
Z-Soft Corp. Suite A-495 1950 Spectrum Circle Marietta, Ga. 30067	*PC Paintbrush Designer series*	320K	No	No	No	Yes	No	No	No	No	75	64	Yes	Yes	No	Yes	No	No	Yes	$235



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Reliance STAR brings the power of parallel processing technology to your transaction processing environment. You can design and buy for today. And grow into tomorrow. Up to 1000 terminals, without sacrificing any of your hardware/software investments.

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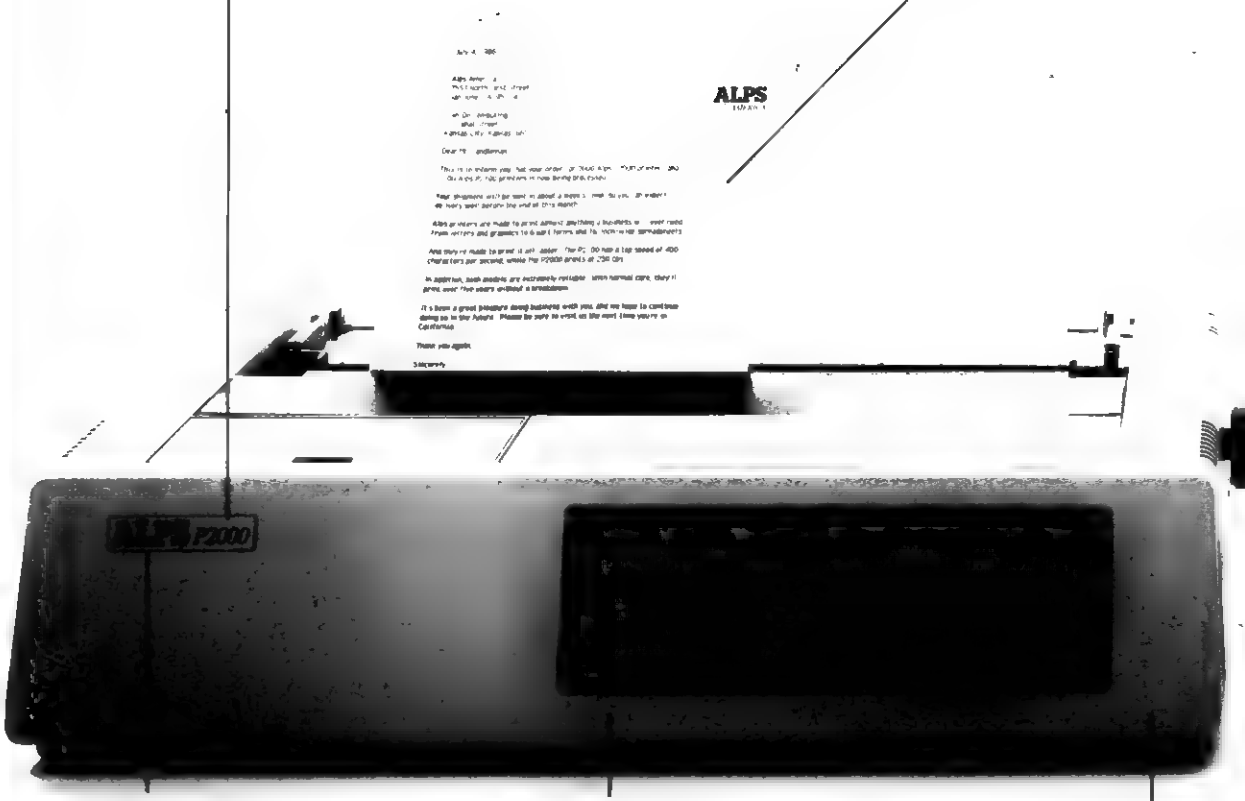
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Only $995.

Fast. Top speed 250 cps in draft mode.



Manufactured by Alps Electric, a $1.5 billion Japanese maker of computer and electronic products, and member of the International Fortune 500.

Fully compatible with all the most popular business PCs and software.

Built like a tank.

Welcome to the Alps.

The Alps P2000™ and new P2100™ Dot Matrix Printers. They just may be the perfect printers for a department full of PCs.

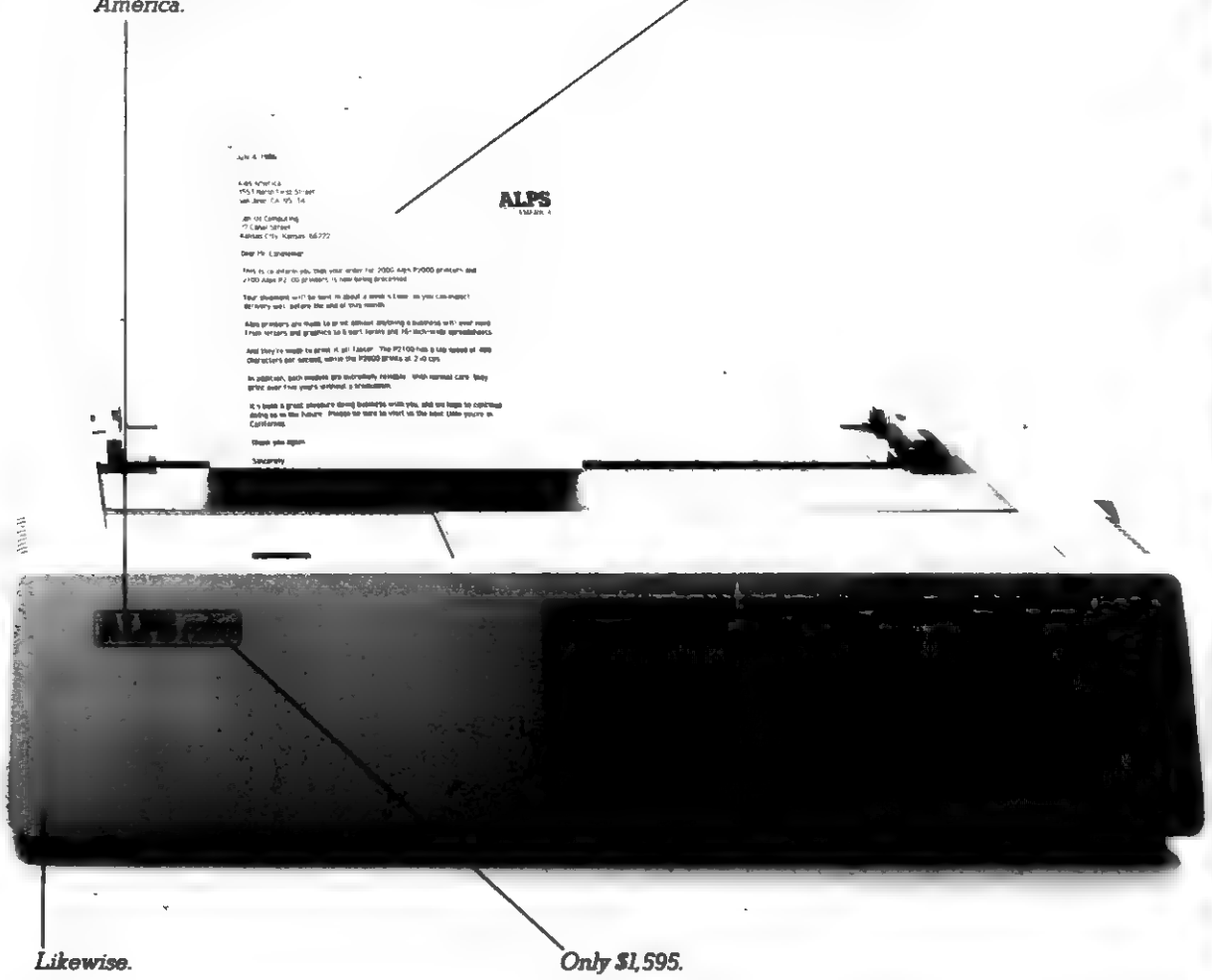
They're fast. The P2100 prints drafts at an amazing 400 characters per second (cps), the P2000 at an almost amazing 250 cps.

They're reliable. With normal care, they'll last for over five years without a breakdown.

THEY ARE.

Sold, serviced and supported in the U.S.A. by Alps America.

Very fast. Top speed 400 cps in draft mode.



Likewise.

Only $1,595.

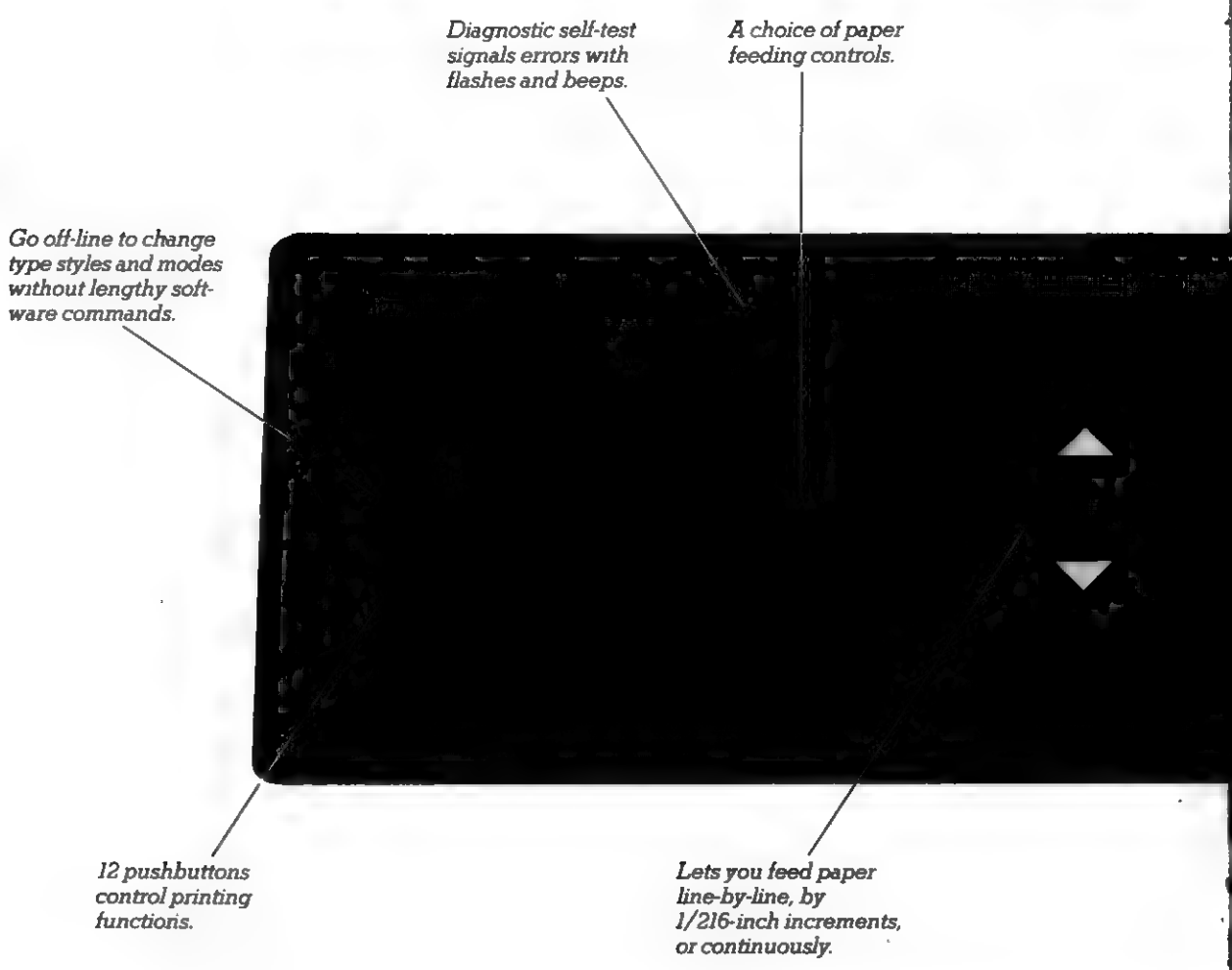
And they're versatile. They'll print most anything, and run with all the most popular PCs and software.

Now, if you'd like to explore these Alps further, our free tour begins on the next page.

It's your chance to see something you probably don't see every day.

Printers that work as hard as you do.

MEET
DISTINGUIS



The first thing that sets Alps printers apart from similarly-priced models is their sheer wealth of printing functions. And the ease with which you can perform them.

For example, you can change type styles or print modes without getting involved in lengthy software commands. Just push a button on the front panel instead.

Which is about all you'll ever have to do to handle any Alps printing job. Whether you're feeding paper in 1/216-inch increments or reprinting

T OUR
HED PANEL.



data stored in the print buffer.

The built-in print buffer (4K expandable to 256K) also frees up your PC for other jobs while the Alps is still printing.

And in the unlikely event of an operating error, our panel will immediately diagnose the problem and inform you.

With distinguished beeps and flashes.

FEED IT A

Can print 6-part forms.



3 standard paper feeding methods, including top, bottom and rear feed.

Most business printers are very picky.

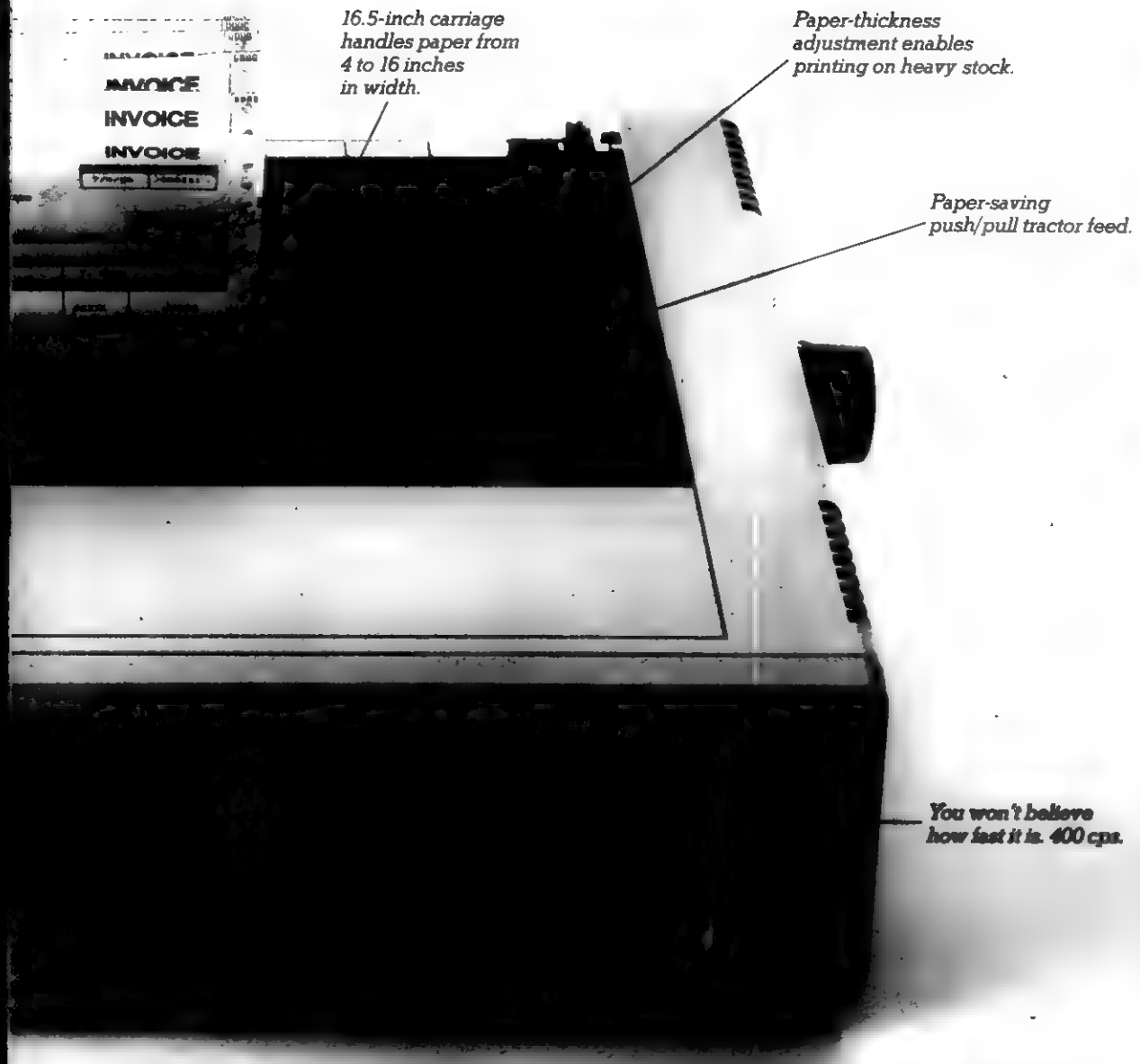
They simply refuse to deal with some of the jobs you have to deal with. Like printing on heavy stock. Or on oversized sheets.

But Alps printers are different.

They're made to print almost anything your business will ever need. From letters and graphs to six-part forms and 16-inch-wide spreadsheets.

And they not only handle most

NYTHING.

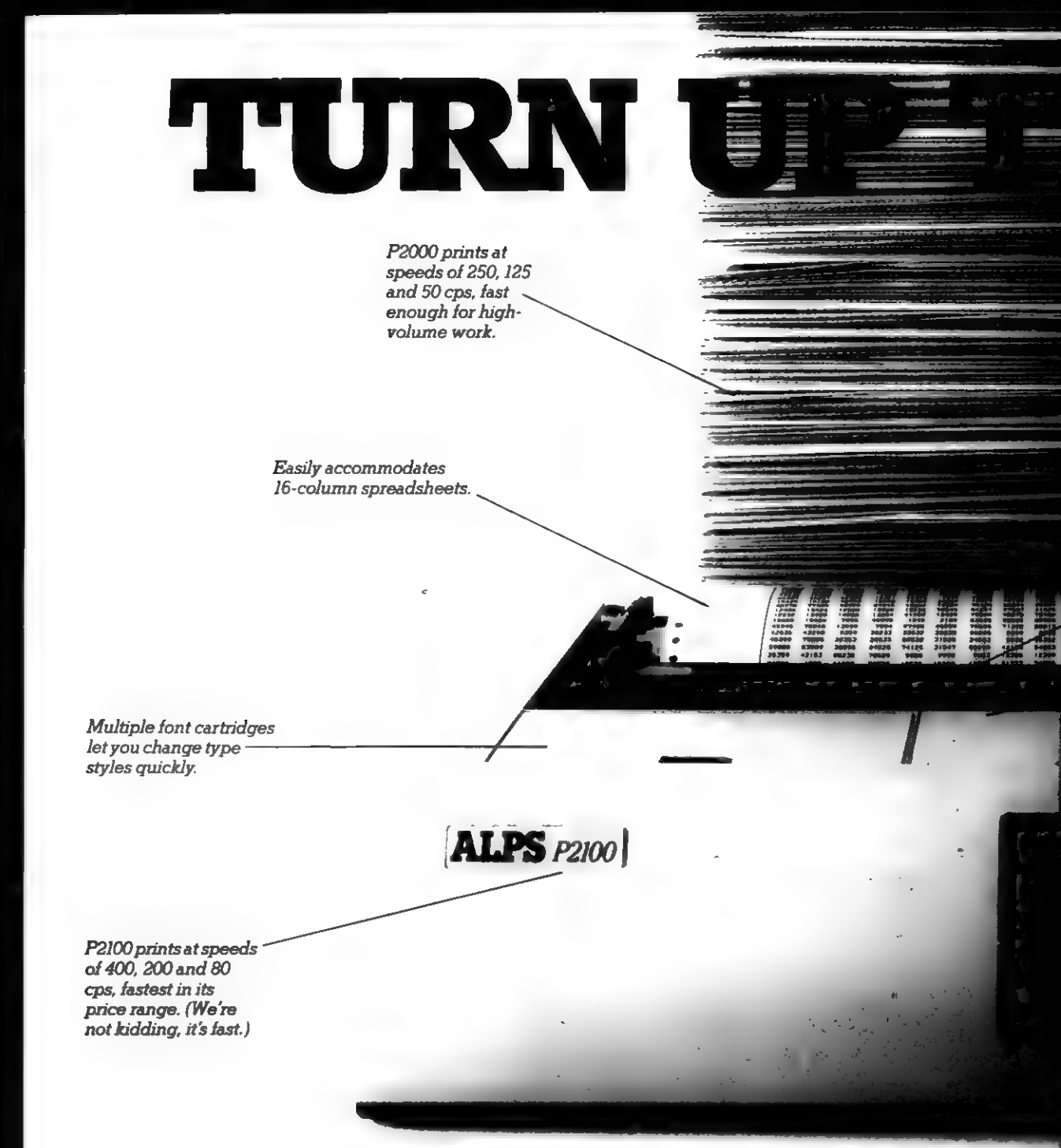


everything, they handle it more efficiently.

Both come with a built-in two-way tractor feed (push and pull) that saves paper other printers would normally waste. Plus a choice of three different paper feeding methods, all standard.

All in all, you'd be hard pressed to find printers with a greater appetite for work.

TURN UP

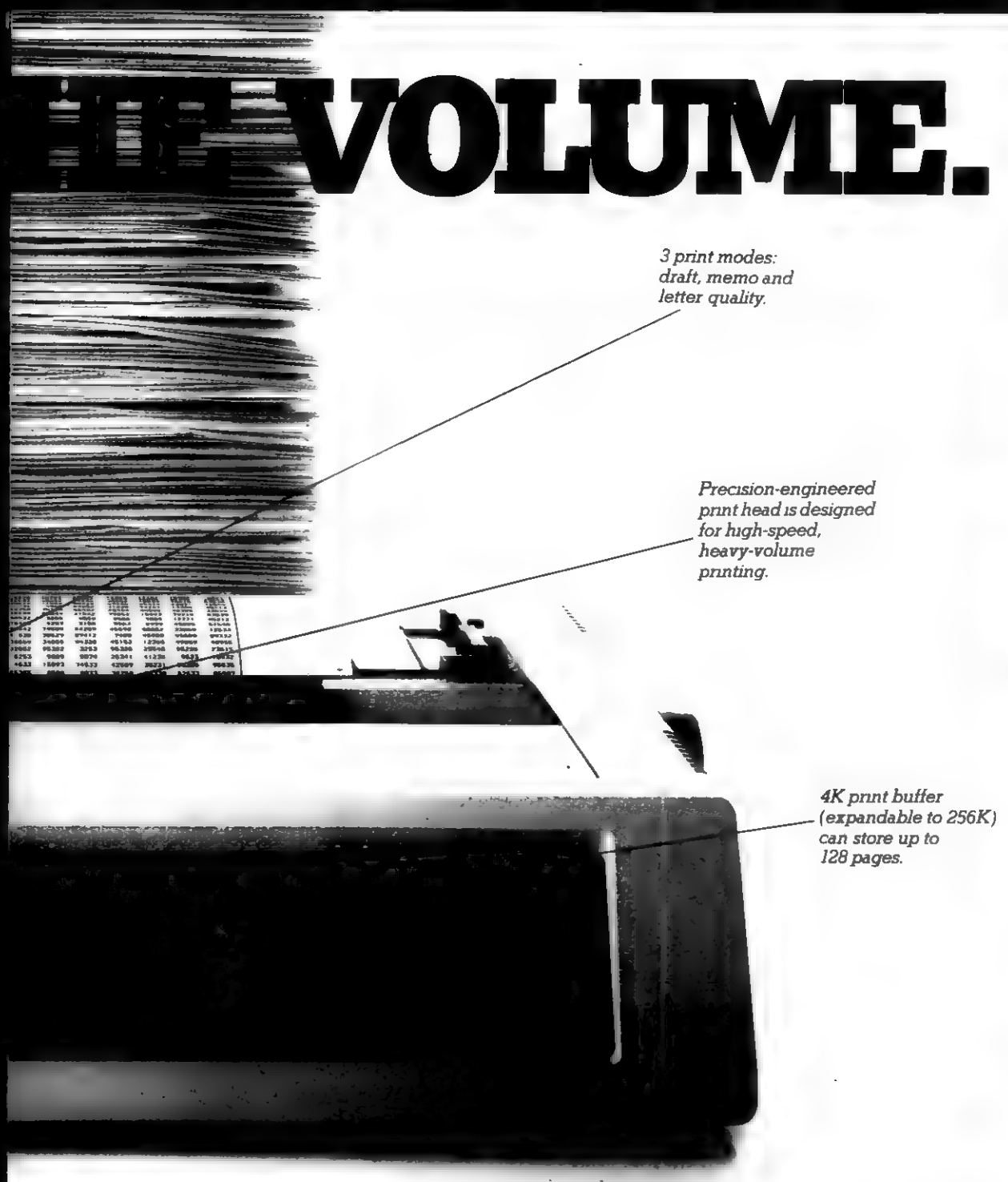


Kept adequately fed, Alps printers will handle more work than any printers in their class.

Each offers a choice of three speeds. All fast.

The P2100 prints drafts at 400 cps, memos at 200 cps and letter-quality documents at 80 cps, while the P2000 prints at 250, 125 and 50 cps in its three modes.

HE VOLUME.



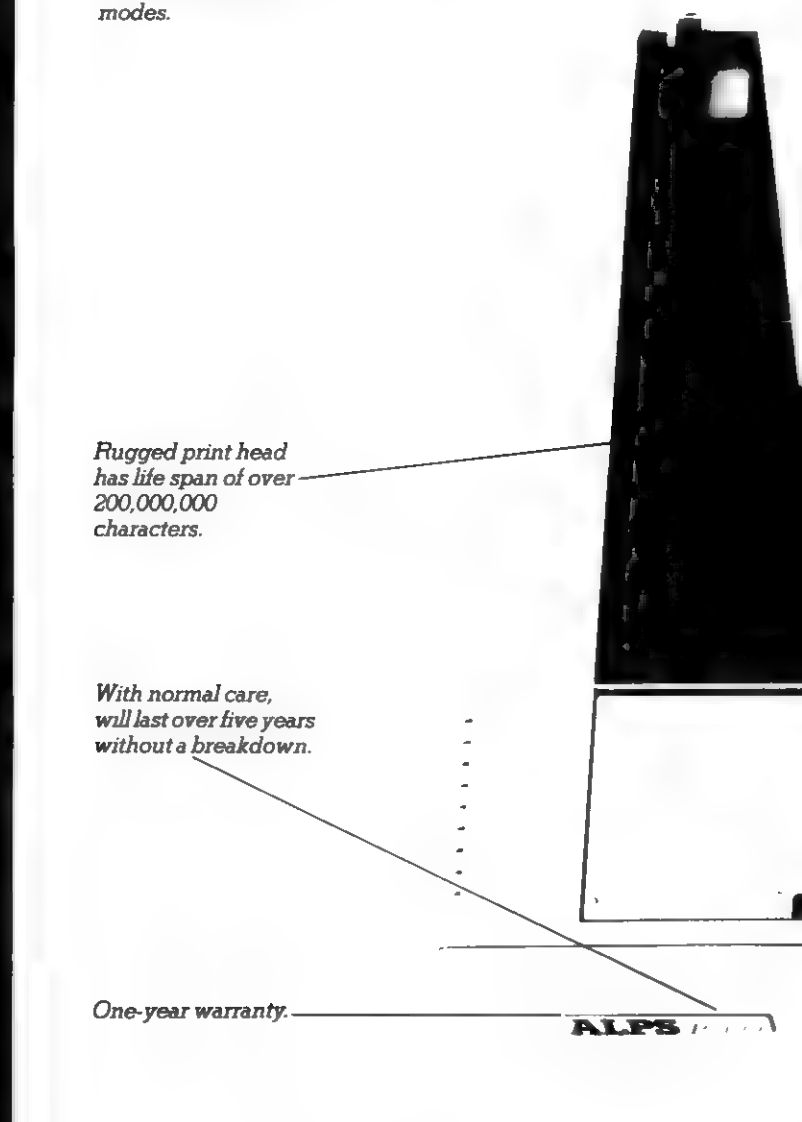
So either printer can easily take on all the work an office full of PCs can dish out.

And they'll take care of it faster, thanks to time-saving features like a built-in tractor feed, expandable print buffer and multiple type font cartridges.

In fact, for heavy volume work, Alps printers stack up favorably against much more expensive machines.

LISTEN TO

Superb print quality in all three printing modes.



Rugged print head has life span of over 200,000,000 characters.

With normal care, will last over five years without a breakdown.

One-year warranty.

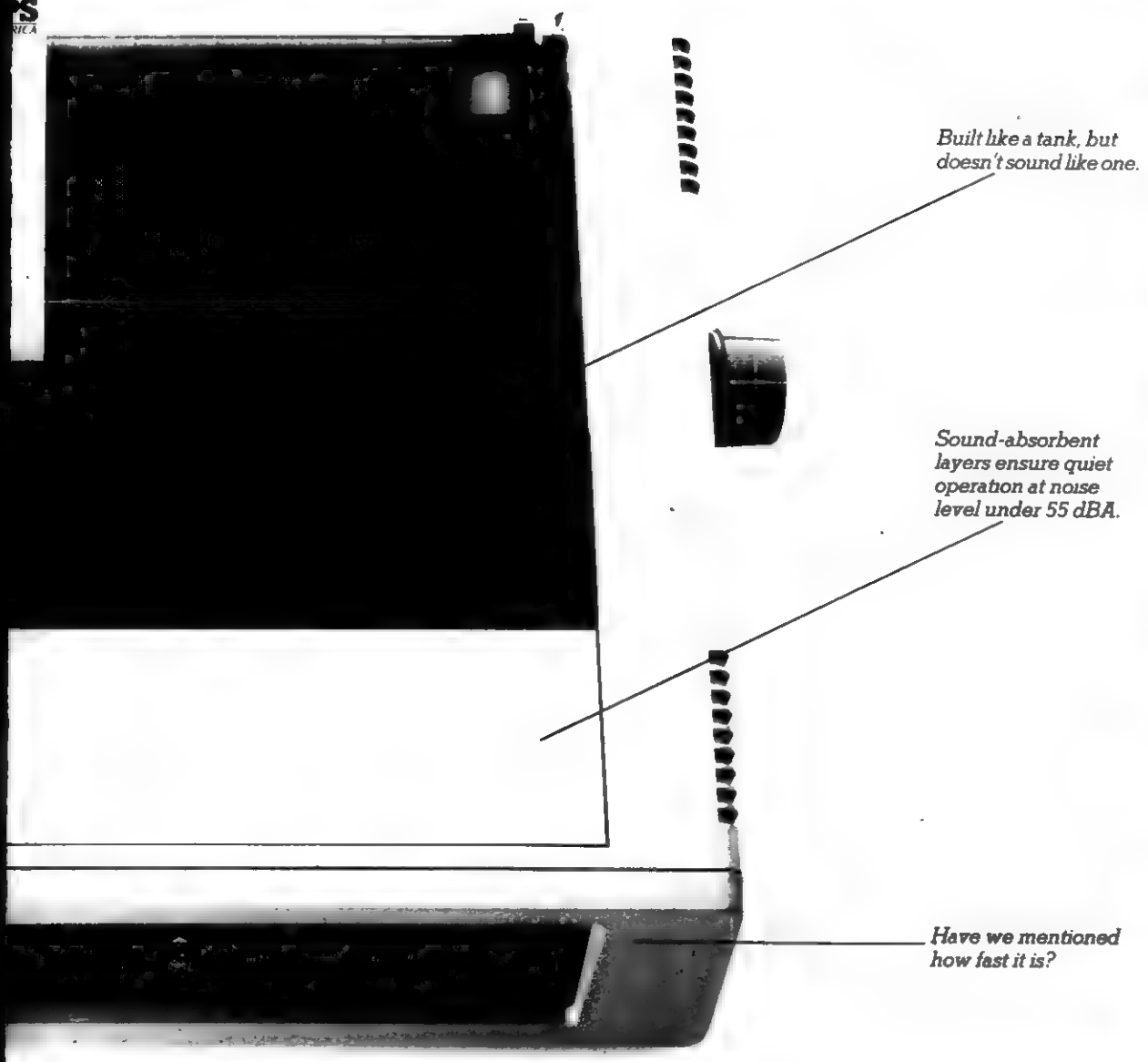
Even when the volume's up all the way, you won't hear much. Because Alps printers are built to print up a storm without sounding like one.

Every open space is covered with sound-absorbent layers, keeping noise in and dust out.

But Alps printers aren't just built to run quietly. They're built to run a long, long time.

Our precision-engineered print head will deliver over 200 million characters of superb output. No matter how hard you work it.

THIS PAGE.



What's more, if you give our printers normal care, they'll give you over five years of trouble-free printing.

Which is not surprising when you consider that they're built by Alps Electric, a $1.5 billion Japanese company that's been successfully manufacturing computer printers for over a decade.

And though our printers are quiet, we're sure you'll be hearing a lot about them from now on.

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The one thing better than an Alps demonstration on paper is an Alps demonstration in person.

Especially when it could get you a free trip for two to the Japanese or Swiss Alps. For 10 days. With all expenses paid, including airfare, hotel and meals.

Just fill out and send in the attached coupon. Or, if it's been removed, you can call or write us at the address shown below.

We'll then contact you to arrange a free demonstration of the Alps P2000 or P2100 at your convenience. And we'll enter your name in our drawing for a free Alps vacation.

After all, anyone working without an Alps printer could certainly use a vacation.

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☐ Yes, I'd like to see the Alps P2000 and P2100 Dot Matrix Printers in action. Please contact me to arrange a free demonstration. And enter my name in your drawing for a free 10-day vacation to the Japanese or Swiss Alps.

☐ No, I'm not interested in a free demonstration right now. But please enter my name in your drawing anyway.

NAME _____

COMPANY: _____ TITLE: _____

ADDRESS: _____

CITY: _____ STATE ____ ZIP _____ PHONE: _____

NO PURCHASE NECESSARY TO ENTER OR CLAIM A PRIZE.

To enter sweepstakes print the information on this card and return it to: Alps America, 3553 North First St., San Jose, CA 95134. Only one entry per person. Mechanically reproduced entries not eligible. All entries must be received no later than Sept. 30, 1986. Not responsible for late, lost or misdirected mail.

2. Winner will be selected in a random drawing on or about October 5, 1986 from all entries received under the supervision of Marden Kane, an independent judging organization. By participating in the sweepstakes, entrants agree to be bound by the rules and the decisions of the judges, which shall be final. Winner will be notified by mail, and must be required to sign an Affidavit of Eligibility and Release which must be returned within 14 days, or an alternative winner will be selected. The awarding of the prizes and individual travel shall be made at the discretion of your employer and/or in accordance with your employer's written policies governing promotion awards, where applicable. Winner grants permission to the use of their name, photograph, likeness for advertising and promotion for this and similar promotions without additional compensation. Odds of winning depend upon the number of entries received. All taxes are the responsibility of the winner.

3. Prize structure: 1 Grand Prize of 10 days for two to the Japanese or Swiss Alps. Trip consists of round trip air transportation (coach) from a major airport nearest to the winner's residence, 9 nights and 10 days hotel accommodations, 2 meals daily and $500 spending money. No prize substitution permitted, nor is prize transferable. Trip must be completed by June 30, 1987 and is subject to availability.

4. Sweepstakes open to individuals who purchase, currently evaluate, recommend, or use printers for personal computers, and are residents of the United States except for employees and their immediate families of Alps Electric (U.S.A.), Inc., their subsidiaries, affiliates, advertising or public relations agencies, and Marden Kane. Void where prohibited by law.

5. For the name of the winner, send a stamped, self-addressed envelope to: See the Alps, Winner, Alps America, 3553 North First St., San Jose, CA 95134.

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In Depth

Image processing offers MIS a new view of information

Digital image processing will change the way information is stored, accessed, transmitted and analyzed. Yet few in MIS are aware of the potential effects — reduced costs, improved information control and easier access — on the organization.

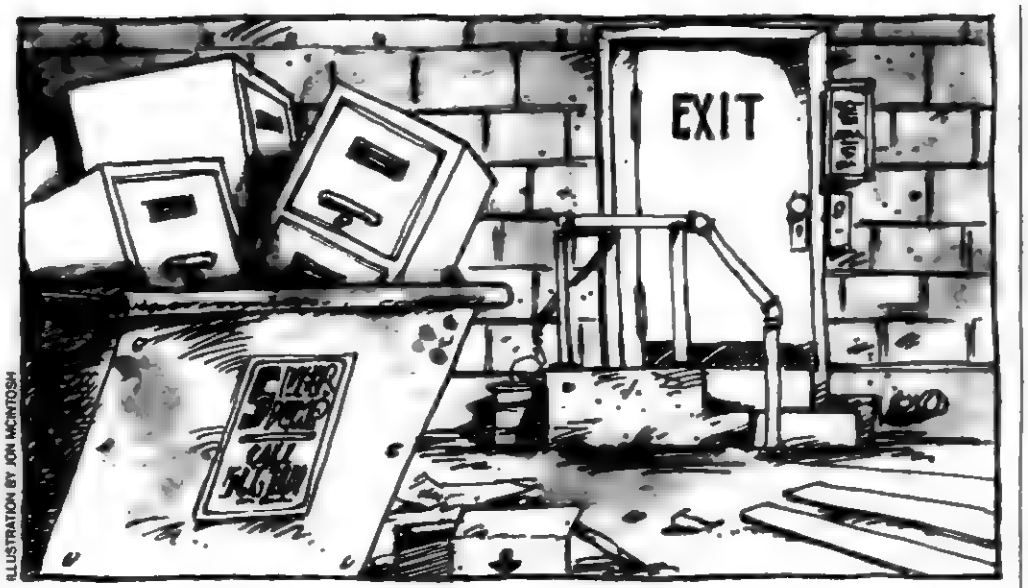


ILLUSTRATION BY JON MCINTOSH

By CONNIE MOORE

MIS directors rarely view the elimination of paper as exciting work or even as a task within DP's domain. Office automation specialists, trying for years to achieve a "paperless office," have succeeded only in creating a "less paper" office.

The burden of storing and retrieving vital business records traditionally has fallen on the records management department. This department has been trying for years to cope with manual filing systems, hordes of filing clerks and cumbersome micrographics equipment.

Digital image processing has the potential to change this otherwise bleak picture. Through digital image processing, paper documents can be scanned line by line, converted to digital bit streams, stored on optical disks and displayed on high-resolution computer terminals. Once converted to digital format, document images can be transmitted over communications networks and accessed by several users at the same time.

This technology represents the first opportunity to literally destroy original documents and replace them with computerized images.

Digital image processing technology is not simple. Digital image systems frequently use optical disks, data base management systems, artificial intelligence, local-area networks and advanced optical character recognition (OCR) techniques. Often these systems must achieve throughput rates that equal or surpass large transaction systems. In addition, a large image system can cost several million dollars for hardware alone; the software development and integration costs may be even greater.

The role of MIS

Despite the complexity of digital image systems and the overwhelming interest in this technology by several organizations in both public and private sectors, few MIS professionals are aware of digital image processing and its potential impact. Instead, the technology has caught the attention of the records management and end-user departments. Because these departments process paper on a daily basis, they are more aware of the paper problems within organizations than either DP or office automation specialists.

Because MIS is relatively uninvolved in digital image processing, some organizations unknowingly allow costly and sophisticated image systems to be designed and installed with

Moore is a manager in the Management Information Consulting Division of Arthur Andersen & Co. in Washington, D.C.

minimal input from the MIS department. All too frequently, the unsophisticated buyer relies upon hardware vendors to complete the functional and technical design of the system.

In other instances, the records management department or end users design the system without a good understanding of image indexing requirements, functional requirements, audit trails, networking and throughput requirements, integration with data processing systems, performance and other complex design issues.

Data processing professionals need to understand what digital image technology is and the importance of incorporating this technology into DP's domain.

Image processing may be the next major type of information handling that will fundamentally change the way information is stored, accessed, transmitted and analyzed. The MIS department must become involved in this new technology as organizations move away from paper-based information to digital image systems.

> ***Image processing may be the next major type of information handling that will fundamentally change the way information is stored, accessed, transmitted and analyzed.***

Why digital image processing?

Digital image processing is well suited for organizations — such as insurance companies, banks, financial institutions, transportation and shipping companies, manufacturers, engineering companies and government agencies — that deal with large document-handling problems. Several of the more pioneering organizations that are aggressive in the use of leading-edge technologies for productivity enhancement have become extremely interested in digital image systems during the past two to three years.

Through its involvement in wholesale equipment procurements and major installations, the U.S. government has been largely responsible for the initial interest and growth of image systems. Some of the earliest federal installations include the Library of Congress, the U.S. Patent & Trademark Office, the U.S. Army and Air Force and the Internal Revenue Service. The government-sponsored image systems users group, Digital Image Applications Group (DIAG), has grown to more than 400 members in the past two years. Several other state and federal agencies are currently designing and procuring digital image systems.

Because companies are concerned about divulging too much information to competitors with similar business problems, details on image processing installations in private industry are less available. However, interest in the technology remains quite strong, especially for paper-intensive insurance, banking and engineering operations. Some well-known commercial user organizations include Security Pacific National Bank, United Services Automobile Association and General Electric Co.

Problems and solutions

DP and office automation systems have not eliminated the "paper factories," because nearly two-thirds of the paperwork used in businesses is available only in nondigital format.

These paper documents cannot be input into computer systems for a number of reasons. First, drawings, signatures and pictures cannot be typed into the computer. In addition, manual data entry would be far too time-consuming and prohibitively expensive. The on-line computer storage costs would be astronomical. Finally, certain documents must be retained in image format for legal purposes.

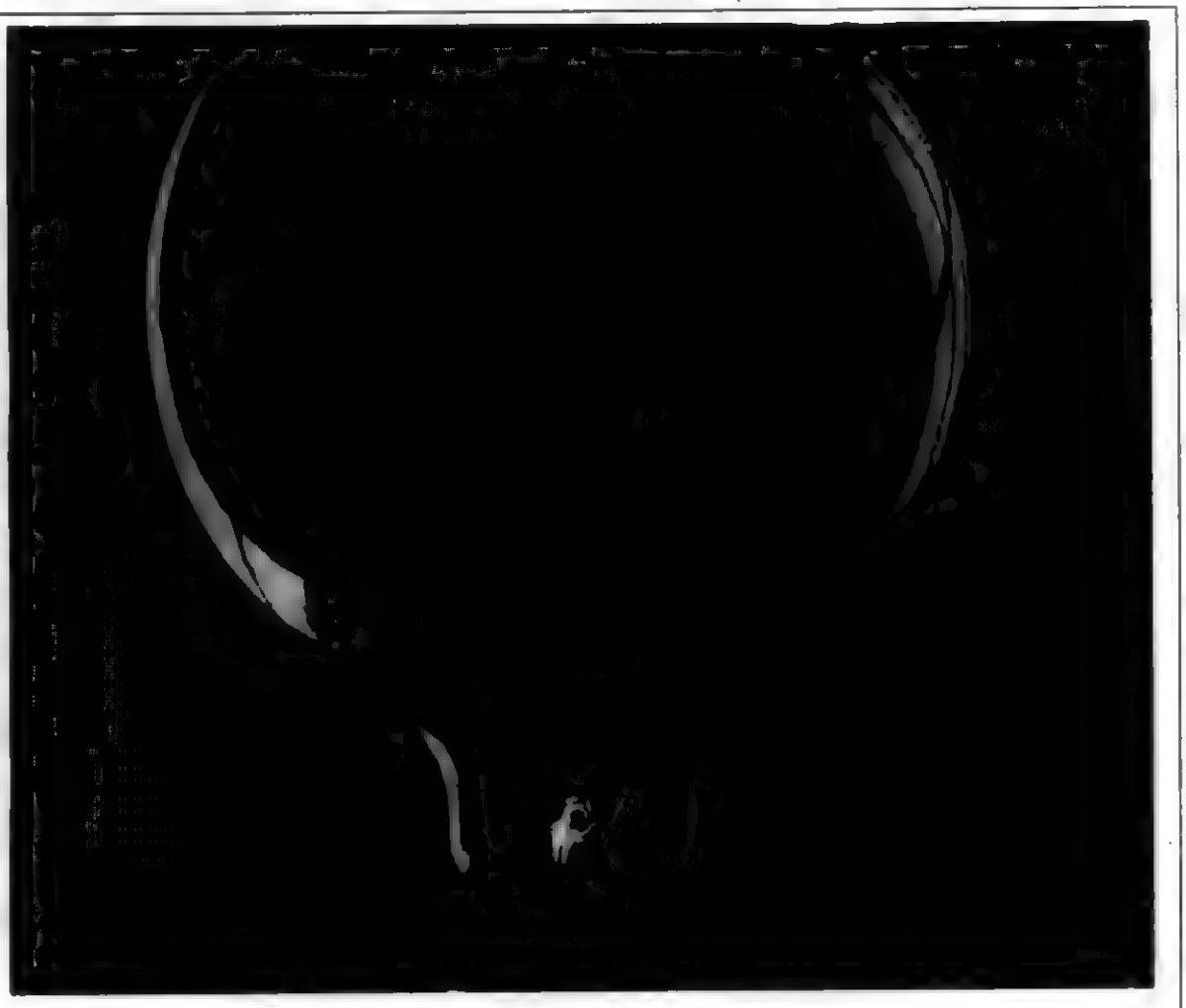
In the past, paper filing systems could be replaced only by cumbersome and labor-intensive micrographics systems. Digital image systems offer an alternative to traditional micrographics.

Digital image processing eliminates the need for organizations to use hard copies of paper documents. Instead of paper files, image processing systems create digital images of documents that can be stored and retrieved electronically. Some of the benefits include the ability to do the following:

- Reduce costs.
- Safeguard information: improved document control, elimination of lost documents.
- Reduce storage space.
- Reduce clerical personnel requirements.
- Provide electronic access to documents for remote users.
- Allow users to access the same documents simultaneously.
- Increase competitive edge: increased speed for document retrieval.

Reduce costs. According to the Association of Information System Professionals, only 5% of the filing costs in an office goes to equipment, while 70% goes to salaries, 20% to space and 5% to supplies. By increasing the investment in alternative information systems and equipment, the cost of office space and salaries can be drastically reduced.

The most tangible and impressive benefit of image processing, which is one of these alternative



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CCA's MODEL 204 offers you the speed you need for your production applications. And for your decision support needs, there simply isn't a system that's faster. Or, that stores more. Or, that has a true fourth generation language that's any easier to use.

So all of your end users get something they never have been able to get before: Answers to an unlimited number of complex inquiries with, as one user put it, "heartbeat" response.

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For a copy of the study, write John Donnelly, V.P. Marketing, Computer Corporation of America, Four Cambridge Center, Cambridge, MA 02142. Or, call 1-800-258-4100, extension 600.

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technologies, can be substantially lowered costs. The cost for large paper-based filing and retrieval operations may approximate as much as 35% of an average company's base operating cost.

For example, a major financial institution's image requirements study revealed that an image system would pay for itself within three to four years. The results show a savings in the range of several million dollars during the first five years. Dollar savings are based on a reduction in clerical personnel and in the space devoted to records storage.

Some of the most dramatic cost savings are associated with the storage of engineering drawings. The saving of storage space alone can justify an image system purchase. Most engineering drawings (34 in. by 44 in.) are much larger than office documents, and each copy of the engineering drawing must be retained for a number of years. The time-consuming and error-prone methods currently used to file and retrieve large volumes of engineering documents have resulted in systems that are costly and inefficient to maintain.

Most engineering departments realize a two-year payback for image processing. Typically, manual engineering drawing systems require 20 clerical hours per week for filing and retrieving paper drawings. Digital image processing can significantly reduce the time spent filing and retrieving these documents.

Safeguard information. Too often, businesses are in a position in which valuable information has been retained, but the paper file cannot be located. Image processing reduces the risk of misfiling paper, because employees no longer handle the physical documents after the input process.

Digitized documents cannot be readily destroyed, lost or altered, because they are stored on nonerasable media. As a result, signatures, stamps and other legal imprints are protected. Using proper disaster recovery procedures, digital images can be guarded from fires, floods and other disasters, while it is almost impossible to safeguard the masses of paper documents stored in warehouses.

Reduce storage space. The amount of office space that can be saved through image processing is substantial. A single 12-in. optical disk can easily store 20,000 paper document images on each side of the disk. A storage device holding 100 optical disks can store the equivalent of 400 filing cabinets, 250,000 engineering drawings, 80 million pages of text or 16 million bit-mapped screens of computer-aided design and manufacturing (CAD/CAM) or graphics data.

The cost of storage space alone can be a major reason for installing a document image system. For example, the federal government estimates that if all of its documents were filed in filing cabinets placed side by side, the line of cabinets would extend more than 1,000 miles.

Frank Moore, project manager of the IRS' Files Archival Image Storage and Retrieval System Optical Image Project, estimates that the National Archives is currently holding 1¼ billion income tax returns — taking up 3½ million cubic feet of space — that must be retained for seven to 7½ years, depending on the type of return. Also, the IRS itself is storing an additional 1½ million cubic feet of returns. According to Moore, the IRS spends an estimated $13 million a year for storage and retrieval of documents housed at the archives and, additionally, spends $20 million a year on its own storage, control and transportation.

In the private sector, one large manufacturer plans to acquire an image processing system in order to avoid constructing another office building to store paper.

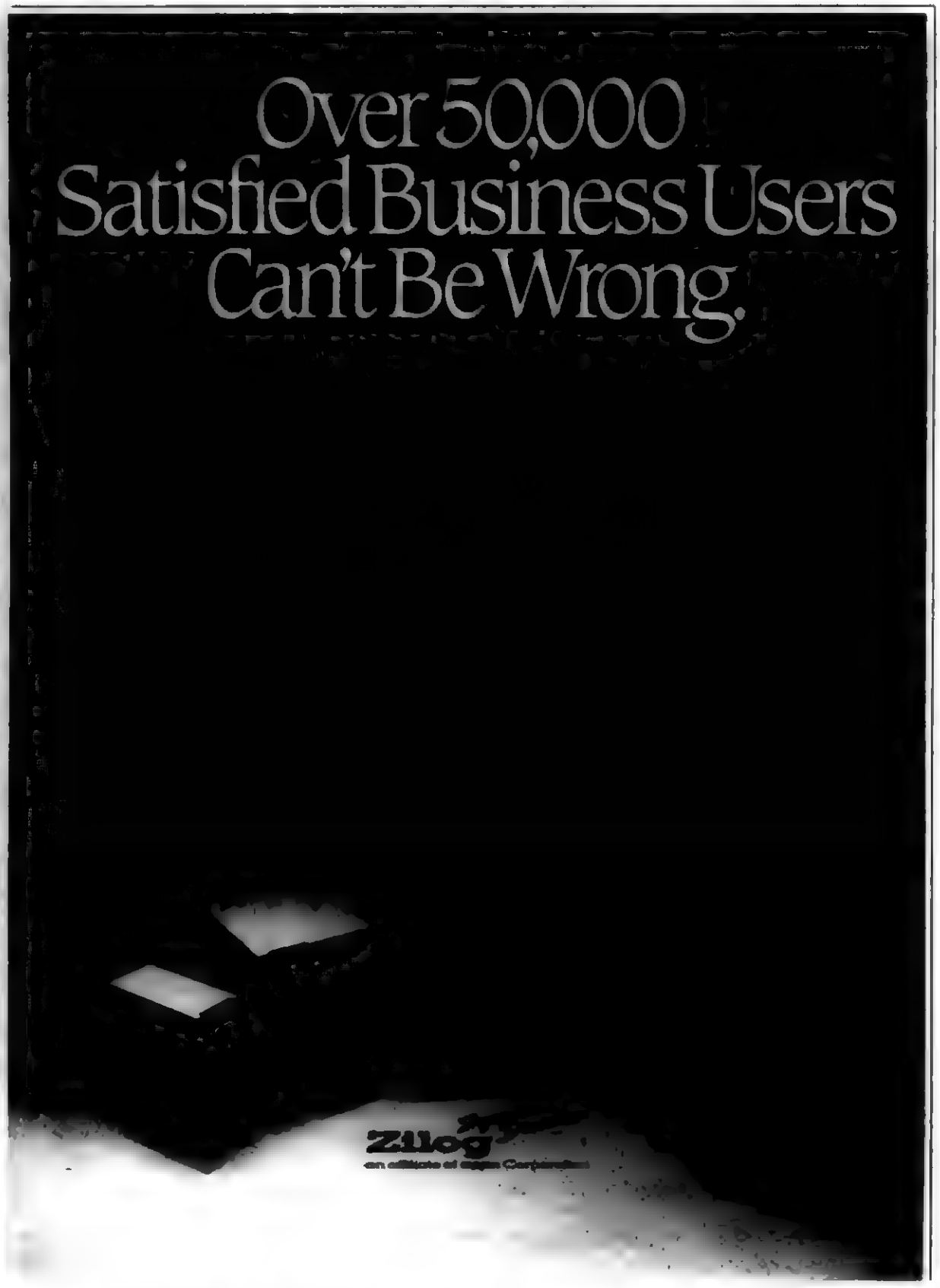
Reduce clerical personnel. By the 1990s, there will be fewer workers available to fill clerical positions. At the same time, the shrinking work force will command higher salaries. According to a recent study by a leading OA vendor, there will be 40% fewer entry-level workers in the 1990s and fewer office workers available to handle paper documents.

The limited availability of clerical workers may force businesses in the future to rely upon technology to fill clerical positions. For example, one company is experiencing difficulty in hiring file clerks to work in certain geographical areas, because it is unable to meet regional wage demands. This company is experimenting with image technology as an alternative means of filing and retrieving information.

Provide electronic access to documents for remote users. A future goal of image processing is to provide remote users with high-quality, high-resolution access to document images. Current means of image delivery include mail services, overnight delivery services and transmission by facsimile machine.

Image transmission through wide-area networks is difficult because networks currently available are not designed to move the large amount of data required to produce images. Once transmission obstacles are overcome, electronic image access will allow rapid delivery of handwritten signatures and information, graphics presentations as well as other documents.

Provide accessibility of documents. Frequently, companies find the sheer logistics of moving paper throughout the organization difficult. Problems arise when several workers need to access a paper file at the same time. The problem is solved either by duplicating files or by having workers wait until the original file is returned to storage. Other inefficiencies arise when employees in multiple sites need access to paper files. For example,



System components: Scanners, lasers build an image

The primary components used in a typical digital image system include document scanning devices, image system controllers and processors, optical disk storage devices, printers, high-resolution workstations and system software. Although many peripherals are available from OEMs, a vendor or hardware systems integrator is needed to assemble all of the components into a functional image system.

Scanners. Scanners are the primary input devices for an image system. Image scanners are quite different from optical character recognition (OCR) readers, because scanned documents are not converted to alphanumeric text. Instead, during the scanning process each line on the document page is divided into thousands of picture elements, or pixels.

When a document is scanned, each pixel is interpreted as either a black or white point on the page. The scanned image becomes a bit stream of 1s and 0s that represent black or white dots on the page. After the entire document is scanned, the pixels can be electronically reassembled to reproduce an exact copy of the paper document.

Typically, scanning densities are measured by the number of pixels per inch on the horizontal and vertical axes. Most organizations require 200 by 200 pixel/in., although engineering departments usually require a much higher scanning density for blueprints and drawings.

Scanners are available in many different varieties. Expensive, high-speed scanners can process up to one page per second, whereas slower desktop scanners may only scan 10 to 12 pages per minute. Scanners can be combined with bar code readers and OCR devices so that the scanning process captures both raster and alphanumeric information as the pages are scanned.

Scanning color images is definitely feasible, but may be prohibitively expensive. For most normal business applications, black-and-white scanning is sufficient.

Image controllers. Although various hardware components differ in many ways, all must be configured to the scanner, terminals and storage devices attached to a hardware device known as an image controller. Depending on vendor and configuration, the image controller may range from a plug-in board in a personal computer to a minicomputer.

Typically, this device provides image and data interface, compression and decompression of scanned images, conversion from analog signals to digital bit streams and the physical routing of images throughout the system.

Optical disks and other storage. Of all the peripheral devices used on an image system, the optical disk has captured the greatest amount of user attention. Optical disks are a new storage media that use lasers to read and write information onto the surface of the disk.

One of the primary advantages of optical disks is the write-once nature of the media in today's market. Once information is written onto write-once disks, the data cannot be erased. Although the write-once characteristic limits data storage, the feature protects images that serve as original documents. Erasable optical disks should be commercially available in the next three to five years, but they have limited use for image processing in most environments.

Another advantage of the optical disk is the vast amount of data that can be stored on a small surface. For example, a 12-in. optical disk can store 1G byte of data on each of its sides. By using the storage capability available with optical disks, it is possible to store 40,000 images on one 12-in. disk.

> *"Whatever the configuration, a digital image system must have the ability to process large numbers of documents rapidly, enhance document images to an acceptable level, store these documents at a low cost, allow retrieval times of a few seconds and provide accessibility to multiple users."*

Large storage capacity is essential for digital image systems, because scanned documents require significantly more storage than typical documents. For example, an 8½ by 11-in. page scanned at 200 pixel/in. requires 4 bytes of storage on a magnetic disk after data compression. When compared to the storage requirements for typical text documents, the storage requirements for digital images are staggering.

The difference between images stored on digital microforms and those on optical disks, for some vendors, particularly Eastman Kodak Co. and Canon U.S.A., Inc., digitized micrographics provides a technological bridge from traditional micrographics systems to optical disk systems.

Jukeboxes. For an image system to be successful, a certain number of active documents must be accessible on-line. Typically, the on-line documents are stored on optical disks located in a device known as a "jukebox." The name of the unit is derived from the old-fashioned record jukebox, and the general principle is similar.

The jukebox is an electromechanical device that uses a variety of mechanisms to move an optical disk quickly from storage onto a disk drive. A single unit can hold from 20 to 200 optical disks and multiple disk drives.

Currently, most digital image systems use jukeboxes for on-line storage. Some experts in the technology foresee that jukeboxes will ultimately become unnecessary when optical disk drives are less expensive and when drives can handle stacked platters.

Workstations. One of the more expensive components of an image system is the image display terminal. Workstations are costly, because the terminals are often intelligent high-resolution devices that display from 200 to 400 pixel/in. and zoom, pan, rotate and window the image.

Sometimes the image workstations can be linked to the mainframe through an IBM 3270 coaxial connection in addition to being linked to the image system. However, many user organizations are still reluctant to buy expensive image terminals, particularly if users already have a 3270 terminal or a desktop micro. A few OEM suppliers are developing an image display capability for PCs that should eventually lower the per-workstation cost and address the problem of needing two workstations on a single desktop.

Output devices. Output devices are usually graphics printers that cover the range from desktop laser printers to [illegible]. Other devices may include [illegible] for engineering drawings — which is appropriate for [illegible] of large volumes of historical records or in applications that have not completely converted to digital images.

Software. [illegible] software is the glue that ties all of the components of an image system together. Software is available from OEMs, systems integrators and independent software vendors. Whatever the configuration, a digital image system must have the ability to process large numbers of documents rapidly, enhance document images to an acceptable level, store these documents at a low cost, allow retrieval times of a few seconds and provide accessibility to multiple end users.

— CONNIE MOORE

engineering companies often must duplicate drawings in order to allow engineers in different locations access to the same drawings.

Digital image processing allows users in an organization simultaneous read access to an image. Digital images stored on a central system can eliminate the need for duplicate files in multiple locations throughout a building.

The automatic routing of images is another major benefit associated with digital image processing. Work flow software, which establishes an electronic path for the movement of documents through an organization, can replace the physical movement of paper by routing document images between workers in different work groups or departments without end-user intervention.

Increase competitive edge. Service companies attract and retain customers by providing fast processing and quality service at a lower cost.

A digital image system can increase productivity significantly, lower costs and shorten the amount of time that customers have to wait for service.

By implementing digital image systems, several banks and insurance companies claim to have considerably increased their competitive advantage over companies that are still using paper-based systems.

In one financial services company, the trust department was able to handle more customer inquiries about individual retirement accounts (IRA) and process a greater number of IRA applications before the income tax filing deadline by gaining more immediate access to information. This company claims to have increased productivity by 100% and to have gained a competitive advantage over other financial institutions selling IRAs.

In another case, the international division of a bank was able to show a significant cost saving by reducing the float — the interim period in a money transfer transaction — associated with sending international banking documents to correspondent banks throughout the world.

In these instances, the financial organizations not only increased productivity and lowered costs but also gained a significant advantage over competitors through the application of technology.

A typical installation

A typical user organization can process hundreds or thousands of documents a day using a digital image system (see story above). These documents, of various shapes and sizes, consist of handwritten forms, typed documents, printed materials or a combination of formats.

To input a document into the system, the paper is scanned and the document stored temporarily on a magnetic disk buffer. At this time, a worker views the document on a screen, checks the electronic image for legibility and assigns identification information to the image. The document image is then transferred



ILLUSTRATION BY JON MCINTOSH

> ***The federal government estimates that if all of its documents were filed in filing cabinets placed side by side, the cabinets would extend more than 1,000 miles.***

from the magnetic disk buffer to an optical disk located in one of the disk jukeboxes.

The identification information assigned to the document is entered into the image index, which serves as the image system data base. Depending upon the architecture used, the image index resides on the image system or is located in the mainframe data base management system. Wherever it resides, the purpose of the index is to track vital information about the image and provide a logical means for retrieving the document.

The system administrator or an automated job scheduling module routes document images to specific departments or individuals. The routing of images corresponds to the physical paper flow previously used when documents were in paper form.

Using the work flow software, which is either custom developed or vendor supplied, high-priority documents can be moved to the top of the work queue or scheduled for the next available worker to process. Time limits can be assigned so that work in process moves quickly from one worker to another. Summary data is generated to track the time required to move documents through the organization and provide an electronic means to identify and eliminate work bottlenecks.

Once processed, document images reside on optical disks until recalled by end users. End users would locate an image using the image index software. The image index can stand alone or, in some situations, can be integrated with DP applications. For example, the worker could access a mainframe data base that points to electronically "stapled," or merged, images stored on the system. In either case, the image index can provide an access path to the image.

Once the document is retrieved, it can be viewed on high-resolution workstations. In some instances, the terminal can provide a window to mainframe DP applications. Additionally, some image systems software allows word processing to be used to overlay text on the image. If a hard copy is desired, the image can be routed to high- or low-speed laser printers for output.

Business needs

Organizations have many different needs for digital image systems, depending upon the applications and the business environment. End-user requirements have a direct impact on the specific design for the system architecture, peripheral devices, application software and system interfaces.

In general, there are five basic types of business needs for digital image systems:

- Transaction processing.
- Records management.
- Office automation.
- Manufacturing and engineering drawings.
- Information distribution.

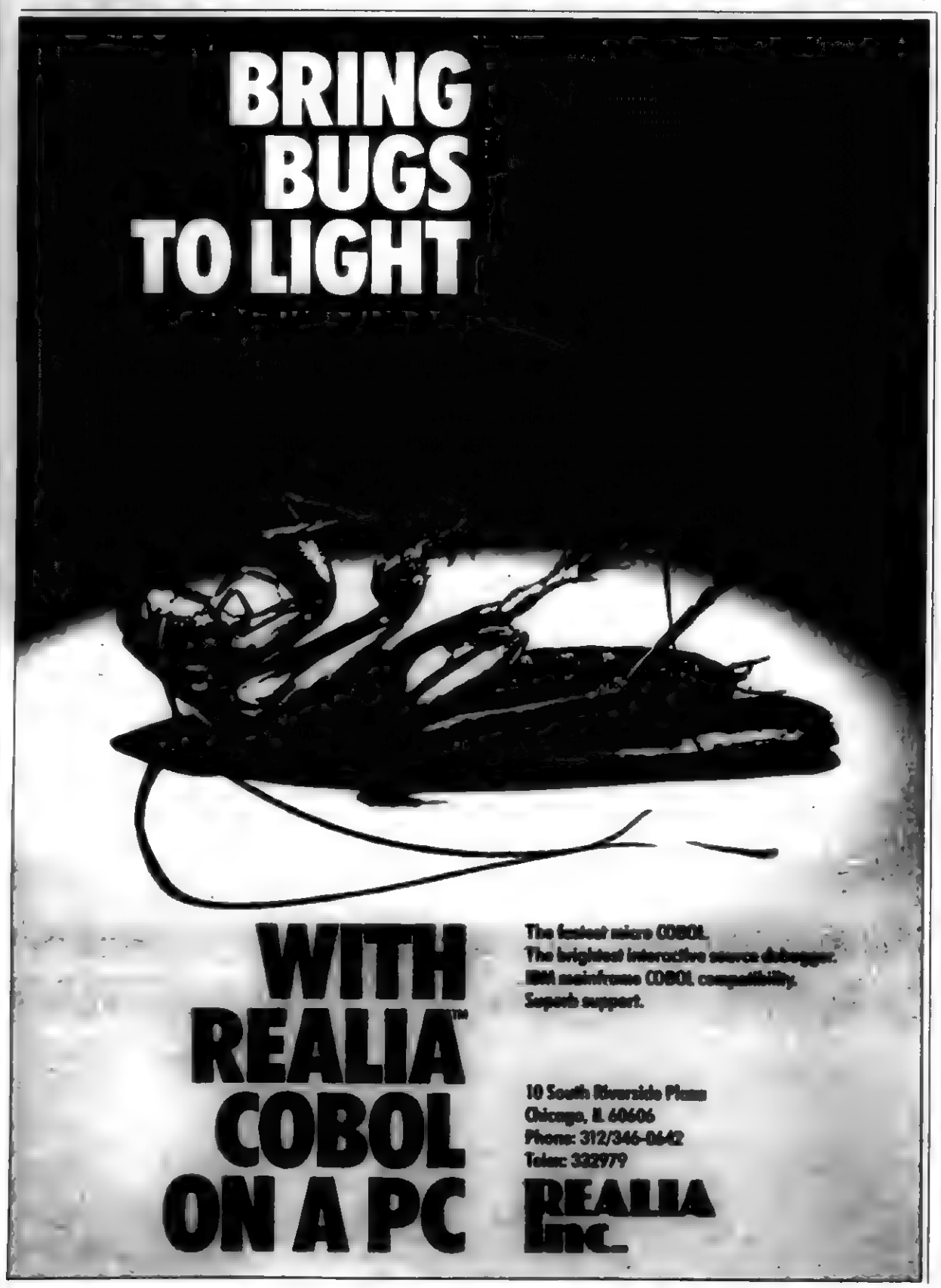
Transaction processing refers to applications in which incoming documents need to be matched with existing information, routed throughout the organization, processed quickly and stored for subsequent retrievals.

Typically, these applications are key business functions that are essential to the overall business operation. In most instances, the business activity has already been automated to a large degree using data processing systems, and the next step is to integrate the manual paper flow into the automated system.

Digital image systems for these applications must provide high throughput, reliability, fast response time and, ideally, integration of OCR with image scanning. In almost all transaction processing applications, the document images must be fully integrated with data processing applications in order to process information quickly in a cost-effective manner.

Transaction processing operations generally are found in large service companies that process millions of incoming documents per year; insurance policies and claims are examples of transaction processing applications.

The emphasis in **records management** is primarily archival. Most



organizations with this focus are trying to convert either inactive paper archives or micrographic archives to digital images.

In records management applications, the primary focus is on saving storage space, reducing clerical filing activities and the time required to retrieve files, providing users with simultaneous access to paper files and eliminating redundant copies of information and costly shipping and handling charges for long-distance paper distribution.

Often the image system does not need to be integrated with mainframe applications, because image retrievals are infrequent and can operate on a stand-alone basis. However, the records management system should be designed to receive and archive alphanumeric data and text from word processing and data processing systems. To do so, the image system may need interfaces to other automated systems within the organization.

Archival records that may require long-term digital image storage include purchasing documents; time-dependent documents; books, magazines and other publications; reference manuals; customer records; personnel and administrative files; shipping receipts; and accounts payable invoices.

For some time, the **office automation** vendors have advocated the processing of text, data, voice and images within an office environment. Terms such as "compound documents," "electronic file folders," "electronic stapling" and "electronic envelopes" are frequently used to describe documents containing related information in image, text, data and voice formats.

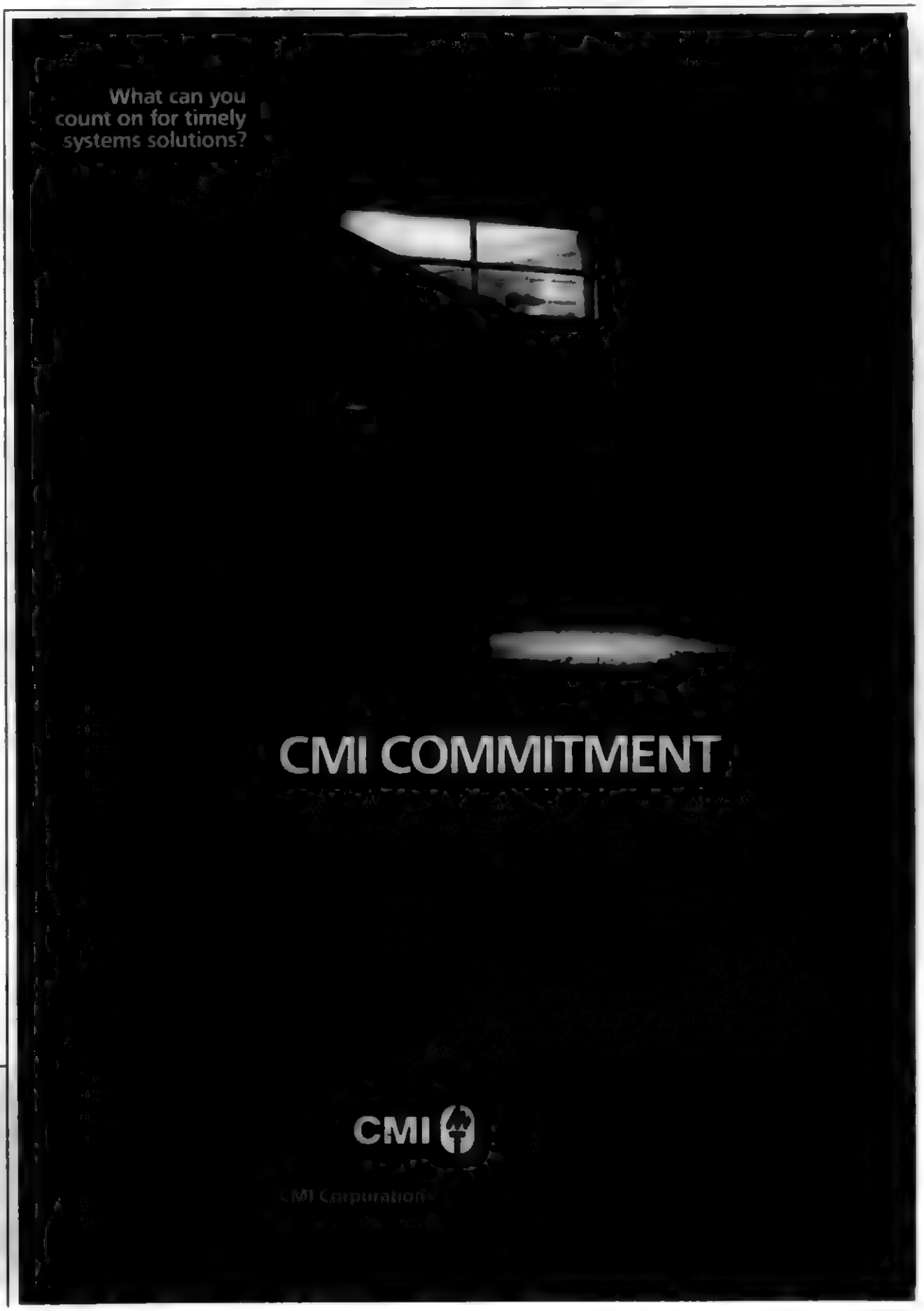
However, almost no office automation products can handle compound documents that consist of all four types of information. For example, a single compound document should be able to overlay text on images, place graphics in spreadsheets and integrate annotated voice messages.

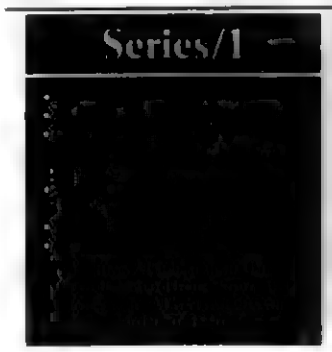
The few office systems products that offer imaging capabilities, such as IBM's Distributed Office Support System and Wang Laboratories, Inc.'s Professional Image Computer, seem to be deficient in several areas. In the long term, image technology using optical disks may become integrated with existing office automation systems, but the major OA vendors currently do not offer the products to meet most organizations' imaging requirements for OA applications.

> ***Once transmission obstacles are overcome, electronic image access will allow rapid delivery of handwritten signatures and information, graphic presentations and other documents.***

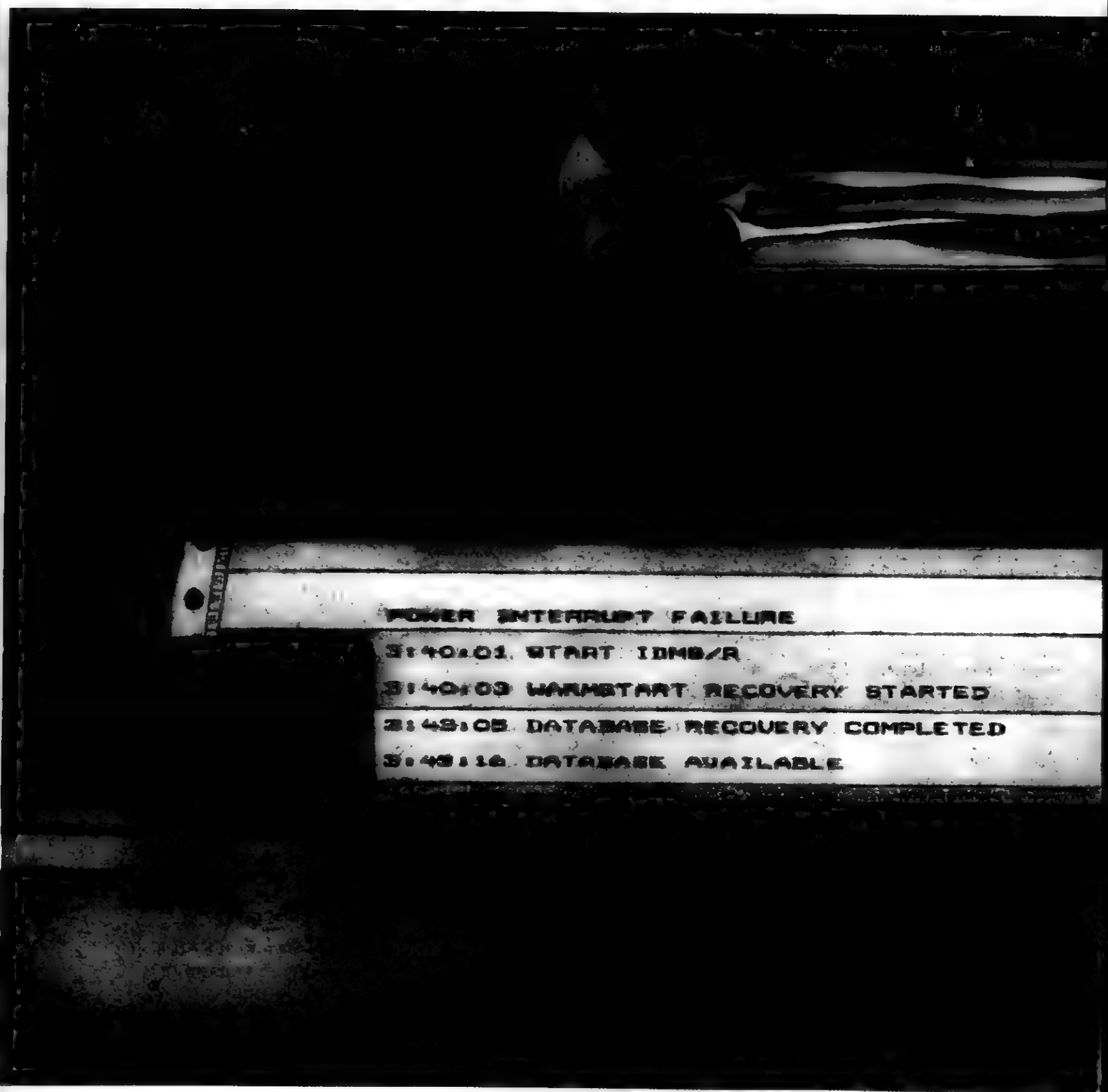
Manufacturing and engineering organizations have unique requirements for digital image systems. Typical documents that may need to be stored, retrieved and displayed on an image system include engineering drawings in paper dimensions ranging from A-size through E-size, CAD/CAM files, design documents, technical manuals, topographical images, inventory parts diagrams, architectural drawings and blueprints.

The requirements for most engineering image systems include on-line document storage capabilities for alphanumeric text, interfaces to CAD/CAM devices, aperture card scanners, scanners for E-size drawings, high-resolution display terminals of 400 pixels per inch, the ability to transfer between

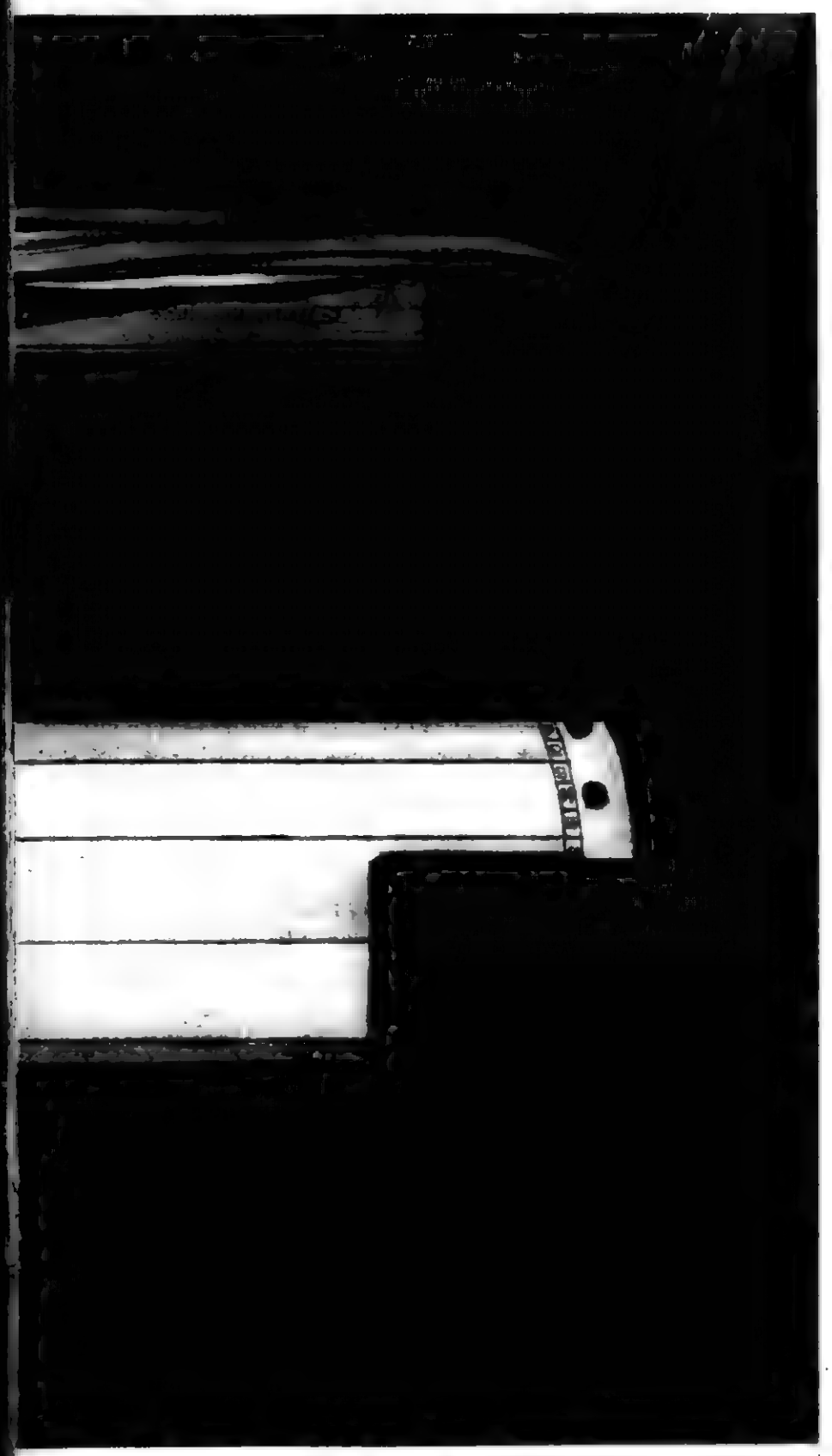




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raster format and vector graphics and the ability to update active drawings.

Some organizations are turning to digital image processing systems as a vehicle for **information distribution.** This application grew out of the need to distribute reference data/text/image information to a wide number of users.

For example, the U.S. military services are interested in distributing maintenance manuals with text and images to all military sites where equipment must be maintained. This type of system could significantly reduce printing and distribution costs associated with disseminating manuals throughout the world.

In the commercial sector, the publishing community has been very active in promoting the idea that read-only optical disks can be used to disseminate data, software and images throughout geographically dispersed installations. Much of the printed material used to publish books no longer exists in type format, so image distribution often is the only realistic means of electronic publishing.

User organizations

As image technology becomes more widespread and standard products become more available, image processing applications will increase in most large businesses and offices. Organizations that currently have a pressing need for digital image systems include insurance companies, financial institutions, manufacturing and engineering companies, service companies and government agencies.

Insurance companies. Image processing is ideally suited for insurance companies, because large volumes of paper are received on a daily basis, paper files are frequently retrieved and updated, and paperwork is retained for a specific time period ranging from a few months to the duration of an insured individual's lifetime.

Possible transaction processing applications for digital image technology include policy, claims and underwriter processing. Records management applications can include correspondence, personnel records and administrative records storage.

Because insurance companies are advanced users of office automation equipment and microcomputers, image processing for OA applications is a logical choice.

Financial institutions. Large financial institutions have a significant need for digital image equipment

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Naturally, we believe that Software AG products offer the best solutions available to the problems you face. And we'd like to have an opportunity to convince you—not by competitive claims and counterclaims, but by demonstrated performance in real-world customer sites.

In the meantime, we'd like to offer a few thoughts on some factors that contribute to performance.

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If you've been involved in data processing for any length of time, you already know more than enough about the dangers of piecemeal "quick fixes". You don't have to be sold on the value of integrated tools that meet a full range of organizational needs through a common syntax and shared procedures.

But while many vendors preach integration, few practice it on the scale of Software AG. From our core products, ADABAS and NATURAL, we have created an entire universe of software products that simultaneously meet the needs of everyone from MIS professionals to end users with no programming experience.

We're also integrated in another way—geographically. As more and more organizations seek to coordinate resources and data on a worldwide basis, they need a caliber of support that is consistent worldwide. Software AG's reach is unique among independent software vendors—with products installed in 52 countries.

Fourth-generation technology: Who needs it? Who's got it?

A lot of vendors have expended a lot of hot air on the subject of fourth-generation languages. And we'd be the last to deny that a well-designed 4GL like NATURAL can be a phenomenal productivity tool—as much as 10 to 20 times more productive than COBOL, for instance.

But the language itself is only part of the story. Because in committing to a fourth generation system, you're really committing to an entire technology for meeting your organization's needs. You'd better be sure that technology includes everything you need—from DBMS, 4GL, and data dictionary to end-user computing tools, office systems, micro/mainframe links, and intersystem communication facilities. If it doesn't, you may be looking at only a partial solution.

In any case, don't evaluate a 4GL by itself. Evaluate it in relation to the other products that are required to satisfy your total information needs. Do they share a common architecture or system? Were they designed together, or are they simply marketed together? And most important of all, how do people like working with them?

We *know* how people like working with NATURAL. After all, it's the world's most widely installed, widely experienced fourth-generation language—used by over 75,000 programmers. If you're looking for insights into 4GL technology, you might start by talking with one of them.

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> ***Many of the operational installations for digital imaging systems are located in government organizations. Key government agencies have already proven that the technology works in pilot installations and have documented the cost savings realized through the equipment use.***

because of the large volume of documents they receive on a daily basis. Many of these documents, such as checks and credit card receipts, are mailed to customers on a periodic basis. A growing trend in financial institutions is to reduce costs through the use of descriptive billing, whereby document images are archived and customers receive an itemized statement rather than the original documents.

Other financial applications include storage for mortgage loans, installment loans, bank-by-phone records, credit card receipts, signature cards, contracts, trust department records and personnel files.

Engineering and manufacturing companies. These companies could use digital image systems to store different types of drawings and documents. The primary manufacturing application would be to store and retrieve engineering drawings and technical data. Transaction processing applications include order entry records, shipping documents and parts ordering. Archival information includes personnel records, job descriptions, publications and shipping data.

Service companies. The initial users of digital image processing in service organizations could include large retailers, wholesalers and distributors; transportation and shipping companies; hospitals and medical centers; overnight delivery companies; hotel and restaurant chains; telecommunications companies; and large universities, libraries and museums.

Transaction processing is the major business need for these companies. Representative applications include routing and distribution, ordering by phone, order processing and customer records and billing.

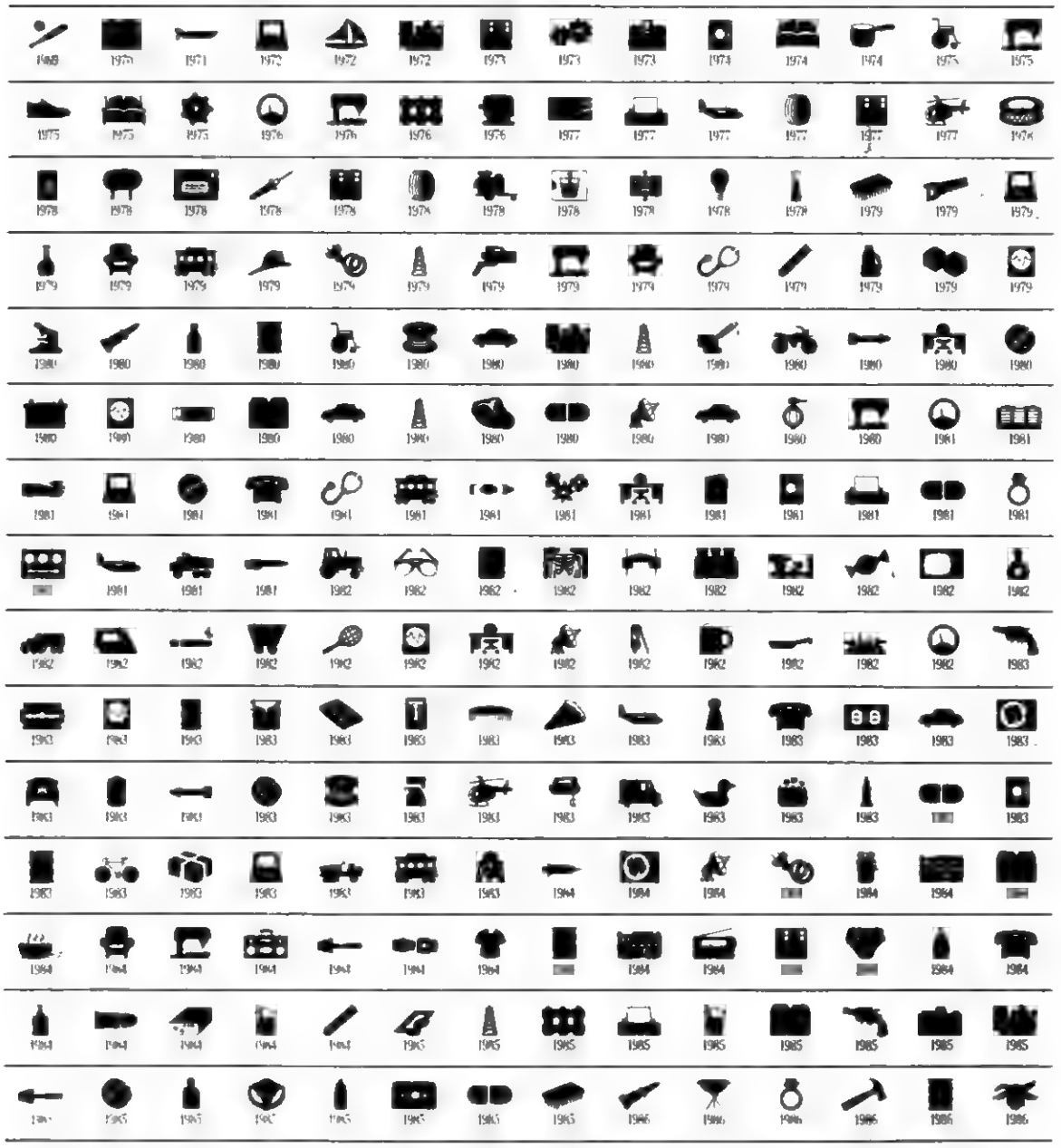
Government agencies. The federal government's image processing requirements are expanding rapidly and are not expected to diminish in the foreseeable future even though the Gramm-Rudman budget cutbacks have affected procurement budgets. The government agencies need image processing systems to provide a means for organizing, storing, retrieving and disseminating information collected from outside its ranks.

Many of the operational installations for digital imaging systems are located in government organizations. Key government agencies have already proven that the technology works in pilot installations and have documented the cost savings realized through the equipment use.

According to Bill Hooton, director of the Optical Digital Image System Project for the National Archives, an estimated 3% of all government documents are considered to be permanently valuable and as such must be stored indefinitely. As of 1983, the archives estimated that the document storage space for all government agencies totaled more than 22 million cubic feet, at a storage cost — excluding personnel — of $13.42 per cubic foot. That same year, the Federal Records Center, the final repository for government records, utilized storage space totaling 14.4 million cubic feet of space, at $1.06 per cubic foot.

The Federal Records Center's estimates for 1985 show that 1.34 million cubic feet of records were transferred to the center from federal agencies — a figure the center f nds inadequate. Hooton, who is also chairman of the DIAG users group, explains that because of this inadequacy, the National Archives is turning to

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digital image processing as a way to speed record intake and is currently in the process of procuring a digital image system.

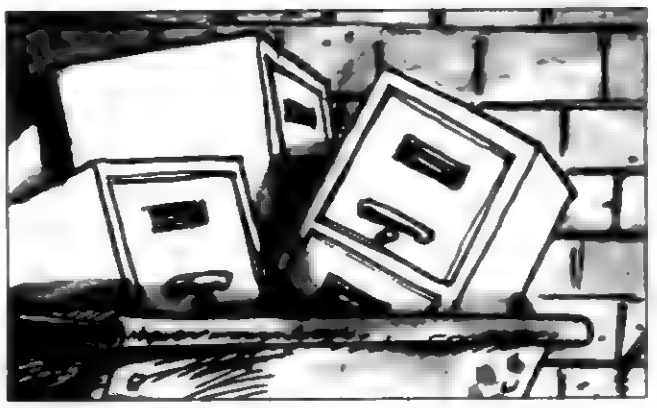
Several organizations have moved to the next implementation phase and are in the process of planning and designing production image processing systems. The Patent & Trademark Office is planning to use digital image systems to store patent designs. In addition, the Army and Air Force, in a joint effort, are installing a multisite image system to store and access engineering drawings. Because a number of government agencies endorsed this technology at an early stage, the use of digital image systems in federal government is more advanced than in private industry.

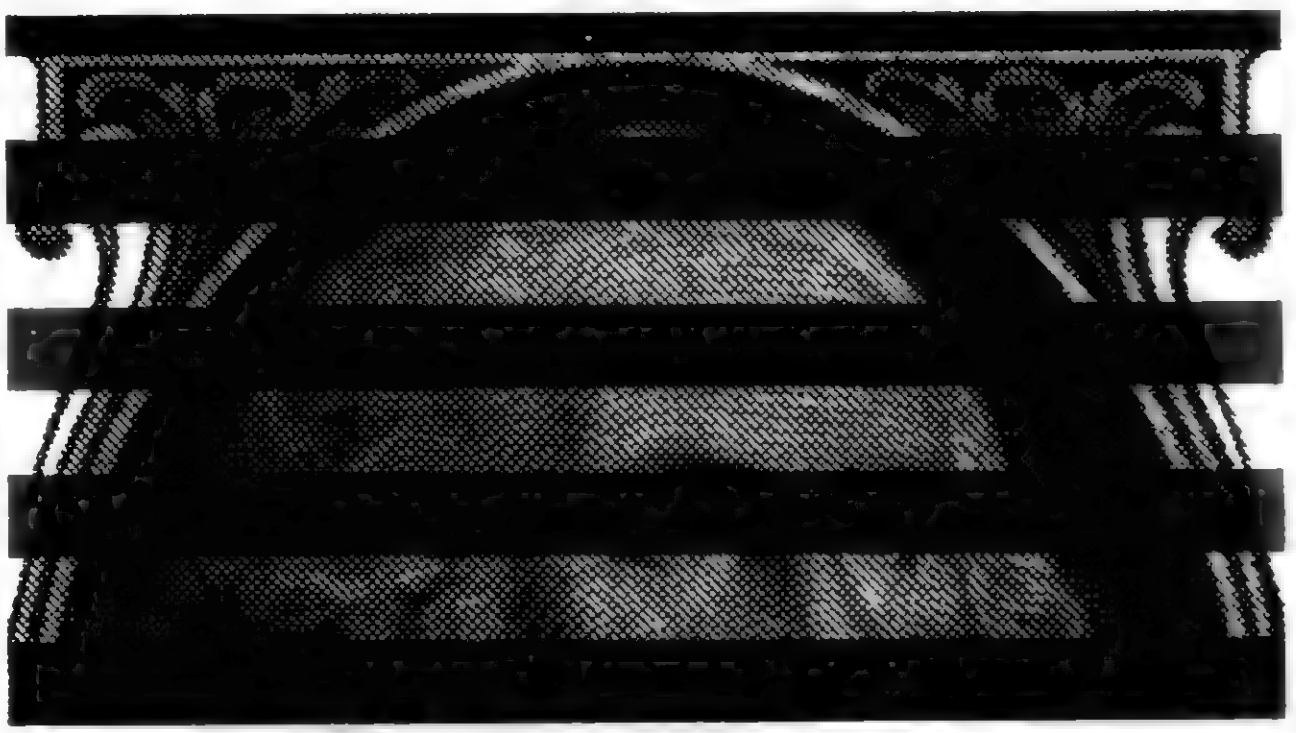
Image processing systems are also needed in state and local governments. Many of the problems encountered in the federal government are experienced at lower levels. Several states are planning to install image processing systems. Potential image processing applications for state governments include vehicle and driver's license records, tax forms, prison records, land planning and zoning, educational records and unemployment compensation records.

Implementation approach

Because digital image technology is in its infancy, many of the available products are not ideally suited for all business needs and applications. To determine whether an image system is appropriate for a particular application, an organization should identify the overall business objectives, determine key success factors and ensure that the proposed image system fits into the overall information plan. If an image system is to be implemented, the organization must carefully manage the

"An estimated 3% of all government documents are considered to be permanently valuable and as such must be stored indefinitely. As of 1983, the estimated document storage space for all government agencies totaled more than 22 million cubic feet, at a storage cost — excluding personnel — of $13.42 per cubic foot."





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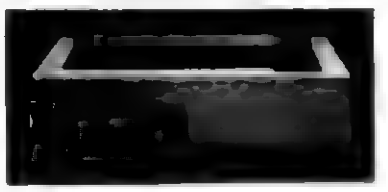
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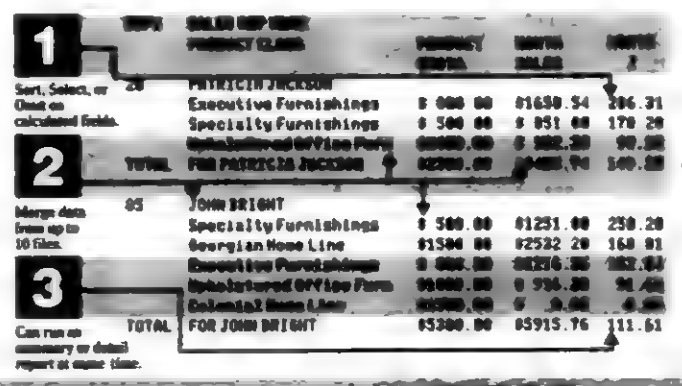


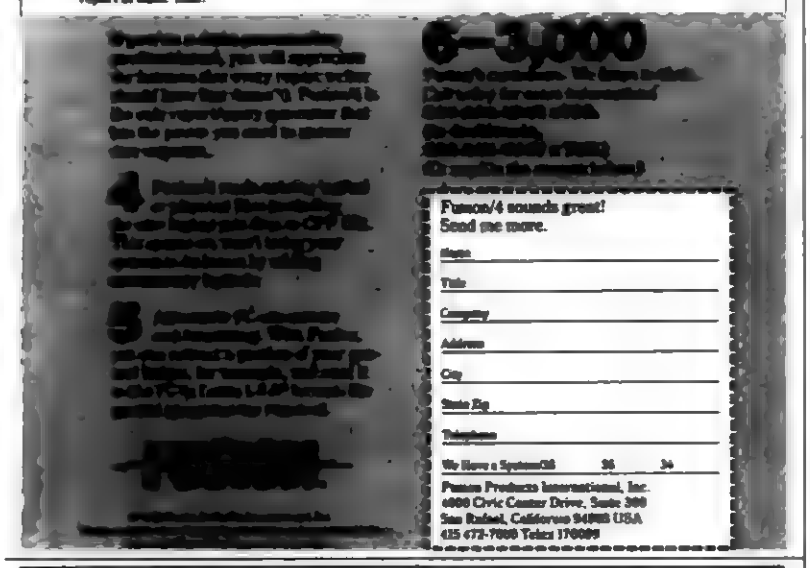


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As organizations move ahead in applying new technologies and developing new systems, MIS should develop the skills needed to plan, design and install large-scale image processing systems. MIS personnel should begin to educate end users in the potential applications of digital image processing as well as caution users about acquiring vendor-designed solutions before their system requirements have been thoroughly identified and analyzed.

project to ensure a successful installation.

As in any major system, the stages in the image system development process are planning, design and installation. Key steps in the planning phase include the following:

- Survey the image processing technology.
- Identify image processing technical and user requirements.
- Develop an image processing equipment strategy.
- Develop the conceptual system design.
- Estimate costs and benefits.
- Develop an organization plan.

Once the planning phase is completed, the business can determine whether the cost and benefits justify continuing the project. In most instances, the cost and benefits are confirmed through a research and development test installation or a pilot system installed in a small department.

If the project is to be extended, the design phase should be initiated, implementing the following steps:

- Prepare the functional specifications.
- Design the system and software architecture.
- Select the image processing hardware.
- Develop a conversion approach.
- Develop an installation work plan.
- Confirm the costs and benefits.

The installation phase is undertaken once the cost and benefits are confirmed and management approval is obtained. Key installation steps include the following:

- Complete the design of the system in detail.
- Install the integration software.
- Prepare user procedures.
- Install the image hardware and operating software.
- Test the system.
- Convert files.
- Train users.
- Convert the system to production status.

Vendors

Digital image processing technology holds a lot of promise, and the number of peripheral manufacturers is increasing at a rapid pace. However, user organizations cannot install an image system merely by connecting the system components. Either standard or custom-developed hardware is required for the image components to work as a system.

Currently, the number of standard products for digital image processing is limited. The industry leader in standard-product installations is Filenet Corp., a start-up that helped to develop the marketplace for digital image systems. Other firms that have introduced turnkey products or are developing systems include Eastman Kodak Co., 3M Corp., Cygnet Technologies, Inc., Access Corp. and several Japanese companies that sell through U.S. distributors.

An alternative to a standard product is a custom-developed image processing system designed to meet unique requirements. In addition, some of the large federal government procurements have been awarded to the more traditional systems integrators.

More companies are becoming involved in digital image processing, and it may be only a matter of time before the major vendors offer image processing systems.

Planning for the future

Many factors determine the success or failure of a digital image system installation. Return on investment, increased productivity, end-user acceptance, system performance, equipment reliability and vendor support are only a few factors that influence the overall outcome of a project.

Too often, the well-proven techniques and steps within systems development are overlooked whenever a new technology is introduced. However, in each of the image system development phases, there are critical issues that create an impact on the overall design of the image system architecture, application software, security, performance and interfaces to other systems. It is very important to plan and design an image system carefully in order to maximize its use and create a positive impact on the organization.

Many benefits can be realized through digital image processing, and the technology's future looks very bright. As organizations move ahead in applying new technologies and developing new systems, MIS should develop the skills needed to plan, design and install large-scale image processing systems.

MIS personnel should begin to educate end users in the potential applications of digital image processing as well as caution users about acquiring vendor-designed solutions before the organization's system requirements have been thoroughly identified and analyzed.

Information plans should address the possible future use of image processing technology within organizations. Future large-scale development projects should review image processing technology to determine if the equipment is the appropriate technology to meet technical and end-user requirements.

All of these steps are needed to develop effective digital image processing systems. If the MIS department becomes involved in this new technology, it may be finally possible to begin the process of automating our "paper factories." ■

MANAGEMENT



TAKING CHARGE
David Ludlum

Portrait of the CIO as manager

"What's in a name? That which we call a rose
By any other name would smell as sweet."

— **William Shakespeare,** ***Romeo and Juliet,*** **II, II, 43**

The converse of these frequently repeated lines is also true — calling something a rose doesn't make it smell sweet.

The same holds true for a prevalent catchphrase in the world of information systems management — "chief information officer," usually referred to as CIO.

Creating the position doesn't necessarily mean the person who fills it functions according to the CIO concept, according to some top information system executives and consultants who took up this question at a recent Executive Roundtable, held by The Information Group, Inc. of Santa Clara, Calif.

First, the CIO concept. There was a consensus that the basic function of a CIO is to counsel the chief executive officer on a company's technological requirements. This distinguishes him from the traditional information system manager, who is responsible for operating information systems and might report to the chief operating officer.

One roundtable participant equated the role of the CIO with the chief financial officer, while another likened it to the chief planner, acting as the line managers' conscience and taking responsibility for some of their actions.

See **PORTRAIT** page 89

Ludlum is Computerworld's senior editor, management.

Utility wires execs to data

Desktops keep managers on top of deregulatory changes

By Jeffry Beeler

SAN DIEGO — A public utility last week began installing personal workstations to help its top 18 executives chart the firm's course through the turbulent waters of deregulation.

The workstations, based on IBM Personal Computer ATs, will form part of an executive information system, which officers of San Diego Gas & Electric Co. (SDGE) will use to monitor the utility's increasingly rapid changes.

Scheduled to become operational in about eight weeks, the system will use Command Center — an executive information system introduced early last year by Boston-based Pilot Executive Software, Inc. — to marry the PC ATs with the company's IBM 3083.

On the mainframe, SDGE has installed Command Center's relational data base, which will run under VM/CMS. The workstations, by contrast, will run a set of Pilot-produced menus that each target user will be able to define individually to spotlight needed information in the data base.

The ATs additionally will support a Command Center software module that will turn the selected information into color graphics and thus help SDGE's senior executives track internal activities and identify trends.

Probably the largest share of the firm's graphics will take the form of organizational charts. Why is SDGE attaching so much importance to this seemingly inconsequential category of corporate graphics? Like banks and companies such as AT&T, utilities today are fast ceasing to be regulated monopolies. "We're preparing for a different world, a world of competition that is somewhat new to our industry," explained SDGE's Information Technologies Manager Gary Rinehart.

Deregulation of the utility's business has triggered "tremendous changes in our

See **UTILITY** page 90

Technology key to strategic edge

By David A. Ludlum

LAS VEGAS — Using information technology to gain a competitive edge in business took center stage as keynote speaker Robert L. Crandall, chairman of American Airlines, opened the 1986 National Computer Conference last Monday.



Crandall

Information systems managers and vendors should try to identify business problems that they might help solve, said Crandall, who helped develop American's highly profitable SABRE reservations system.

SABRE generated revenue of more than $100 million last year, he noted.

Crandall, who is also chairman of American's parent company, AMR Corp. of Dallas, gave two examples of problems American is trying to solve: widespread disruptions of its schedule due to weather problems and the need to get aircraft and spare parts to mechanics at least every four days.

He said American sees a market for a worldwide freight tracking system and that "we're excited about information processing for the cable television business, which we have entered in a very small way.

"As we become a larger and larger service vendor, we're going to need more hardware and more software and lots more of your help," Crandall told the NCC audience of systems users and vendors.

He said that while he is concerned about uncertainty, he believes the best years of the information processing industry, as well as the airline business, are in the future. Data processing and communications represent a $300 billion industry heading for its first $1 trillion year early in the next decade, Crandall said.

As for American, its goal is to become a

See **TECHNOLOGY** page 91

INSIDE

Books: Reviews consider MIS organization, management skills/**87**

Calendar: Conferences, shows, seminars/**88**

INSTANT ANALYSIS

"If the approach from the information systems manager to the executive suite is to say, 'Gee, I have this really neat hardware, here's what we can do with it' . . . that [may] fall on deaf ears."

— **Joel P. Friedman, partner, Management Information Consulting Division, Arthur Andersen & Co.**



Gary Koenig: Video teleconferencing "cuts down on air travel time."

Video-teleconferenced reports alleviate road-show stops

By Donna Raimondi

After preparing a recent research report on a biotechnology company, the San Francisco brokerage firm Hambrecht & Quist staged a video teleconference on the report between its headquarters and its New York and Boston offices.

The presentation avoided the need for road-show stops in which the brokerage firm's analysts, perhaps with officials of the biotechnology company, would have traveled to the East Coast for several days to talk with institutional investors, according to Gary Koenig, Hambrecht & Quist's manager in Boston.

"In theory, you cut down on a lot of managers' air travel time. In fact, you may not have done those meetings at all because the time level would have been prohibitive," Koenig says.

Video teleconferencing can also speed up the presentation process, he adds. Hambrecht & Quist distributed the report on a Friday, gave the analysts and managers until the Wednesday of the next week to read it and put on the teleconference that same Wednesday.

The technology, which is also put to work in conjunction with initial offerings of stock and other activities, gives the brokerage firm a competi-

See **BROKER** page 91

IF NUMBERS ARE THE WEAPONS OF YOUR MARKETPLACE,

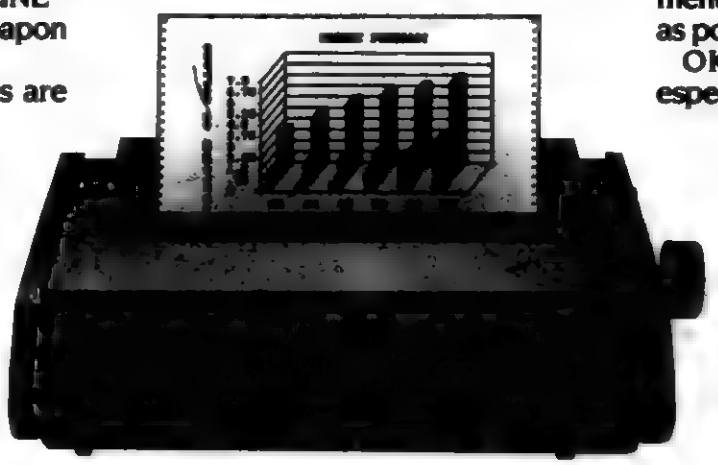
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New books aid managers in organizing information systems

By J. Daniel Couger

The quality of new books on the management of information systems is the most notable improvement in the books listed in the *19th Annual Bibliography of Computer Books* published by the University of Colorado.

The best of the new books on information systems management are both published by Prentice-Hall, Inc. They are *Information Systems Management in Practice*, by Ralph Sprague and Barbara McNurlin, and *A Management System for the Information Business*, by Edward Van Schaik.

Both are valuable additions to a company's library because they have different purposes yet are complementary. The Sprague/McNurlin book is designed to further develop information system managers' knowledge and skills. The Van Schaik book focuses on information system management architecture — on organizing the information business.

Van Schaik's book uses three windows to examine the organization and management of information systems. While the three concepts are fairly well known, the book is the first to examine their comparative relationships and show how a combination of the three can be used.

The primary window is IBM's "information systems management architecture." The second is the "stages of growth" concept. The third is McKinsey and Co.'s "7-S organization concept," which brings a business perspective to the other two windows.

The stages of growth concept was originated by Richard Nolan of the Harvard Business School. He defined six stages: initiation, contagion, control, integration, data administration and maturity.

According to Nolan, many information systems organizations are still locked in late Stage 2, contagion, or Stage 3, control. Larger organizations have taken 15 to 20 years to reach this point, and many have failed to cross into Stage 4. Very few have reached Stage 5, data administration. Van Schaik shows how these information systems learning experiences can be set back by changes within the enterprise as a result of developments such as mergers or the introduction of new products.

McKinsey and Co.'s 7-S concept is composed of seven factors, all beginning with the letter "S." They are the following:

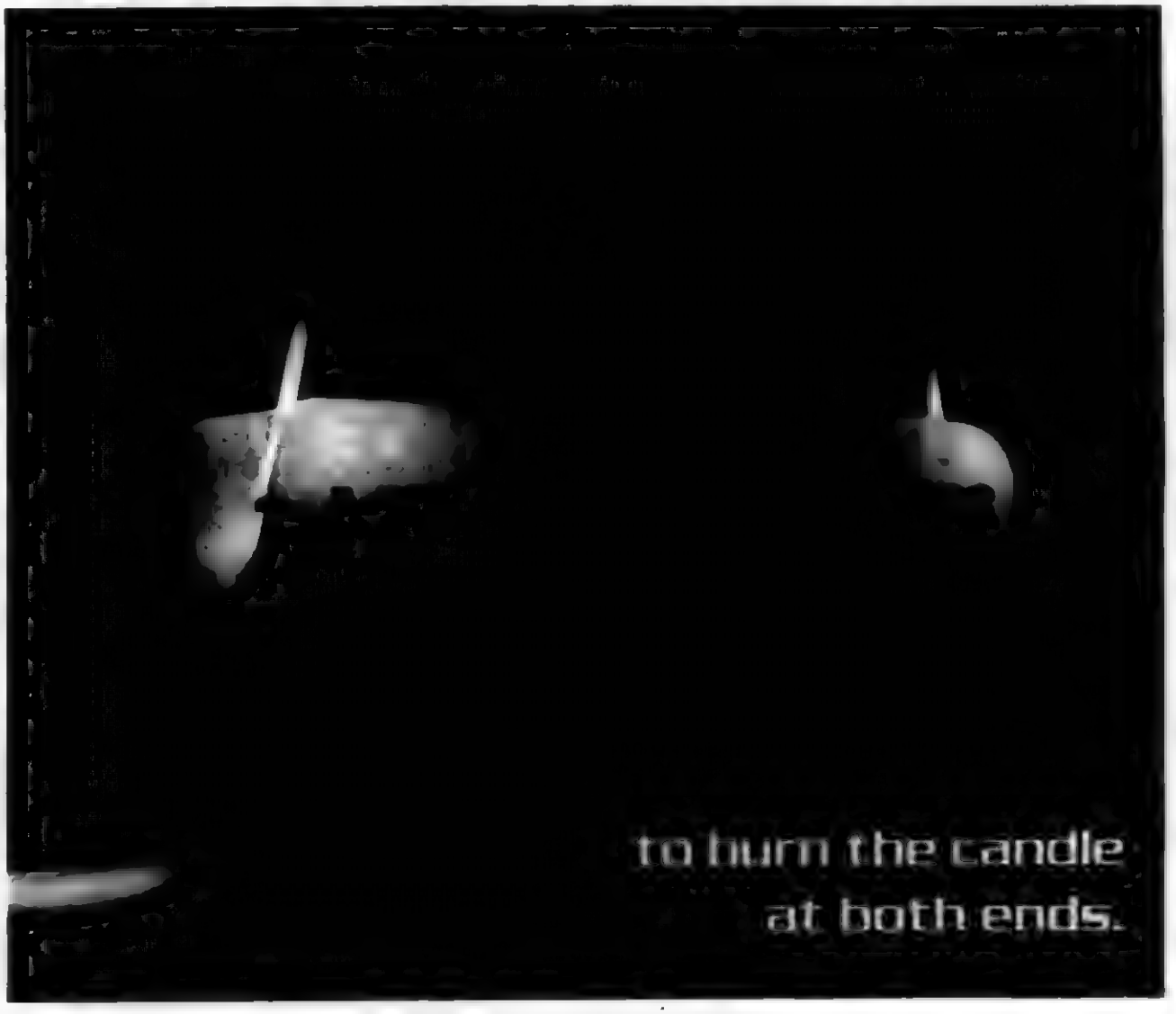
- Strategy. The plan or course of action leading to the allocation of a firm's scarce resources.
- Structure. The character of the organization chart.
- Systems. Standard reports and processes, such as meeting formats.
- Staff. A demographic description of important personnel categories within the firm.
- Style. How key managers behave in achieving the organization's goals; also, the cultural style of the organization.
- Skills. The distinctive capabilities of key personnel or the firm as a whole.
- Superordinate goals. The significant meanings or guiding concepts that an organization imbues in its members.

Only one-sixth of Van Schaik's book is devoted to the stages of growth and 7-S factors, superimposing the seven factors on the stages of growth. Together, the two windows provide a powerful management tool.

The information systems management architecture provides a generic representation of the processes and data that must be managed by the information systems organization. A business process defines the decisions and activities that must be accomplished. If we combine those processes with data, we form a planning and con-

See INFORMATION page 90

Couger is a distinguished professor of computer and management science at the University of Colorado.



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CALENDAR

WEEK OF JUNE 29

JULY 2-3, LAS VEGAS — **Fall Meeting of the Design Automation Standards Subcommittee.** Contact: Ron Waxman, Design Automation Standards Subcommittee Co-Chairman, IBM FSD, 9500 Godwin Drive, Manassas, Va. 22110.

WEEK OF JULY 6

JULY 7-9, WASHINGTON, D.C. — **Deregulated Centrex vs. PBX.** Contact: Telestrategies, Suite 100, 1355 Beverly Road, McLean, Va. 22101.

JULY 8-11, COLUMBIA, MD. — **The Technical Manager in a Changing Environment.** Contact: Continuing Education Institute, Suite 102, 21250 Califa St., Woodland Hills, Calif. 91367.

JULY 9-10, NEW YORK — **Online: The Information Connection.** Contact: The Information Systems & Technology Division of the American Management Association, 135 W. 50th St., New York, N.Y. 10020.

JULY 9-11, NEW YORK — **The Fourth Annual PC Expo.** Contact: PC Expo, P.O. Box 1026, Englewood Cliffs, N.J. 07632.

JULY 10-11, LOS ANGELES — **Knowledge Engineering.** Contact: Education Foundation of the Data Processing Management Association Seminars, Dept. KE, P.O. Box 3608, 3420 Kashiwa St., Torrance, Calif. 90510.

WEEK OF JULY 13

JULY 13-18, CHICAGO — **Guide 65.** Contact: Guide International Corp., 111 E. Wacker Drive, Chicago, Ill. 60601.

JULY 14-17, BOSTON — **Software Trends for Executive Planning and Strategy.** Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

JULY 16-18, WASHINGTON, D.C. — **SNA Architecture and Implementation Seminar.** Contact: Communications Solutions, Inc., 92 S. Saratoga-Sunnyvale Road, San Jose, Calif. 95129.

JULY 17-18, PALO ALTO, CALIF. — **CD-ROM Product Development: What Does It Take?** Contact: Information Industry Association, Suite 800, 555 New Jersey Ave. N.W., Washington, D.C. 20001.

WEEK OF JULY 20

JULY 20-23, TORONTO — **Directions at Toronto.** Contact: Cincom Systems, Inc., 2300 Montana Ave., Cincinnati, Ohio 45211.

JULY 21-22, SAN JOSE, CALIF. — **Computer-Aided Logistics Support.** Contact: Education Foundation of the Data Processing Management Association Seminars, Dept. CALS, P.O. Box 3608, 3420 Kashiwa St., Torrance, Calif. 90510. Also being held July 24-25 in Los Angeles.

JULY 23-25, BOSTON — **Microtrends '86, Education: Redirecting the Revolution.** Contact: Bobbi Hunt, International Communications Industries Association, 3150 Spring St., Fairfax, Va. 22031.

JULY 23-25, MORRISTOWN, N.J. — **Data Communications: Fundamentals and Beyond.** Contact: The American Institute, Carnegie Building, 55 Main St., Madison, N.J. 07940. Also being held July 30 to August 1 in Los Angeles.

JULY 24-25, ATLANTIC CITY — **Integrated Logistics Support.** Contact: TTS Seminars, c/o Technology Training Corp., Dept. ILS/LSA, P.O. Box 3608, 3420 Kashiwa St., Torrance, Calif. 90510. Also being held July 28-29 in Orlando, Fla., and July 31 to August 1 in Washington, D.C.

JULY 24-25, SAN FRANCISCO — **Advanced Communications Architectures Seminar.** Contact: Communications Solutions, Inc., 992 S. Saratoga-Sunnyvale Road, San Jose, Calif. 95129. Also being held August 19-20 in Washington, D.C.

JULY 24-25, WASHINGTON, D.C. — **EDI Training Session.** Contact: TDCC, 1101 17th St. N.W., Washington, D.C. 20036. Also being held August 21-22 in Arlington, Va.

WEEK OF JULY 27

JULY 27-30, BOSTON — **Recognition Technologies**

See CALENDAR page 89

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Portrait of the CIO

From page 85

One of the roundtable session leaders proposed four alternative CIO roles with regard to strategic initiatives and asked the managers to pick the one they follow.

The four were: to champion or sponsor the initiatives; to stimulate discussion of them; to wait for issues to be raised, then jump in; and "to avoid them like the plague." All seven of the information system managers present said they go with the second choice — to stimulate discussion.

With this understanding of the CIO concept, one might question whether it is actually realized when a chief information officer is appointed. One roundtable participant said some CIOs have the title but not the duties, although true CIO use is catching on faster than he expected.

Another, noting that the CIO concept has been hyped in the press, said "it doesn't mean diddly if [CIOs] don't have the respect of their peers." He added that a true CIO must also have a proactive plan for managing technology.

Given these views on the issue of true CIOs vs. bogus ones, one might wonder what attributes make a good CIO. Among the attributes suggested were the following:

- An orientation to the specific business.
- The ability to communicate with executives outside information system operations, both peers and lower-level managers.
- The ability to promote ideas, negotiate and influence others.
- The abilities to delegate and think in terms of long-term strategy.
- Political astuteness or awareness.

After these points were raised, one consultant noted one attribute that had not been mentioned — technical knowledge. Another person said it was assumed that the CIO has some level of technical knowledge and consequently, what that level should be was debated.

That debate was wrapped up with the comment that some technical knowledge is desirable, but that, in many cases, the greater a manager's technical skills, the weaker his more crucial conceptual abilities. As one consultant said, information systems "are scientific; management is art."

After the observation that the CIO must change attitudes toward information technology through face-to-face dialogue, a consultant said the CIO should be able to read the chief executive's body language or the situation.

What does all this boil down to? The consultant just quoted said the information systems manager who becomes a CIO is usually one "with happy users."

Often an assistant information system manager leapfrogs his boss to the position because the assistant has been the one who dealt with users, he concluded.

CALENDAR from page 88

Users Association Forum '86 Summer Session. Contact: Recognition Technologies Users Association, P.O. Box 2016, Manchester Center, Vt. 05255.

JULY 27-31, ANAHEIM, CALIF. — **Third Annual Information Center Conference & Exposition.** Contact: Information Center Conference & Exposition, Weingarten Publications, Inc., 38 Chauncy St., Boston, Mass. 02111.

JULY 28-29, AVON, COLO. — **How to Manage Data and Information as a Resource.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

JULY 28-29, BOSTON — **Fast Algorithms Seminar.** Contact: Technology Training Corp. Seminars, Dept. FA, P.O. Box 3608, 3420 Kashiwa St., Torrance, Calif. 90510. Also being held July 31 to August 1 in Orlando, Fla., and August 4-5 in Washington, D.C.

JULY 28-30, RENO, NEV. — **1986 Summer Computer Simulation Conference.** Contact: The Society for Computer Simulation, P.O. Box 17900, San Diego, Calif. 92117.

JULY 28-AUGUST 1, SEATTLE — **Omnicom Week.** Contact: The Omnicom Institute, Omnicom, Inc., Suite 304, 501 Church St. N.E., Vi-

See CALENDAR page 91

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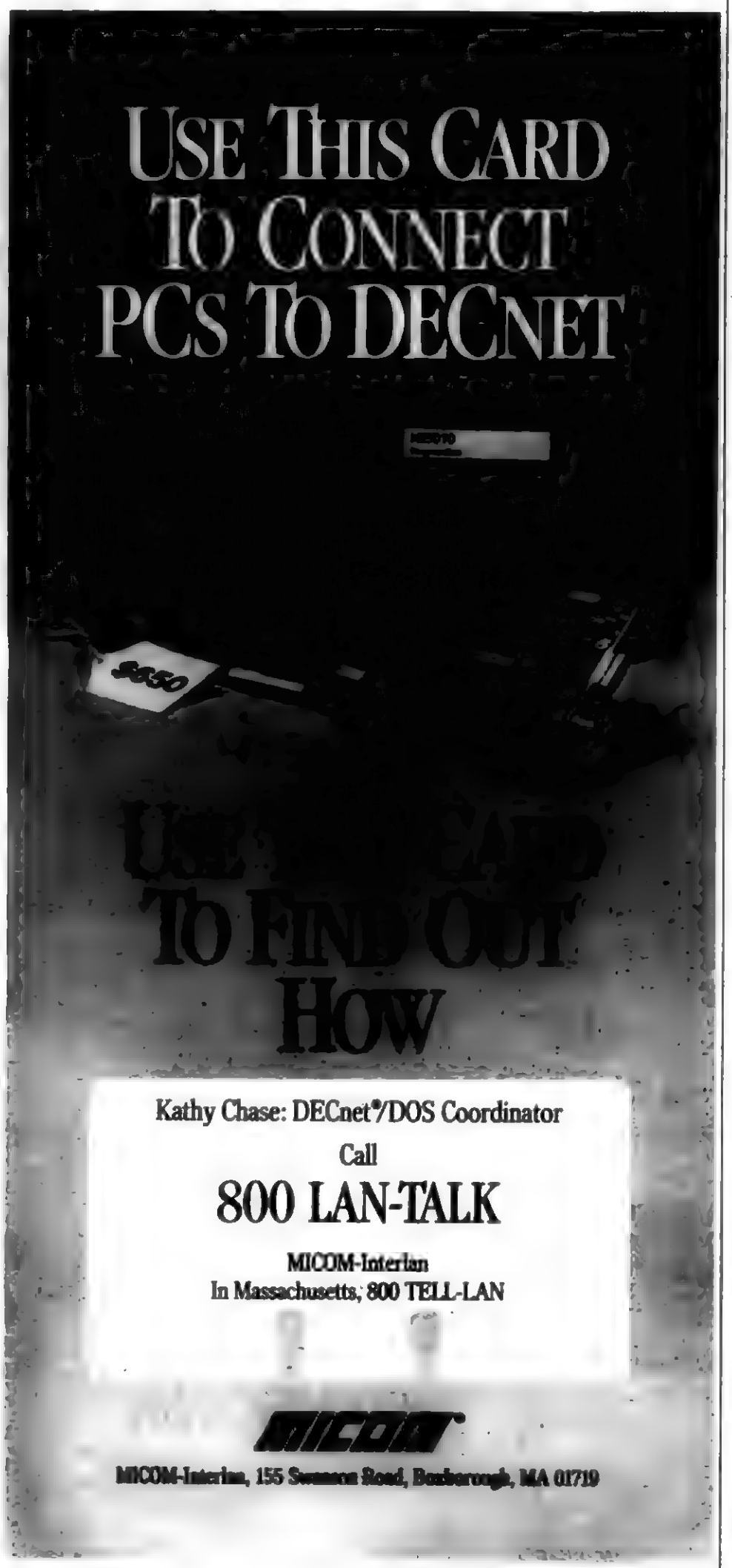


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MANAGEMENT

Utility wires execs to data

From page 85

company's culture, philosophy and structure," he said. "Right now, we're in a continuing state of flux," which demands constant scrutiny.

SDGE's system belongs to an infant product category that, though still small, appears to be gaining steadily in popularity. The first executive information system found its way into corporate use during the third quarter of last year. Since then, the number of systems in use has grown to between 40 and 50, according to Ann Morley, editor of International Data Corp.'s monthly software newsletter.

The information systems were developed to address the needs of senior executives. As such, they differ profoundly from most decision support systems, which are aimed mainly at middle managers, according to Robert Kniffin, vice-president of marketing for Pilot Executive Software, Inc.

Internally, the system allows companies to cull material from data bases and check corporate functions and trends. "They are oriented . . . toward tracking projects or controlling financial variables like cost," Kniffin said.

Installation of the system may have repercussions, some of them not entirely pleasant. Because it is geared for information collection and delivery rather than manipulation, it threatens to displace some middle managers, Rinehart said, although he could not predict how many.

The introduction of the firm's executive information workstations hardly marks SDGE's debut in executive-oriented computing. Previously, the corporation furnished chief officers with IBM 3178 and 3270 terminals that supported messaging and scheduling through IBM's Professional Office System.

SDGE had also installed a small-scale executive information system that performed some of the same tasks as the incoming PC ATs. But the existing installation, which ran on a single 8-bit Altos Computer Systems, Inc. ACS 8000, could accommodate only three of the 18 potential users.

The previous system also swamped its users with too much information and made opportunities and problems hard to spot, Rinehart said.

Executive information systems originated as a concept in the late 1960s, but initially made few inroads among users for several reasons, one of which was poor data quality.

Further, executive information systems suffered from overly ambitious first efforts to install the systems.

The turning point started during the late 1970s with the emergence of sophisticated, business-oriented graphics.

Then came the arrival of personal computers, which gave executive information systems further impetus.

According to Richard Crandall, president of Comshare, Inc., another executive information system vendor, the product category became a commercial reality with the recent entrance into the marketplace of Pilot and Comshare. Both vendors announced similar off-the-shelf systems at roughly the same time, he said.

Information systems books

From page 87

trol loop called the information systems management architecture.

The informations systems management architecture begins with setting strategic objectives. These objectives are then translated into tactical objectives for the operation of ongoing services and the creation of new services. These two sets of objectives are consolidated into a plan to achieve them, called resource planning.

More than half of Van Shaik's book concentrates on implementation of the information systems management model, using a hypothetical company. The book is thought provoking and will force information systems managers to re-evaluate their architectural approaches.

The Sprague/McNurlin book is very well written and easily read. Its strengths are the cases and examples from real companies. It is divided into five parts, each dealing with a major portion of the field of information systems.

The authors have kept the material quite practical, giving many examples. The examples are mini-cases that illustrate how companies have put some of the ideas in each chapter into practice. The 501-page book is a valuable addition to information systems management literature.

The University of Colorado bibliography lists more than 1,200 books from 155 publishers separated into 86 categories. Topics include management, programming, artificial intelligence, system analysis, system design and applications. The books also are catalogued by type and style of presentation.

Broker uses video teleconferencing

From page 85

tive edge, Koenig says.

A portfolio manager at a Hambrecht & Quist client in Boston said he feels the technology also gives him an edge.

"I recently watched a video teleconference at Hambrecht & Quist that presented a company just starting out on a road show," says the manager, Rick Spillane of Eaton Vance Management, Inc.

"That company was planning to be in Boston two days later on the actual road show. Having information two days in advance is very important in this business. If the information strikes me as being of value, I can act that much faster than my competitors," Spillane says.

Takes less time

Furthermore, it only took an hour to watch the conference, while it would have taken at least two hours to go to the luncheon when the company came to Boston, according to Spillane.

And many of the video teleconferences he attends are for presentations that are not brought to New York or Boston, so he gets access to information some other Boston managers do not have, he says.

Daily agenda setting

Hambrecht & Quist managers in San Francisco, New York and Boston congregate each morning via video teleconference to set the day's agenda and determine which stocks the company wants to buy or sell, according to Koenig.

Because the market is a real-time situation, the meetings would have to take place one way or another. "The real advantage is the visual contact," Koenig says.

An entire conference room is outfitted with cameras, screens, auxiliary screens for graphics, controls and communications equipment.

Hambrecht & Quist owns the equipment, whose cost Koenig declined to specify, and leases telephone lines for it.

Dedicated lines, satellite

Transmission goes by dedicated telephone line between Boston and New York and via satellite from New York to San Francisco.

The system also allows the firm to tape meetings that take place in San Francisco when the Boston and New York offices have closed and send the tapes by overnight mail to Boston and New York, where they can be played on a videocassette machine the next day.

System has some bugs

The equipment does have some bugs, such as echoes, voice and video breaks and garbled transmission, but most of them can be fixed by minor adjustments, Koenig says.

Maintenance is handled by a staff communications specialist in San Francisco and occasionally by the vendor, Compression Labs, Inc. of San Jose, Calif.

"Occasionally, it breaks down and the whole system doesn't work — about once a year," Koenig says. "It is less common than it used to be."

Technology key to strategic edge

From page 85

fully integrated airline, offering data processing services to other airlines that choose not to get as fully involved in that aspect of the business, Crandall said.

American, which recently signed an agreement to provide Pan American World Airways with computer reservations services through SABRE, is talking with other airlines about doing so for them, Crandall said. However, American sees no advantage in spinning off SABRE, he said.

CALENDAR from page 89

enna, Va. 22180.

JULY 30-AUGUST 1, AVON, COLO. — **How to Build and Use a Data and Information Resource Directory.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

WEEK OF AUG. 3

AUGUST 4-8, ANN ARBOR, MICH. — **Contemporary Data Communication Networks: Planning, Management and Computer-Based Design.** Contact: Engineering Summer Conferences, 300 Chrysler Center/N. Campus, Ann Arbor, Mich. 48109.

AUGUST 4-8, FORT COLLINS, COLO. — **Topics in Manufacturing Systems Engineering.** Contact: National Technological University, P.O. Box 700, 601 S. Howes St., Fort Collins, Colo. 80522.

WEEK OF AUG. 10

AUGUST 11-14, SNOWMASS, COLO. — **AM/FM International Ninth Annual Conference.** Contact: AM/FM International, Suite 820, 8775 E. Orchard Road, Englewood, Colo. 80111.

AUGUST 11-15, PHILADELPHIA — **AAAI-86 Fifth National Conference on Artificial Intelligence.** Contact: AAAI-86, The American Association for Artificial Intelligence, 445 Burgess Drive, Menlo Park, Calif. 94025.

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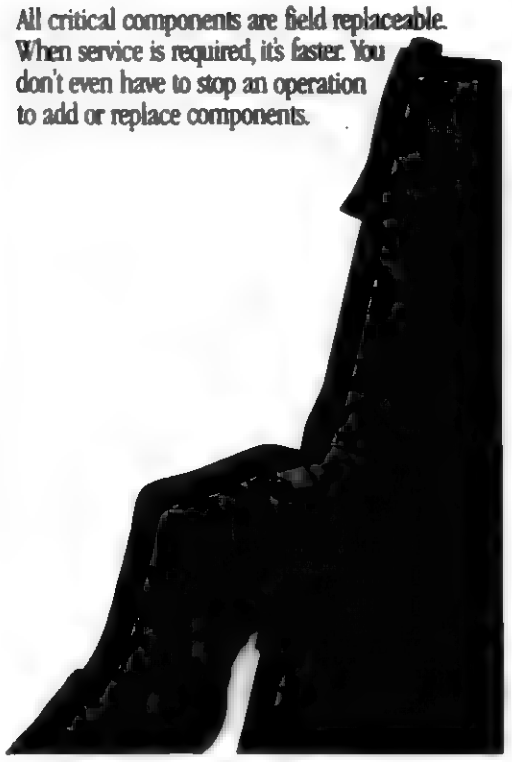


PROCESSORS WITH LARGE APPETITES.

The VLX processors move transactions in 32-bit chunks. They reach into main memory in 64-bit chunks. Because this happens in parallel, more work gets done in less time at a lower cost per transaction.

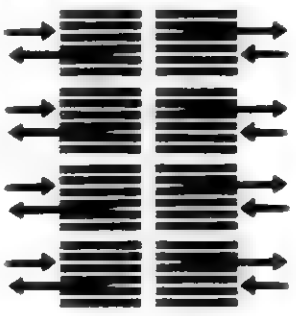
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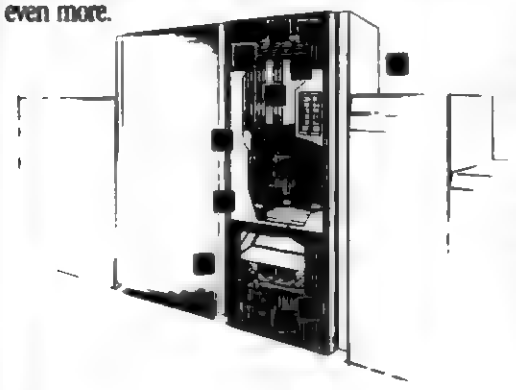


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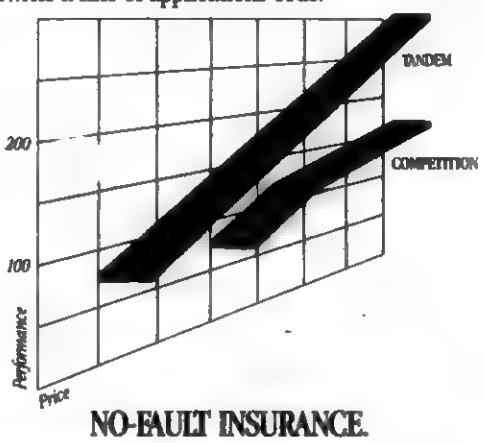


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To add power, just add processors. You can grow from a base four-processor system to 16. From there, you can expand in whatever increments you choose, all the way to 255 systems. You never buy more than you need, and you'll never have to rewrite a line of applications code.



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Tandem systems achieve fault-tolerance with a unique, parallel processing architecture. There are no idle back-up components. Instead, multiple components share the workload. If one goes down, the others pick up the slack, and application processing is uninterrupted.

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The VLX is compatible with any Tandem system and with all major communications standards—SNA, X.25, MAP and O.S.I. And by acting as a gateway to other vendors' systems, the VLX can link them and enhance their value as well.

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TANDEMCOMPUTERS

NEW PRODUCTS

Software now runs on 13 boards

Network Software Associates, Inc. of Laguna Hills, Calif., has enhanced its entire family of personal-computer-to-personal-computer and PC-to-mainframe communications software, allowing each product to work with any one of 13 different makes of hardware boards.

The software uses IBM's Synchronous Data Link Control (SDLC) protocol and runs on any IBM-compatible PC.

The new versions of the software products are said to be compatible with SDLC boards from any of the following companies: ABM Computer Systems Co.; AST Research, Inc.; Computer Logics; Emulex/Persyst Corp.; Forte Data Systems Corp.; Frontier; IBM; Pathway Design, Inc.; SSI, Inc.; Techland Systems, Inc.; Trisystems; UDS; and Wang Laboratories, Inc.

The software products now compatible with the 13 different boards include Adaptsna RJE, Adpatsna 3270, Synctalk, Adaptsna PCcom and Adaptsna LU6.2/Advanced Program-to-Program Communication (APPC).

Adaptsna RJE emulates an IBM 3770 remote job entry workstation for mainframe communications and file transfer applications. It costs $585.

Adaptsna 3270 emulates an IBM 3274 controller equipped with a 3278 or 3279 printer for 3270-type mainframe communications and file transfers. It is priced at $585.

Synctalk is a symmetrical communications program for PC-to-PC applications. Synctalk provides file transfer and remote IBM PC-DOS capabilities at 9.6K bit/sec. Synctalk costs $195.

Adaptsna PCcom provides direct SDLC PC-to-PC communications, file transfer and remote PC-DOS capabilities at 19.2K bit/sec. Adaptsna PCcom costs $475.

Adaptsna LU6.2/APPC is an implementation of IBM's Logical Unit 6.2 protocol, including a number of APPC functions. Adaptsna LU6.2 costs $795.

Multiple-quantity discounts and site licenses are available, the vendor said.

Uccel expands Infopoint line

Five packages added for banking applications

Uccel Corp. of Dallas has added five Infopoint series software products to its Infopoint banking applications line.

According to the vendor, the Infopoint Profitability package for the information management system (IMS) environment addresses such functions as customer relations, profitability analysis, service charging and cross-selling. It is priced at $215,000.

The Infopoint Combined Statement software is said to provide detail and summary reporting on any group of related accounts on a single statement. It is priced from $35,000 and will be available in December.

A third product, Infopoint Combined Interest Reporting, provides the means to combine customer and account information for financial institutions to meet Internal Revenue Service regulatory reporting requirements, the vendor said. This product is priced from $30,000 and will be available in September.

According to the vendor, Infopoint Infoloans is an integrated commercial, consumer and mortgage loan and dealer floor planning product that can be purchased separately or collectively. Infopoint Infoloans is priced from $150,000 and will be available in the fourth quarter of this year.

The fifth package, Infopoint ACH, is an automated clearinghouse product that is said to process electronic transfers. It was designed to make use of private sector processing capabilities. Pricing for this product begins at $80,000. It, too, will be available in the fourth quarter, according to the vendor.

According to Uccel, the Infopoint series is composed of more than 20 software products spanning deposits, transactions, loans and financial management. It also provides multiple-application support software, making possible such activities as cross-application profitability measurement, combined statements, combined interest reporting and ad hoc reporting.

According to a company spokesman, Uccel is planning to introduce three additional Infopoint series products in 1987, including Customer Management, Enterprise Management and a Transaction Management System.

Autocad bows for 3270 PC AT

Autodesk, Inc. of Sausalito, Calif., has introduced a version of Autocad, its computer-aided design software, for the IBM 3270 Personal Computer AT, 3270 PC AT/G and 3270 PC AT/GX.

The company also announced a driver update for the IBM Personal Computer version of Autocad that contains drivers for the Autodesk Device Interface (ADI) and 17 graphics peripherals from third-party vendors.

According to a company spokesman, Version 2.18 of Autocad costs $2,500 and is compatible with Version 3.2 of the IBM 3270 PC Graphics Control Program, said to support extended memory address capability and to allow up to four operations to be executed concurrently.

With Version 2.18, users can convert an Autocad on-screen display into an IBM Picture Interchange File (PIF) format. PIF is supported by IBM's graphics editors and document processors. Users can also transmit Autocad drawing files to mainframe graphics programs and peripherals with Version 2.18, the vendor said.

The driver update, which is currently offered as a separate disk for $80, provides support for the ADI Display Interface, an interface specification used to develop display drivers for Autocad.

Additionally, the update disk includes drivers for such third-party peripherals as the Hewlett-Packard Co. Laserjet Plus laser printer, the Number Nine Computer Corp. NNIOS Graphics Display, the Wyse Technology, Inc. WY-700 Graphics Display and the Scriptel Corp. SPD Tablet.

INSIDE

Software & Services/94
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Systems & Peripherals/111

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SOFTWARE & SERVICES

Systems software

IMSL has announced that its **IMSL Library, SFUN/Library** and **Protran** problem-solving systems have been ported to the IBM RT Personal Computer.

The IMSL Library and SFUN/Library are said to provide a selection of mathematical and statistical Fortran subprograms. The Protran systems were designed for mathematics, statistics and linear programming.

The software uses the IBM RT PC Fortran 77 compiler under the AIX operating system.

A first-year license costs from $850 to $1,200, renewable from $550 to $1,000.

IMSL, 2500 Parkwest Tower One, 2500 Citywest Blvd., Houston, Texas 77042.

■

Global Software, Inc. has introduced **Vista**, an information retrieval software product for IBM mainframes and minicomputers.

Vista is said to include such features as password security and a data access design that allows greater control of data. The menu-driven system also facilitates on-line access of information across various applications.

Vista is packaged to allow access to specific-application or multiple-application data files.

Vista runs in the DOS and OS environments.

Vista for DOS costs from $25,000 to $50,000; for OS it costs from $30,000 to $60,000.

Global Software, 1009 Spring Forest Road, Raleigh, N.C. 27609.

■

Syncsort, Inc. has announced **Release 1.7** of **Syncsort DOS**, its sort and merge program for IBM DOS/VS environments.

Release 1.7 is said to offer improved serial I/Os, problem-state CPU time and supervisor-state CPU time. It is also said to provide new installation and maintenance procedures and enhanced Sortwrite and record formatting capabilities.

Other new features include the ability for work data sets to be opened dynamically and support for ASCII tape I/O files and spanned variable-length records in I/O files.

Release 1.7 of Syncsort DOS is licensed at $5,000 for three years.

Syncsort, 50 Tice Blvd., CN18, Woodcliff Lake, N.J. 07675.

Languages

Michaels, Ross & Cole Ltd. announced **MRCQL**, an SQL implementation for the IBM System/38.

MRCQL allows users to define and modify reports through its nonprocedural command structure. According to the vendor, it is integrated to the MRC-Query series fourth-generation language and allows a range of reporting, from the simplest reports to free-formatted reports to externally described printer files and RPG-III programs.

Other features include Help key documentation, multilevel security, multifile reports, Boolean selection criteria and pagination.

MRCQL is priced at $3,440.

Michaels, Ross & Cole, Building E, Suite 304, 800 Roosevelt Road, Glen Ellyn, Ill. 60137.

Utilities

Software Technologies & Research, Inc. has announced **Release 1.3** of the Dynamic Allocation/Deallocation Subsystem (DADS) designed for use with CICS.

The release features transient data extrapartition data set support; dynamic Oscore adjustment option; batch interface queued request processing during CICS start-up; batch control file maintenance and copy utility with on-line support for DL/1 RecoverDB and DBRC global options; and a multiple DSname version option.

Release 1.3 of DADS is priced at $5,000, the vendor said.

Software Technologies & Research, 160 West St., Cromwell, Conn. 06416.

■

Dodson Consulting has announced **DCmenu**, a fourth-generation methodology tool said to provide a framework for developing the menus of information systems based on Information Builders, Inc.'s Focus fourth-generation language.

DCmenu reportedly enables users to run, maintain and document the menus for multiple systems from one Focus data base; prototype all the menus for a system; assign user access codes to each menu selection; go to any menu in a system; and bypass any menu level. It can also execute CMS Execs or TSO Clists.

DCmenu runs on IBM mainframes with Focus Release 5.0.2 under VM/CMS or TSO. It costs $595, including source code.

Dodson Consulting, 3434 Huntertown Road, Allison Park, Pa. 15101.

■

Help/38 has introduced **RPG V**, a software system for the IBM System/38, said to provide free-form coding in IBM's Source Entry Utility (SEU), RPG V super-shorthand coding and 10 SEU enhancements.

Reportedly, programmers can code RPG V or free-form RPG in SEU. RPG V automatically checks the syntax and generates formatted RPG-III code on the screen. In the free-form mode, RPG V lets users insert 100 lines of code in SEU without being aware of RPG column locations.



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NEW PRODUCTS/MICROCOMPUTERS

The SEU enhancements include the ability to get into the command entry screen while in SEU, instant command execution from SEU and an SEU notepad.

RPG V costs $995 per CPU.

Help/38, 210 Baker Technology Plaza, 6101 Baker Road, Minnetonka, Minn. 55345.

MICROCOMPUTERS

Systems

Integrated Business Computers has announced the **Multistar 4 series** of microcomputers to support multiuser applications.

The Multistar 4 series is made up of Theos Software Corp.'s Theos 8-based Multistar 4 and Multistar 4T. The systems are said to support an 8-MHz Zilog, Inc. Z80 CPU with 256K bytes of memory, a hard and floppy disk controller and four serial ports. The Multistar 4T also is said to feature a 60M-byte streaming tape drive.

Multistar 4 costs from $3,000 for a 25M-byte system to $3,750 for a 50M-byte system. The Multistar 4T costs from $5,000 for a 25M-byte system to $5,750 for a 50M-byte system.

Integrated Business Computers, 21621 Nordhoff St., Chatsworth, Calif. 91311.

Software applications packages

PC Productivity Systems announced **Crossroads**, a software package for mechanical engineering applications.

Crossroads enables users to perform operations such as transformation, surfacing and mass properties analysis using a mouse, icons and drop-down menus. All construction takes place with a Z-axis, and multiple windows allow up to four views of the same part at one time.

Crossroads runs on the IBM Personal Computer XT, AT and compatibles under Microsoft Corp. MS-DOS 2.0 or higher. It costs $2,995.

PC Productivity Systems, Suite 200, 5252 Orange Ave., Cypress, Calif. 90630.

■

Business Systems International has announced **Lasersoft/Data Entry**, an application software package that reportedly allows a microcomputer to act as a data entry device for the completion of electronic forms on laser printers.

According to the vendor, the software allows users to design a form, type the information onto a personal computer or workstation and have the data completely superimposed on the form. The laser printer then prints the completed form.

Lasersoft/Data Entry costs $495.

Business Systems International, 20942 Osborne St., Canoga Park, Calif. 91304.

■

Skok Systems, Inc. has announced **Drawbase**, an integrated computer-aided design, drawing and data management software program.

Drawbase is said to create two-dimensional designs and drawings and simultaneously track associated nongraphic information. The integrated data management system includes an interface to Lotus Development Corp.'s 1-2-3 and Symphony.

Other features include pop-up windows, on-screen indicators and on-line Help.

Drawbase runs on an IBM Personal Computer AT or a Hewlett-Packard Co. Vectra PC. Two monitors are recommended; one for graphic display and one for nongraphic information.

Drawbase costs $4,995.

Skok Systems, 222 Third St., Cambridge, Mass. 02142.

■

Clear Lake Research has announced **CLR Anova**, an analysis of variance program for the Apple Computer, Inc. Macintosh computer.

According to the vendor, CLR Anova allows users to perform analyses of variance computations and follow-up procedures such as range tests and contrasts. It can compute up to a 10-factor analysis with unequal sample sizes and repeated measures. Plots of interactions can be drawn.

CLR Anova is priced at $53 through August. Beginning in September, the price will be $78.

Clear Lake Research, #127 5615 Morningside, Houston, Texas 77005.

■

Pearlsoft, Inc. has announced **Basic Accounting**, a six-module, user-customized accounting software package said to be capable of running stand-alone or integrated with Ashton-Tate's Framework II.

Basic Accounting combines general ledger, accounts payable, accounts receivable, invoicing, inventory and payroll modules with Flexset, a fourth-generation natural language customization module.

The Basic Accounting package is priced at $995.

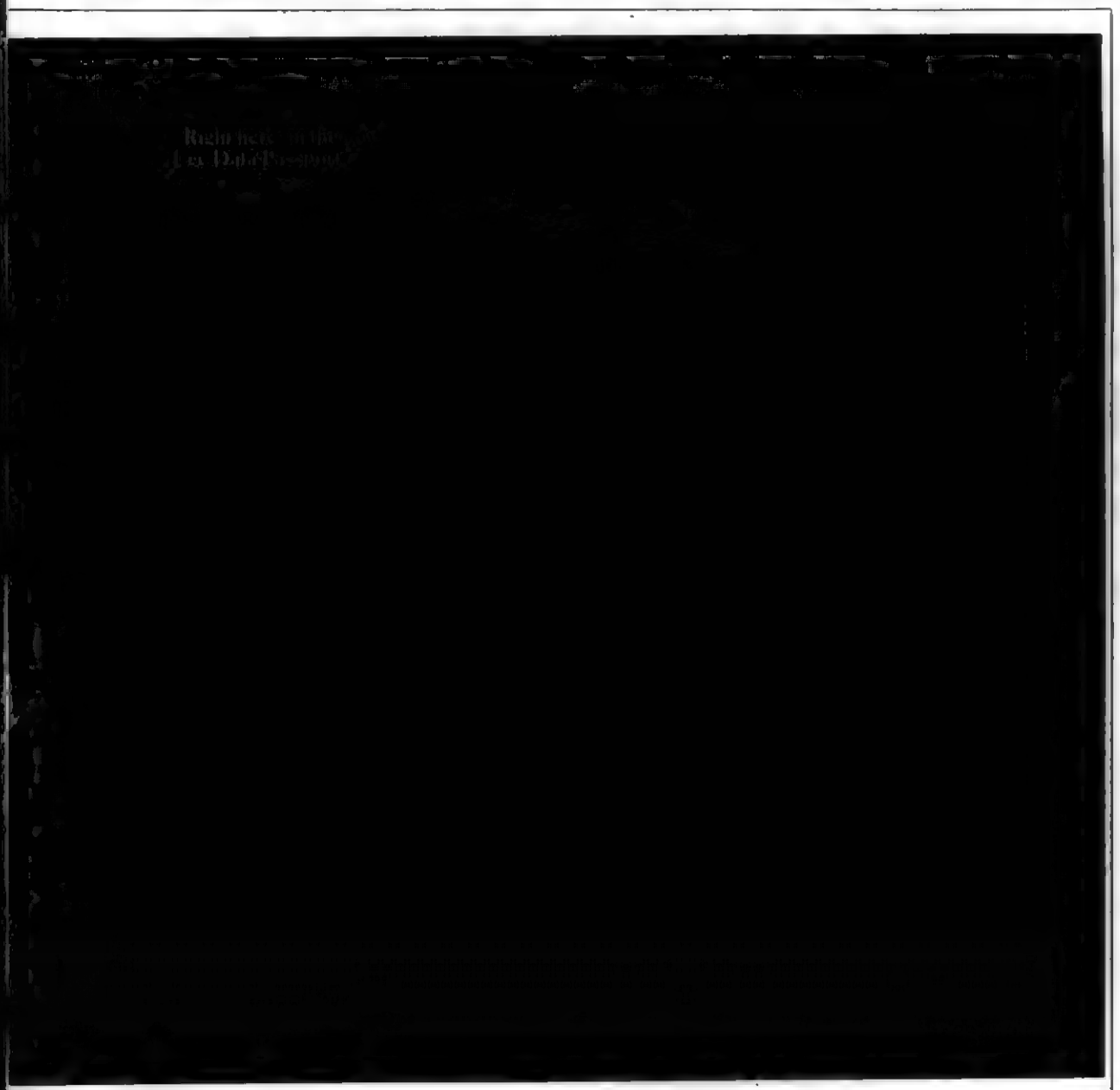
Pearlsoft, P.O. Box 638, Wilsonville, Ore. 97070.

■

Sapana Micro Software has released its **Mail-Track-II with Lettermerge II**, a mailing list management package for IBM Personal Computers and most compatibles.

The program includes features that handle U.S., Canadian and foreign addresses and merged and split mailing lists. It keeps mailing lists in ZIP and postal code order and allows up to eight control codes. The program costs $95.

Sapana Micro Software, 1305 S. Rouse, Pittsburg, Kan. 6672.



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NEW PRODUCTS/MICROCOMPUTERS

Business & Professional Software, Inc. (BPS) has announced that **35mm Express**, its presentation graphics software package for IBM Personal Computers and compatibles, now supports the Apple Computer, Inc. Laserwriter laser printer.

Reportedly, 35mm Express users can now produce black-and-white paper handouts and overhead transparencies.

Users can scale images down to any size and place them anywhere on a page, the vendor said.

The Laserwriter produces text and graphics at 300 dot/in.

It has three read-only memory-resident fonts and will offload a batch of up to 32 images.

The 35mm Express Laserwriter driver diskette is priced at $45, according to the vendor.

Business and Professional Software, 143 Binney St., Cambridge, Mass. 02142.

Microcomputer Graphics, Inc. has introduced the **MGI/CADD** drafting program, a combination of the MGI/Schematic Drafter and MGI/Mechanical Drafter programs.

MGI/CADD is said to be able to draw fillets and tangents with a single keystroke. New line styles and variable text sizes are standard features. The MGI/CADD market includes architects and engineers as well as schools and industries. According to the vendor, familiarity with computers is not necessary to operate MGI/CADD.

MGI/CADD costs $895.

Microcomputer Graphics, 13468 Washington Blvd., Marina Del Rey, Calif. 90292.

■

IGC Technology Corp. has introduced **Pegasys LX**, a computer-aided design and drafting system for use with AT&T's Unix Personal Computer Models 7300 and 3BI.

Pegasys is said to include such features as intelligent drawing structure, a macro language, assignable variables and an on-line calculator to facilitate development of user-defined applications. Pegasys is menu driven.

The Pegasys software package costs $2,900. The combined hardware and software package costs $9,500.

IGC Technology, 305 Lennon Lane, Walnut Creek, Calif. 94598.

■

C. R. Smolin, Inc. has introduced **E-Z-CRP**, a capacity-requirements planning system that operates as an add-on module to the company's E-Z-MRP material-requirements planning system.

The E-Z-CRP is said to determine the day-by-day utilization of the user-defined work centers by calculating the work center capacity, the user-defined routings and the total manufacturing requirements. E-Z-CRP produces reports in tabular and graphic forms.

E-Z-CRP operates on any IBM PC-DOS- or Microsoft Corp. MS-DOS-based microcomputer.

E-Z-CRP costs $995.

C. R. Smolin, Suite J, 7760 Fay Ave., La Jolla, Calif. 92037.

■

McDonnell Douglas Corp. has introduced **Orderxchange**, a communications software sales tool designed to speed the order entry process and reduce errors.

Users can place orders from any location by using an IBM Personal Computer, a PC Convertible laptop or compatible and a modem.

The cost for installing the base system is $10,000; cost for placing an order through Orderxchange ranges from 15 cents to $1.25.

McDonnell Douglas, 20705 Valley Green Drive, Cupertino, Calif. 95014.

■

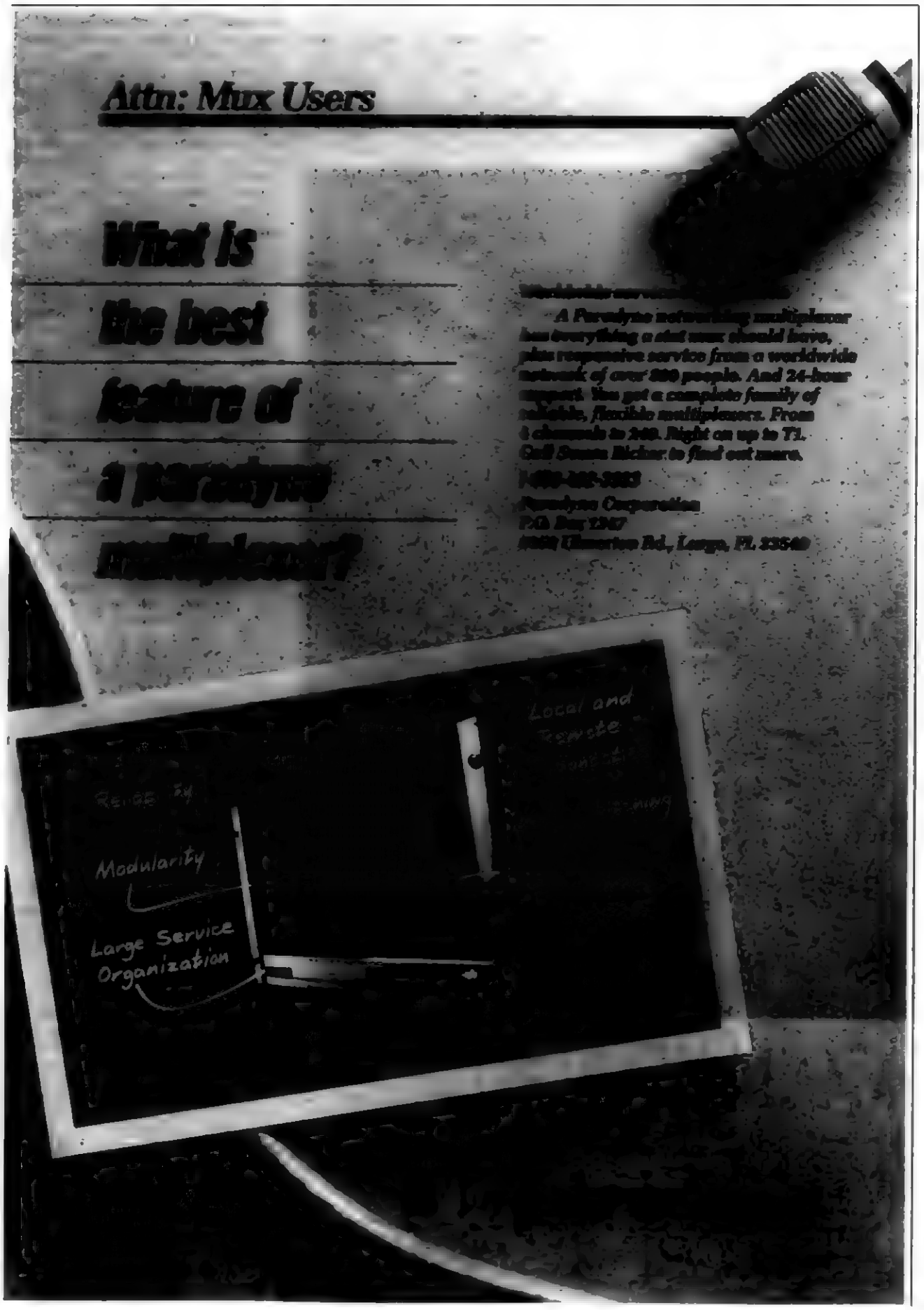
CHI/COR Information Management, Inc. has released **Recovery/1**, a microcomputer-based software system used to maintain a comprehensive disaster recovery plan.

Recovery/1 is said to provide 40 system-supplied reports, including equipment configuration lists, application media profiles and equipment forms.

Recovery/1 is also said to include features such as project management orientation and compatibility with the IBM Personal Computer.

Recovery/1 is priced at $5,000, according to the vendor.

CHI/COR Information Management, 10 S. Riverside Plaza, Chicago, Ill. 60606.



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Software languages

Data Access Corp. has ported its **Dataflex** application development system and fourth-generation language software to Digital Equipment Corp.'s VAX computers.

Dataflex is said to provide mid-range system users with transportable software. The Dataflex program can be used for program generation, report creation and data base management.

Dataflex is also available for microcomputer operating systems, including IBM PC-DOS and AT&T Unix System V.

Dataflex for DEC VAX systems costs $1,800.

Data Access, 8525 S.W. 129 Terr., Miami, Fla. 33156.

Software utilities

Theos Software Corp. has introduced **Theos 286-V**, a software product said to give multiuser capability to Microsoft Corp. MS-DOS programs.

According to the vendor, the 16M-byte memory space of Theos 286-V enables users to keep large programs and data structures in memory for immediate access. Theos 286-V also provides built-in security to users with its memory management and protection features.

Theos 286-V can support 14 to 32 users, the vendor said.

Theos 286-V is priced from $695 to $895.

Theos Software, Suite 100, 201 Lafayette Circle, Lafayette, Calif. 94549.

■

Summit Computer Resources, Inc. has introduced **Disk Censor**, a security and user interface system available for users of IBM Personal Computers, Personal Computer ATs, XTs and compatibles.

Disk Censor is a menu selection system that allows for up to 112 program entries divided over two pages.

The system includes a hardware device that controls the booting process and a resident control program that requires 45K bytes of random-access memory while in operation.

Disk Censor costs $59.95 for the control program and user manual and $59.95 for the expansion card; the network version costs $200 per five workstations.

Summit Computer Resources, 1416 S. Third St., Louisville, Ky. 40208.

■

Cytek, Inc. has announced **Multi-C**, a multitasking library of functions for program developers.

Multi-C is said to link with users' code to provide a multitasking environment in the program. Designated functions become tasks that can schedule other tasks, communicate with each other and use almost all standard C functions.

Multi-C is available for Lattice, Inc., Microsoft Corp. and Computer Innovations, Inc. 8086 C compilers as well as Paragon Technology Corp.'s Z80 C cross-compiler for IBM PC-DOS and Microsoft MS-DOS. It costs $149.

Cytek, Unit 202, 805 Turnpike St., North Andover, Mass. 01845.

National Instruments Corp. has announced **Labview**, a software product for the Apple Computer, Inc. Macintosh.

Labview is said to combine interactive graphics with programming technology developed by National Instruments, called graphical diagramming.

Labview reportedly provides an environment for developing scientific applications that integrate instrument control, data acquisition, data analysis, data entry, data management and report generation.

Graphical diagramming allows the user to draw a diagram and automatically run it.

According to the vendor, there is no need for the user to write, debug and document the code.

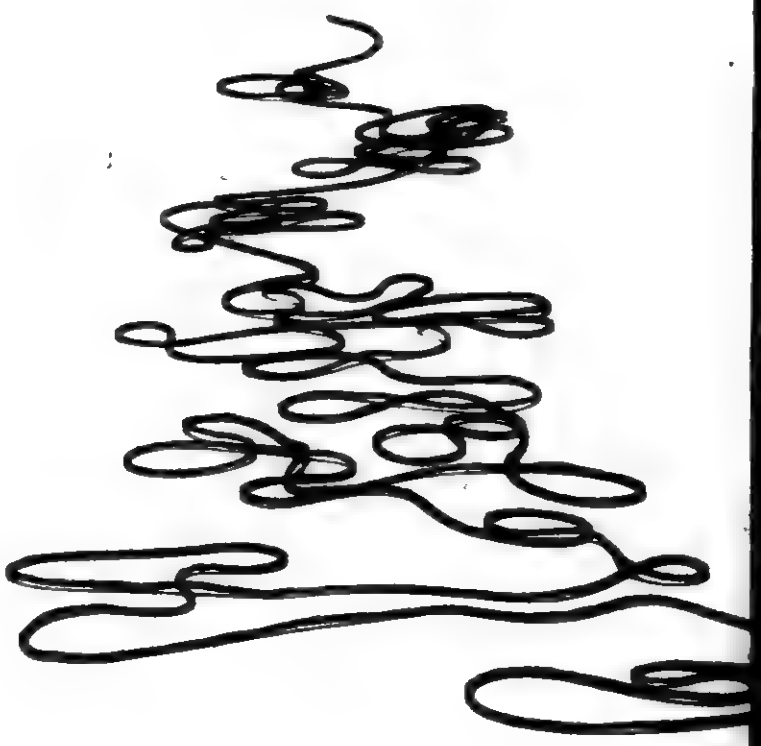
Labview is priced at $1,995.

National Instruments, 12109 Technology Blvd., Austin, Texas 78727.

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NEW PRODUCTS/MICROCOMPUTERS

Expertelligence has announced **Exper-Prolog II**, a Prolog interpreter for the Apple Computer, Inc. Macintosh.

Exper-Prolog II is said to include real numbers, string manipulations and advanced process control. According to the vendor, it allows the user to interactively load, execute, extend and modify Prolog programs.

The interpreter comes with a set of documentation, including a reference manual, a user manual and the Prolog II book written by F. Giannesini, M. Van Caneghem, H. Kanoui and R. Pasero.

Exper-Prolog II is priced at $495.

Expertelligence, 559 San Ysidro Road, Santa Barbara, Calif. 93108.

■

Backpac International Corp. has introduced **PSDOS 3.00**, a software product for use with the BP-100+ write-once optical disk drive system.

PSDOS 3.00 is a Microsoft Corp. device driver that allows the user to expand storage needs in increments of 115M bytes by adding additional optical drives as needed.

According to the vendor, the modular drives are fully user configurable to provide both high-speed access and efficient data transfer.

PSDOS 3.00 runs with IBM Personal Computer XTs, ATs and compatibles.

The PSDOS 3.00 costs $134.95.

Backpac International, 1701 Directors Blvd., Austin, Texas 78744.

■

Compuvision International has introduced **Total Printer**, a text and graphics utility that allows control of the features of Hewlett-Packard Co. Laserjet and Laserjet Plus printers linked to IBM Personal Computers, Personal Computer XTs, ATs or compatibles.

Total Printer can be used to control fonts, pitches, point sizes and italics. According to the vendor, some features of Total Printer include automatic envelope formatting, automatic counters for numbering pages or paragraphs and changeable output destinations to other communications, printer ports or files.

Total Printer costs $79 per copy.

Compuvision International, P.O. Box 1287, Old Chelsea Station, New York, N.Y. 10013.

■

International Microcomputer Software, Inc. has added **Turbo-Halo** and **IMSI Galleria** to its graphics software product line for use with IBM Personal Computers and compatibles.

Turbo-Halo is an IBM Enhanced Graphics Adapter-compatible tool kit. IMSI Galleria consists of three graphics libraries: the business library, the home library and the picture library. Each library enables users of graphics programs to pull up pictures, icons, borders and artists' drawings.

Turbo-Halo costs $99. Each IMSI Galleria library costs $29.95. Two libraries cost $49.95, and all three cost $59.95.

International Microcomputer Software, 633 Fifth Ave., San Rafael, Calif. 94901.

Software enhancements

Generic Software, Inc. has announced **Generic CADD Version 2.0**.

Generic CADD is a computer-aided design and drafting package. New features include increased speed, macros, plot spooling, feet and inches, polar coordinates and ortho mode. Added capabilities include rotate, rescale and global editing.

Generic Cadd costs $99.95.

Generic Software, 8763 148th Ave. N.E., Redmond, Wash. 98052.

■

Graham Software Corp. has announced **Version 1.3** of **Alice: The Personal Pascal**.

The enhanced version is said to be compatible with industry-standard Pascal compilers. It also supports Borland International, Inc.'s Turbo Pascal.

Other Version 1.3 enhancements include improved Help facilities and expanded automatic program formatting. File conversion capabilities have been added to handle the translation of

Continued on page 100

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NEW PRODUCTS/MICROCOMPUTERS

Continued from page 98

Turbo Pascal programs that use Include File routines.

Alice: The Personal Pascal Version 1.3 is priced at $95.

Registered users of previous versions can upgrade for $19.95.

Graham Software, 212 King St. W., Toronto, Ont., Canada M5H 1K5.

■

Master Computer Systems, Inc. has announced **Formix Version 2**, an upgrade of its screen management system and software development environment for the IBM Personal Computer family and compatibles.

Formix is said to be language independent. Version 2 automates 45 additional screen functions in a panel-oriented environment. It features a memory-resident executive that executes 57 screen management functions and a menu-driven development environment.

Formix Version 2 is written in assembly language. It interfaces to most Microsoft Corp. MS-DOS compiler languages.

Development systems are available for $695 per copy.

Master Computer Systems, 9531 W. 78 St., Eden Prairie, Minn. 55344.

■

Locus Computing Corp. has released **Version 2.7** of its **PC-Interface** designed to enable users to share resources between systems running Unix 4.2 and Microsoft Corp.'s Xenix, as well as AT&T's Unix System V and those running under Microsoft's MS-DOS.

Release 2.7 features additional distributed processing functions that enable a user to begin a Unix process from within a DOS program. Another enhancement is the capability to run software packages such as Ashton-Tate's Dbase II and Multimate and Autodesk, Inc.'s Autocad.

The PC installation costs $250, and the Unix host installation costs $500.

Locus Computing, 3330 Ocean Park Blvd., Santa Monica, Calif. 90405.

■

Universal Intergraphix Corp. has announced **Version 3.5** of its **3-D Graphixx** computer-aided design and drafting system.

3-D Graphixx is said to be capable of three-dimensional modeling, production drafting and editing surface of rotations, incremental rotation, controlled distortion and multiple edit types on lines or primitives.

Features of Version 3.5 include real-time animation on all three axes, additional on-line Help, a Go-To feature, expanded line and geometric primitives, line and primitive bisectors, a color mapping feature and electronic documentation.

3-D Graphixx interfaces to various applications, including finite element analysis and any ASCII word processing system. It costs $3,995.

Universal Intergraphix, Suite 108, 2990 E. G St., Ontario, Calif. 91764.

■

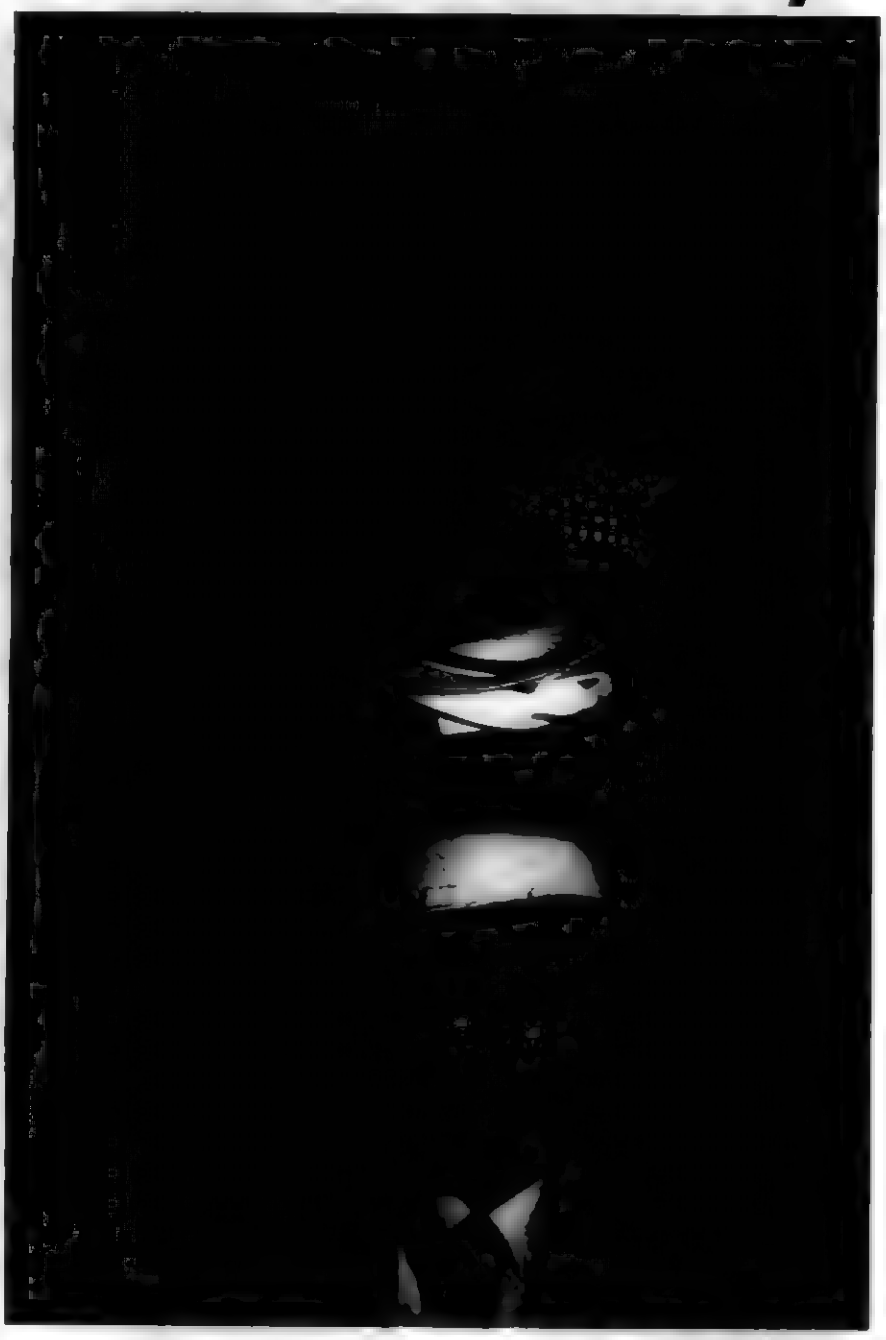
Penton Software, Inc. has enhanced its **Statpro 2.0** statistical software package to support high-resolution graphics.

Statpro 2.0, which operates under Microsoft Corp. MS-DOS or IBM PC-DOS, offers statistical capabilities in areas such as descriptive statistics, regression and time series.

The enhanced software now supports the standard color graphics adapter, the

Continued on page 102

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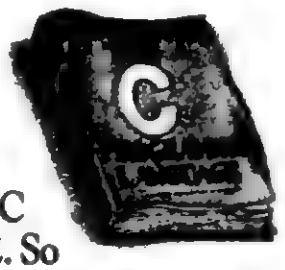
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2. THE UNIX WORLD.



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3. THE REMOTE TELECOM WORLD.



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4. THE ELECTRONIC-MAIL WORLD.



Maybe you don't need to talk to this many applications from a single terminal—today. But if you're getting ready to install multiple computers or replace single-function terminals—don't. Until you look at the Falco 500.

It's the only terminal that lets your operators be in six places at once—getting lots more work done. And the only one that doesn't mind if those places are ANSI- or ASCII-oriented; mainframe, mini or micro; or located in an office, factory or engineering lab. Plus the

5. THE LOCAL AREA NETWORK WORLD.



adaptability of the Falco 500 means you no longer need several terminals doing just one thing at a time. Because it does six things on one terminal—half a dozen on another.

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NEW PRODUCTS/MICROCOMPUTERS

Continued from page 100

Hercules Computer Technology Co. high-resolution monochrome adapter and the IBM Enhanced Graphics Adapter. Statpro 2.0 also supports graphic printers such as those from IBM, Epson America, Inc. and Hewlett-Packard Co.

Statpro runs on the IBM Personal Computer, Personal Computer XT, PC AT and compatibles.

Statpro 2.0 costs $795.

Penton Software, Suite 2846, 420 Lexington Ave., New York, N.Y. 10017.

■

Management Graphics, Inc. has released an updated version of **Personal Business Slideware**, its personal computer-based software package.

The software is said to allow users to design and preview business graphics on IBM Personal Computers and compatibles and have them processed into high-resolution presentation 35mm slides or transparencies.

The menu-driven package includes black-and-white texturing, a tab chart function and text editing features.

Personal Business Slideware costs $595.

Management Graphics, 1401 E. 79th Street, Minneapolis, Minn. 55420.

■

Texasoft, Inc. has introduced **Version 3.0** of the **Thinker Electronic Spreadsheet** for the business and educational markets.

Version 3.0 has statistical, math and financial functions and includes spreadsheet files on disk. According to the vendor, the Thinker has the same command structure as Lotus Development Corp. 1-2-3.

Version 3.0 is IBM PC-DOS and Microsoft Corp. MS-DOS compatible and works with any printer on floppy or hard disks.

Version 3.0 costs $39.95.

Texasoft, P.O. Box 1169, Cedar Hill, Texas 75104.

■

McGraw-Hill CCIG Software has enhanced its program profiler, **X-View 86**, to run with with IBM PC-DOS and Microsoft Corp. MS-DOS Debug Version 3.0.

New features include a resident timer program to allow X-View 86 to execute system timer-dependent programs. According to the vendor, the program also helps improve program performance, get rid of unwanted side effects and expedite program conversion and porting. X-View 86 runs on IBM Personal Computers and compatibles.

X-View 86 costs $59.95.

McGraw-Hill CCIG Software, Suite 1350, 8111 LBJ Freeway, Dallas, Texas 75251.

■

McDonnell Douglas Professional Services Co. has announced **Prokit Analyst Release 2.0**.

The product is said to integrate a graphics package with a data dictionary, allowing users to interactively create and maintain data flow diagrams at the same time that they maintain a data dictionary.

Release 2.0 includes direct access to dictionary maintenance from the diagram editor, expansion of the import/export function, addition of an on-line report browse facility with split-screen capabiltiy, expanded support for multiple projects, pop-up windows with search capability and improved text processing functions.

Prokit Analyst runs on IBM Personal Computers and costs $2,450.

McDonnell Douglas, P.O. Box 516, St. Louis, Mo. 63166.

■

Open Systems, Inc. has announced **Resource Manager 3 with Windows** for its Open Systems Accounting Software (OSAS) Version 3 product line on 3Com, Inc.'s 3+ network.

The Resource Manager 3 with Windows automates installations and provides system utilities for OSAS applications. It features predefined inquiry windows.

The Microsoft Corp. MS-DOS and IBM PC-DOS versions cost from $795 to $1,895, depending on the number of users. The Microsoft Xenix version costs $395, and the AT&T 3B2 Unix V version costs $995.

Open Systems, 6477 City West Pkwy., Eden Prairie, Minn. 55344.

■

Campbell Services, Inc. has upgraded its **Reminder Time Management and Follow-Up System** for IBM Personal Computers.

The appointment and to-do scheduler system is said to support background-resident as well as stand-alone operation. Features include the ability to create daily appointment and to-do lists for user-selected categories, prioritize tasks in any category, carry incomplete tasks over to the next day and sound a reminder alarm up to four hours before an appointment.

Reminder costs $99.

Campbell Services, Suite 1070, 21700 Northwestern Highway, Southfield, Mich. 48075.

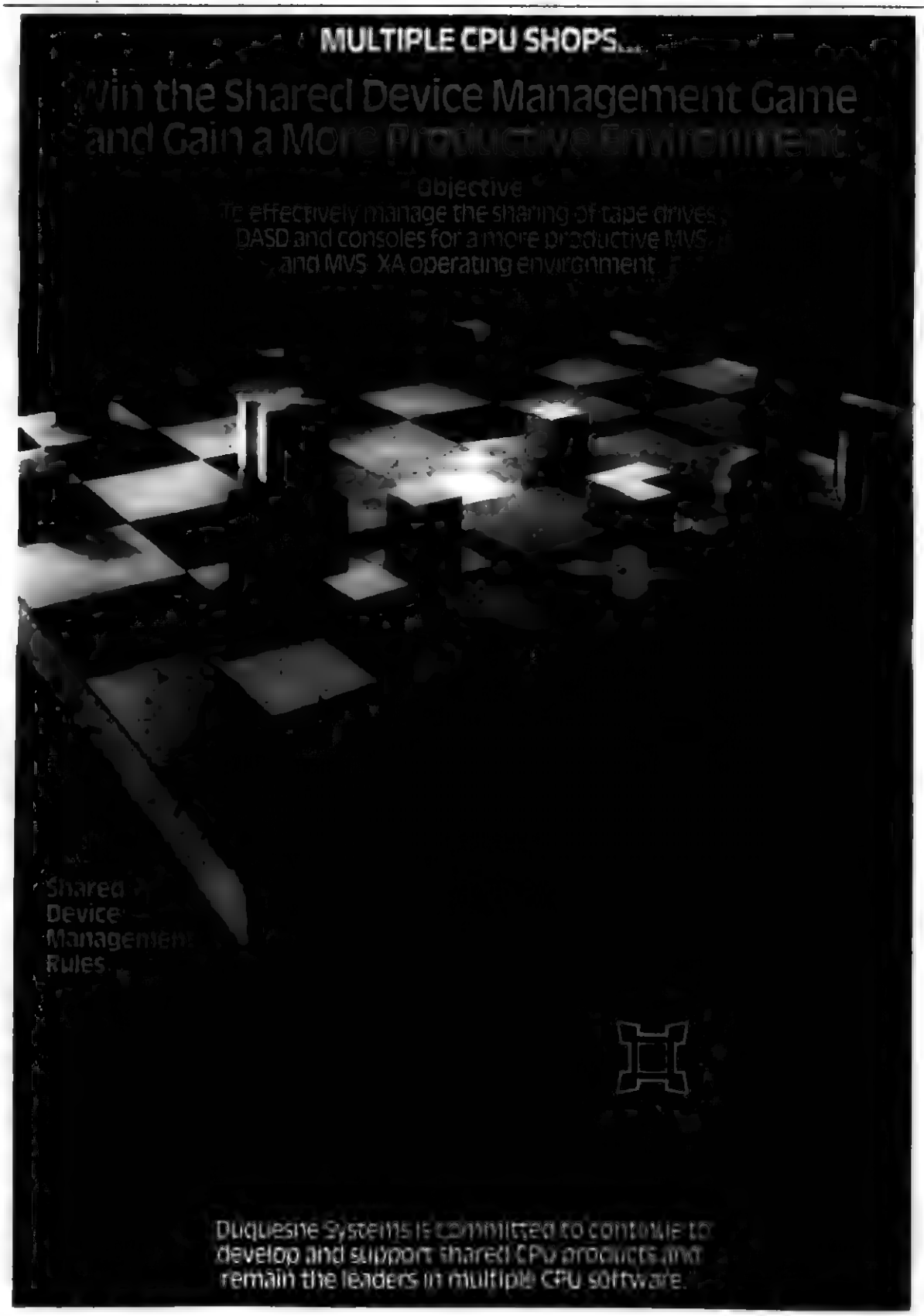
■

Microphonics Technology Corp. has enhanced its **Stylewriter** print manager.

Enhanced features of Stylewriter include an expanded print buffer, expanded type style selection and bar-code printing capabilities.

According to the vendor, Stylewriter upgrades standard dot matrix

Continued on page 106





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Good news for companies with millions tied up in computers and communications.

Honeywell has just announced a new capability that will change the way your company looks at computers and communications.

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ONE is an information-sharing architecture, a unique combination of hardware and software products that now help to make information stored in your IBM, Wang and Honeywell Systems mutually accessible.

But ONE provides much more than just access. With ONE you not only transfer data, you can manipulate it as needed.

From a single workstation, ONE lets you integrate office processing, data processing, and communications, with decision support tools. Now departments can transfer, share, and combine information from dissimilar data bases. Without extra steps or costly duplications of effort.

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By establishing communications among incompatible systems, the significant investment you've made in mainframes, minicomputers, communications systems—even personal computers—is protected, even enhanced. And future growth is simplified.

ONE helps managers manage more effectively.

Office Network Exchange helps managers manage by providing faster, more efficient access to multiple departmental data bases. With ONE, information can be shared from system to system, department to department. Throughout the company. Around the world.

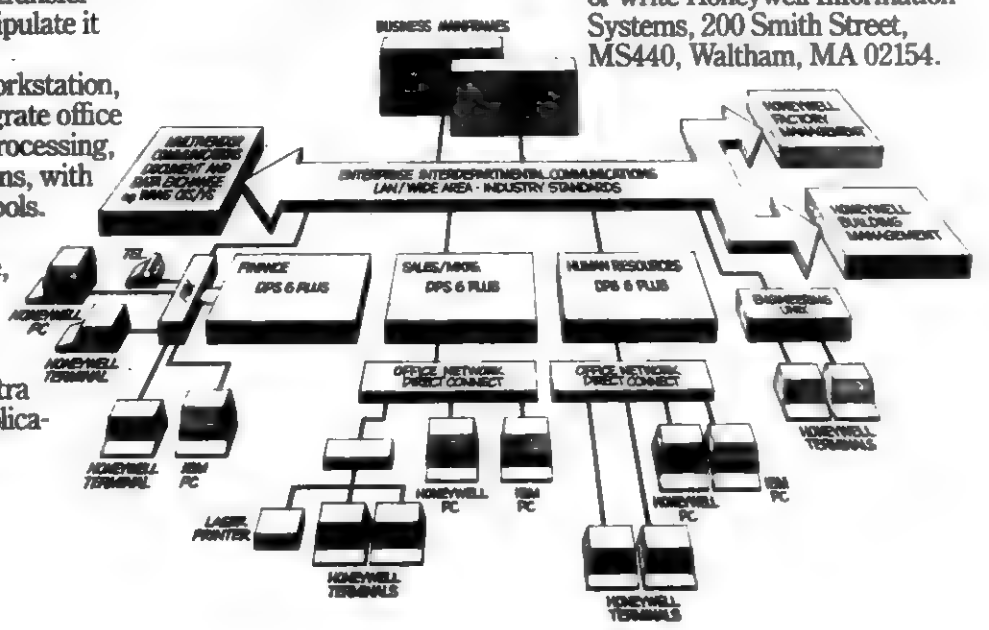
ONE is a major step toward total systems integration.

Right now, Office Network Exchange links a variety of systems from IBM, Wang, and Honeywell. Plus communications systems from AT&T.

Soon it will include other computer vendors such as Digital Equipment Corporation and Hewlett Packard.

So if you have computers from more than one computer company, Honeywell is the company that can help make them work together. And the company that will help integrate your computers, communications and controls into ONE.

To find out more information, call 1-800-328-5111, ext. 2783 or write Honeywell Information Systems, 200 Smith Street, MS440, Waltham, MA 02154.



Together, we can find the answers.

Honeywell

NEW PRODUCTS/MICROCOMPUTERS

Continued from page 102

print to actual or near letter quality.

Stylewriter works with computers offering a parallel port and most parallel dot matrix printers.

Stylewriter costs $229.

Microphonics Technology, Suite B, 25 37th St. N.E., Auburn, Wash. 98002.

Communications

Wordtech Systems, Inc. has announced a local-area network version of its **Networker** file server module for Ashton-Tate's Dbase III.

Networker is said to control records and file locking of Dbase III Plus data. It was designed for use with Wordtech's Dbase III Compiler for the Dbase III programming language.

According to the vendor, only one Networker is required per file server on a local-area network. It features a transparent mode that allows automatic record addition and file locking to a Dbase III application.

Networker costs $99.

Wordtech Systems, P.O. Box 1747, Orinda, Calif. 94563.

■

Gammalink has introduced an upgraded version of its **Gammafax** communications product.

Gammafax consists of a single adapter card plus menu-driven software. It is said to provide IBM Personal Computers, Personal Computer XTs, ATs and compatibles with the ability to communicate with Group III facsimile machines over dial-up lines worldwide.

According to the vendor, with Gammafax installed, the PC emulates a facsimile machine, becoming part of the facsimile network.

Gammafax costs $995.

Gammalink, 2452 Embarcadero Way, Palo Alto, Calif. 94303.

■

Pick Systems has released **Mainlink**, a software package that allows bidirectional transfer of data between IBM Personal Computer ATs and XTs and larger systems based on the Pick operating system.

Mainlink is said to move items, files or accounts from one system to another at speeds of up to 3M bit/hr. Mainlink also offers advanced communications capabilities when installed on two or more PCs.

Mainlink is priced at $295 for the Personal Computer XT and $395 for the PC AT.

Pick Systems, 1691 Browning, Irvine, Calif. 92714.

■

McDonnell Douglas Applied Communications Systems Co. has introduced **Filexchange**, software said to transfer personal computer files among dispersed offices.

Using a modem or hard-wire connection to the Tymnet network, Filexchange users send personal computer files to a store-and-forward host. Filexchange uses the X.PC communications session protocol to detect and correct transmission errors.

Filexchange operates with IBM Personal Computers and compatibles. A monthly subscription fee is $300 per account. The PC software is $99 per copy, and file transfer charges are 25 cents per kilocharacter during prime time or 13 cents per kilocharacter during non-prime time.

McDonnell Douglas, 20705 Valley Green Drive, Cupertino, Calif. 95014.

Data storage

Innovative Software Systems has announced **Revision 2.5** of its **PCLIF** utility software package and the **FDD35** microfloppy disk drive system for the IBM Personal Computer family.

According to the vendor, users of PCLIF and FDD35 can bidirectionally transfer files between IBM PCs and Hewlett-Packard Co. technical computers through the exchange of 3½-in. or 5¼-in. floppy disks.

PCLIF costs $495 and FDD35 $795.

Innovative Software Systems, Suite 122, 1611-D Crenshaw Blvd., Torrance, Calif. 90509.

■

Syquest Technology has announced the **SQ319 kit**, a hardware and software package said to enable users to integrate removable hard disk drives with IBM and IBM-compatible personal computers.

The kit features a 5¼-in. half-height Syquest 15M-byte removable hard disk drive. It includes an enhanced controller, utility software and installation and connecting hardware.

According to the vendor, all Syquest removable hard disk drives provide data security and transportability.

The SQ319 kit is prices at $1,395.

Syquest Technology, 47923 Warm Springs Blvd., Fremont, Calif. 94539.

Toshiba America, Inc. has announced the **PC Floppy Link**, a storage option for its T1100 portable personal computer.

The PC Floppy Link allows the floppy drive in an IBM Personal Computer or Personal Computer XT to be used as an external floppy disk drive for the T1100.

According to the vendor, a switch on the T1100 allows users to designate the T1100's internal drive as drive A and the PC's drive as drive B, or vice versa.

The PC Floppy Link consists of a peripheral card and cable that fit inside the personal computer and an external cable that connects it to the T1100.

The PC Floppy Link is priced at $99.

Toshiba America, 2441 Michelle Drive, Tustin, Calif. 92680.



NEW PRODUCTS/MICROCOMPUTERS

Proapp, Inc. has announced the **Proapp 10** and the **Proapp 20**, 10M-byte and 20M-byte hard disk subsystems said to be interchangable between the Apple Computer, Inc. Apple II and Macintosh computers.

The subsystems are composed of a drive, a controller and port circuits and attach to the floppy disk ports or the small computer systems interface ports of the computers.

According to the vendor, users can partition the disks to accommodate different operating systems. The subsystems are also said to include a printer and spooler interface that is compatible with the Apple Image Writer.

The Proapp 10 subsystem is priced at $795, and the Proapp 20 is priced at $995.

Proapp, 1475 S. Bascom Ave., Campbell, Calif. 95508.

Express Systems, Inc. has announced the **Express Hard Diskcards**, a series of hard disk cards ranging in capacity from 20M to 60M bytes.

Each card comes complete with software, cables and instructions. Average access speeds vary from 60 msec to 80 msec at 5M to 7.5M bit/sec. transfer rates. All 60-msec average access speed drives come with automatic head retraction.

The Express Hard Diskcards are compatible with IBM Personal Computers and compatibles. According to the vendor, the 40M- and 60M-byte cards require two slots; all others require 1½ slots.

Prices range from $449 for the 20M-byte AT Backup Diskcard to $1,095 for the 60M-byte card.

Express Systems, 1254 Remington Road, Schaumburg, Ill. 60195.

Fastore has introduced its **Solidisk/Li**, a solid-state, nonvolatile mass storage system for use with IBM Personal Computers and compatibles.

Solidisk/Li utilizes ultralow power static random- access memories to provide 96K bytes of read/write storage.

Solidisk/Li also uses 256K bytes of erasable programmable read-only memory (EPROM) to provide 384K bytes of read-only memory.

According to the vendor, Solidisk/Li is said to combine an on-board EPROM programmer with high-speed programming algorithms.

Solidisk/Li storage system is priced at $950. According to the vendor, it is available immediately in prototype quantities.

Fastore, 134 Old Ridgefield Road, Wilton, Conn. 06897.



Printers/Plotters/Peripherals

Compuscan, Inc. has announced a **Honeywell Word Processor Interface** for its desktop PCS page reader.

The page reader scans type text and transmits the information to word processors such as the Honeywell, Inc. DPS 6 and IBM-compatible personal computers. It reads approximately 120 pages per hour, according to the vendor, and documents can be stacked up to 50 sheets at a time.

The PCS page reader with a Honeywell interface costs $6,495.

Compuscan, Building 2, 81 Two Bridges Road, Fairfield, N.J. 07006.

■

Sharp Electronics Corp. has announced the **CE-700P** transfer printer, said to print directly onto overhead projector transparencies.

The CE-700P prints in either text or a 480 dot/in. graphics mode. In text mode, courier and elite fonts are standard. The printer was designed for use with Sharp's PC-7000 IBM-compatible personal computer. It also works with any standard parallel printer port.

The CE-700P costs $399.

Sharp Electronics, Sharp Plaza, Mahwah, N.J. 07430.

COMMUNICATIONS

Voice/data communications

Octel Communications Corp. has announced **Newscomm**, a voice processing communication system for large newspapers.

Newscomm is said to provide a range of applications, such as fast and accurate routing of messages, by providing a customer service representative to answer calls and then delivering those calls as recorded messages to an appropriate mailbox.

Newscomm prices start at $45,000.

Octel Communications, 890 Tasman Drive, Milpitas, Calif. 95035.

■

Innovative Technology, Inc. has unveiled **Nitareceptionist**, a telephone reception and messaging system.

Nitareceptionist is a software program that works in conjunction with the vendor's Nita plug-in board for the IBM Personal Computer and compatibles. The system is said to be capable of automtic call answering and routing, call screening and message recording. It can operate in the background while the personal computer is running other applications.

A four-line system costs $2,595. Line-expansion modules cost $1,995.

Innovative Technology, Suite 422, 1000 Holcomb Woods Pkwy., Roswell, Ga. 30076.

■

Equatorial Communications Co. has added the **C-250** micro earth station for remote locations with critical response time or large-block transmission requirements to its Equastar satellite transaction network.

The C-250 is said to be capable of sending data at 9.6K bit/sec. and receiving up to 19.2K bit/sec. of information from a shared 150K bit/sec.

Continued on page 108

Continued from page 107

satellite channel.

Other additions to Equastar include expanded network facilities such as a third 11-meter antenna and 2.5 million amperes of uninterruptible power and supplementary master earth station backup capacity.

The C-250 is priced at $8,000 in quantities of 500 or more.

Equatorial Communications, 189 N. Bernardo Ave., Mountain View, Calif. 94043.

Quality Software, Inc. has announced **QS Call Version 3.0**, an update of its asynchronous telecommunications package.

Added features include an automatic installation procedure, parameters for a phone-entry system, 40 user-definable function keys and Help screens. QS Call supports data transfer rates from 110 to 9.6K bit/sec. and Transmitter On and Transmitter Off protocols.

QS Call offers dumb terminal emulation and Hayes Microcomputer Products, Inc.-compatible modem support. Also, the user's manual has been expanded.

QS Call runs on IBM Personal Computers and compatibles. It costs $150.

Quality Software, 60 Lewis St., Newton, Mass. 02158.

■

Ilex Systems, Inc. has announced the **PC 9624** voice digitizer printed-circuit card, designed for real-time transmission of digital voice from an IBM Personal Computer or compatible.

The card fits into one PC expansion slot. It provides four modes of operation: voice-only transmission, data-over-voice transmission, data-only transmission and facsimile transmission.

All output is via the synchronous port on the card. The audio input to the voice digitizer is via a telephone handset or an optional operator headset.

The operation is controlled by an Ilex software package. Digital output is under PC bus control.

The PC 9624 costs $3,950.

Ilex Systems, 1423 S. Milpitas Blvd., Milpitas, Calif. 95035.

Protocol converters

Dynatech Corp.'s ISDP division has announced the **Delta Probe 1**, an Integrated Services Digital Network (ISDN) interface emulator.

The Delta Probe 1 was designed to generate the physical characteristics of the ISDN basic rate interface. It features five predetermined CCITT-compatible frame patterns and one user-definable pattern. It checks the interface at the CCITT's reference point in both directions.

The Delta Probe 1 is priced at $495.

Dynatech ISDP, 5419 D Backlick Road, Springfield, Va. 22151.

■

The Industrial Products Division of Industrial Electronic Engineers, Inc. has introduced the **Universal Serial Data Converter Module with Memory** (USDCM/M).

The unit is said to provide serial-to-parallel data conversion with RS-232C, RS-422A or 20 mA current loop input levels. Up to 127 messages, totaling 16,000 characters and commands, are stored in battery-backed random-access memory and can be sent to displays. Two separate displays can be addressed individually or simultaneously.

The USDCM/M features selectable data rates up to 9.6K bit/sec. Up to 127 units can be controlled by one host output port.

The unit costs $152.

Industrial Electronic Engineers, 7740 Lemona Ave., Van Nuys, Calif. 91405.

■

Avatar Technologies, Inc. has introduced the Avatar **DC202 Coax Baluns**, said to allow modular telephone cable or twisted-pair wiring to be used for transmitting data of IBM 3270-type devices at distances up to 1,200 ft.

According to the vendor, the baluns take the coaxial signal from an IBM 3274 or 3276 controller and transmit it to the peripherals over modular telephone cable or twisted-pair wire.

On the peripheral end, the coaxial baluns take the input and change it back to coaxial.

Each unit has two I/O connectors, a male BNC connector attached to a 10-in. piece of coaxial and an RJ11 connector. According to the vendor, they cost $80 per pair.

Avatar Technologies, 99 South St., Hopkington, Mass. 01748.



FAQS/XP™ has a solid track record as a leader in the field of system utilities. Since 1977, FAQS/XP has met the needs of 1800 DOS/VSE users. But if you are like the many who have turned to VM, a new champion in console and spool file management, FAQS/VM™, is available to you now.

FAQS/VM allows VM users to view current console activity and to execute operator commands from individual terminals. Past system activity can be displayed on-line and archived to tape. Also, system activity can be search/selected by user-ID, time of occurrence, or string-literal matches, and users can review spool files with the VIEWSP facility. Finally, FAQS/VM provides complete extended color support so you can highlight messages in different colors with reverse video, underlining, high intensity, low intensity, or blinking.

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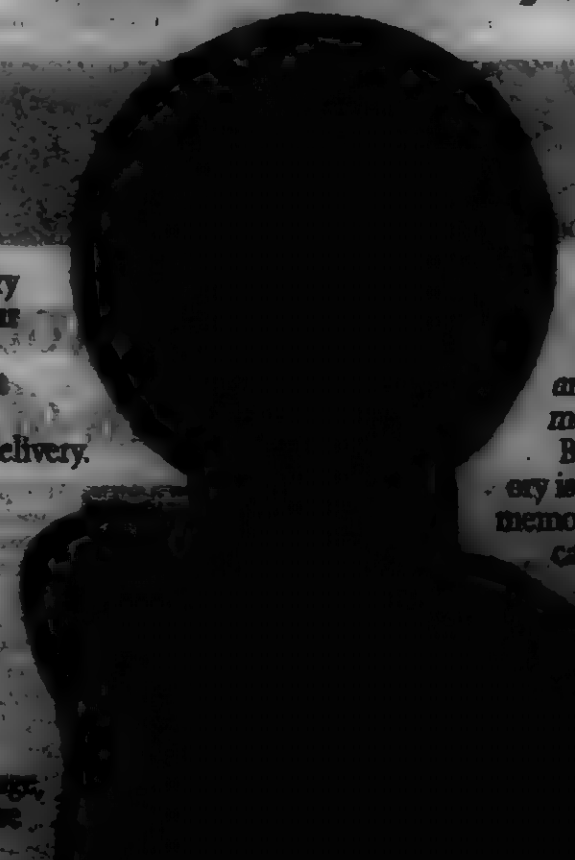
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Insufficient main storage is the single biggest limitation on the performance of your System/36.

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What's more, every single EMC memory board undergoes a rigorous 300-hour test and burn-in procedure in one of our own System/36's.

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We've installed more memory [illegible] in IBM mainframes than any other independent supplier.

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And EMC memory boards are 100% compatible with your System/36. They fully support all IBM memory and memory diagnostic routines—*and do not affect your IBM maintenance agreement in any way.*

Better yet, EMC's new 512Kb and 256Kb memory is priced a full [illegible]% less than IBM's comparable memory. Our volume discounts and trade-up credits can make your savings even greater.

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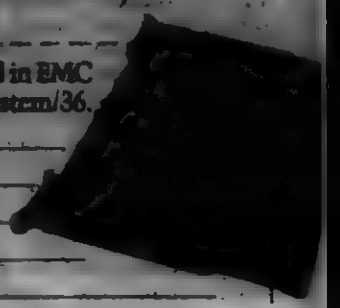
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NEW PRODUCTS/COMMUNICATIONS

Software

Tymnet, Inc. has introduced **Smartym 3270**, a communications software package for the IBM Personal Computer and compatible systems for use with Tymnet's Asynchronous-to-3270 protocol conversion service.

Smartym 3270 is said to enable a PC to access 3270 host applications without the need for synchronous emulator boards, protocol converters or host-based conversion software.

The package features soft keys and capture-to-disk.

Smartym 3270 costs $175.

Tymnet, 2710 Orchard Pkwy., San Jose, Calif. 95134.

■

Fischer-Innis Systems Corp. has announced **Release 2.6** of its **Emc2** electronic mail communication center system.

Emc2 operates in IBM mainframe environments including MVS, TSO, VSE, VM, CICS, IMS and Distributed Office Support System. It also offers networking among multiple CPUs and integrated personal computer file support.

The new release allows users of CICS and IMS to automatically log on to Emc2. Other features include the ability to broadcast a message to all users and enhanced personal computer support capabilities.

MVS and CMS versions lease for $800 per month, and the VSE version leases for $600 a month. Purchase prices start at $18,000 for MVS and CMS versions and $14,000 for the VSE version.

Fischer-Innis Systems, 4175 Merchantile Ave., Naples, Fla. 33942.

■

Gateway Communications, Inc. has enhanced **Advanced Netware 286**, a file server operating system for its G/Net local-area network for IBM Personal Computers and compatibles.

Advanced Netware 286 supports a network configuration of up to 100 PC workstations and up to 32 file/print servers.

The software also provides features such as electronic mail, disk optimization, systems security and file and record locking.

Advanced Netware costs $2,095 for a two-node hardware and software kit.

Gateway Communications, 16782 Red Hill Ave., Irvine, Calif. 92714.

Multiplexers/Modems

Racal-Milgo has introduced three fiber-optic multiplexers, **Omnimux 1400 T-1**, **Omnimux 8100** and **Omnimux 8600**, and two fiber-optic modems, **Fibermode 1100 T-1** and **Fibermode 8100**.

According to the vendor, the Omnimux fiber products provide wideband communications for the single-building or campus-like networking environment. They are said to feature high data throughput at low error rates.

Fibermode modems are compatible with Racal-Milgo Omnimux 82, 162 and 322 statistical multiplexers and can be incorporated into existing analog networks.

The Omnimux fiber products are priced from $1,200 to $3,080; the Fibermode products cost from $176 to $1,200.

Racal-Milgo, P.O. Box 407044, Fort Lauderdale, Fla. 33340.

■

Pilkington Communication Systems, Inc. has announced **1904**, a four-port, fiber-optic time division multiplexer.

The 1904 is said to feature a triple-channel expansion mode that can be independently expanded to three asynchronous channels without control signals, giving the user a total of 12 channels. It operates each channel at up to 64K bit/sec.

The 1904 uses the RS-232C standard interface and optional V.35 and RS-442 interfaces.

The cost of 1904 is $895.

Pilkington Communication Systems, 65 Moreland Road, Simi Valley, Calif. 93065.

When you need a system the sum of its parts: Count

To maximize the availability of your data communications network today—especially multi-node T1 networks—you need a system that's even greater than the sum of its parts. At GDC, we know it's not just one part, but every part working together that makes your network a success.

Putting that knowledge to practical use has made GDC the leader in megabit multiplexing, with the largest installed base of private T1 networking products. We have maintained our leadership position with MEGANET, the ultimate service for cost-effective networking and control. It's the only solution that adds products plus services to equal a total networking system. A system that offers the broadest, most compatible line of products with built-in flexibility that work together to fit your particular communications requirements; from sophisticated multiplexed or switched multi-node T1 networks, to simple local area access.

Even more importantly, MEGANET includes comprehensive service and support with extensive people management capabilities for installation and training. With MEGANET, it all adds up to a total networking solution you can count on.

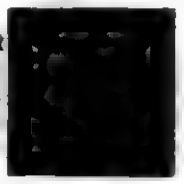


Multiply your wide area networking capabilities.

GDC's software-based MEGAMUX® II, a fourth-generation multiplexer, multiplies your multi-node T1 networking like never before.

It represents 10 years of GDC leadership in T1 multiplexing. It accommodates up to 16 aggregate links, with aggregate rates up to 2,048 Mbps. It includes an autoframe feature to maximize efficiency of bandwidth allocation in multiple node, multiple aggregate networks. It uses the same data and voice channel cards as GDC's MEGAMUX® PLUS and KILOMUX™ PLUS multiplexers to provide flexible, compatible and cost-effective configuration. And it incorporates redundancy and diversity switching to ensure reliability, with pre-programmed alternate routing in case of line failure.

With three types of voice channels, plus centralized control and management via GDC's NETCON® Network Management System, MEGAMUX II is the next step to higher level networking.



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A truly flexible communications system extends the reach of your network in every direction, including the latest technological developments in packet switching.

With our GEN•NET® family of concentrators, and our GEN•PAC X.25 PAD access devices, you have your own link to a packet-switched network. For high-speed, high-density applications, they offer the most economical, reliable way to connect geographically dispersed computers and terminals.

Eliminate network errors with greater accuracy and reliability.



It's a fact that 75% of the major telecommunications carriers in North America have standardized on GDC datasets for internal use and resale. Why? Because our analog, digital and down line programmable datasets offer greater performance, reliability and cost-effectiveness. They give you the broadest selection available for switched and private line networks. And they incorporate many features to help eliminate costly and time-consuming errors.

In addition, they include GDC's exclusive DataCommonality modular packaging to reduce spares and simplify operation and maintenance. The same plug-in circuit card can be used for both stand-alone and rack-mount units; front only access provides for ease of installation, quick changes and adjustments. And you can upgrade efficiently and cost-effectively within a limited network area, easily moving from lower to higher data speeds or from dial-up—switched network—to leased line operations.

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SYSTEMS & PERIPHERALS

Processors

Comark Corp. has introduced the **MV30/35** enhanced Intel Corp. Multibus processor.

The MV30/35 is a single board featuring the NEC Corp. V30 series processor, 1M byte of dual port parity random-access memory, sockets for an Intel 8087 FPP, 8089 direct memory access controller and four 28-pin erasable programmable read-only memories.

Other features include three independent counter timers, a programmable interrupt controller, programmable read-only memory disable and 4-bit page registers, according to the vendor.

The MV30/35 is software compatible with Intel's ISBC 8630 and ISBC 8635. It is reportedly available with the Concurrent DOS system and operates at 10 MHz.

The MV30/35 costs $1,095.

Comark, P.O. Box 474, 93 West St., Medfield, Mass. 02052.

■

Recognition Technology, Inc. has announced the **RTI-400** series of Motorola, Inc. VMEbus-compatible boards.

The series includes the PX-401V intelligent pixel processor, the AS-401V analog subsystem for video inputs and video outputs and two image memory boards, the DS-401V and the DS-441V. Together the boards are said to form a complete vision engine subsystem.

Software support is provided by RTILIB/400, a real-time image processing/machine vision subroutine package with C-callable routines covering image enhancement, segmentation, feature extraction and more.

The AS-401V costs $2,995; the PX-401V costs $3,496; the DS-401V costs $2,495; the DS-441V is priced at $3,495; and the RTILIB/400 costs $1,500.

Recognitions Technology, 335 Fiske St., Holliston, Mass. 01746.

■

Motorola Semiconductor Products, Inc. has introduced the **Model MVME133** 32-bit VMEbus-compatible microcomputer board.

The board is said to incorporate a 12.5-MHz 68020 MPU with a companion floating-point math coprocessor plus a 1M-byte dynamic random-access memory array. It features a serial debug and two RS-232C multiprotocol serial I/O ports, three 8-bit timers, a real-time clock and a VMEbus master interface with system controller capabilities.

The MVME133 board is priced at $1,995. A 16.67-MHz version of the board is available.

Motorola Semiconductor Products, P.O. Box 20912, Phoenix, Ariz. 85036.

■

Force Computers, Inc. has announced the **CPU-6** series of Motorola, Inc. VMEbus CPU boards, said to support fast floating-point operations and multiprocessing applications.

The series incorporates Motorola 68000 or 68010 processors and offers 512K bytes of dedicated on-board dynamic random-access memory, permitting zero-wait-state operation at 8 MHz and one-wait-state operation at 12.5 MHz.

According to the vendor, features include four 28-pin erasable programmable read-only memory sockets, three RS-232C serial ports, one parallel port and a real-time clock with battery backup.

The CPU-6 is priced at $1,845.

Force Computers, 727 University Ave., Los Gatos, Calif. 95030.

■

Force Computers, Inc. has introduced **Miniforce-2P21**, a 32-bit multiuser hardware and software development system.

The Miniforce-2P21 provides a Motorola, Inc. VMEbus-based open-system architecture. According to the vendor, the system runs at 16.7-MHz without wait states and features the PDOS real-time operating system.

Key features of the system include a 51M-byte Winchester disk, a 1M-byte floppy disk and two RS-232 serial ports. Miniforce-2P21 works with the Motorola 68020 CPU and the 68881 floating-point coprocessor.

The Miniforce-2P21 is

Continued on page 112

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NEW PRODUCTS/SYSTEMS & PERIPHERALS

Continued from page 111

priced at $15,990.

Force Computers, 727 University Ave., Los Gatos, Calif. 95030.

■

Southern Data Systems, Inc. has introduced the **DM8 2MB** memory board for the Wang Laboratories, Inc. 2200 series of processors.

The DM8 memory board provides up to 1M byte of internal data memory and a minimum of 1M byte of Southern Data Systems' random-access memory disk, depending on the data memory requirements, all on a single board.

According to the vendor, the 1M byte of data memory will support up to 16 terminal partitions of 16K bytes each.

The DM8 2MB memory board is priced at $3,600.

Southern Data Systems, 5115 Holly Ridge Drive, Raleigh, N.C. 27512.

■

GMX, Inc. has announced the **Micro-20 SBC** add-in board.

The board combines a 12.5-MHz or 16.67-MHz Motorola, Inc. 68020 32-bit microprocessor and an optional 68881 floating-point coprocessor with 2M bytes of 32-bit wide random-access memory, up to 256K bytes of 32-bit wide erasable programmable read-only memory, four serial ports, an 8-bit parallel port, a 5¼-in. floppy disk controller and a real-time clock with battery backup. A 16-bit expansion connector allows the addition of off-the-shelf or custom I/O interfaces.

The board is priced at $2,750 including a GMX version of Motorola's 020 Bug monitor/debugger and a set of hardware diagnostics.

GMX, 1337 W. 37th Place, Chicago, Ill. 60609.

■

Clearpoint, Inc. has announced the **RTRAM** series of add-in memories for the IBM RT Personal Computer RT.

The RTRAM/4 offers 4M bytes of memory, and the RTRAM/8 offers 8M bytes of memory. Both boards allow users to configure up to 16M bytes for the full address space of the RT PC.

Both boards are IBM-compatible and support the RT PC error detection and correction logic.

The RTRAM/4 is priced at $1,895 and the RTRAM/8 costs $4,395.

Clearpoint, 99 South St., Hopkinton, Mass. 01748.

■

CIE Systems, Inc. has introduced the **Turbo CPU** upgrade module for its Motorola, Inc. 68000-based multiuser business systems.

The module is available for midrange members of the CIES 680 family running either Pick Systems' Pick or RM/COS operating systems.

Two versions are available: the Turbo CPU with 256K bytes of onboard memory and the Turbo-Plus CPU with 1M byte of on-board memory. Both can address up to 8M bytes of system memory. They are based on the 32-bit Motorola 68020 CPU running at 16.7 MHz.

The Turbo CPU costs $4,995, and the Turbo-Plus CPU costs $8,395.

CIE Systems, 2515 McCabe Way, Irvine, Calif. 92714.

■

Plexus Computers, Inc. has introduced add-on **Advanced Communications Processor** (ACP) boards said to double the capacity of its P/35 and P/60 Unix-based computer systems.

According to the vendor, the P/60 can be expanded by up to 80 users with the addition of five ACP boards, and the P/35 can be expanded to 32 users with two ACP boards.

The boards are front-end processors that remove the I/O functions from the main job processor's workload. Each has 16 serial ports and one parallel printer port and can support Systems Network Architecture, Bisynchronous, X.25 and Defense Data Network protocols.

Each ACP board costs $6,000.

Plexus Computers, 3833 N. First St., San Jose, Calif. 95134.

Graphics systems

P. Nikola Co. has introduced the **RG02**, an intelligent graphics controller.

The RG02 is said to change vector graphics into a matrix understood by laser matrix printers. It is a single Euro-format card fitted with an RS-232 or RS-422 serial interface as well as a Centronics Data Computer Corp. parallel interface.

Features include erasable programmable read-only memory software, a mini calculator and a data buffer with a capacity of 512K bytes, expandable to 10M bytes. According to the vendor, the RG02 can reproduce all vectors.

The RG02 is priced at $1,495.

P. Nikola Co., Benzstr. 12, D-7050 Waiblingen, West Germany.

■

Management Graphics, Inc. (MGI) has enhanced the **Videotrace scanning system**, an optional attachment for Management Graphics' tabletop slide-making systems and workstations.

The Videotrace system is said to enable the operator on any Management Graphics system or workstation color monitor to view images such as technical schematics, line drawings, logos and medical graphs. The Videotrace scanning system incorporates an 850-line resolution.

The cost of the Videotrace scanning system is $4,495.

Management Graphics, 1401 E. 79th St., Minneapolis, Minn. 55420.

■

Palantir Corp. has introduced **Palantir Compound Document Processor** (CDP), a system said to read typeset or typewritten text without being manually trained.

Features of the Palantir CDP in-

Continued on page 115

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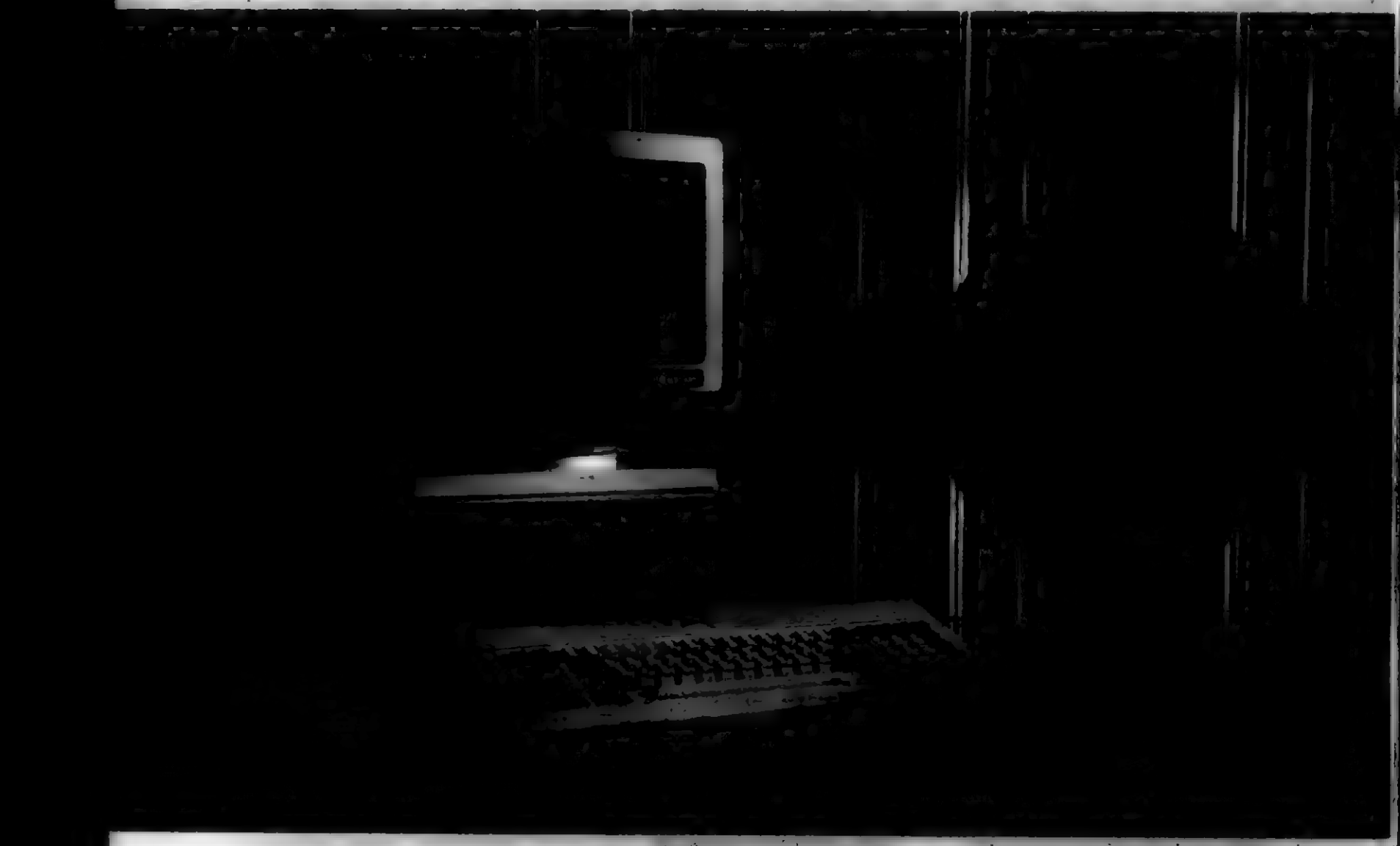
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NEW PRODUCTS/SYSTEMS & PERIPHERALS

Continued from page 112

clude page processing that permits all the information to be extracted from documents with multiple columns, embedded text and graphics and form processing.

Typically, the CDP works as part of a larger system that includes a host computer, display device, mass storage and printer.

The suggested price of a single end-user system is $39,500.

Palantir, 2500 Augustine Drive, Santa Clara, Calif. 95054.

■

Sony Corp. of America has announced the **VPH-1030Q1** and **VPH-2030Q1** multiscan projection systems.

The VPH-1030Q1 is said to project a picture measuring 100 in. diagonally. The VPH-2030Q1 projects a picture measuring 200 in. diagonally.

Using red-green-blue (RGB) inputs, the horizontal resolution is more than 900 TV lines at the center of the screen. Character display capacity of 4,000 char. can be achieved. In composite video, horizontal resolution is more than 520 lines.

Other features include two RGB inputs with independent horizontal shift controls, built-in speakers, video output connectors and remote control capability.

The VPH-1030Q1 costs $8,666, and the VPH-2030Q1 costs $8,888.

Sony, 9 W. 57th St., New York, N.Y. 10019.

■

Pericom, Inc. has added the **MX6000** and the **MX8000** color graphics terminals to its Monterey graphics family.

The MX6000 is said to be the functional equivalent of Tektronix, Inc.'s 4109. It features a 19-in. screen and 640- by 480-pixel resolution. According to the vendor, it is noninterlaced and runs at 60Hz. It allows 16 simultaneous, user-definable colors.

The MX8000 adds a 1,024- by 1,024-pixel resolution to all of the features of the MX6000.

The price for the MX6000 color graphics terminal is $6,995, and the price for the MX8000 is $8,995, according to the vendor.

Pericom, Suite 250, 111 Sepulveda Blvd., Manhattan Beach, Calif. 90266.

■

JDL, Inc. has announced the **GL Processor**, a graphics protocol converter said to provide Hewlett-Packard Co. 7475A plotter emulation for the vendor's color matrix printers and plotters.

The GL Processor is said to convert computer-generated, vector-based graphics data in the HP graphics language format into the raster format that is used by JDL.

According to the vendor, the GL Processor also operates as a print spooler for word processing and data processing.

The Model 15 is priced at $1,290 and can produce A-size color and monochrome, B-size two-color as well as C-size monochrome prints.

The Model 30 is priced at $1,690 and can produce A- and B-size four-color and monochrome and C-size two-color prints.

JDL, Suite 104, 2801 Townsgate Road, Westlake Village, Calif. 91361.

Printers/Plotters

Infoscribe, Inc. has enhanced its **Model 1100** printer.

The printer now features standard friction feed in addition to tractor feed, with manual feed of cut-sheet paper or single and dual tray automatic sheet feed using the AS-250 bottom-feeding automatic sheet feeder.

The Model 1100 provides 200 char./sec. data processing-quality printing, 100 char./sec. correspondence-quality printing and 40 char./sec. near-letter-quality printing. It also offers 72 by 72 dot/in. dot-addressable graphics, multiple type fonts and bar code printing options.

The Model 1100 is priced at $1,767.

Infoscribe, 1808 Michael Faraday Court, Reston, Va. 22090.

Western Automation Laboratories, Inc. has announced the **Seleris**, an intelligent plot spooler designed to work with computer-aided design systems.

The Seleris is said to attach to computers via an RS-232 serial communications port. It is available in .5M-byte, 1M-byte and 2M-byte sizes. Each comes with its own power supply.

The Seleris plot spooler stores multiple plots and allows the user to selectively delete any or all of the plots. According to the vendor, other features include the ability to interrupt or abort a plot in progress and the ability to make multiple copies of a selected drawing.

Prices for the three models are $495, $795 and $1,295.

Western Automation, 1700 N. 55th St., Boulder, Colo. 80301.

Kel, Inc. has announced the **Model 5311 laser page printer**.

The Model 5311 is said to offer a 20 page/min printing speed and 300 dot/in. resolution. It incorporates a Motorola, Inc. 68000-based controller, a laser engine and an amorphous silicon drum.

It accepts legal, letter and ledger-size paper. Paper handling options include a 2,000-sheet capacity paper deck, a dual face-down stacker with offset capability and a duplex print module for two-sided printing.

According to the vendor, standard communications capabilities include RS-232 serial and Centronics Data Computer Corp. parallel I/O interfaces.

Prices for the 5311 laser page printer start at $17,800.

Kel, 400 W. Cummings Park, Woburn, Mass. 01801.

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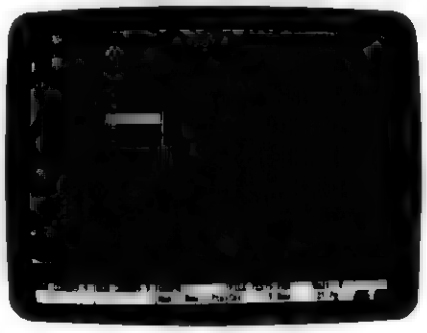
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NEW PRODUCTS/SYSTEMS & PERIPHERALS

Versatec, Inc. has announced the **Model 820 Raster Processing Machine**.

The unit is a 32-bit single microprocessor-based rasterizer designed for use with a Versatec electrostatic plotter, computer interface and host software.

It comes standard with 4M bytes of dual-ported memory. Main memory can be expanded to include either 8M or 12M bytes of dual-ported memory.

An optional 140M-byte hard disk can also be included in the system.

According to the vendor, the Model 820 can be upgraded to include two additional graphic processors, a bit-slice processor and a very large-scale interface processor.

The Model 820 Raster Processing Machine costs $12,000.

Versatec, 2710 Walsh Ave., Santa Clara, Calif. 95051.

■

Management Graphics, Inc., has added a **black-and-white laser printer** to its product line.

The laser printer output includes A4 and B5 international size copies and overhead transparencies, all at 300 dot/in. resolution.

According to the vendor, after the first copy is produced in 90 seconds, remaining copies are produced at up to eight page/min.

The laser printer is said to produce proof and handout copies of images created on the vendor's TTS/Tri-Master computerized slide-making system.

The laser printer comes with user-replaceable cartridges.

The Management Graphics laser printer costs $14,900.

Management Graphics, 1401 E. 79th St., Minneapolis, Minn. 55420.

Power supplies

Interactive Technologies, Inc. has introduced a computer-controlled **power supply** said to deliver variable regulated ouputs up to 20.47 VDC.

Along with the variable outputs, the power supply is said to deliver independent fixed +5VDC and ±12VDC outputs.

It features an IEEE 488 interface bus. Output and ground connections are binding posts or banana jacks on the panel front or a 12-pin connector on the back.

According to the vendor, the unit's memory recalls stored voltage settings.

The power supply is priced at $1,395.

Interactive Technologies, 2266 N. Second St., North St. Paul, Minn. 55109.

■

Modular Power Corp. has introduced **Upstar**, a series of electronic motor generators ranging from 15 KVA to 480 KVA.

Upstar is said to be able to protect mini and mainframe computer installations from outages and incoming utility power fluctuations. It enables the customer to add power protection as the load increases.

It features a design that includes large-scale integrated circuits, internal redundancy and a Help facility.

Upstar is priced from $30,000.

Modular Power, 1150 Ringwood Court, San Jose, Calif. 95131.

Elgin Electronics, a subsidiary of **Combustion Engineering**, has introduced the **FCP25/48FE** power supply.

The FCP25/48FE is a packaged power unit designed for private automatic exchange and private branch exchange as well as private automatic branch exchange telephone switches in which batteries are not required.

According to Elgin Electronics, the unit has a 25A capacity and a 48-volt DC power supply.

FCP25/48FE power supply is regulated and filtered.

The FCP25/48FE unit reportedly operates on 60 Hz single-phase AC voltage.

The FCP25/48FE is priced at $1,160.

Elgin Electronics, 5533 New Perry Highway, Erie, Pa. 16509.

Auxiliary equipment

Itran Corp. has introduced its **Vision Statistical Processor** (VSP), designed for use with Itran machine vision inspection equipment.

The VSP is said to perform statistical process control for ensuring quality control during the manufacturing process.

It is a stand-alone, plug-compatible product that provides ongoing statistical measurements of parts as they are inspected.

VSP analyzes measurements of parts by computing such statistics as averages and variances.

The results are reportedly displayed on a CRT or printed out as hard copy.

VSP is priced at about $12,000.

Itran, P.O. Box 607, 670 N. Commercial St., Manchester, N.H. 03105.

RTE Deltec Corp. has announced **Watchman I**, the first in a series of small standby power systems.

The units are said to include 20 minutes of battery backup time for personal computers.

Should the utility power fail, an alarm sounds, a red light flashes and the Watchman I takes over until utility power is again available. It then switches back to standby mode and recharges its battery.

According to a company spokesman, the units are compatible with personal computers from IBM, Apple Computer, Inc., Compaq Computer Corp., Kaypro Corp., Commodore Business Machines, Inc. and AT&T as well as other vendors.

The Watchman I standby power system is priced at $299.

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COMPUTER INDUSTRY

Section begins on page 150

Japanese markets more open to U.S. than many execs claim

Nakasone helping to break down barriers

SECOND OF THREE PARTS

By Takahiko Kondoh
Computerworld News Service

TOKYO — Though some foreign executives in Tokyo still feel Japan has barricaded its markets to outsiders, many U.S. vendors are starting to hail the efforts of the Japanese government, and Prime Minister Yasuhiro Nakasone in particular, to make the nation's markets more competitive.

In recent years, a "tremendous amount of progress was made on all of the Japanese government's barriers, and a tremendous amount of credit belongs to Nakasone," says Lawrence F. Snoden, vice-president of Tokyo-based Hughes Aircraft International Service (Far East), the international marketing subsidiary of Hughes Aircraft Co.

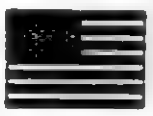
Japanese markets are more accessible now than 10 or even two years ago, says Snoden, a past president of the American Chamber of Commerce in Japan, a group of U.S. businesses based in Japan. Today, he adds, the problem is not so much that barriers in Japan exist, but that U.S. businessmen still maintain that they exist.

Too many U.S. executives believe all the stories about the difficulty in doing business with the Japanese, Snoden charges.

Those executives, he believes, must be made aware "that the Japanese market has changed and is still changing and that Japan is a good place to come to."

The efforts of the Japanese government to open the door to foreign imports include the establishment in 1982 of the Office of Trade and Investment Ombudsmen (OTO), an agency that handles trade complaints from foreign businesses.

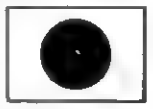
The agency operates under the slogan, "If you've got a gripe, we want to hear about it" and has received a total of 234 complaints of alleged trade barriers set up by the Japanese government. Roughly 220 of those complaints have already been processed, says Koyoshi Ota, director of the 20-member OTO.



Often, problems that beset U.S. businessmen in Japan stem from differences in the ways the two cultures approach agreements or treat customers.

For example, at Tokyo-based Nippon Ashton-Tate Co. — a joint venture established last June between the U.S. parent company and a Japanese software house — management has been perplexed by the divergent ways in which Japanese and American vendors relate to the concept of merchandising.

"U.S. users strictly define the purposes of purchasing," Nippon Ashton-Tate Vice-President Toshihiko Funayama observes. "What they expect from a $100 software product should naturally be different from what they want in a $1,000 item." He notes that Nippon Ashton-Tate's sales staff must always be aware that Japanese buyers lack this concept.



For product promotion, Funayama advises that U.S. makers modify or fine-tune their American style of advertising.

He also says that, while American users most often buy from among several choices they consider equivalent, "the first thing Japanese customers do is doubt everything offered to them. This forces us to spend a lot of time to persuade Japanese clients."

Japanese vendors also refuse to segment their target markets, a behavior that perplexes U.S. vendors here. Funayama says Ashton-Tate's U.S. effort to target corporate managers would never be used in Japan, because most Japanese firms lack managers with duties so clearly defined.

A key part of Japanese business culture is "wining and dining," a ritual that has become an essential to clinching a contract. Most U.S. businessmen, Hughes' Snoden says, view this practice coolly.

Sharing Snoden's view is Viktor Knoesel, president of Siemens K.K., the Japanese subsidiary of West Germany's Siemens A.G. "To accept a dinner invitation in Europe doesn't give you any commitment. We can always be neutral," he says. "The same should be true in Japan."

Siemens has operated in Japan for more than 100 years, but Knoesel warns that newcomers to Japan must establish a corporate identity in Japanese business circles. Before they meet a Japanese customer, Knoesel says, the sales representatives from a non-Japanese firm must make elaborate preparations, rehearsing how to present the company and its products to the customer.

The U.S. style of marketing does not work well in Japan, Knoesel says: "The Japanese mentality is just the opposite — if you want a success here, the straightforward method is very dangerous."

In Part Three of the series next week, Computerworld *will examine the challenges facing foreign computer vendors doing business in the U.S.*



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Lessors face taxing dilemma

Loss of tax credit forces market to specialize

By Michael L. Sullivan-Trainer

CHICAGO — Reflecting tremendous uncertainty within the computer leasing industry, concrete answers about the potential impact of tax changes on lease rates were hard to come by at the second annual Computer Leasing Conference and Expo (Comlease) held recently.

Unwilling to go out on a limb about specifics, leasing company representatives told about 80 users, in general terms, that their businesses will change drastically because of the likely elimination of the investment tax credit and increased lessor specialization.

"We are facing a new world," said Tom Martin, the conference chairman and president of Computer Financial, Inc., a Hackensack, N.J., leasing firm. "The cost of leases will increase significantly, and it will be crucial for lessees to re-evaluate the strengths of their lessors in light of the changing tax laws."

Because many leasing companies base their businesses on the tax advantages gained by the investment tax credit, they will either have to change their focus or go out of business, Martin said. In the future, lessors will likely be less dependent on IBM and will feature more specialized product lines. Microcomputers and telecommunications equipment, including digital private branch exchanges, are expected to receive increased attention in the leasing market.

Other tax reform proposals that will change current leasing practices include limitations on individual investors, making it less likely that they will consider computer lease deals desirable.

The Internal Revenue Service is paying increased attention to "wrap leases," in which leasing companies arrange for an investor to own equipment involved in a lease, thereby taking maximum advantage of the tax benefits. As a result, there may be an increase in the participation of institutional investors, who can afford to take greater risks.

In addition, Martin told users, the IBM mainframe market is mired in uncertainty because of the sluggish acceptance of the 3090s and the wide availability and declining price of used 3080s.

"If you think you're having trouble figuring out what the prices ought to be, we as lessors have the same problem. The market is moving too quickly and in some ways in an erratic fashion," he said.

Lessors are looking to 3090 enhancements to increase the popularity of the IBM Sierra over the 3080s. Martin predicted that IBM will soon announce software to allow faster transfer rates of 6M byte/sec., new 3090 models named the 300 and 600, as well as expanded function cache and controllers. Regular price cuts will continue, he added.

With the loss of some major tax benefits, the residual value — the remaining value of the equipment at the end of the lease — will become more important, speakers told attendees. Yet none of the many methodologies available for predicting residual value can promise total accuracy, and lessees are often forced to accept the lessor's assumptions.

Even equipment appraiser Ralph Page, a technical consultant for leasing with Marshall & Stevens, Inc. in Los Angeles, could not present a standardized method for determining re-

See LESSORS page 122

U.S. goes after emerging chip niches to challenge Japanese

By Clinton Wilder

NEW YORK — The worldwide semiconductor industry is undergoing a fundamental change that will permanently alter the competitive landscape for both U.S. and Asian suppliers, according to several industry executives and analysts at a recent investment conference.

Executives from industry giants and small niche companies told attendees at the recent L. F. Rothschild, Unterberg Towbin semiconductor conference that U.S. vendors can no longer compete with Far East firms in commodity chip markets, which now include virtually all memory chips.

Successful firms in the 1980s and 1990s will be those that capitalize on emerging markets for application-specific integrated circuits (ASIC), user-configurable chips and chips based on CMOS technology, they said.

"Fabrication technology itself is becoming a commodity," said Jack Carsten, senior vice-president and general manager of the ASIC group at Intel Corp. "Anyone who has the capital can buy state-of-the-art production equipment with virtually no experience. That's a natural evolution in most industries; we have to stop thinking that we're so different from everyone else."

VLSI Technology, Inc. Chairman and Chief Executive Officer Alfred Stein predicted that the world's top three volume chip producers in 1986 will be Japanese, an unprecedented occurrence that would dramatically illustrate the shift in the world industry. "This will also be the year that the size of the Japanese market passes the U.S.," Stein said.

Several panelists urged U.S. vendors to focus on design automation — selling better solutions to systems vendors designing their own chips. "You build a market with solutions, not products," said Phillip Kaufman, president of Silicon Compilers, Inc. "Design automation includes a lot of services that customers need."

"The need for chip makers to understand system manufacture and design is going up exponentially," added Tim Propeck, vice-president of corporate marketing for Monolithic Memories, Inc.

One member of a panel of firms that purchase chips expressed dissatisfaction with U.S. vendors, particularly in the ASIC area.

"There are a lot of false promises in this industry," said Albert C. Wong, executive vice-president of microcomputer add-on board maker AST Research, Inc. "There is a lot of vapor from the industrial giants on

See U.S. page 124

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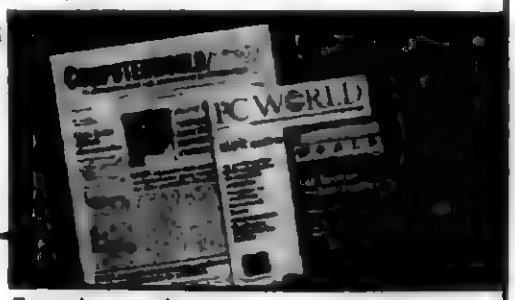
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EXECUTIVE REPORTS

Special Editorial Features

Every issue of Computerworld presents either a Product Spotlight or Executive Report. For advertisers, it's still not too late to take advantage of the hot topics set for July!

Expert Systems Shells (Product Spotlight, July 14) Features a comparison of the types of PC-based expert systems shells and presents a discussion of basic program capabilities and performance features. Also, a representative sampling of five shells now available for mini and mainframe applications. Plus, a product chart featuring up to 30 vendors and products. Closing date June 27.

PBX Networks (Product Spotlight, July 21) Explores the latest in PBX technology with a look at corporate applications. Examines digital versus analog PBX systems and advises readers on data transmission alternatives — when a PBX is the right choice over a LAN, and vice versa. Closing date July 3. (Note early close)

Management Training for DP Executives (Executive Report, July 28) Are MIS/DP professionals too technically oriented to be effective managers? A lack of people-managing skills can create numerous problems — including the alienation of workers. This report also looks at packages that are available to address this issue. Closing date July 11.

And it doesn't stop there! Important and pertinent Executive Reports and Product Spotlights topics continue through August and September.

ISSUE	TOPIC	CLOSING DATE
August 4	Applications Generators (Product Spotlight)	July 18
August 11	Information Centers (Executive Report)	July 25
August 18	End-user Computing (Executive Report)	August 1
August 25	Image Processing (Product Spotlight)	August 8
September 1	The MAP Marketplace (Executive Report)	August 15
September 8	Computer Leasing (Executive Report)	August 22
September 15	Spreadsheets (Product Spotlight)	August 29
September 22	Communications Standards (Executive Report)	September 5
September 29	On-line Computing (Executive Report)	September 12

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PRODUCT SPOTLIGHTS

GM, Toyota may join telecom service venture

By Takehisa Kondoh
Computerworld News Service

TOKYO — Japanese trading house C. Itoh & Co. has reportedly asked Toyota Motor Corp. and General Motors Corp. to participate in the creation of a transborder communications service firm.

Sources said both vendors have agreed to join the $719 million project, in which the UK's Cable and Wireless Public Ltd. (C&W) is already a participant.

Communications industry experts in Tokyo said that they believe the Toyota-GM joint effort with C. Itoh threatens Kokusai Denshin Denwa Co. (KDD), which has monopolized the Japanese overseas telecommunications market. That market is growing by 17% annually and is expected to reach an estimated $7.7 billion by 1995.

While a Toyota spokesman would not say whether the company has chosen to participate, he said the company is "deeply interested in international communications. That certainly will give us a great business opportunity."

The international telecom project will take shape when the four firms launch a company that will conduct a feasibility study. The research company will also be financed by three Japanese banks, said C. Itoh, the project's coordinator.

The joint telecom firm itself will open its doors in about 1990, using C&W's existing network between Hong Kong and London as well as the optical-fiber cables C&W is constructing beneath the Atlantic Ocean and in North America.

For communication between the U.S. and Japan, a transpacific undersea optical-fiber route will be constructed under a separate project, with financing from C&W and GM.

Nippon Telegraph and Telephone Corp. (NTT), meanwhile, is believed to be providing technical assistance to the C. Itoh project through an engineering and consulting subsidiary, NTT International. NTT itself is banned from doing business in overseas communications.

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See the classified section

COMPUTERWORLD
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IBM backlog at record high

From page 150

processors is an indication that the price elasticity may indeed still be with us.

The fact that 3090 sales represent an area of strength within IBM's generally sluggish business should also dispel the recent theories frequently heard, especially on Wall Street, that an apparent lack of functional differentiation from the 3080 mainframes is hurting the 3090.

Since the 3090 is still selling well, debates about what may be hurting its sales are an example of solutions looking for nonexistent problems.

Such opinions probably reflect the efforts of some analysts who are groping for excuses to explain their earlier multibillion dollar overestimates of IBM revenue.

The most encouraging news for IBM shareholders is a 40% increase in the gross margins on service.

Fueled by a rise in software prices, especially for the XA operating systems, this IBM business segment's gross margins now exceed 60% for the first time. At 62% of revenue, the service gross margins are now up four points since a year ago and 17 points since 1978.

Another piece of good news for IBM is the fact that after years of spending billions on new plants and equipment (over $20 billion in the last six years), IBM has finally started to curtail its capital spending.

Largely due to the projects already under way, this year's capital spending plan is likely to be flat compared with that of 1985.

Lessors to face taxing dilemma

From page 120

sidual value, particularly for the large IBM systems.

"How do you determine the trade value of a 3090?" Page said.

"None have been traded on the used market. My personal opinion is that the 3080s will have a longer life than the experts are predicting because of the 3090's slow acceptance," Page said.

Discussing the leasing options available for microcomputers, Leonard Cohen, president of Scientific Leasing, Inc. in Farmington, Conn., said that the residual value of personal computers is currently between 20% and 25% of the purchase price, depending on the PC's brand and configuration.

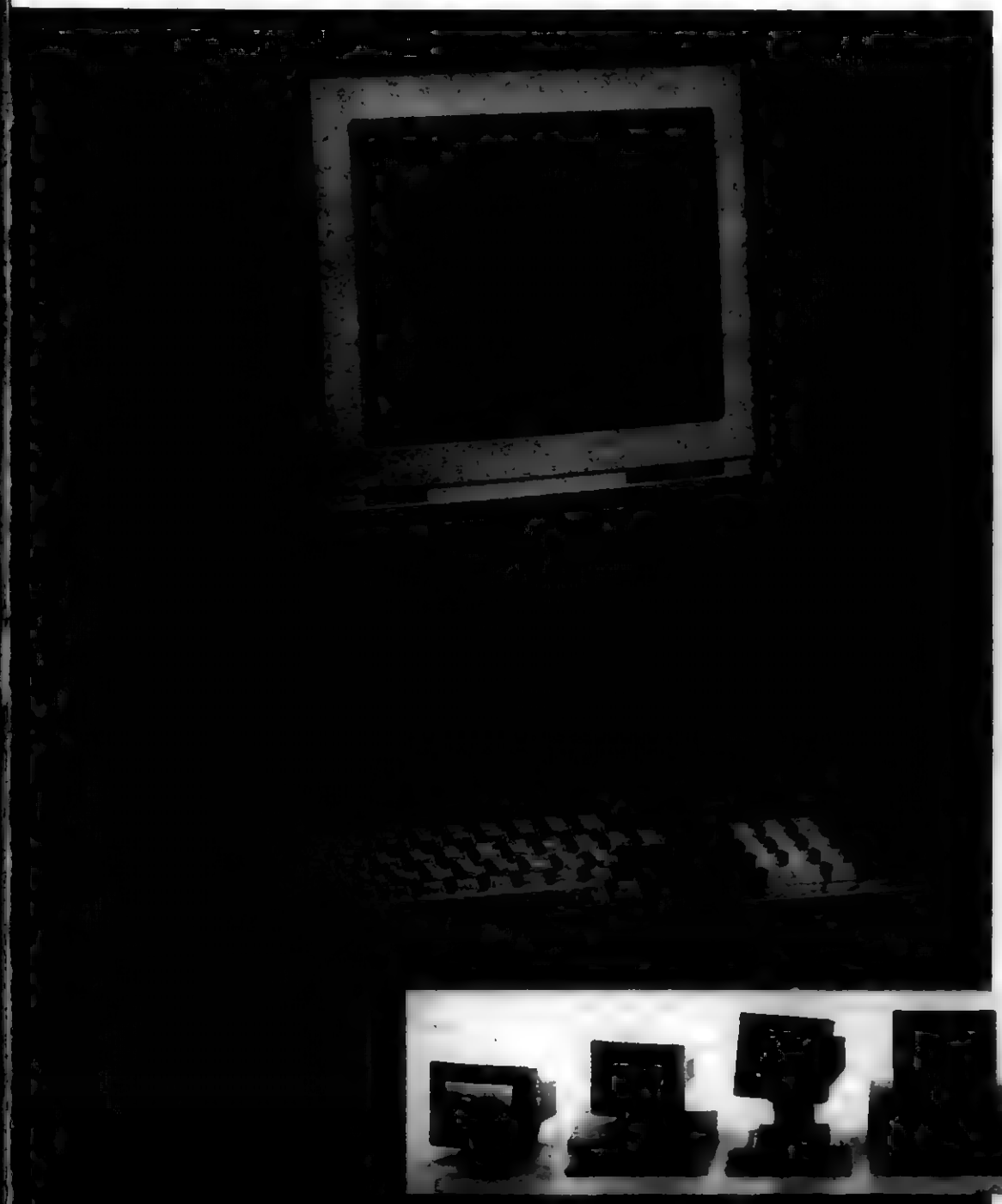
Residual value

Predictions also are hard to come by concerning the residual value of PBXs and other communications products because the market is changing so rapidly and because evolving standards may determine future equipment value.

Comlease had only eight leasing companies in attendance, as opposed to 16 last year.

Some major leasing companies, notably IBM Credit Corp. and Greyhound Leasing and Financial Corp., were not in attendance.

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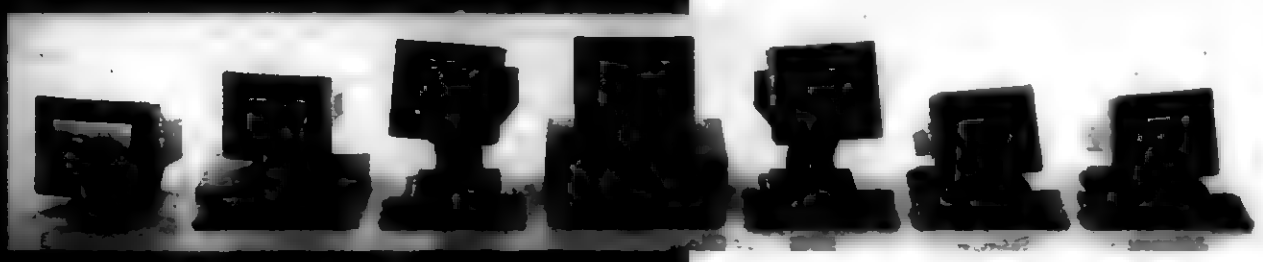
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Professional services firm to expand into corporate sector

PRC seeks talent, skills via buy-outs

By Mitch Betts

MCLEAN, Va. — Planning Research Corp. (PRC), which recently has concentrated on the lucrative business of handling large systems integration projects for the U.S. government, is on the verge of expanding into the corporate sector, the firm's president said in a recent interview.

Recognizing that it takes different skills to win commercial contracts, Wayne Shelton, president and chief operating officer, says PRC will obtain the necessary talent through either an acquisition or an in-house investment within the next year.

Industry analysts say that PRC is on the right track, pruning its unprofitable businesses, focusing on government computer systems integration and centralizing management.

Christopher W. Mortenson, analyst with Alex Brown & Sons in Baltimore, said in a recent report that acquiring a small or medium-size computer services firm with a corporate client base would be a plus for PRC. "The company's technical and project management skills are readily transferable to the corporate sector," he said.

PRC is no stranger to acquisitions. It began 32 years ago as a think tank and, through a series of acquisitions in the 1960s and 1970s, moved into about 30 different professional services markets, ranging from architectural and engineering services to computer programming.

But over the past few years, PRC has been shedding many of its lackluster business ventures and narrowing its focus to federal information systems contracts. PRC's star performer is its Government Information Systems Group, which Shelton headed before his promotion to the new position of chief operating officer last August.

In the first six months of 1986, the group accounted

U.S. focuses on chip niches

From page 120

the ASIC bandwagon." Wong said that five of his company's 11 ASIC designs are supplied by Japanese vendor NEC Corp.

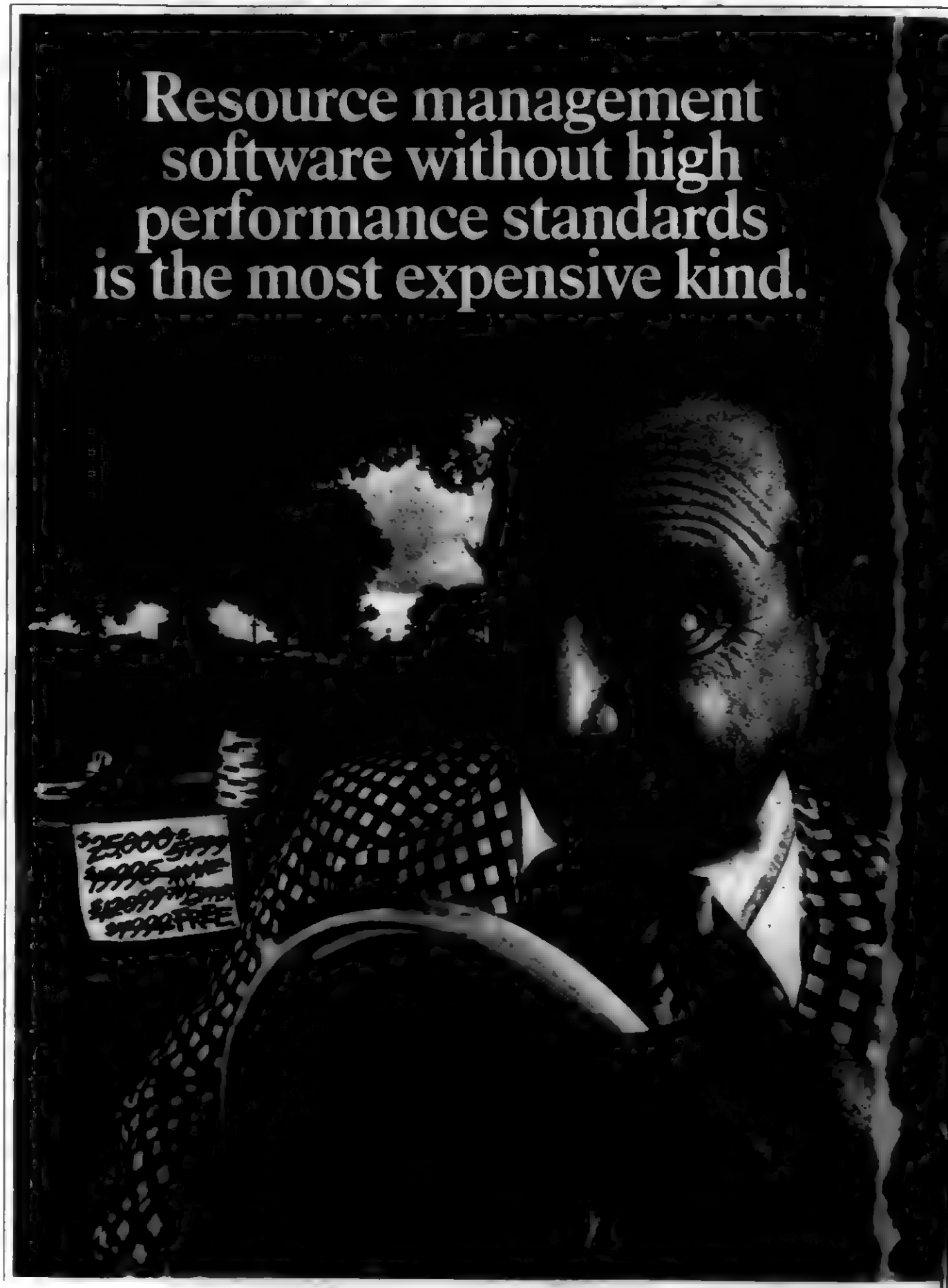
Michael Hackworth, president and CEO of ASIC vendor Cirrus Logic, Inc., said the ASIC market is poised for growth, but is still in its infancy. "The roles of vendors, users and makers of design tools are still being sorted out," he said. "There is a lot of confusion and smoke right now, but each niche will find its right mix of those roles."

The overall U.S. chip industry will grow by 9.5% this year, said Andrew Rappaport, president of the Boston-based Technology Research Group. That figure represents a solid rebound from the industry's worst-ever recession in 1985 but is well below the 20% annual growth rates predicted by Dataquest, Inc. in 1984.

Clyde Prestowitz, former counsel to the U.S. Secretary of Commerce and a driving force behind recent U.S. anti-dumping actions, painted a discouraging picture of the U.S.-Japan trade outlook.

He placed the U.S. semiconductor industry's competitive decline in the broader context of all U.S. industries, which face higher costs of capital, a lower literacy rate and much more short-term stockholder pressure than their Japanese rivals. "Trade actions may help, but the real issue over the next five to 10 years is to improve the fundamentals," he said.

Prestowitz said that except for IBM and AT&T, U.S. high-tech firms lack vertical integration, or the practice of buying components from other units of the same corporation.



COMPUTER INDUSTRY

for about 35% of PRC's total revenue and 52% of operating profits. Overall, PRC had revenue of $372 million in fiscal 1985, and analysts expect revenue to reach $450 million in fiscal 1986.

Federal government contracts make up 57% of PRC's sales, but the company is choosy about the contracts it pursues.

It bids only on large contracts for complex information systems that require a high degree of innovative integration, according to Floyd Jean, president of the applied systems division.

PRC executives like to point to the company's $289 million contract to develop an automated patent storage and retrieval system for the U.S. Patent and Trademark Office as the kind of business they covet. The contract requires linking optical disk drives to custom workstations for use by patent examiners.

PRC's intent is to win a few similar contracts, valued at $100 million or more, each year, as well as numerous "bread and butter" contracts in the $20 million to $50 million range, Jean says.

An example in the latter category is PRC's $30 million contract with the U.S. Army for a worldwide office automation system, which is custom-designed for use by investigators from the Army's inspector general office, according to John Cover, who directs the project for PRC.

Analysts say the big risk for PRC is that federal budget-cutting legislation could stall or kill some of its federal contracts. But PRC executives say they do not foresee any drastic reductions in business with Uncle Sam.

To be more competitive in winning contracts, Shelton is also trying to centralize management in what had been very independent operating units. Shelton has appointed a high-level technology czar to prod the operating units into sharing and exploiting their proprietary technologies.

Shelton and John Lytle, the new corporate director of technology development, say that PRC's long-run strategy is to continue attracting highly skilled computer professionals by offering them challenging work.

"Employees tell us they want one hard assignment after another. That's very positive motivation," Lytle says.

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Eagle files for bankruptcy, seeks investor

GARDEN GROVE, Calif. — Eagle Computer, Inc. recently filed for protection from its creditors under Chapter 11 of the U.S. Bankruptcy Code.

Eagle is looking for new investors, and if financing is found, the company will reorganize according to a court-approved plan, Eagle President Gary Kappenman said.

If Eagle does not have an investor in the next 50 to 90 days, he added, the company will file for total liquidation under Chapter 7 of the Bankruptcy Code.

Investors frightened off

The company said its Chapter 11 filing was prompted by large debts, which had frightened off potential investors, and by a need to gain protection from several lawsuits.

The microcomputer company currently has an estimated $7.2 million and claims to have only $200,000 in assets.

Of the debt, the company owes $4.8 million to the Bank of America of San Francisco and the remainder to 370 creditors.

Before the Chapter 11 filing, Eagle reported a loss of $2.3 million, or 9 cents per share, for its third quarter, which ended March 31.

For the same quarter last year, Eagle reported a loss of $1.6 million, or 8 cents per share.

Revenue for the recent quarter totaled $816,000, compared with $2.5 million a year earlier.

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SEE THE CLASSIFIED SECTION

Review internal security measures to protect trade secrets

OUTSIDE LINES
L. J. Kutten

There are a multitude of steps a trade secret owner can take to internally protect a trade secret.

First and foremost, a trade secret owner is required to take only reasonable steps to protect the trade secret. Absolute secrecy is not required. However, the exact amount of security necessary is relative. It depends on the nature of the secret and its value to the owner.

Among activities that are significant in a review of internal security measures are the following:

- Have all employees dealing with confidential materials sign nondisclosure and noncompetition agreements. If one employee in a department signs, then all must sign. More than one court has viewed such a failure as a fatal blow to a claim of trade secrecy.
- Advise the employees of the confidential nature of the product they are working on. This includes support staff employees such as secretaries and the like.
- Restrict dissemination of confidential material to those who need to know.
- Physically secure buildings, equipment and computer equipment.
- Describe in detail to all employees the scope of the job and the scope of access they are to have within the system.
- Place proprietary notices on all important documents.
- Establish procedures wherein computers containing the trade secret cannot be accessed via telephone lines from outside the system.
- Secure the premises so that the trade secret material is separated by locked doors from the general public.
- Establish universal use of identity badges.
- Establish security audit measures and follow them.
- Establish a magnetic media storage system under which the contents of the magnetic media are not shown on the outside.
- Keep track of the number of copies made.
- Establish a standard by which employees identify their work product.
- Encrypt working data and programs.
- Monitor computer use by installing a billing system so that accurate records can be kept of how much each department and user is using the system and for what purposes.
- Assign specific individuals, data procedures, computer users, explicit ownership and custodial accountability and use rights to certain types of data.
- Establish a method of destroying documents and magnetic media before discarding them.
- Require that all materials containing trade secrets or confidential materials be locked away at night.
- Secure terminals and files in such a way that physical possession of an actual key or knowledge of a password is required for access.
- Change keys and doors to terminals and change passwords on a semiregular schedule.

This list does not contain everything that should or must be done. Internal security is relative and depends on the size of the organization, the nature of the product being worked on and similar criteria. However, no amount of alleged protection will be sufficient if the owner does not treat the material as a secret.

Kutten is a member of the Missouri and Illinois bars and author of The Computer Buyer's Protection Guide, *published by Prentice Hall, Inc.*



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Issue: August 20 - Closing: July 11

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Hogan Systems, Inc. reported a net loss of $6.9 million, or 52 cents per share, on revenue of $27 million for the year ended March 31. This compares with a net loss of $13 million, or $1.06 per share, on revenue of $28.2 million for the like period a year ago. For the fourth quarter, the company reported a loss of $4.2 million, or 32 cents per share, on revenue of $7.2 million. This compares with a net loss of $12 million, or 92 cents per share, on revenue of $5.6 million reported in the fourth quarter a year ago.

■

The Standard Register Co. reported revenue for the first quarter of $109.7 million, compared with $109.6 million a year ago. Profits were $8.1 million, or 61 cents per share, compared with $7.5 million, or 57 cents per share, one year ago.

■

Timeplex, Inc. announced revenue for the third quarter ended March 31 of $30 million, compared with $24.6 million in the previous year. Profits were $1.6 million, or 19 cents per share, compared with $2.3 million, or 26 cents per share, one year ago.

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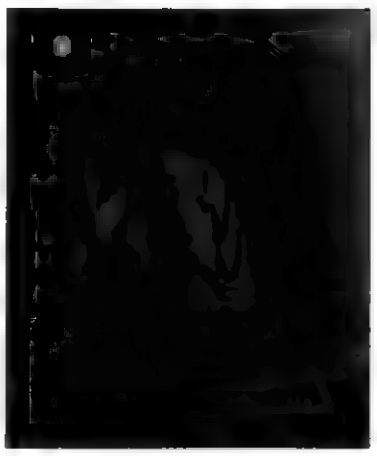
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✓LQ-1000 printer *(136 column)* ..... call
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✓Smartmodem 300 ..... 139.
✓Smartmodem 1200 ..... 369.
✓Smartmodem 1200B *(w/Smartcom II)* ... 349
✓Smartmodem 2400 ..... 579.
✓Smartmodem 2400B *(w/Smartcom II)* ... 539.
✓Smartcom II 2.1 *(software)* ..... 69.
Hercules *(2 years)*
✓Hercules Color Card *(parallel port)* ..... 159.
✓Hercules Graphics Card *(parallel port)* ... 299.
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8087-2 *(works on 8 Mhz computers)* .... 177.
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✓5153 keyboard *(with touch pad)* ..... 279.
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✓PC Mouse with PC Paint+ ..... 139.
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✓Multisync monitor *(EGA compatible)* .... 549.
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Conquest Multifunction Board 0k *upgrades to 2Mb, fully supports LOTUS/INTEL expanded memory specification (EMS)* ..... 284.
Tiny Turbo 286 ..... 459.
PC Turbo 286e w/1 Meg ..... 749.
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✓Color/Mono Card ..... 149.
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✓MultiMate ..... *each* 12.
Toshiba *(90 days)*
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✓10 Meg cartridge ..... 51.
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Word-a-holics unite!

Trying to decide which word processor to buy is like trying to decide which college to go to. The decision will change your life forever, but you may never know if it was the best one. Here are five tried and proven professional packages. They all have spell checkers. None are copy-protected. And hard drives are recommended for all. See PC Magazine 1/28.



MultiMate Advantage 2.0 with Graphlink and On-File $369
Originally designed to emulate the WANG word processor, MultiMate is often referred to as the corporate word processor. It offers sophisticated networking capabilities, and, with two free-for-a-limited-time software programs (Graphlink and On-File), also has built in graphics and database.

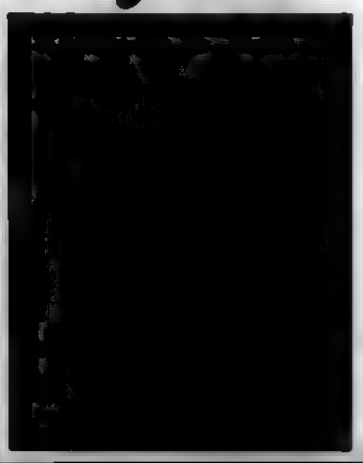
MicroSoft Word 3.0 with Outline $347
With a mouse and a graphics card, MicroSoft Word lets you move words around without touching the keyboard, and see what you got without squinting. Without a mouse or a graphics card it's still a powerful word-processor, with "Style Sheets" that simplify formatting, and a built-in outline program.

WordPerfect 4.1 ..... $239
We have a friend who writes for computer magazines. At one time or another he has used and reviewed virtually every major word processor. He now swears by WordPerfect and swears at all the others. Use this program for a while and you'll be able to touch type most of your commands with your eyes closed and your right hand tied behind your back.

WordStar 2000 Plus Release 2 ..... $295
WordStar has had some trouble shedding its image as the lumbering dinosaur of the microcomputer age. But hundreds of thousands of people use it. There are a lot of programs out there to back it up. And this new version gives it the same advanced features as any top-quality word processor. Even the control keys are starting to make some sense.

Volkswriter 3.0 ..... $147
Solid performance with a reasonable price continues to be Volkswriter's claim to fame. It's fast, and boasts one of the original what-you-see-is-what-you-get screens. With the new version's spell checker and more sophisticated print formatting, it is now able to compete functionally with the other high-end word processors. (Our new low price is pretty persuasive too).

Buy one. Get two.



Hey, got a friend? Don't know? Check your database! What? No database? Have we got a deal for you (and your friend). Until June 30, Microrim will send you a *complete* second copy of Rbase 5000 free when you send in your warranty card and a copy of our sales invoice. So you can get together with your friend, split the cost for one and get two! Or, you can keep the extra copy at home, at a branch office, or down the hall. Rbase 5000 is easy to learn and operate, and has the custom reporting features most users need. Remember, the two for one offer is only good from April 15 till June 30.

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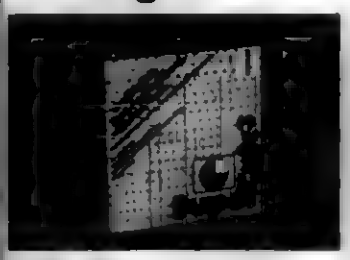
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Bernoulli Berserk!

We've got a problem. The prices we're able to offer on Bernoulli boxes are changing about 10 times faster than we can change this ad. Probably because the machines are selling about 10 times faster than anyone ever dreamed they would. The 20 Meg and 40 Meg versions feature two ½ height drives with removable cartridges. There's a 90 day warranty, and we're an authorized Bernoulli service center—turnaround on repairs is usually 24 hours. Here are our latest up-to-date-but-probably-obsolete-by-now prices!

Bernoulli Box 40 Meg $2499
Additional 20 Meg Cartridges $69
Bernoulli Box 20 Meg $1999
Additional 10 Meg cartridges $51
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Supercalc ifragilistic!



SuperCalc 3 is the kind of product that you'd be proud to bring home to your mother. Like Lotus 1-2-3 it offers spreadsheet, information management and presentation graphics. But it only needs 128k of RAM, and is not copy-protected. It also is compatible with the Hercules Monochrome Card, as well as the Enhanced Memory (EMS) and Enhanced Graphics (EGA) standards. And you get a free copy of Sideways, the program that lets your printer think horizontal is vertical.

SuperCalc 3 2.1 (with Sideways) ..... $
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SixPakPlus Minus$!



AST is so wrapped up in Enhanced Memory and other arcane subjects that they've been letting the price slip on their original claim to fame—the AST SixPakPlus, one of the original and best multifunction cards. So if you're just starting in computing, or outfitting a second unit for home, now's a great time to buy this basic piece of hardware. You get a clock calendar, serial port, parallel port, up to 384k of memory, *and* copies of two classic unprotected programs—Sidekick 1.5 and DESQView. A genuine deal.

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SixPakPlus 384k (fully populated) $219

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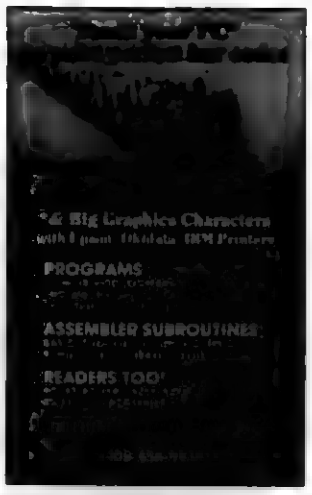
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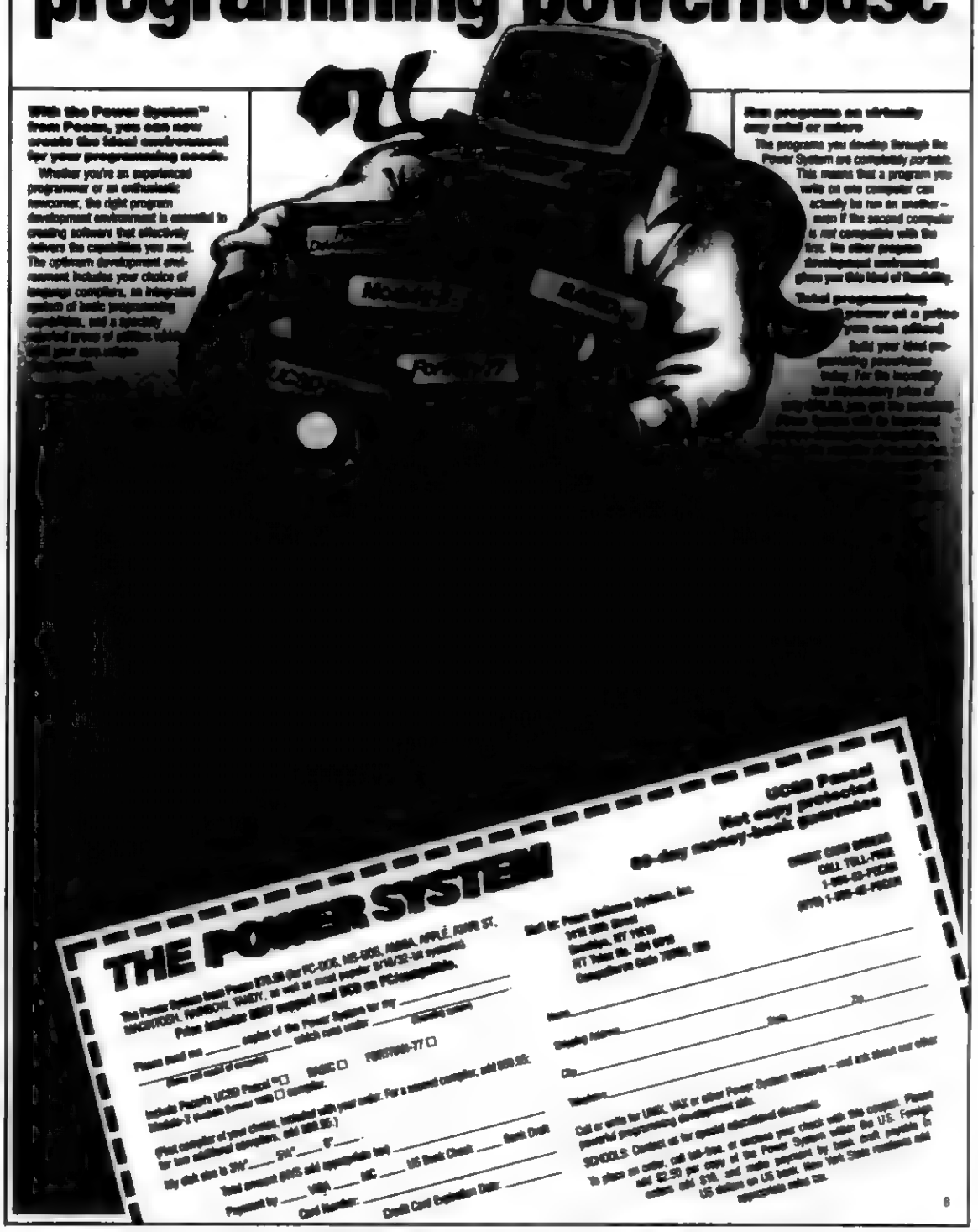
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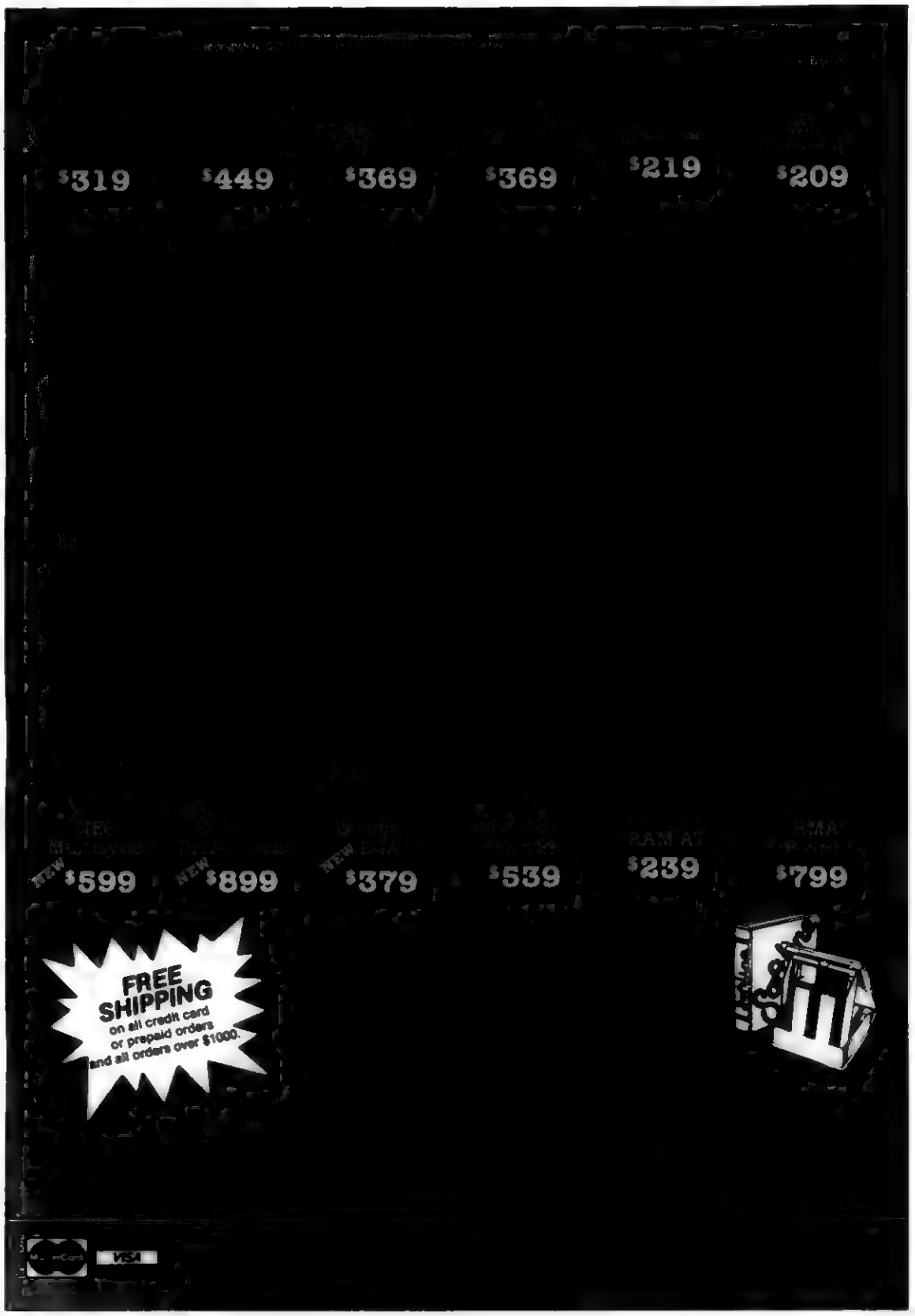
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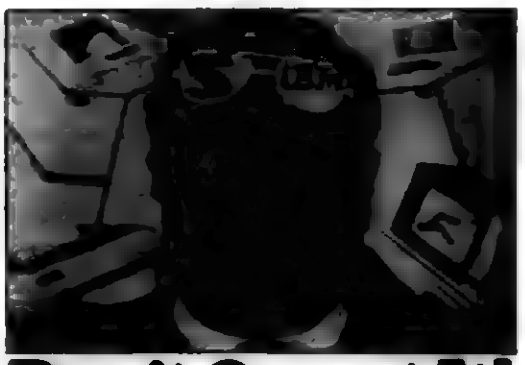
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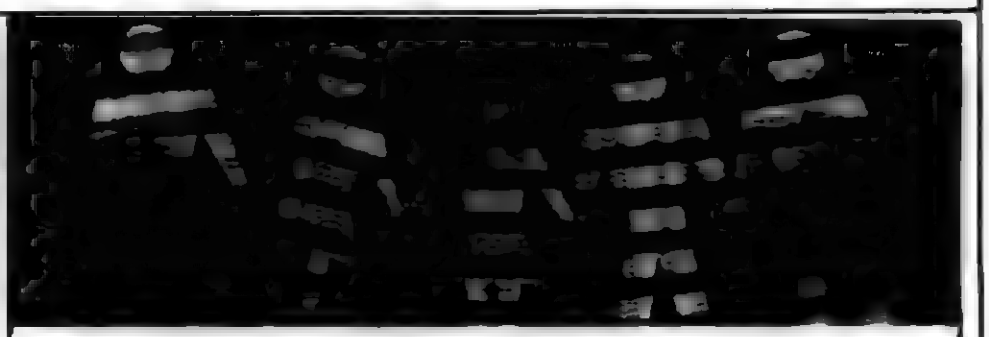
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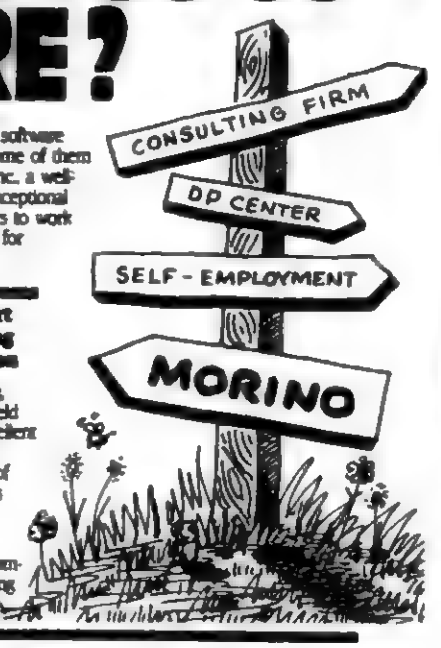
System Developers
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SYSTEMS ANALYST – Respons for the design, developmt & enhancement of computer applications for Securities Trading programs, incl Margin system, Mutual Fund Trading system & Letter of Intent System. 4 yrs or 4 yrs rel programming exp. H.S. grad. Must know COBOL, CICS, VMS, OS/MVS, VSAM, TSO/SPF & PANVALET to be used on IBM mainframe hardware. $35,000/yr, 40 hrs/wk. Resume to S. Huvane #40, Software Design Assoc., 71 5th Ave., NY, NY 10003.

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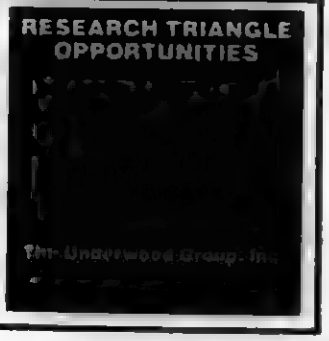
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GROUP LEADER—Strong technical management background to coordinate the implementation of financial and clinical applications. Candidate should have 8-10 years experience in interactive system design and project management experience involving implementation of large application software packages. Health care background is desirable and knowledge of MVS operating systems is a plus.

PROJECT LEADER—Skills in analysis, design, and implementation of interactive systems. Minimum experience of 5 years with at least 1 year of project management. Experience managing senior level programming staff is required. Health care experience is a plus.

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This position requires experience in systems analysis and with developing and maintaining online systems and/or microcomputer applications; ability to work effectively with library and computer services staff; effective oral and written communication skills. Knowledge of telecommunications theory and practical experience with installation and support of data communications lines, modems and/or local area networks desirable, as is experience in an academic research library or research university computer service.

Beginning salary range is $26,100-$33,100/per annum based on qualifications and experience. Send letter of application with resume and names of three professional references to Carolyn J. Henderson, Library Personnel Officer, Stanford University Libraries, Stanford, CA 94305 by July 15, 1986. Cite #284-CW on all correspondence. We are an equal opportunity employer through affirmative action.

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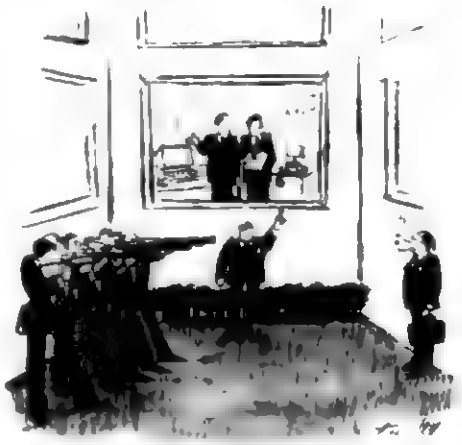
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Qualified candidates should forward their resumes to: JOHN R. PIGGOTT, PRINCETON UNIVERSITY COMPUTING CENTER, 87 PROSPECT AVE., PRINCETON, N.J. 08544

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INDUSTRY NOTES

Micropro posts third-quarter loss

Micropro International Corp. announced a loss of $2.4 million, or 19 cents per share, for the third quarter ended May 31. President H. Glen Haney attributed much of the loss to the recent bankruptcy filing of distributor First Software, which owes Micropro $1.4 million. Third-quarter sales plunged 76% from year-earlier levels to $2.4 million.

■

IBM announced a major retail marketing plan under which high-volume customers can buy products from IBM direct salespeople or from authorized dealers or value-added dealers. Customers who buy machines from dealers will have those purchases applied to their volume purchase agreement commitments, IBM said. In the past, only purchases from IBM's direct sales force could be put toward volume purchase agreement commitments.

■

The 53-member **Corporation for Open Systems** is poised to announce this week that it will accept members from both Europe and Japan as soon as it can change its organizational bylaws.

■

Akers sees IBM profit drop

From page 150

commodity-like, you will see IBM departing those businesses."

IBM System Products Division President Stephen Schwartz said the company remains committed to two separate architectures for its mid-range systems — the System/34, 36 and 38 and the low-end 370 architecture.

"We have been criticized in the past for confusion over whether we support a two-tier or a three-tier strategy," Schwartz said. "Let me put that to rest. We support both. We have 200,000 customers of the System/34, 36, 38 product line. We will not abandon them."

When an analyst questioned why last Monday's mid-range announcements (see story page 1) did not include better software mobility between the System/36 and System/38, Schwartz said the "No. 1 priority" was to provide users with better access from terminals to each host system.

"But," he added, "we will continue to bring the System/36 and 38 closer together. Time will tell how that will unfold."

Terry R. Lautenbach, president of IBM's Communication Products Division, also reaffirmed the company's multiple-architecture philosophy in communications. He said the firm will continue to "marry" Rolm Corp. and IBM technology as well as open Systems Network Architecture (SNA) to non-IBM products and continue to enhance the Token-Ring local-area network.

"Even SNA took a while to catch on, and we expect that same process of acceptance with the Token-Ring," Lautenbach said.

Lautenbach said engineers from the Communication Products Division, IBM's research division and Rolm are now working on long-range product development at IBM's Advanced Telecommunications Systems Lab. "We intend to be the telecommunications leader, and we still have a lot of work to do," he said.

Akers noted that IBM is paring expenses considerably while business is slow but added that the company would prefer to take "short-term financial hits" rather than alter its no-layoff tradition or reduce research and development outlays.

IBM has instituted a virtual freeze on U.S. hiring in all areas except its marketing and sales force, and Akers commented that for the first time since 1975, IBM's domestic work force this year will decline.

He also said that IBM's R&D spending would increase by just 7% in 1986, compared with a 12% rise last year. Spending for plant property and equipment will remain flat at 1985's level of about $6 billion. Akers said IBM would cut travel, meeting and consulting expenses by more than the $700 million by which they were reduced last year.

Analysts split on duration of General Datacomm upturn



ACTIVE ISSUES
Kathy Porteus

In past weeks, General Datacomm Industries, Inc. (GDC — 12¼) has been one of a handful of communications stocks to show new signs of life. But analysts disagree on whether such activity is sustainable.

According to Thomas Linkas, senior technology analyst with Goldman Sachs & Co., General Datacomm's March quarter results revealed initial signs of a turnaround in the company's performance, which strong product introductions, good distribution and a modest upturn in computer industry shipments should sustain.

General Datacomm's new products include a networking T1 multiplexer called Megamux II, a new version of its network management and control system and new 9.6K bit/sec. modems. The company is particularly susceptible to computer shipment trends, because roughly half of its sales are modem products.

"General Datacomm has also been able to reduce its costs by about 25% to 30% in one third of its business," says Ted Moreau, vice-president with Robert Baird & Co. Moreau says he would recommend purchase of General Datacomm even if he did not see a computer industry upturn.

"General Datacomm is well positioned," Moreau maintains, "because its broad product line provides an attractive alternative to the rising cost of using deregulated networks."

However, Andy Schopick, vice-president with Gartner Securities, says he feels negative about General Datacomm's prospects. "The company's performance will be subpar and not justify any sustainable move in the stock," Schopick predicts. Schopick estimates General Datacomm will earn 80 to 85 cents per share in fiscal 1987.

While recognizing that General Datacomm's business is not getting dramatically worse, Schopick contends that competitive pressures in the company's key markets will prevent "as strong a recovery as some people would like to believe."

Grounds for questioning the success of General Datacomm's near-term financial performance, according to Schopick, are increasing price competition, AT&T and IBM's greater thrust into the modem industry and the lack of product innovation, especially when compared with multiplexer companies such as Avanti Communications Corp. or Network Equipment Technologies Co.

According to Joseph Bellace, vice-president with Merrill Lynch, Pierce, Fenner & Smith, "the jury is still out on General Datacomm." In order to change his neutral opinion on the company, Bellace says, he must first see General Datacomm gain share in the T1 multiplexer market.

Bellace says General Datacomm must also demonstrate greater financial control in order to reduce its inventory to sales ratio, which is currently the highest in the communications industry.

The company's operating profit has languished between 1% and 3% so far this year, according to Bellace, although nonrecurring items and a tax credit will boost earnings to about 40 cents per share for fiscal 1986, ending Sept. 30th.

'Cash-flow positive'

Nevertheless, Goldman's Linkas argues, "General Datacomm has been, and will continue to be, a cash-flow positive and has borrowing capacity of another $90 million." The company's current break-even operating rate, according to Linkas, is about $45 million in sales per quarter.

Linkas estimates the company will earn 43 cents per share this year and $1.10 to $1.25 per share in fiscal 1987. These projections are contingent upon the continued favorable reception of General Datacomm's new products and continuing, albeit modest, pickup in the computer industry.

Given these factors, Linkas says he believes the stock can "easily approach its former high of $22."

Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

Senate expected to pass tax bill

From page 150

tion between the old rules and the new.

Under the transition rules, the Senate bill's new investment depreciation schedules would not apply to MCI's 10-state communications network or United Telecom's 20,000-mile fiber-optic network. Both of these networks are under construction.

Likewise, the new depreciation rules would not apply to Federal Express' investment in two new satellites or RCA Corp.'s investment in three new satellites.

The bill also gives CDC a special exemption from the minimum corporate tax on profitable companies. "Our tax department discovered that the minimum tax provisions would have had an apparently unintended negative impact on companies such as Control Data, which had large losses last year," a company statement explained.

In no case is a company actually named in the transition rules, however. For example, in the case of Federal Express, the bill states that the rule applies to two satellites that were authorized by the Federal Communications Commission on July 25, 1985 and cost $120 million.

The provision for CDC states that it applies to "a taxpayer which was incorporated in Delaware on May 31, 1912."

Cullinet earnings down, sales flat

WESTWOOD, Mass. — Cullinet Software, Inc. showed the strain of a continuing slump in the mainframe software industry, announcing yesterday flat sales and a $9.4 million drop in earnings for the fiscal year ended April 30.

Cullinet sales were $184.3 million, compared with $184.1 million a year ago.

Income for the year was $15.3 million, or 50 cents per share, down from $24.7 million, or 81 cents a share, a year ago.

Despite some heavy industry criticism of its IDMS/R data base management system, Cullinet fourth-quarter sales inched up 3% above year-ago figures to $54.2 million.

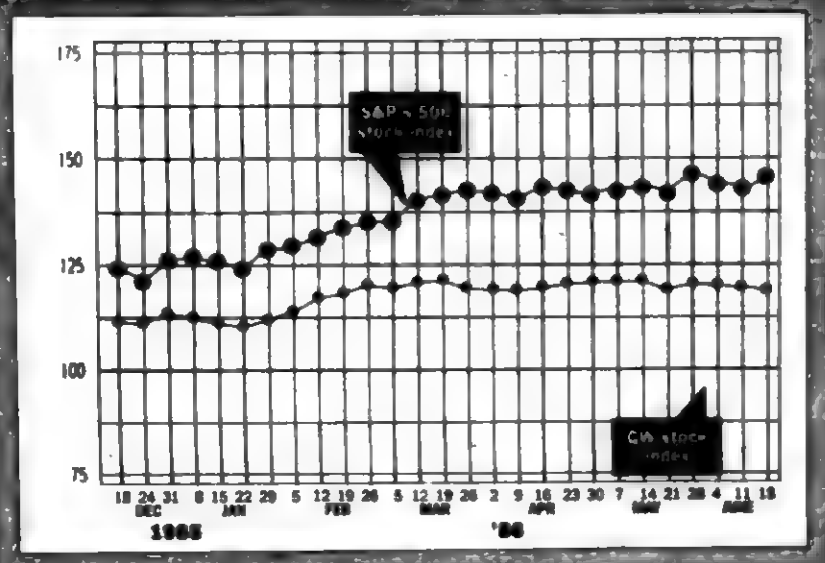
However, income in the fourth quarter dropped 47% to $3.6 million, or 12 cents per share, compared with fourth-quarter earnings of $6.9 million, or 22 cents per share, in fiscal 1985.

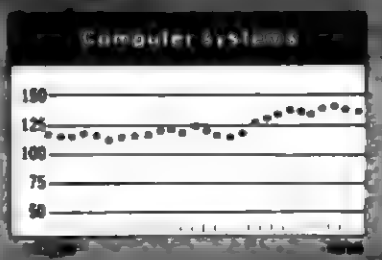
— Maura McEnaney

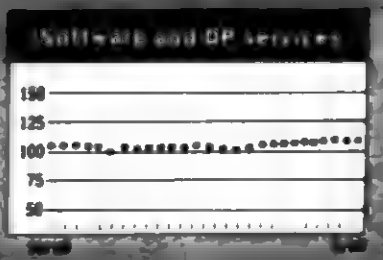
COMPUTER INDUSTRY

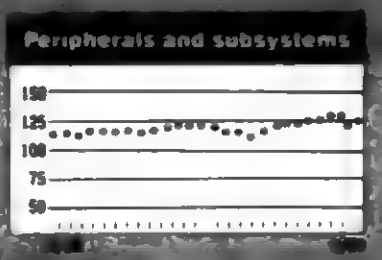
MITCHELL J. HAYES

Computerworld stock trading index

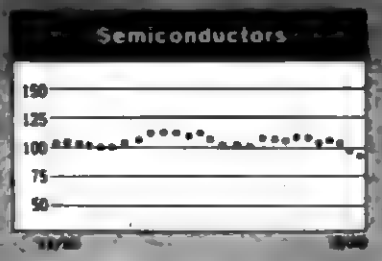














	6/11/86	6/18/86
Computer systems	128.0	128.8
Software and DP services	106.3	106.8
Peripherals and subsystems	124.1	125.6
Supplies and accessories	154.4	154.2
Semiconductors	90.6	92.5
Leasing companies	104.0	104.2
CW stock index	119.0	117.2
Standard and Poor's 500 stock index	144.2	146.5

Computerworld stock trading summary

CLOSING PRICES WEDNESDAY, JUNE 18, 1986

EXCH		52-WEEK RANGE (1)		CLOSE JUN 18 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS					
O	ALPHA MICROSYSTEMS	5-	9	5 7/8	-3/8	-6.0
O	ALTOS COMPUTER SYST	9-	19	16 1/4	-3/8	+2.3
A	AMDAHL CORP	10-	18	17 1/2	-5/8	-3.4
O	APOLLO COMPUTER	9-	31	12 1/2	-1 1/4	-9.0
O	APPLE COMPUTER INC	14-	39	34 1/4	-1 7/8	-5.1
N	AT&T	19-	28	25 1/8	+3/4	+3.0
N	BURROUGHS CORP	52-	71	60 7/8	+1 5/8	+2.7
O	COMPAQ COMPUTER CP	5-	18	14 1/4	-1 1/4	-8.0
O	COMPUTER AUTOMATION	1-	9	3	-1/8	-4.0
A	COMPUTER CONSOLES	5-	14	10 1/8	-7/8	-7.9
N	CONTROL DATA CORP	15-	30	24 1/8	+5/8	+2.6
O	CONVERGENT TECHNOL	5-	13	7 5/8	-1/8	-1.6
O	CPT CORP	4-	8	4 3/8	+1/16	+1.4
N	CRAY RESEARCH INC	25-	94	89 1/4	-2 1/4	-2.4
O	DAISY SYSTEMS CORP	11	38	11 1/2	-1/2	-4.1
N	DATA GENERAL CORP	31-	76	37 1/4	-1 3/4	-4.4
N	DATAPOINT CORP	5-	22	8 5/8	+3/8	+4.5
N	DIGITAL EQUIPMENT	42-	91	83 7/8	-3 3/8	-3.8
A	EECO INC	13-	20	19 3/4	-1/4	-1.2
N	ELECTRONIC ASSOC.	3-	7	5 3/8	1/8	-2.2
N	FLOATING POINT SYST	18-	42	35 7/8	1	-2.7
N	FOXBORO	22-	31	31	+5/8	+2.0
N	GOULD INC	20-	38	20 3/4	-2	-8.7
N	HARRIS CORP	22	35	31 1/2	-1/8	-0.3
N	HEWLETT-PACKARD CO	29-	46	41 7/8	-7/8	-2.0
N	HONEYWELL INC	54-	87	75 7/8	-4 1/8	-5.1
N	IBM	117-	158	146 3/8	-2 3/4	-1.8
O	IPL SYSTEMS INC	1-	4	3	0	0.0
N	ITT CORP	28-	48	45 1/8	0	0.0
N	M/A-COM INC	13-	24	17	-3/8	-2.1
N	MANAGEMENT ASSIST	2-	28	2 1/2	0	0.0
N	MATSUSHITA ELEC(ADR)	49-	98	88 7/8	-7/8	-0.9
O	MENTOR GRAPHICS	13-	30	16 3/8	-7/8	-5.0
N	MODULAR COMPUTER SYS	6-	9	8 7/8	0	0.0
N	MOHAWK DATA SCI	1-	13	2 7/8	-1/8	-4.1
N	NBI INC	11-	20	13 3/4	+1/2	+4.4
N	NCR	25-	56	52 1/4	-7/8	-1.6
N	PERKIN-ELMER	22-	36	27	-3 1/8	-10.3
N	PRIME COMPUTER INC	15-	27	18 1/8	-1 3/8	-7.0
N	SPERRY CORP	38-	75	75 1/8	+5/8	+0.8
O	STRATUS COMPUTER INC	9-	25	21 1/2	+3/4	+3.6
O	TANDEM COMPUTERS INC	13-	34	30	-2 3/4	-8.3
N	TANDY CORP	24-	44	40	-1/2	-1.2
O	TELEVIDEO SYSTEMS	2-	4	3 1/8	+1/8	+4.1
O	TELXON CORP	6-	23	22 1/2	-1/2	-2.1
N	TEXAS INSTRUMENTS	66-	141	119 1/2	-10	-7.7
A	ULTIMATE CORP	8-	34	30 3/8	-3/8	-1.2
O	VECTOR GRAPHICS INC	1-	1	1/8	0	0.0
A	WANG LABS "B"	15-	29	15 5/8	-5/8	-3.8
A	WANG LABS "C"	15-	28	15 3/4	1/8	-0.7
N	XEROX CORP	37-	72	56 1/8	-2 1/8	-3.7
	SUPPLIES & ACCESSORIES					
N	AMERICAN BUS PRODS	21-	38	33 1/8	+1/2	+1.5
N	BARRY WRIGHT	17-	29	23 1/8	-1/2	-2.1
A	DUPLEX PRODUCTS INC	13-	22	21 1/8	0	0.0
N	EMINS BUS. FORMS	14-	28	25 7/8	-3/8	-1.4
N	3M COMPANY	74-	111	111 3/8	+4 5/8	+4.3
N	MOORE CORP LTD	15-	27	25	+3/8	+1.5
O	STANDARD REGISTER	22-	45	39 1/4	-1/2	-1.2
N	WALLACE COMP SERVICE	30-	48	44 5/8	1 5/8	-3.5

EXCH		52-WEEK RANGE (1)		CLOSE JUN 18 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & DP SERVICES					
O	ADVANCED COMP TECH	2-	6	5 1/4	0	0.0
N	ADVANCED SYSTEMS INC	9-	20	17 3/4	0	0.0
N	AGS COMPUTERS INC	10-	25	18 5/8	-2 3/8	11.3
O	AMERICAN SOFTWARE	9-	15	13 1/4	+3/4	+6.0
N	ANACOMP INC	5-	11	5 3/4	-1/2	-8.0
O	ANALYSTS INTL CORP	2-	6	6 1/8	+7/8	+16.6
O	ASHTON TATE	6-	34	26 1/2	-5 3/8	-16.8
O	ASK COMPUTER SYSTEMS	7-	25	11 3/4	-1/2	-4.0
B	ASTRADYNE COMP IND	1	3	1 1/2	-1/8	-11.1
N	AUTOMATIC DATA PROC	18-	39	34 3/4	-1 1/4	-3.4
O	COMPUTER NETWORK	5-	9	7 5/8	0	0.0
O	COMPUTER ASSOC INT'L	9-	25	24 3/4	+1/4	+1.0
O	COMPUTER HORIZONS	5-	14	14	0	0.0
N	COMPUTER SCIENCES	13-	39	39	+1/2	+1.2
O	COMPUTER TASK GROUP	7-	19	17	-1/4	-1.4
O	COMPUTER USAGE	1-	3	2 1/2	1/4	-9.0
O	COMPUTONE SYSTEMS	3-	11	3 1/8	0	0.0
O	COMSERV CORP	1	6	3 7/8	+3/8	+10.7
O	COMSHARE	7	13	13 1/8	0	0.0
N	CULLINET SOFTWARE	12-	33	13 3/8	-1 3/4	-11.5
O	CYCARE SYSTEMS INC	13-	27	15 1/4	-3/4	-4.6
O	HOGAN SYSTEM INC	4	12	10 7/8	-7/8	-7.4
N	GENERAL ELECTRIC CO	56-	81	81 1/4	+1 5/8	+2.0
N	GENL MOTORS E (EDS)	20-	49	47 3/4	+1/4	+0.5
N	GTE CORP	38-	54	50 3/4	1/4	-0.4
O	INFORMATION SCIENCE	1	5	3 1/2	+1/8	+3.7
O	INFOTRON SYSTEMS CP	13-	24	15 1/4	+1/4	+1.6
O	KEANE ASSOCIATES	10-	20	14 3/4	+1/4	+1.7
N	LOGICON	25-	43	34 3/4	1/4	-0.7
O	LOTUS DEVELOPMENT CP	15-	38	35	-1 3/4	-4.6
O	MCI COMMUNICATIONS	7-	13	10	+1/4	+2.5
O	MNGT SCI AMER INC	7-	16	13 3/4	-1 3/4	-11.2
O	MATHEMATICAL APP GRP	1-	8	1/2	0	0.0
O	MICOM SYSTEMS INC	12-	35	13	3/4	-5.4
O	MICROPRO INT L CP	2-	4	2 1/4	1/8	-7.4
O	NATIONAL DATA CORP	8-	25	18 5/8	2 3/4	-12.8
O	ON-LINE SOFTWARE INT	4-	16	13 3/4	1 1/4	-8.3
N	PANSOPHIC SYSTEMS	14-	35	29 1/4	-3	-9.3
N	PLANNING RESEARCH	11-	23	19 1/2	0	0.0
O	POLICY MGMT SYSTS CP	18-	35	18	-1	-5.2
O	PROGRAMMING & SYS	4-	10	9 7/8	-1/8	-1.2
O	REYNOLDS & REYNOLD	30-	65	34 3/4	+1	+2.9
O	SEI CORP	13-	27	18 3/4	-1	-5.0
O	SHARED MEDICAL SYST	26-	38	31 3/8	-3/4	-2.3
O	SCIENTIFIC COMPUTERS	4-	8	4 5/8	-1/8	-2.6
O	SOFTWARE AG	12-	22	19 3/4	0	0.0
N	URS CORP	10-	18	17 1/8	1/4	-1.4
N	UCCEL	11-	23	21 3/4	+1/2	+2.3
O	VM SOFTWARE	17-	31	27	2 1/4	7.6
	SEMICONDUCTORS					
N	ADVANCED MICRO DEV	22-	36	21 1/2	-3 1/2	-14.0
O	ADV D SEMICONDUCTOR	7-	23	9 1/4	1	9.7
N	ANALOG DEVICES INC	14-	24	18	2	10.0
O	ANALOGIC CORP	11-	16	12 1/8	3/8	-3.0
N	APPLIED MAGNETICS CP	9-	19	14 3/4	2 1/4	13.2
O	AVANTEK	17-	26	17 3/8	-1 1/8	-6.0
O	HADCO CORP	3-	7	5	+1/8	+2.5
O	INTEL CORP	21	33	22 3/4	2	-8.0
O	MICRO MASK INC	5-	12	5 1/4	0	0.0
N	MOTOROLA INC	29-	48	38 1/2	-5 1/8	11.7
N	NAT L SEMICONDUCTOR	10-	15	12 1/8	-1 1/8	-8.4
N	TERADYNE	17-	33	23	1	-4.1

EXCH		52-WEEK RANGE (1)		CLOSE JUN 18 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	PERIPHERALS & SUBSYSTEMS					
P	AM INTERNATIONAL	3-	8	8	+1/4	+3.2
A	ANDERSON JACOBSON	2-	5	2 1/8	0	0.0
O	AST RESEARCH INC	7	33	13 3/4	-5/8	-4.3
O	AUTO TROL TECHNOLOGY	3-	13	4 1/2	+1/8	+2.8
O	AVANT-GARDE COMPUTING	3-	21	4	0	0.0
O	BANCTEC INC	6-	13	10 7/8	7/8	7.4
O	BEEHIVE INT'L	1-	2	1/8	0	0.0
N	BOLT BERANEK & NEW	20-	48	44 3/4	2 3/4	5.7
O	CAMBEX CORP	1	3	1	1/4	20.0
N	CENTRONICS DATA COMP	3-	11	6 5/8	1/4	3.6
A	CETEC CORP	6-	9	7 1/4	0	0.0
A	COGNITRONICS	4-	7	3 7/8	1/8	3.1
N	COMPUGRAPHIC CORP	23-	36	23 5/8	0	0.0
O	COMPUTER TRANSCEIVER	0-	1	3/4	0	0.0
N	COMPUTERVISION CORP	9-	44	15	-5/8	4.0
N	CONRAC CORP	12-	18	16 3/8	1/4	1.5
A	DATAPRODUCTS CORP	11	20	16	1	5.8
A	DATARAM CORP	4	17	10 1/2	1 1/2	12.5
O	DATA SWITCH CORP	4	9	8 1/2	1/2	7.1
O	DATUM INC	5-	9	6 3/8	+1/8	+2.0
O	DECISION IND CORP	10-	20	13 3/8	-5/8	-4.4
O	ENDATA, INC	2	8	7 1/2	+3/4	+11.1
O	EVANS & SUTHERLAND	12	27	22 5/8	1 1/4	5.2
O	GANDALF TECHNOLOGIES	5-	13	7 1/4	+1/8	+1.7
N	GEN L DATA COMM IND	8	21	12 1/8	1/2	3.9
N	HAZELTINE CORP	17	30	17 1/8	+1/2	+3.0
O	ICOT CORP	3	12	11 5/8	+1 1/4	+12.0
O	INFORMATION INTL INC	10	17	15	0	0.0
O	INTECOM INC	3	11	5 3/8	1/16	1.1
O	MEGADATA CORP	3	8	3 1/8	1/8	3.8
A	MSI DATA CORP	7	14	13 5/8	1/4	1.8
O	NASHUA CORP	24-	53	50	1 1/8	2.2
O	NETWORK SYSTEMS CORP	11	27	13 5/8	5/8	4.3
N	NO AMERICAN PHILIPS	32	47	43 1/4	+1/8	+0.2
N	NORTHERN TELECOM LTD	26-	41	29	1/8	-0.4
O	OMEX	1	3	1/2	-1/8	+33.3
N	PARADYNE CORP	6-	18	9 3/8	0	0.0
A	PENRIL CORP	7-	14	7 3/8	1/8	1.6
N	PLESSEY CO (ADR)	19-	38	35 1/2	+3 3/8	+10.5
O	PRINTRONIX INC	9	18	13 1/4	+1/4	+1.9
O	QMS INC	6-	16	14 7/8	+5/8	+4.3
O	RAMTEK CORP	2	7	5 1/2	1/4	4.3
N	RECOGNITION EQUIP	9-	17	12 1/4	1/4	2.0
N	SANDERS ASSOCIATES	29-	44	29	0	0.0
O	SCAN TRON CORP	9-	23	23	+1 3/4	+8.2
N	SCIENTIFIC ATLANTA	10-	15	10 3/8	1/8	1.1
O	SEAGATE TECHNOLOGY	5-	13	10 5/8	1 1/4	10.5
N	STORAGE TECHNOLOGY	1	5	3 3/4	0	0.0
O	SYKES DATATRONICS	0	2	3/8	+1/8	+99.4
A	T BAR INC	5	9	5 5/8	5/8	10.0
A	TAB PRODUCTS CO	9	15	14 3/4	1/4	1.6
O	TANDON CORP	3-	9	6 1/8	1 1/8	15.5
A	TEC INC	5	13	5 1/8	0	0.0
N	TEKTRONIX INC	47	68	60 1/2	-3/4	+1.2
N	TELEX	34	68	56 1/4	3 1/4	5.4
O	TESDATA SYSTEMS CP	0	3	3/8	1/16	12.4
N	TIMEPLEX INC	15	23	17 3/8	+1/8	+0.7
N	TITAN CORP	4	11	9 1/2	+1/2	+5.5
O	VISUAL TECHNOLOGY	1	3	1/2	0	0.0
	LEASING COMPANIES					
N	COMDISCO INC	7	24	21 1/4	3/8	1.7
N	CONTINENTAL INFO SYS	5	12	11 5/8	+1	+9.4
O	FINALCO GROUP INC	3	5	3 1/8	0	0.0
O	PHOENIX AMERICAN INC	2	6	4 1/8	1/8	2.9
O	SELECTERM INC	6	12	7 1/4	-1/8	-1.7
N	U S LEASING	32	46	43 1/2	+2 1/8	+5.1

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COMPUTER INDUSTRY

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Computer lessors face a new world with the upcoming repeal of the investment tax credit/**120**

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Eagle Computer joins the ranks of bankrupt micro vendors/**125**

INSTANT ANALYSIS

"We feel it's a terrific investment of up to $1.5 billion. Others are buying companies for not too much more than that."

— John F. Akers, IBM chairman, president and chief executive officer, on the IBM stock buyback plan announced earlier this year

Akers sees IBM profit drop

Says sluggish economy may prevent '86 earning increase

By Clinton Wilder

SAN JOSE, Calif. — Describing a gloomy scenario for the U.S. computer industry in 1986, IBM Chairman John F. Akers last week predicted that IBM will record its second straight yearly earnings decline unless the U.S. economy picks up.

In his annual briefing of securities analysts at IBM's General Products Division headquarters, Akers sounded a more pessimistic note than in his April statement, in which he said the company was "cautious" about the year's prospects.

"If business does not pick up in the U.S., IBM will have difficulty showing earnings growth for the year," he said. "We haven't seen any indications yet that it has turned up."

In 1985, IBM's profits slipped from $6.58 billion to $6.55 billion, its first year-to-year earnings decline since 1979. First-quarter 1986 earnings advanced just 3.1%, and Akers said second-quarter results will be similar.

While Akers said IBM's overseas business should grow by about 20% this year, Allen J. Krowe, senior vice-president of finance and planning, later admitted that most of those gains will come from currency valuations rather than unit sales. "After you deduct the currency effect, the worldwide revenue growth is very modest," Krowe said.

Akers hinted that IBM does not plan any more price cuts in the short term to boost sales, an action that the company did take on its 3090 and 4300 lines in February. "This slow growth period means less price-elasticity of demand, and we expect price stability in the near term," Akers said.

While he hedged on the issue of further price cuts for the IBM Personal Computer line, Akers hinted that Big Blue may stop making its Personal Computer rather than fight a price war against less-expensive Asian-made PC clones.

"Our strength has always been to differentiate our products," Akers said. "If parts of the computer industry become too

See **AKERS** page 148

Senate expected to pass tax bill

By Mitch Betts

WASHINGTON, D.C. — The U.S. Senate tomorrow is expected to pass a historic tax reform bill that completely restructures the corporate tax code, after hotly debating the so-called "transition" rules designed to protect certain firms from the changes.

Beneficiaries of the transition rules include Control Data Corp., MCI Communications Corp. and United Telecommunications, Inc. as well as satellite investments by Federal Express Corp.

The bill must still undergo compromise negotiations in the U.S. House of Representatives before it can be enacted. In general, the thrust of the Senate bill is to lower corporate tax rates in return for ending most tax deductions and credits, with the hope of eliminating the economic bias caused by tax provisions that favor certain types of investments.

The Senate bill would reduce the top corporate tax rate to 33% from 46% and eliminate the 10% investment tax credit, which would slightly increase the cost of buying or leasing computers and other equipment.

Although most tax credits are eliminated by the bill, a coalition of high-tech companies won a four-year extension of the 25% tax credit for research and development expenditures [CW, May 19].

The Senate bill must be reconciled with a vastly different bill produced by the House of Representatives before tax reform becomes law.

However, the Senate bill has more widespread support and momentum than the House bill does, so the final legislation is likely to look more like the Senate version, predicted Julie Sedky, analyst for Washington Analysis Corp.

A controversial feature of the Senate bill is a set of transition rules intended to help specific firms deal with the major changes in tax policy. For the most part, the transition rules "grandfather" certain investments so they may retain the tax benefits of the existing law.

Sen. Howard M. Metzenbaum (D-Ohio) sharply criticized these provisions as greedy favors for special interests, but supporters said they help firms with big investments that are caught in the transi-

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INDUSTRY INSIGHT
Bob Djurdjevic

IBM backlog at record high

After a slight decline in the fourth quarter of 1985, primarily caused by the volume shipments of the 3090s, IBM's inventory resumed its steep incline in the first three months of this year.

For the first time ever, its value, at IBM's cost, exceeded $9 billion — almost double the already high level of two years ago. At the retail price level, the value of IBM inventory broke the $30 billion mark. That's about eight months' worth of sales at the 1985 hardware revenue level.

The largest increase since the first quarter of 1985 was in the finished goods category, up 48%. The greatest rise since Dec. 31, 1985, however, was in the work-in-process category, which went from $5.7 billion to $6.3 billion in just three months. The sharp rise in the finished goods inventory is an indication of the relative weakness of demand for IBM products. The work-in-process increase, however, suggests a stockpiling of current products and some unannounced ones, too.

Only three product lines are currently meeting IBM's expectations: the 3090, the 4381 and the Personal Computer AT. This means that even the peripherals, traditionally an area of strength for IBM, have now joined the list of candidates for significant price reductions.

When IBM dropped 3090 prices only a year after the machine's announcement, it was hoping there was still some price elasticity left in the marketplace. That was also the reason the 4381 product line last February underwent the most significant price/performance reductions since 1979 [CW, March 24]. The good sales of the two

See **IBM** page 122

Djurdjevic is a computer industry analyst and president of Annex Research, a Phoenix-based computer research and consulting firm.

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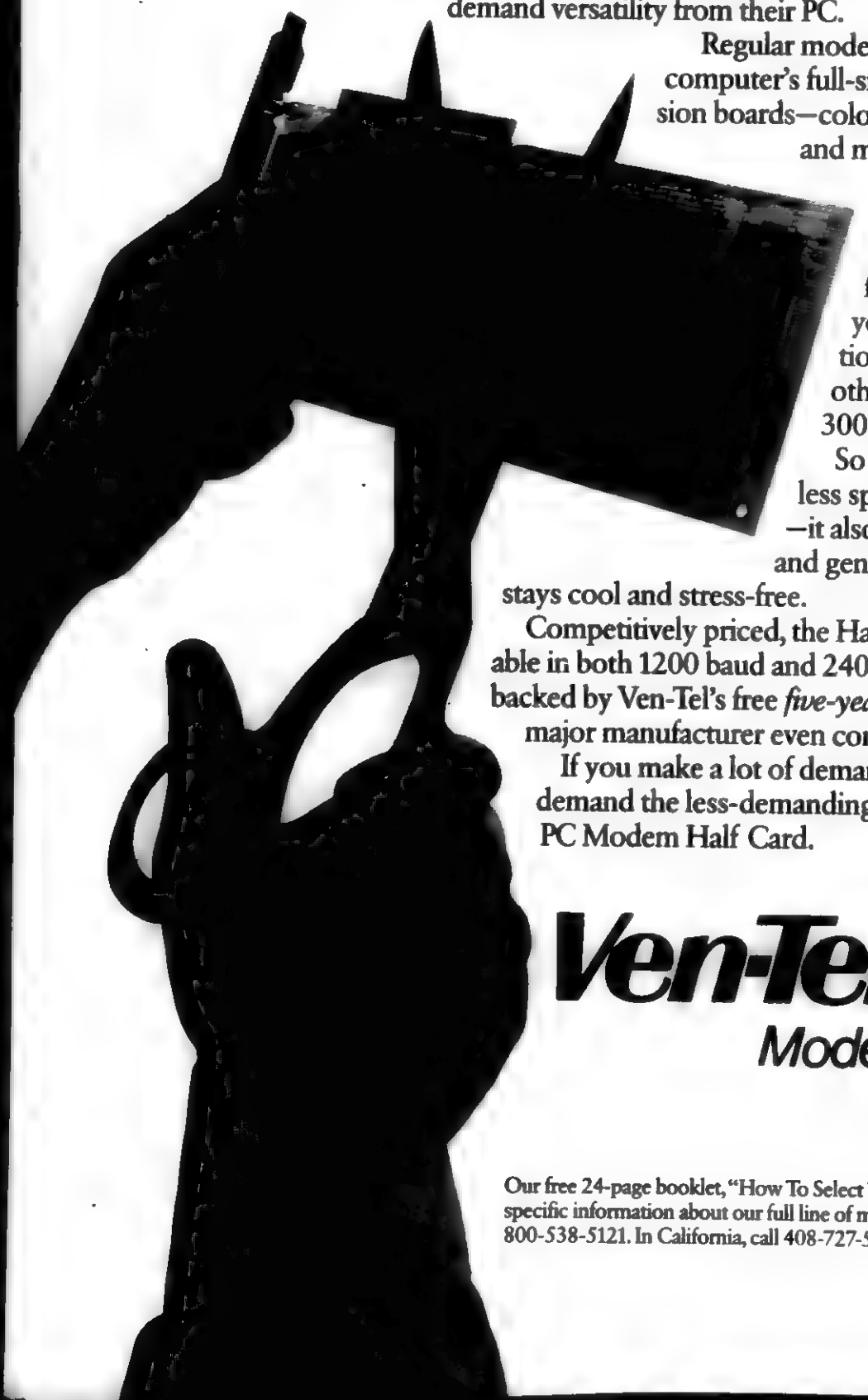
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Despite an expected revenue hike, Wang Laboratories hints at further consolidations. **Page 118.**

■

Microrim offers one price for standalone and network use of its latest micro data base management package. **Page 8.**

■

There is no likelihood of increased demand for large IBM mainframes, according to a survey of 500 MIS shops. **Page 13.**

■

Tolerant Systems is expected to announce today a high-end transaction processing system. **Page 25.**

■

User skepticism greets IBM's most comprehensive micro-to-mainframe offerings. **Page 2.**

■

Analysts expect AT&T to announce a low-end PBX to replace the discontinued Horizon at a press conference tomorrow. Analysts are looking for a switch priced between $500 and $600 a line, featuring 120-line capability.

■

It's been a tough year for AFIPS. First the group decided to fold its Office Automation Conference into another conference next year; then the National Computer Conference this month fell far short of expectations. Now sources say the second NCC/Telecommunications show, scheduled for 1987, will likely be canceled because the June date is too close to another popular communications conference, TCA, the U.S. Telecommunications Association show.

AFIPS would officially confirm only that the fate of the telecommunications show was being discussed. John Gilbert, AFIPS conferences director, said, "The board is in the process of working on alternatives" for sites and dates. No preregistration figures are available yet for the first NCC/Telecommunications show scheduled for this September.

■

The product has not been introduced

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Tax reform ups lease cost

Investment credit cut dims appeal of new unit rentals

By C...ton Wilder

The U.S. Senate's massive tax reform bill passed last week is expected to have substantial effects on MIS computer purchasing patterns. One provision could increase the cost of leasing new equipment, encouraging more MIS shops to lease used equipment.

The long-awaited tax bill, which passed the Senate by a 97-3 vote, is virtually certain to eliminate the investment tax credit, which leasing companies claim has allowed them to pass on lower rates to their customers.

Although a House-Senate conference

See **TAX** page 4

Users relieved by IBM shift

By James Connolly and Rosemary Hamilton

MIS managers last week expressed relief that IBM's June 16 flood of product announcements signaled an endorsement of both the System/36 and System/38 minicomputers.

Although managers tempered their remarks by noting that they were still analyzing product literature, most of those interviewed by *Computerworld* — whether they were System/36 or System/38 users — praised the product announcements. In addition, comments were generally positive about the performance boosts and

See **USERS** page 8

Code snafu threatens T1 private nets

By Elisabeth Horwitt

Users of private high-speed telecommunications lines are unknowingly staking their network operations in a game of Russian roulette because of a code standard adopted three years ago by the T1 equipment industry, observers claim.

Vendors and carriers have split into rival interest groups with conflicting views on how — and even whether — the problem should be solved. Meanwhile, no one is bothering to inform T1 users, who may be encountering disruptions without realizing what hit them.

Private T1 systems are in jeopardy because, due to code mix-ups between two types of equipment, commands that are sent from one network diagnostic system to another do not always arrive.

This has two possible results, depending on which vendor's equipment is involved.

One possibility is that when the network manager tries to initiate a diagnostic routine called loopback for locating errors on a T1 line, the system does not respond. An even worse situation occurs when the system, once put in loopback, cannot be taken out again.

Right now, the odds of an MIS manager running into this problem are low, most vendors and carriers claim. But a number of concerned industry spokesmen view the situation as a time bomb that, unchecked, will cause an increasing number of network failures as customer-based T1 networks proliferate.

The situation began developing three years ago when the customer service unit industry adopted as a de facto standard a code that was already being implemented on other equipment in use on T1 networks. Customer service units test the reli-

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CW EXCLUSIVE

Liberty Weekend: Improvised DP system behind July 4th fete

By Donna Raimondi

NEW YORK — G. Edward Smith faced a unique and historic challenge when producer David Wolper hired him as general manager of Liberty Weekend. Smith's mission: to create a sophisticated data processing department capable of coordinating all official celebration aspects of the Statue of Liberty's 100th birthday.

This turned out to be no small DP department. Liberty Weekend, the umbrella organization responsible for the ticketing and accreditation services for five shows over the four-day period that will honor the statue's anniversary and recent renovation, must gather and archive information on thousands of attendees. It must account for a budget in excess of $20 million, most of which will be spent in two weeks' time.



Smith's department was born in December 1985 in sublet offices on the 17th floor of a Park Avenue building. The high-rise, itself in the midst of renovation, had no weekend power supply, no furniture, faulty air-conditioning and elevators too small to transport large computer equipment.

The DP department had to start from scratch and become operational in a matter of several weeks. It had to run seven days a week without a hitch. When its work is finished on July 31, there must not be a single asset left to be disposed of or a single loose end.

Liberty Weekend is a division of the not-for-profit Statue of Liberty/Ellis Island Foundation, Inc. The foundation, formerly headed by Chrysler Corp. President Lee Iacocca, was created by a presidential private initiative committee to refurbish the statue and the island. Iacocca tapped TV and movie producer Wolper, who staged the spectacular opening and closing ceremonies of the 1984 Olympics, to head Liberty Weekend, with a mandate to provide ticketing and accreditation services for

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NEWSPAPER

Users skeptical about IBM micro-to-mainframe package

Networking 'hype' has buyers wary of software

By James A. Martin

IBM's recent announcement of a more comprehensive micro-to-mainframe communications software package that reportedly will allow transparent access and file transfer within certain applications was met mostly with skepticism by users interviewed last week by *Computerworld*.

"For connectivity issues, including local-area networks, we are investigating AT&T and other telecom vendors," said a communications systems analyst for a large California newspaper. "Most of IBM's product announcements dealing with connectivity and networking have been more hype than real, and we've been disappointed too often in what they have tried to do in those areas. We don't feel like running out and investigating this one as a result."

At the 1986 National Computer Conference in Las Vegas, IBM announced its Enhanced Connectivity Facilities software, which is said to allow users to access host files, disk space and printing facilities from a micro. Menu-driven programs will allow Personal Computer and 3270 Personal Computer users to query hosts and extract data and transfer files, among other applications [CW, June 23].

> ***'I think we would benefit from the direct access to DB2, but I don't really know if it would give us features we don't already have.'***
>
> — Gordon Andrews
> A. H. Robins, Inc.

Direct access

One of the features offered in the PC-to-370 link is direct access from a micro to DB2 and SQL, IBM's relational data bases. "I think we would benefit from the direct access to DB2, but I don't really know if it would give us features we don't already have," commented Gordon Andrews, information center analyst for A. H. Robins, Inc. in Richmond, Va.

Andrews said the company's IBM PCs, PC ATs and PC XTs are linked to mainframe data bases with terminal emulation cards and modems. "We are already hooked up to the mainframe as it is. So it sounds like they are blowing their horn, but what does it give us that we don't already have?"

The primary new feature offered by Enhanced Connectivity Facilities is a virtual file capability, which allows users to access host data one file at a time. "Users can be more selective in the data they access, since it brings the host data down one file at a time," said Mary Patterson, director of cooperative processing at IBM's Entry Systems Division in White Plains, N.Y.

Although Enhanced Connectivity Facilities addresses a growing MIS concern, "a few more applications need to be developed for it before we would consider it," according to Rick Golden, teleprocessing analyst for the University of Nebraska's computer services network in Lincoln.

"Right now we're running applications in IMS, CICS and IDMS, so this announcement doesn't really help us at this point in terms of direct access," Golden explained. "But we are looking at moving toward DB2, so it could be helpful in a couple of years."

Transparent interaction

Transparent interaction between host and micro is a goal worth working toward, and Golden said he is glad to see IBM doing something about that particular MIS and end-user concern. "We want to work toward an easy interaction, and the [Lotus Development Corp.] 1-2-3 users are always asking for mainframe information for their spreadsheets. I think this system will have its place in the market, in time."

"I appreciate the direction IBM is going in," said Ernest Campbell, manager of applications support for Crawford & Co., a risk management insurance services firm in Atlanta.

"The trick now in office automation is to make the connection between micros and mainframe more vanilla, transparent," he commented. "We can use that kind of technology."

Enhanced Connectivity Facilities consists of several components that will not be shipped until third-quarter 1987. In the interim, customers can begin writing applications to the Server-Requester Programming Interface (SRPI) this fall.

Campbell said he would rather wait for a total solution than to get involved with what might be replaceable technology. "If I train users now and have to train them again in six months, I've spent a lot of needless money. But when it's ready, IBM will have a much slicker, better solution, and I would rather wait for that. Two years from now, they'll have the technology that we are going to need then, and that's the important thing."

Although Enhanced Connectivity Facilities is not complete in applications and will not be available in its entirety until next year, it is "a strong base plan for IBM to build upon," Patterson said. "That's why the SRPI has been included. We want to encourage applications to be written to it, and we've tried to set a foundation from which to grow."

Most customers will require some lead time before implementing a new communications system, so IBM said it did not see the third-quarter shipment date as a drawback.

"With SRPI, you can start preparing now for when the whole package is ready," Patterson said, "to understand where all the pieces are going to fit and to begin writing your own applications."

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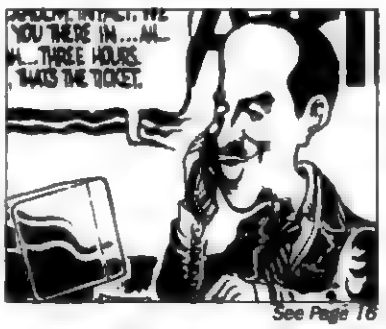
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RTI claims Oracle DBMS tests were biased

Says VAR supplied benchmark results

By Charles Babcock

Spokesmen for Relational Technology, Inc. (RTI) have disputed Oracle Corp.'s claims that its relational data base management system has gained a significant performance advantage over RTI's Ingres.

Oracle claimed in its announcement of Oracle Version 5 that a series of DeWitt benchmark tests showed Oracle on the average "was about twice as fast as Ingres."

RTI spokesman Randall S. Livingston said the test results are suspect because they were supplied by Nokia Information Systems, a Finnish OEM and consulting firm. "Nokia is a distributor for Oracle," he said.

Oracle provided the Nokia test results to *Computerworld* after being asked for independent verification of its performance claims for Oracle Version 5. It did not disclose its business relationship with Nokia along with the test results, explained Vice-President Kenneth Cohen, because "the test was conducted before Nokia became our distributor."

Cohen later said "distributor" was not the correct word to describe the relationship. Nokia is an Oracle value-added reseller and "a member of our dealer network for Oracle's PC product."

Livingston asserted that Oracle had the opportunity to influence the tests and challenged the way the tests were run. Nokia tested Version 5 of Oracle against Version 3 of Ingres in September, but the results were not made public until after Ingres Version 4 was out on the market, Livingston said.

> ***Ingres was tested with the data and operating system on one disk drive, while Oracle was tested with the data and operating system on separate disks.***

In addition, the RTI spokesmen said Ingres was tested with the data and operating system on one disk drive, raising the possibility of disk arm contention, while Oracle was tested with the data and operating system on separate disks.

Livingston further claimed that while RTI accepted the DeWitt benchmarks as "the most appropriate suite of tests for relational data base management systems," the Nokia test selected some benchmarks and rejected others.

Cohen explained that Nokia decided which benchmarks were selected and that he had no insight into how the tests were run.

Livingston said similar tests of Oracle Version 5 against Ingres Version 4 by RTI showed a close matchup, with Oracle winning some benchmarks and Ingres winning others. After the Nokia tests, he added, the subsidiary for which they had been conducted, Telenokia, bought Ingres.

Cohen disputed this point, saying the Ingres purchase was made before the company tested Oracle. "After the test, Nokia decided to become a distributor for Oracle," he said, before backing away from the term "distributor" to describe Oracle's relationship to Nokia.

The two California companies are young contenders for market share in the emerging relational DBMS market. Both use a version of IBM SQL to make their DBMS products compatible with IBM's DB2 and SQL/DS.

Tax bill raises leasing costs

From page 1

committee will be hammering out a compromise between the two versions of the bill, both the House and Senate versions call for the end of the tax credit to compensate for revenue lost by the lowering of overall corporate tax rates.

The Congressional tax bill is already starting to affect some MIS decisions. Medical Economics Co., a health care publishing firm in Oradell, N.J., recently decided to lease a used rather than a new IBM 4381 when its third-party lessor raised the rate on the new machine by $1,000 per month.

"Right before we were about to sign the contract with the low bidder, they said the prices to lease new machines had gone up because of changes in the depreciation schedules and their calculated residual values," said Jeffrey Fass, Medical Economics' vice-president of information systems.

"We verified with other leasing companies that this was true across the board, and decided to lease a used 4381 instead."

The Medical Economics case exemplifies what leasing company executives have been predicting.

"When you take the investment tax credit away, it really narrows that spread between the value of a new and used machine," said Peter Cooperstein, vice-president of marketing for Western Marketing and Financial Corp., a San Rafael, Calif.-based leasing firm.

The end of the tax credit will also mean the end of the so-called investment tax credit-to-lessor lease, in which the lessor maintains control of the equipment's tax benefits while passing a lower lease rate on to the lessee. "The lowest rates will no longer be available," Cooperstein said.

Buying, leasing patterns

Cooperstein explained that buying and leasing patterns will not change suddenly. "The users have to change their thinking, but they're not going to do it on Day 1," he said.

The most dramatic effects of the tax changes on MIS may well be felt in the information systems organizations of capital-intensive, smokestack industries, in which all major purchases of new equipment will be scrutinized more carefully.

"Unless companies are finding that their computers are not meeting their needs, they will be more hesitant to invest in new ones," said Douglas Newman, tax manager of the Boston office of Big Eight accounting firm Coopers & Lybrand.

"The MIS managers have a tougher sell to the financial department. They can no longer sell tax benefits; they have to rely on the other attributes of the purchase."

Computer purchasing in other industries, however, may see little or no impact from potential tax changes.

"We have absolutely ignored the investment tax credit for three years because of the tax status of the banking industry," said George DiNardo, executive vice-president of information management and research at Mellon Bank in Pittsburgh. "When our IBM 3090 delivery slipped from December to January of this year, it didn't matter as far as the taxes were concerned."

Large banks have been utilizing tax deductions from making tax-free community improvement loans and have not needed the tax credit, DiNardo said.

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Uccel bundles Synova software into one data center package

Interface tool allows concurrent user access

By Eddy Goldberg

ST. LOUIS — Targeting demand for data center management tools, Uccel Corp. last week announced Synova, an interface layer of software for the MVS operating system that is said to allow concurrent end-user access to multiple applications.

Uccel's strategy, as announced at last week's national user group meeting in St. Louis, is to offer a bundled software package designed to integrate data center management products. This is a departure from Uccel's original approach announced at last year's user group meeting [CW, June 17, 1985], which was to offer the software as individually released tier products.

The first of those products was Nova:Log, which is a common access to its systems packages and is now included in Synova.

Synova's success will be determined by how accurately Uccel has defined the needs of the data center, according to observers at the St. Louis gathering.

"I think that if they have identified the correct problems to solve, that's half the battle," said Jim Poyner, a stock analyst who follows Uccel in Dallas for Rauscher Pierce Refsnes, Inc. "The users I talked to here seemed to agree that [Synova] deals with the key kinds of headaches and issues involved in dealing with multiple vendors, different protocols and multiple terminals sitting on your desk."

Removes one-application limit of VTAM

According to Irv Overman, a member of the Synova development team, the software removes the one-application limit of IBM's VTAM. In addition, it is capable of allowing an end user to move from an application under IMS to one under CICS, TSO, VM, Applied Data Research Inc.'s Roscoe development system or a system developed in-house.

In addition to saving logoff and logon time, Synova's integration characteristics also permit the extension of IBM's ISPF screen management beyond the MVS/TSO environment. As with Synova session services, Overman said, the dialogue services component adds ISPF-like capability "to any on-line environment."

A data center could use this capability to add menu and Help screens, Overman suggested, or to make formats consistent between products. Information can be extracted from various systems and presented to an end user on a consolidated screen, Overman said.

A third feature of Synova, according to Overman, is its communications services that use IBM's LU6.2 protocol to allow peer-to-peer communications among in-house, Uccel and other vendors' software products in the data center.

The communications services "eliminate the need for in-house creation of LU6.2 communication handlers," Overman claimed.

Though many attendees of the users group meeting welcomed the promise of a product that will make their jobs faster and easier, Synova is still unproved. The product will enter beta testing in July and is scheduled for a controlled release in October. The fully functional package will be available late in the first quarter of 1987, company officials said.

"The product's greatest potential, in terms of all portions of the system's functionality as currently conceived, will occur when it's fully available, which will not be until 1987," said Terrence Quinn, a systems software industry analyst with E. F. Hutton & Co. in New York. Nevertheless, initial attendee reaction to Synova was favorable, if somewhat uncertain.

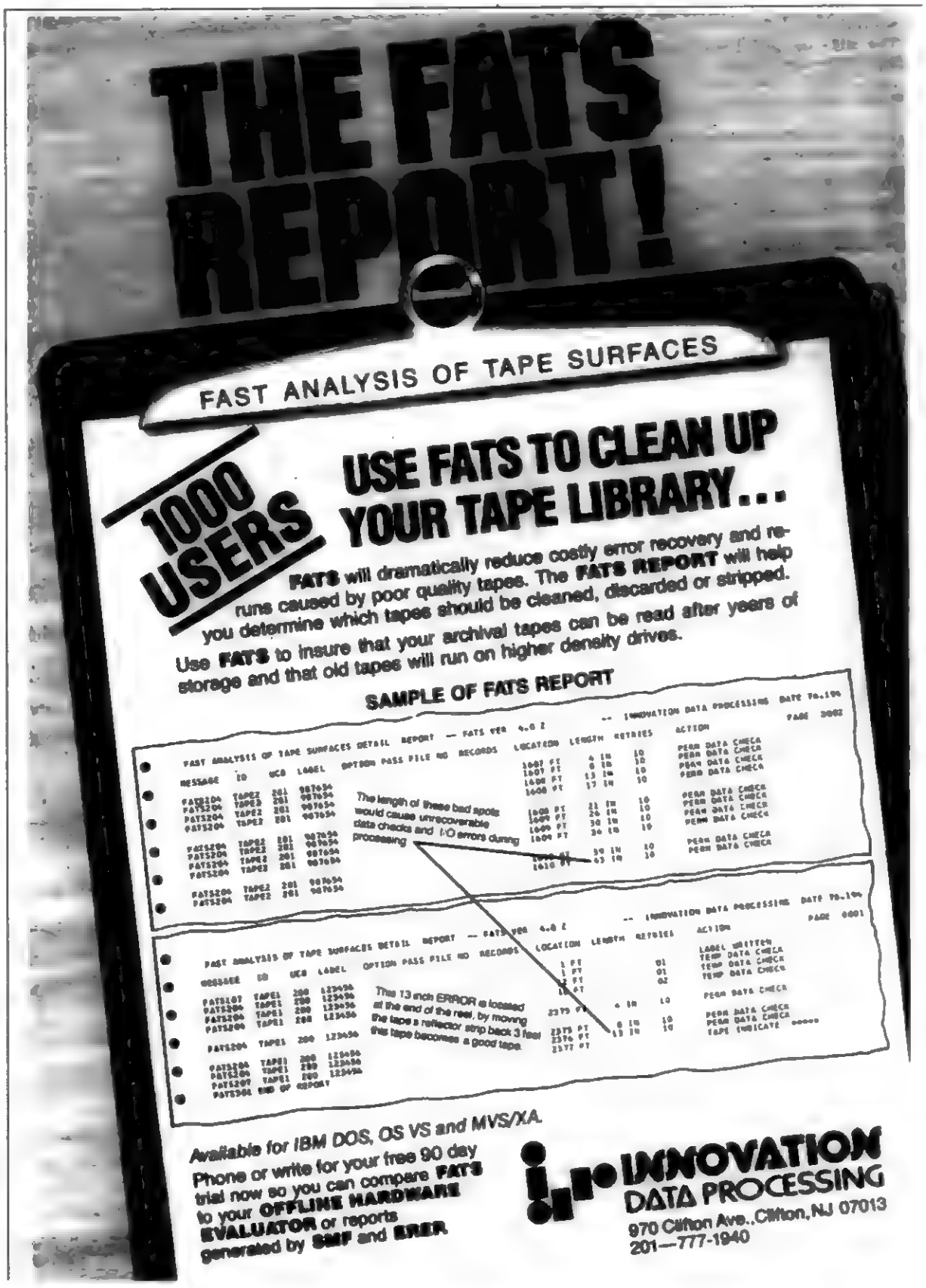
"Synova is an interesting concept," said Gary Groff, supervisor of computer operating systems for the Illinois Power Co. in Decatur, Ill. "I think it's a good idea. As computer systems get more complex, it's harder to keep up with them. You need something that integrates it."

'Everybody needs a standard'

Jim Black, director of the Advanced Concepts group that created Synova, noted, "If you look at it logically, everybody needs a standard for integration. People have problems because that standard doesn't exist. If we've done it right, and I think we have, Synova will be like the IBM 3270 — a de facto standard" in the data center.

Neil McCann, manager of computer operations for Shell Canada Ltd. in Calgary, Alberta, saw some quick hardware savings resulting from Synova: "This kind of package means I can replace my $12,000 IBM 3270 Personal Computer with a 3179 or any dumb terminal and jump from one application to another with just a couple of keys."

The list price of $75,000, Poyner said, seems like a bargain. "I think $75,000 for the main architecture package is going to be cheap if it allows you to offset that immediately by some reduced hardware needs, and, more importantly, if it can save some labor, the payback ought to be very quick," he said.



Snafu threatens T1 private nets

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ability of T1 line segments by creating a loop in which transmissions go out to a remote site, then return along the same line. If they return with nothing missing or garbled, then the line is considered trouble-free.

In one case, the problem arises when a T1 is equipped with a B302 Automatic Protection Switch (APS) manufactured by Lynch Communications Systems, Inc., said Lynch engineering manager Clifford Davidow. The code used by customer service units as a command to get out of loopback mode is interpreted by this type of APS as, "there is trouble on the T1 line; divert transmissions to backup facility."

The APS assumes that the command was meant for its own use and does not pass it along, so the remote customer service unit never receives it. As a result, customers find their T1 line ensnared in endless loopback — and, hence, unusable.

Not limited to Lynch equipment

This problem is not limited to Lynch equipment. A similar miscommunication between the customer service unit and an APS from California Microwave, Inc. prevents users from being able to initiate a loopback test, according to California Microwave senior engineer Robert Dalton. "The APS occasionally thinks the loop-up code is a reset command," he explains.

Last October, an ad hoc T1C1 committee of the Exchange Carrier Standards Association chaired by Dalton produced a report on the extent of harm caused by the code conflict.

Two cases were reported to the committee. One, involving a California Microwave APS and a customer service unit from Kentrox Industries, Inc., took place in Westchester County, N.Y. However, Nynex Service Co. spokesman Joseph Fey claims that when Nynex investigated that case, it did not find that type of problem.

The other case, involving a Lynch APS and customer service units from both Kentrox and Verilink Corp., occurred under test conditions at United Telephone Co. of Florida.

United Telephone was "getting the problem a lot," according to equipment engineer Thoai Van Ha. But instead of taking the APS out of service, the company chose to stop using customer service unit-based network diagnostics. "We have gone back to the old way of diagnosing failures, which involves sending an engineer out to each end of the link" and setting up a test manually, Ha says.

"I think there's a real problem, especially in metropolitan regions like Nynex's and regions like Bell South Corp.'s where there are a lot of hurricanes and floods," Dalton says. "Those are the areas where a lot of APS are installed."

And those systems have a five- to 10-year life cycle, so they won't be phased out in a hurry, he adds. The total number of APS that can potentially cause loopback problems is estimated to be in the hundreds of thousands.

Unable to reach a consensus

The T1C1.2 subcommittee of the Exchange Carriers Standards Association has been discussing the issue for over a year now but has been unable to reach a consensus.

One major faction recommends solving the problem by retrofitting the customer service units with new code that does not duplicate any APS code. This group includes Lynch, California Microwave and ITT Corp. — the companies whose APS are involved in the problem — and customer service unit vendors Larse Corp. and Kentrox.

"The problem is only occurring in about 1% of cases, but when it occurs, it has a serious impact," says Kentrox T1 customer premise equipment manager Chris Iburg.

The opposing group, which includes Nynex and Verilink, claims that the problem is too small to warrant any major action, let alone an expensive service unit upgrade.

"Changing the service unit codes would mean a substantial rate hike for customers," says Fey of Nynex. "We have received no customer complaints and do not perceive a significant problem; there is very little of that particular combination of equipment out there."

> ***'The problem is only occurring in about 1% of cases, but when it occurs, it has a serious impact.'***
>
> — Chris Iburg, Kentrox Industries, Inc.

Dalton, however, suggests that the number of user complaints is an unreliable indicator of the extent of the trouble. Customers — especially smaller companies that have little experience in T1 lines — are likely to perceive only that there is a malfunction of some kind and call up the regional operating company to fix it, he notes. "The local Bell companies will knock down the circuit and bring up operations again without anyone realizing what the trouble was."

Lynch's Davidow says that his company hopes to get the committee to decide on action in the next two to four months. "I don't think the problem is shelved at all. No one is saying we need a complete customer service unit retrofit; we just want to stop the problem from proliferating."

Users instituting safeguards

Individual customers and carriers are effecting their own safeguards. George Goodman, a vice-president at Baltimore investment firm T. Rowe Price Associates, Inc., is currently overseeing the installation of T1 lines and customer service units within his company.

"Now that I know about the problem, I won't shoot myself in the foot by initiating a loopback test pattern unbeknownst to AT&T," Goodman notes.

First National Bank of Chicago, which uses T1 lines to connect Chicago and New York operations, has had no troubles of this type so far, says assistant operations manager of telecommunications John Prusinski.

"We use Verilink 551 customer service units but we haven't asked our carriers, Illinois Bell and AT&T Communications, to install APS on our lines," Prusinski says.

APS are only installed on request, Prusinski notes, adding that the bank is likely to want the increased network reliability provided by APS in the near future.

Diagnostic technology

By then, however, First National hopes to have installed a new type of diagnostic technology that enables users to collect T1 network error statistics without going through local operating company facilities — or the APS.

Nondisruptive diagnostics, which will be available from Verilink by the first quarter of next year, will enable customer service units to communicate across T1 lines, pulling error data directly off the network, Verilink product line manager Judith Blaski says.

However, First National will have to take out its current CSU installation in order to acquire the new feature, Prusinski notes.

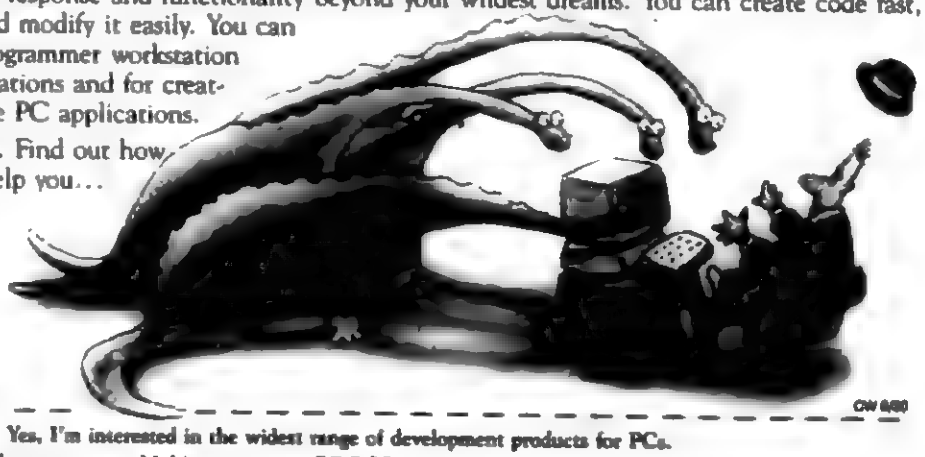
Lynch's Davidow admits that his company has encountered "a number of people who have bought customer service unit equipment who are not wild about changing the code. I tell them, 'You're playing Russian roulette: You've fired twice and not been hit so you think it's safe.' "

Davidow, however, adds, "Retrofitting the customer service units is only one possible solution; we're still scratching our heads. We'd be willing to listen to any solution that works."

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TOP OF THE NEWS

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formally, but Nixdorf Computer Corp. is marketing a Unix-based superminicomputer on a limited basis in the Chicago area. The Targon/35 made an appearance at the 1986 National Computer Conference. A general announcement for the 32-bit, reduced-instruction-set-computing-based system is still a few months away.

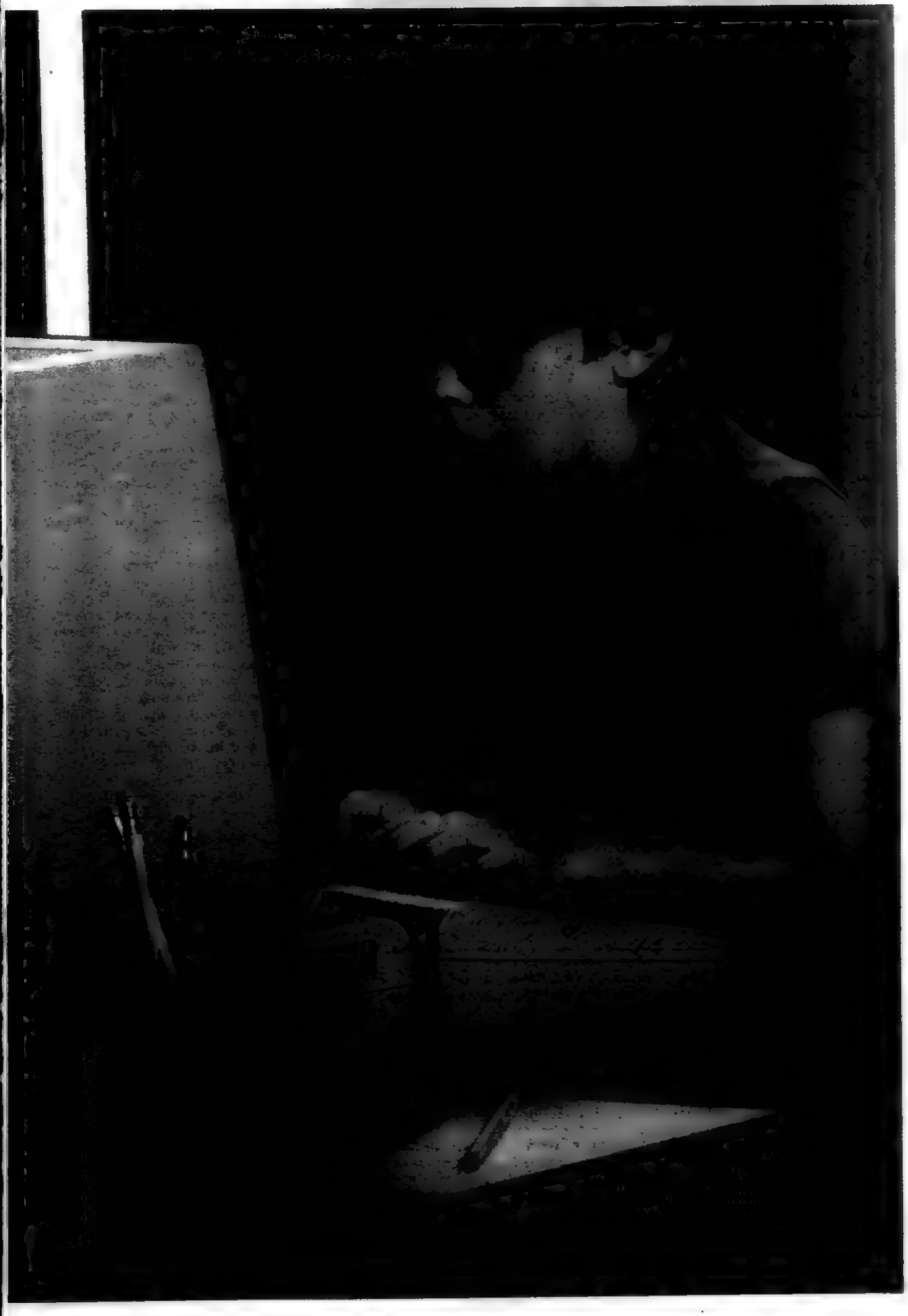
■

AT&T's 156,000 striking employees returned to work late last week after a 26-day walkout by members of the Communications Workers of America (CWA). An earlier general agreement was reached June 17, but CWA members remained on strike until all six AT&T business units agreed to contract terms.

■

Federal Judge Harold Greene approved a waiver for Ameritech to make telecommunications equipment in foreign countries for overseas sales. Under terms of the 1984 AT&T divestiture agreement, the regional companies were prohibited from manufacturing.

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Network and PC users offered micro DBMS at one price

Early user likes increased power

By David Bright

REDMOND, Wash. — Hoping to gain some ground on market leader Ashton-Tate, Microrim, Inc. last week offered a single-price microcomputer data base management program for both stand-alone and network use.

According to the initial impressions of one early R:Base System V user, Cheryl Currid, manager of sales, systems, planning and information at Coca-Cola Foods in Houston, the most appealing qualities of the new product were its more powerful applications generator, the advanced math and financial analysis functions and the one-price-per-server licensing. Currid has been a user of Microrim's R:Base 5000.

"It looks like a pretty strong program — well thought out and very well integrated," commented Oliver Picher, who tracks data base management systems at Datapro Research Corp. in Delran, N.J. "It seems to be one of the smoother products around, in that someone who knows very little about data bases can do something fairly complex with the program very quickly."

The same $700 package can run on both a stand-alone IBM Personal Computer and on a server in a local-area network. Analysts and users said this rather uncommon pricing arrangement, along with increased relational capability, give R:Base System V a distinct advantage over Ashton-Tate's top-selling Dbase III Plus.

"Ashton-Tate has a lot of homework to do in order to catch up," Currid said. Although Dbase III Plus carries a single-user price of $695, Ashton-Tate currently charges an extra $995 for every three additional users on a network. Since Coca-Cola Foods will be using R:Base System V in a series of networks, the set pricing should result in a "substantial savings," Currid noted.

However, in terms of sales, Microrim is far behind the market leader. While Ashton-Tate last year took in about $100 million from sales of its Dbase data base management products alone, total sales at the privately held Microrim reached approximately $20 million, estimated Bob Lefkowits, vice-president of software research at San Jose, Calif.-based Infocorp.

The package offers several improvements over the company's flagship R:Base 5000 product, Microrim spokesmen said. These include expanded applications and data base structure generation, improved forms creation with a multifile capability, faster sorting and extensive math functions.

"R:Base System V will appeal to a growing user market that wants to develop and use data management programs but finds that available current products erect a wall for all but experienced programmers," Microrim President Kent Johnson claimed.

One user expecting to benefit from the package's multifile forms feature is Ted Waltman, project leader at Dataslink Business Systems, Inc. of Inglewood, Colo. So far, the Delta Air Lines subsidiary has been using R:Base 5000 to develop complex reporting packages for travel agencies. With R:Base System V's relational capabilities, Waltman said, development time and forms presentation should be speeded considerably. This is because one line of code can now replace the 10 to 12 lines of code previously needed to access several tables.

Available in August, R:Base System V supports the IBM PC Network as well as networks from 3Com Corp. and Ungermann-Bass, Inc. A hard disk drive and at least 512K bytes of random-access memory are required to run R:Base System V. R:Base System V has a menu-driven prompting feature for accessing all of the program's functions.

For the creation of programs, data base structures, forms and reports, the package builds upon the Express application generator used in R:Base 5000, Microrim officials said. The package also incorporates a high-level procedural language for use in developing more sophisticated applications.

The program's multiuser features include automatic row verification to handle simultaneous file access, automatic table locking for exclusive use of a file and password protection.

Up to 80 tables may be opened at once for relational operations, and many relationships can be formed.

Using the program's gateway, data can be read from or written to Lotus Development Corp.'s 1-2-3 and Symphony, as well as ASCII and Lotus Visicalc files. Files created from Dbase programs and Software Publishing Corp.'s PFS:File data base management system can be imported.

Users relieved by IBM shift

From page 1

new capabilities offered, despite the fact that most users still want more.

"It was very encouraging. I had heard some gossip that the System/36 might be discontinued, and I didn't feel good about that. Now I feel IBM is as smart as I am," commented Larry Nottingham, MIS director at Gary Drilling Co. of Bakersfield, Calif., which uses a System/36 Model 5360.

"I'm pleased that they are not going to obsolete it too soon. There's plenty of room for growth. Six years ago, my company purchased a System/34, and we outgrew it rapidly. But I feel we'll be happy with the System/36 for a long time to come," Nottingham added.

Blunted speculation

The announcements blunted mounting speculation — mostly on the part of critics of each system — that either the System/36 or System/38 would be phased out in the near future.

"You keep hearing rumors about the System/38 dying, but it's not. It's a wild machine. I don't think anybody really understands how much it can do. It's a real price performer," said Dave Kaestner, DP manager for the Rochester Coca Cola Bottling Co. in Rochester, N.Y.

Kaestner reported that his company hopes to upgrade its System/38 Model 6 but that those upgrade plans were set back by the announcements, which require further study to determine which of the new System/38s is the right replacement. However, he said he was happy to see the introduction of more compact disk drives for use in small computer rooms.

Included in the June 16 announcements were the high-end D series models for the System/36, a replacement line of System/38s with twice the memory of their predecessors, new disk drives for both systems and new operating systems for both product lines with support for more communications between the System/36 and 38.

Officials at an agency that IBM has in the past identified as one of its largest System/36 customers, the U.S. Department of Agriculture (USDA), were among the few who said they had not been concerned about the future of the product line before the announcements.

"I've always felt the System/36 had a good future. I've had a gut feeling, and I've seen where the development efforts were taking it," said Jim Dinwiddie, director of the information resources management division of the USDA's Agriculture Stabilization Conservation Service.

Dinwiddie, whose agency uses 2,500 Model 5362s, said of the overall announcement: "It's all obviously very positive for us. It fills an immediate need to grow the product line without moving up to the 5360. Our concern right from the beginning had been that we could not see having to replace the 5362s with 5360s." He added that one exciting aspect of the announcement was the ability of the 5362 to support external direct access storage devices (DASD).

IBM restructures System/36 lineup

	5360 Model D	5362 Model B	5362 Model C
Memory (M bytes)	1-7	1-2	1-2
Maximum Disk Storage (bytes)	1.4G	120M	520M
Availability	First-quarter '87	Fourth-quarter '86	Fourth-quarter '86
Price	$67,850-$106,850	$12,625-$27,625	$21,625-$31,625
Price of 1M-byte Additional Memory	$3,500	$3,500	$3,500

But even those who endorsed the announcements were looking for more enhancements and, in some cases, more of a melding of the systems.

"Everything bodes well for the product line," commented Dennis Klinger, vice-president for MIS at Ryder Truck Rental, Inc. in Miami. Klinger, who is supervising the acquisition of 150 System/36s during the next year, said, "We certainly like the upsized memory and the upsized DASD, and we like the peer-to-peer communications. But it does look like they've got more DASD there than anyone could back up intelligently."

Mad hoped for more

Klinger indicated he had hoped for even more from IBM. "I wish they had put in more things in the way of productivity and development aids and relational data base capabilities like those of the System/38," he said. "I think they will be there eventually, but it probably won't be in time for my project."

One System/36 user said he probably will upgrade his Model 5360 B24 to a new 5360 D24. David Cicero, assistant administrator at Ouachita Hospital in Camden, Ark., said, "I like the idea of upgrading to a processor that's supposedly twice as fast. IBM had a former announcement about six or eight months ago that upgraded memory. So this last one was icing on the cake. We don't need that much memory. What I really liked is the idea of continued support."

Robert Bone, director of data processing at Bergen Burnswig Corp. of Orange, Calif., a pharmaceutical and medical supplies distributor, reported that he has 57 Model 5360s located in warehouses and distribution centers across the U.S.

'Very enthused'

"We were very enthused because our business is growing, and we want to keep the same programs running," Bone said. "One of our divisions is very large, and we were concerned that when we needed to get a bigger system that we couldn't get one with enough power."

Bone added that he found the links between the System/36 and System/38 interesting and that he hopes there is more merging of the two systems. Noting that he uses RPG-II now, he said, "eventually we'd like a data base-type system like RPG-III. We were concerned that the System/36 would never have that type of language."

However, some users questioned said they were unfamiliar with the announcements.

"My reaction is one of surprise. I haven't heard a thing about it, and I've already talked to my IBM representative this week," said a DP manager at one manufacturing company that uses a System/38.

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LEADING MAINFRAME SOFTWARE VENDORS AS IDENTIFIED BY SURVEY RESPONDENTS

Percent of Installed User Base – 1984		Percent of Installed User Base – 1985		Percent Considering Vendor for 1986	
Manufacturing Resource Planning					
IBM	34.5	IBM	35.6	Cullinet	42.1
Sperry	8.6	Comserv	9.6	IBM	13.2
Comserv	6.9	Cullinet	9.6	Comserv	10.5
Arthur Anderson	5.2	Cincom	8.2	MSA	7.9
Burroughs	5.2	Martin Marietta	5.5	Cincom	5.3
Inventory Control					
IBM	38.4	IBM	25.6	Cullinet	21.4
Comserv	6.8	American Software	13.4	Undecided	14.3
Welker	6.8	Cullinet	9.8	American Software	11.9
MSA	5.5	MSA	9.8	Cincom	8.5
Sperry	5.5	Comserv	4.9	Arthur Andersen	7.1
Bill of Material Processing					
IBM	43.6	IBM	35.6	Cullinet	45.2
Comserv	9.1	Cullinet	10.4	Comserv	17.1
Sperry	7.3	Comserv	9.0	MSA	9.5
MSA	5.5	Martin Marietta	6.0	IBM	8.5
Arthur Andersen	3.6	MSA	6.0	Undecided	6.5
Master Production Scheduling					
IBM	34.0	IBM	25.5	Cullinet	37.5
Comserv	11.4	Cullinet	8.5	Comserv	18.8
MSA	8.4	MSA	8.5	IBM	9.4
NCR	6.4	Comserv	6.4	MSA	8.3
Software Intl.	4.3	Honeywell	6.4	Cincom	6.3
Integrated Financial (A/P, A/R, G/L)					
IBM	18.0	MSA	31.0	Cullinet	21.4
McCormack & Dodge	18.0	McCormack & Dodge	21.8	MSA	17.9
MSA	12.0	IBM	10.3	McCormack & Dodge	14.3
Software Intl.	10.0	American Mgmt. Systems	3.4	IBM	7.1
Information Associates	8.0	Cullinet	3.4	Lawson Assoc.	3.6

*"The Software News/1986 Survey reports – "Cullinet's standings in manufacturing and financial software this year are clearly the most striking among all the mainframe software vendors. Cullinet, the leading independent supplier of mainframe database management software, began offering applications packages just three years ago."

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Laser printer lineup includes high-volume duplexing model

Aimed at high-end corporate publishing

By Peggy Watt

SANTA CLARA, Calif. — Imagen Corp. plans today to announce a high-volume laser printer that can produce double-sided pages of mixed text and graphics at a speed of 20 letter-size (8½- by 11-in.) page/min.

The Imagen Imageserver XP line includes four models, all scheduled to be available in August. All are built around the Canon U.S.A., Inc. laser engine, which has been used in other Imagen printers, and print at a speed of 300 dot/in.

Imagen, which already produces a line of laser printers, positioned the latest releases as shared resources for work groups of multiuser mini or supermicro systems, according to Joseph Mendolia, Imagen's marketing director.

The line is aimed more at the high-end of corporate electronic publishing, as opposed to the desktop publishing package promoted by Apple Computer, Inc. Mendolia said the latest Imagen printers are intended for mass production of laser-printed copies rather than for the output of a single camera-ready page that is then reproduced on a printing press.

The high-end 7320 system, the only one of the models that offers automatic duplexing — printing both sides of a page in a single output — also accommodates 11- by 17-in. paper and is priced at $32,950.

Other features include 3M bytes of memory and a 2.5M-byte raster image buffer for faster graphics processing, three input trays and two offset output stackers for easier collating. The 7320 supports Unix, Digital Equipment Corp. VMS and IBM 3270 host environments.

The mid-range system, the Imageserver XP Model 3320, also handles 11- by 17-in. pages and is priced at $21,875, with optional upgrades to the Model 7320.

The two low-end systems replace other Imagen printers. The Imageserver XP Model 4324 replaces the Imagen 24/300 and is priced at $29,950. Like the older model, it handles 11- by 17-in. page formats, has three input bins and a face-down offset stacker and produces 24 8½- by 11-in. page/min. The Imageserver XP Model 2308 is a tabletop system that replaces the Model 8/300 system and sells for $8,950. It produces 8 page/min and includes collation, page reversal and automatic jam recovery.

Imagen is taking orders for the new printers immediately and expects to ship them in August, according to Mendolia.

Imagen's printer drivers are its own page-description languages — Impress and Document Description Language — which the company has said will soon support Interpress, the page-description language promoted by Xerox Corp.

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"Hello, I'm Lisa Metric. Whenever, wherever and however you need DP equipment, you'll never need anyone but me."



DEC powers up PDP-11 system with single board

By James Connolly

MAYNARD, Mass. — Loading one of its Q-bus-based microcomputer systems onto a single processor and memory board for the first time, Digital Equipment Corp. introduced a low-end member of its PDP-11 family of minicomputers.

The MicroPDP-11/53, supporting up to eight users, is twice as powerful as the previous low-end PDP-11 system, the MicroPDP-11/23, according to DEC officials.

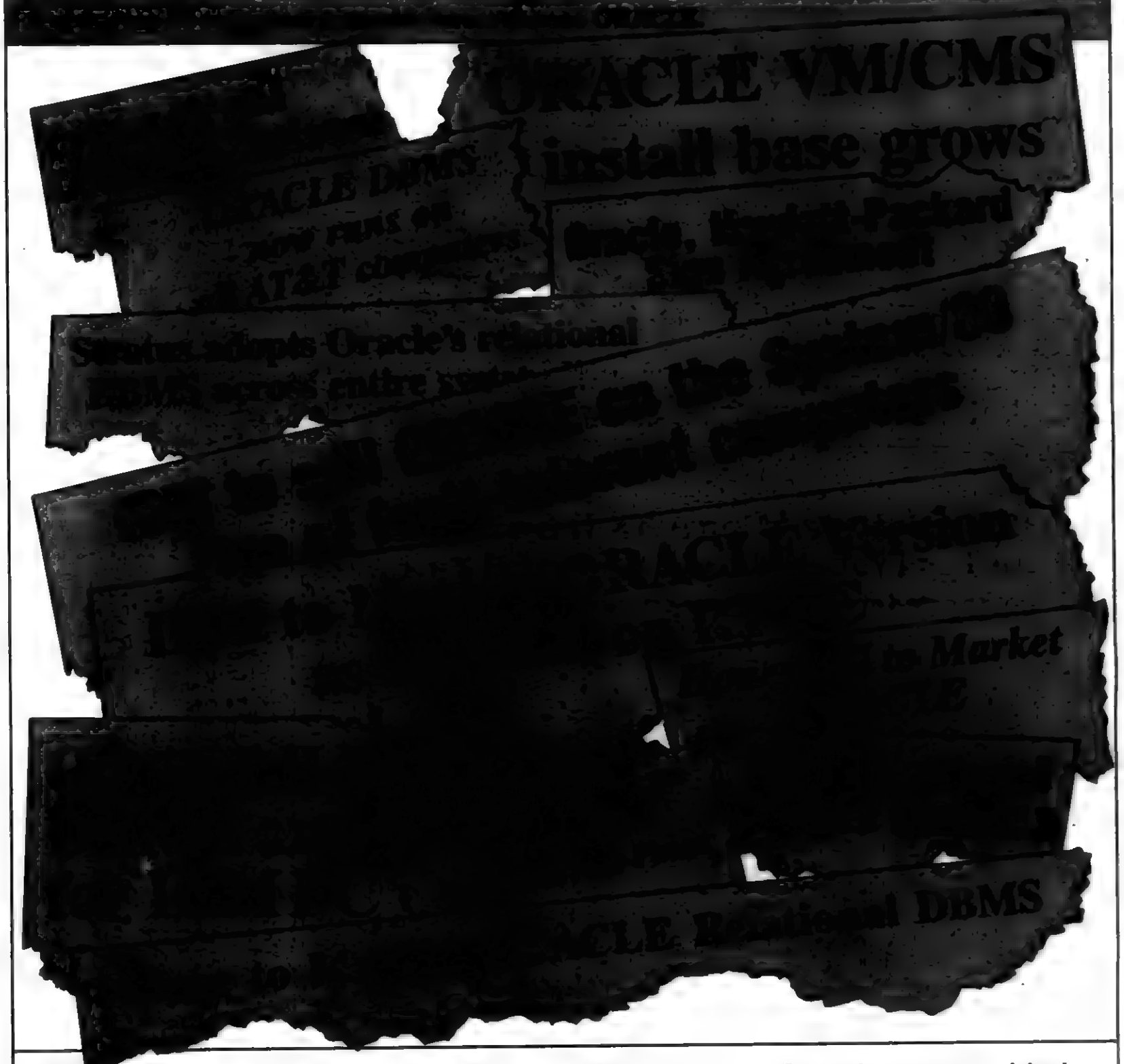
In addition to the system, DEC announced half-height 5¼-in. floppy disk and Winchester disk drives and new configurations for its MicroPDP-11/73 and MicroPDP-11/83.

The MicroPDP-11/53 reportedly is the first of its family to have a single-board processor including memory with 500K bytes of memory on the processor board. It is said to be expandable to 4M bytes of memory and 40M bytes of hard disk storage.

Available in pedestal and rack-mount versions for the end-user and OEM markets, the MicroPDP-11 is intended for use in real-time process control, small business, scientific, communications and government applications. Prices start at $9,270, with deliveries scheduled for August.

DEC also introduced its first half-height 5¼-in. floppy disk drive, the RX33. The drive was designed to provide 1.2M bytes of storage and to accept diskettes in DEC's RX50 and the IBM Personal Computer AT formats for file media interchange. DEC officials also said the MicroPDP-11/83 is now available in rack-mount configurations, deskside and cabinet enclosures. Prices begin at $15,200 for a rack-mount system and range to $50,630 for a cabinet system.

The MicroPDP-11/73 is now available in deskside versions through addition of a kernel system containing a CPU and a 2M-byte memory module. Prices begin at $10,450 for a rack-mount kernel system with 2M bytes of memory. A 40-in. cabinet option costs $4,500.



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GAO raps military for incompatibility of publishing projects

WASHINGTON UPDATE
Mitch Betts
CW Washington Bureau

Congressional investigators recently criticized the military's new electronic publishing projects on grounds that each military service is building its own system that will be incompatible with the others.

The U.S. Department of Defense has ordered the military services to automate their repositories for technical information, such as engineering manuals and drawings.

However, the General Accounting Office (GAO) recently reported there are five different projects underway, "resulting in duplicative and nonstandard approaches to automating repositories."

For example, the U.S. Army and Navy are pursuing independent digital projects, while the Defense Logistics Agency project does not include digital systems, the GAO reported, because that agency believes the technology is unproven. The GAO said a central Pentagon office is needed to provide oversight and coordination.

A key Pentagon official, who declined to be named, said the GAO report is misguided. He said the ultimate goal of the Computer-Aided Logistic Support program is to develop standards and interfaces so all of the military data systems will be compatible with each other and with those of defense contractors [CW, Dec. 9].

■

Despite all of the rhetoric and hoopla surrounding the passage of trade legislation by the U.S. House of Representatives [CW, June 9], analysts and lobbyists doubt far-reaching legislation will be enacted this year because Congress is running out of time.

Stephen D. Cohen, an analyst with Washington Analysis Corp., said members of the U.S. Senate may support a "get tough" trade bill for political reasons, but there will not be time to forge a compromise with the House bill because of the dwindling number of working days left in this session of Congress.

"The threat of a presidential veto will become increasingly irrelevant if and when it becomes apparent that there will not be time for a conference committee to reconcile differences between the House and Senate versions of a trade bill," Cohen said.

An electronics industry lobbyist agreed, noting that members of the Senate Finance Committee who handle trade legislation are tied up with tax reform.

He said enactment of a scaled-down and less controversial trade bill covering telecommunications is possible.

■

The Department of Commerce, at the request of the Reagan administration, is studying the possibility of handing its huge data base of government research reports over to a private vendor.

The National Technical Information Service (NTIS), located in Springfield, Va., with about 350 employees, has more than 1.6 million technical reports that can be obtained in a variety of ways, including on-line searches, floppy disks, magnetic tapes, optical disks, microform and paper.

Because NTIS takes in about $21 million from the sale of its information, the service is self-supporting. The Reagan administration is apparently concerned that it competes with information brokers in the private sector.

The study is expected to address several thorny issues, such as whether a private organization would continue to provide public access to all of the highly technical reports, since many do not appeal to a mass market but are valuable to U.S. researchers.

Joseph F. Caponio, director of NTIS, said the study will be conducted and evaluated later this year.

■

President Reagan recently nominated Mark S. Fowler to a second term as chairman of the five-member Federal Communications Commission. The reappointment means an uninterrupted continuation of Fowler's deregulatory efforts, but his next term will be a shorter one.

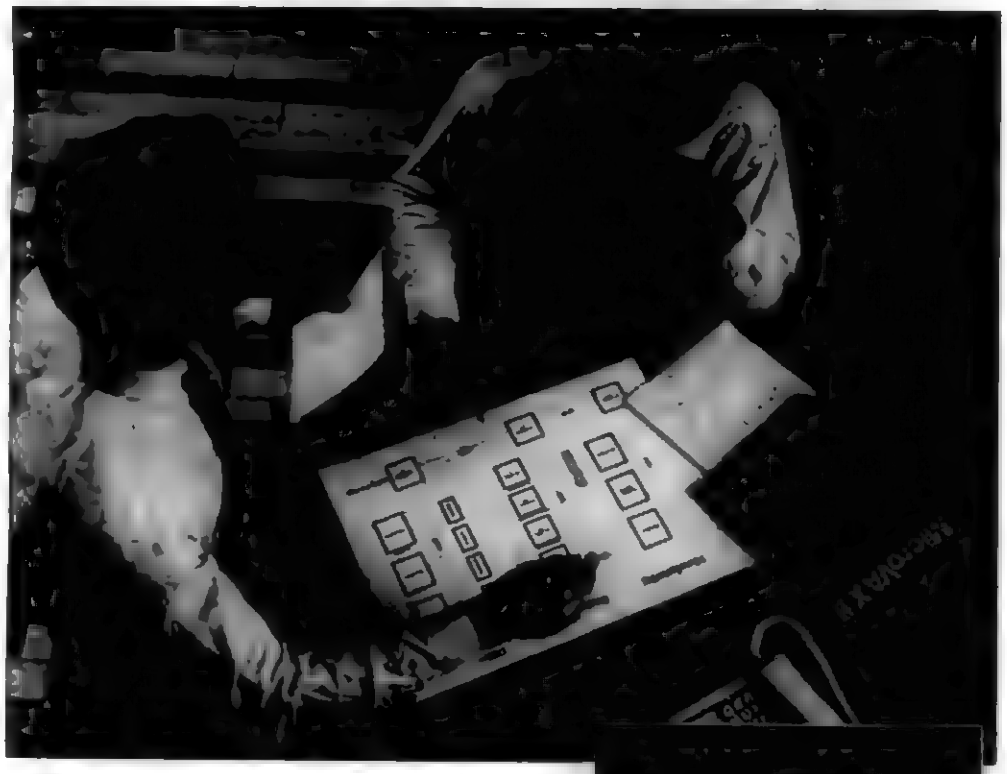
A new law designed to shorten the terms of FCC commissioners from seven to five years has an immediate effect on Fowler and new commissioner Patricia Diaz Dennis. During the transition, Fowler will serve a four-year term (through June 30, 1990) if confirmed by the U.S. Senate. Dennis will serve a three-year term (through June 30, 1989).

■

The National Research Council recently created a blue-ribbon panel to provide advice to government and industry on how to stop the erosion of U.S. leadership in computer science and technology.

The Board on Computer Science and Technology is expected to tackle such topics as competitiveness, education, supercomputers, software and financial support for research. The chairman is Joseph F. Traub, chairman of the computer science department at Columbia University in New York.

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Mainframe slump caused by leveling of power demands

Used 3080s, budget cuts minor factors, study says

By James Connolly

FRAMINGHAM, Mass. — The sluggishness in the mainframe market is a result of a return to normal power demands, not reductions in user budgets or an impact from smaller systems, according to a recent study.

Because of that leveling off in processing power requirements, IBM's mainframe CPU revenue growth will be no more than 5% in 1986, predicted the report, which was produced by the market research firm International Data Corp. (IDC) of Framingham. In addition, the market is weak for data base management systems for IBM-compatible large systems, the report said.

"Despite all of the talk about capital spending cuts, budget constraints are not the key limiting factor," the

MITCHELL J. HAYES



IDC report said. The study found that 80% of those users not acquiring additional mainframes reported that they already had ample processing power for the next 12 months, compared with 9% who said they faced budget constraints. The report was based on telephone interviews with users at 500 U.S. IBM mainframe sites during May.

IDC predicted that 1986 unit shipments of IBM mainframes will rise by only 5% to 10% over the 1985 figures — to between 1,215 and 1,355, which would leave the company well below its record of 1,600 units in 1984. The minimal growth in 1986 will come despite this year's introduction of uniprocessor versions of the 3090 series, known informally as Sierra, and the acceleration of deliveries of the four-processor 3090 Model 400.

"With the Sierra product line now largely unwrapped, it seems clear that IBM's mainframe business is likely to stay in its current doldrums, at least until 1987. In fact, early evidence suggests that, over its entire product life, unit sales of the 3090 family will not significantly exceed those of the 3080; they may even be less," the report said.

IDC officials said they questioned whether the weak demand for 3090s is due to a lack of differentiation from 3080s — and resulting competition from used 3080s — and whether it is due to efforts to downsize mainframe applications to smaller systems.

On the latter point, IDC said its survey found less than 1% of those not acquiring large systems were opting for a shift of applications to smaller systems. IDC estimated that the percentage of users acquiring used 3080 machines is too small to retard overall market growth.

However, IDC said it still expects new 3090 features, such as higher-speed channels, off-loading of more I/O instructions to the channel subsystem and storage capacity increases as well as storage price cuts within 12 to 18 months.

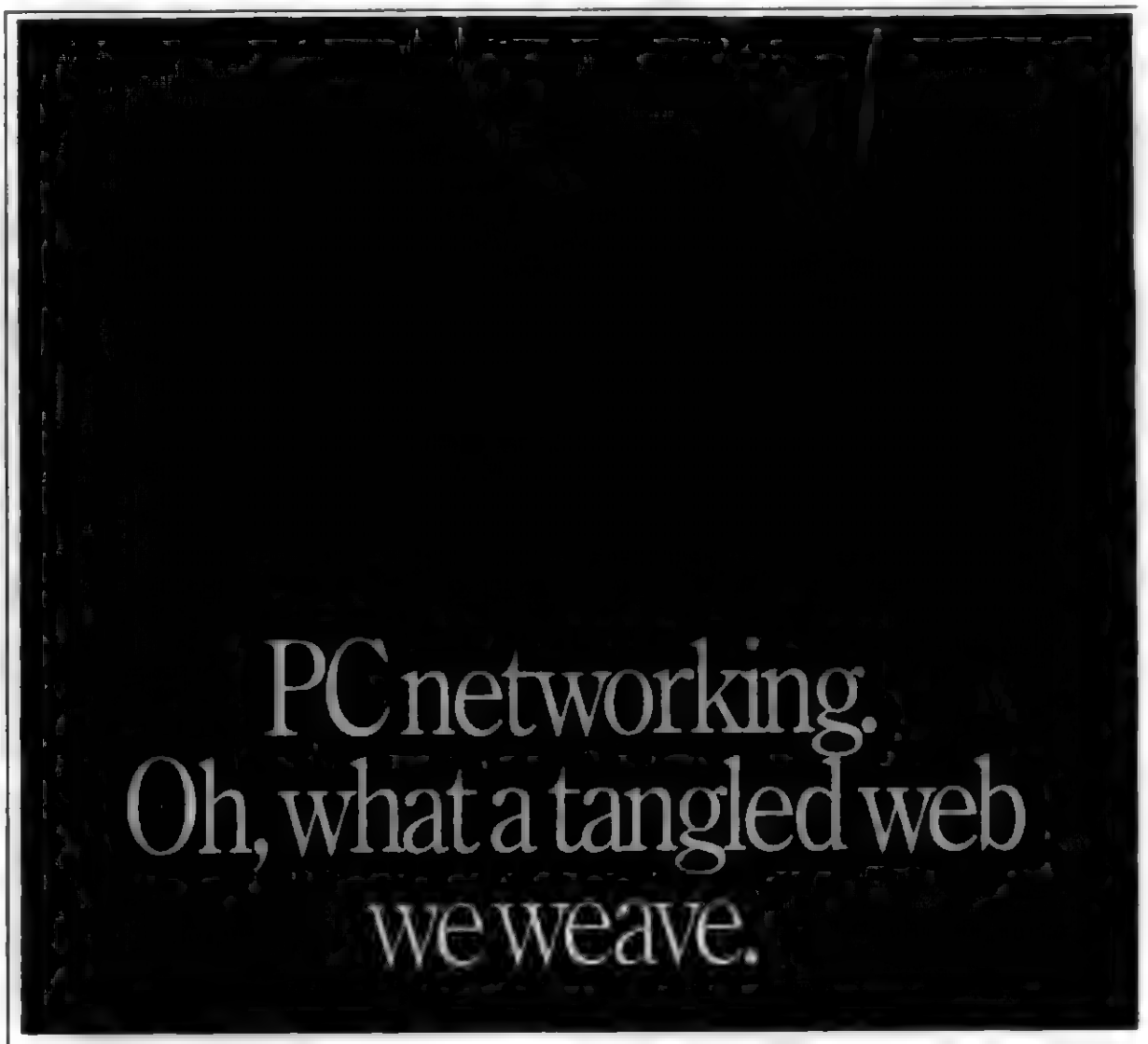
IDC also supported IBM claims that the amount of mainframe processing power being installed remains high, although it is not growing at earlier rates. One such IBM claim is that during its lifetime, the 3090 series will provide more power, as measured in millions of instructions per second (MIPS), than all previous mainframe generations.

IDC cited a slowdown in the rate of growth in MIPS installed, which the researchers said is down from 50% per year in the early 1980s to an estimated 30% to 35% in 1986.

"It is this decline, not the lack of faster channels and specialized processors or fierce competition from used 3080s, that is the source of the current malaise although to some extent these factors are all interrelated," IDC said.

But that 30% figure, the report continued, is closer to the historical norm than to the abnormal 40% to 50% growth that emerged when the 3080 series "tapped the riches of recessionary induced pent-up demand, expanding on-line systems and a favorable tax climate.

The report also predicted that a second 3090 price cut remains possible for 1986 and that there is a chance IBM will advance delivery of the 3090's expected replacement, code-named Summit, from 1989 to 1988 if revenue pressure continues.



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Liberty Weekend

From page 1

the celebration.

Ticket sales and the sale of television rights are expected to cover all costs for the Liberty Weekend events. As many as 13 million people will honor France's gift to the U.S. by attending international naval reviews, parades of tall ships, dance and music concerts, fireworks and sporting events.

Heading the list of attendees at the extravaganza will be President and Mrs. Reagan and French President Francois Mitterrand.

Smith and Jack Strickland, a consultant and partner on loan from Arthur Young, designed the ticketing and accreditation systems then set about looking for a way to implement them. Smith's previous experience as manager of similar systems for the Los Angeles Olympic Organizing Committee from 1979 to 1986 taught him that what he needed was loaned hardware and software and a promise of full support for both.

Olympic experience

At the Olympic Committee, Smith initially designed the ticketing system and later became chief operating officer in charge of asset disposal and other loose ends. "IBM provided the Olympic system hardware. But that is as much as they did. We went with Digital Equipment Corp. this time because DEC wanted to be helpful, and the other people [IBM] were not particularly interested," Smith says.

The Maynard, Mass.-based vendor has loaned a VAX-11/730 minicomputer for the accreditation system, a VAX-11/750 for the ticketing system, 24 Decmate III and two Decmate II word processing machines, 18 Rainbow personal computers, five VT220 terminals, three LN03 laser printers and four Microvax II supermicros.

DEC has also provided Smith's DP shop with three full-time employees to train his staff and keep all systems in working order. During the Fourth of July weekend, DEC's staff will include a "flying squad" of technicians in addition to the training and maintenance people.

A fourth-generation application development and information management software package helped to build the ticketing and accreditation systems. Liberty Weekend used New York-based Intelligent Information Systems, Inc.'s (IIS) Destiny fourth-generation language. IIS agreed to supply the package free and answer any questions relative to its product.

In addition to the ticketing and accreditation systems, Smith needed both an accounting system and a payroll plan that could gather information from five separate show production companies, each with a myriad of operational differences, and make the information coherent to the centralized computer system.

The accounting system is a stand-alone package called Computerite Accounting and Budgeting from Computerite, Inc. in New York. It consists of three IBM Personal Computer ATs and six PC XTs running proprietary software that is unique to the budgeting of shows. "It has built-in show union rates and knows the difference between time, overtime, rehearsal and production," says Lawrence Arnold, one of the two people Smith hired to oversee computer systems.

Arnold had to tailor the system somewhat. Instead of running one show, in which the producer has control

LIBERTY WEEKEND™

over all functions such as transportation and catering, Liberty Weekend is running five shows. Each show has separate producers and some common functions, such as transportation and catering, that will be managed by the umbrella organization.

Smith went to Hollywood, Calif., for the payroll plan. "A lot of the people we hire are show union types. It would be insane to try to build a system from scratch that can work with six or eight or 10 unions, all with different kinds of health, welfare and retirement benefits," he says.

He pays the payroll company, Zenith Information Systems of West Los Angeles, Calif., on a per-check basis. Smith brought the business' owner to the East Coast to oversee the system so he would not have to concern himself with the day-to-day operations.

Reliance on employees

One major factor in Smith's ability to pull off the Liberty Weekend feat is his absolute reliance on the people he chooses to work for him. "Sixty percent of my key people I have worked with before," he says. "Other than asking them occasionally how their work is going, I don't worry," he adds.

Flexibility is the primary key to success. "I'll tell you one thing — we don't plan," Arnold says. "We don't know that far in advance just what is going to happen."

Equipment and personnel are moved to where they are needed. Retraining or additional training is a fact of life when the nature of the jobs change with each day. At the beginning of the project, administrators concentrated on filling out contracts for construction, provisions and equipment. Now, a production group is busy writing and rewriting show scripts, sometimes needing to change the scripts on an hourly basis. "The production group did not even exist at the time contracts were being typed," he says. The word processing machines used for both projects had to be taken from one group and given to the other.

Some of the DEC Rainbows are used as terminals when necessary, and word processors and personal computers are interchanged.

In the beginning, all the computer equipment was in a central location, but as production dates got closer, the Microvax IIs moved to the event sites, such as Liberty Island, where the opening ceremonies will take place on July 3; the Meadowlands sports complex in New Jersey, where closing ceremonies are scheduled for July 6; and Battery March City, N.Y., where there will be grandstands for viewing the tall ships. Each system, located either in a building or a construction-type trailer, has a backup Microvax in anticipation of any problems. Maggie Guzowski, a DEC customer support representative who works full time for Liberty Weekend doing training, keeps a list of equipment locations, as does Arnold. The two people coordinate lists once in a while to be sure there are no discrepancies.

Software packages are chosen on the basis of what is donated and what the workers have used before. Some of the the staff brought in their own personal computers at the beginning of the project. They use such packages as Lotus Development Corp.'s 1-2-3 for budgeting and Ashton-Tate's Dbase II for data bases that perform functions such as scheduling the transportation of people and things, Arnold says.

"To wed software that runs on the Rainbow with the basic data, which is in the VAX running on the ISS software, so that the whole

See LIBERTY page 15

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PC to help boaters safely navigate Liberty Weekend festivities

Coast Guard plots harbor's vessel flow

NEW YORK — A personal computer will help keep New York City's harbor waters safe during the Fourth of July celebrations for the Statue of Liberty's 100th birthday.

For the past nine months, the personal computer has been used as a tool to plan for vessel traffic and help protect the masses of people who will anchor in New York's Upper Bay for the four-day event, says Edward Sweeney, operational coordinator for Operation Sail.

Sweeney, a project engineer for ITT World Communications, Inc. and district operations officer for the U.S. Coast Guard Auxiliary's Third Northern District, is responsible for organizing more than 3,500 auxiliary members and 225 vessels to provide safety to boaters during the weekend's events.

"We expect 1,500 search-and-rescue cases, including sickness and mechanical breakdowns from the 40,000 to 60,000 vessels expected to clog the harbor during the weekend." The Auxiliary responds to about 50 search-and-rescue missions in a normal weekend, he says.

"Our main job is to help the boating public and keep the Tall Ships parade route open. We will keep people from getting too close to the ships," he says. "We are keeping archival information that will go to both the Coast Guard and the Auxiliary," Sweeney adds.

Sweeney uses Ashton-Tate's Dbase III Plus data base on an ITT Xtra personal computer with 640K bytes of memory, a 10M-byte hard disk and a floppy disk. He records each Auxiliary vessel's size, call signs, location, staff, fuel, length of operating time and equipment it has, such as firefighting, water pump or diving apparatus. The data base will help Sweeney plan for dangers to guests and Auxiliary members inherent in the celebration.

The information Sweeney tracks helps other Auxiliary members become familiar with the trouble spots.

"Several thousand vessels will enter Hell's Gate, a well-know confluence of the East and Harlem Rivers that is the only route to Long Island. If one vessel breaks down it could cause a terrific traffic jam to back up," Sweeney says. "A gentleman who might have a six-pack of beer or two in the hot sun may not realize how much his judgment is disabled, and he may not navigate as well as usual."

Sweeney's forces will be ready to respond to such problems, in part because their leader can access information that will help him send the most appropriate aid to the emergency site.

— Donna Richmond

Liberty Weekend

From page 14

thing works together is quite complex," Arnold says. "But DEC helped us to get it together so from the outside it looks like it runs together easily."

The flexibility extends to special programming required on the Rainbows in order to create graphics that will lead to the printing of badges from the accreditation system.

The accreditation system collects information on ticket holders that must be sent to the Federal Bureau of Investigation for its security checks on locations where the president will be.

Liberty Weekend's data processing office will be without power on the most important weekend of all — the Fourth of July weekend. Portable power supplies will keep the computers that run the country's biggest celebration of 1986 humming along.

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EXECUCOM

VIEWPOINT

EDITORIAL

Straight talk about standards

One of the problems with the current crop of communications standards is that there is . . . well, there is no *standard* to define what they do and do not mean. After listening to current vendor claims, for instance, a presumptuous computer manager could be forgiven for concluding that the Integrated Services Digital Network standard defines a group of universally accessible, user-configurable telecommunications services. Similarly, he would presume that the Open System Interconnect model defines universal network specification protocols covering everything from cable to applications software.

This is simply not true, and the fact that these misunderstandings are cropping up is indication of a potentially disastrous turn in user-vendor relations.

No doubt, ISDN and OSI are standards that have tremendous appeal to computer managers searching for connectivity solutions, and vendors ought to be applauded for responding to user needs. However, as vendors have rushed to exploit the ISDN and OSI mystique, they have begun to engage in hyperbole that leaves users more confused than ever.

Digital Equipment Corp., for example, claims to have produced "the first commercial implementation" of X.400, the OSI specification for interfacing document distribution systems. DEC can blithely make this claim because it chose to go ahead and implement an incomplete set of specifications that will almost certainly have to be updated. DEC competitors, meanwhile, say that they prefer to wait until the standard is finalized before coming out with an implementation.

There is nothing inherently wrong with doing this, but we must question DEC's exaggeration of the importance of a one-vendor X.400 — a seeming contradiction in terms. Until the standard is completed and widely adopted, it cannot serve its purpose of enabling users to transmit documents between different vendors' computers and services.

Another example: At a recent press conference, AT&T spokesmen announced a batch of telecommunications applications and appended to them the label "pre-ISDN."AT&T justified this appellation on the razor-thin pretext that the applications "give users a foretaste of what ISDN services will be like" and run on AT&T interfaces that eventually (they say) will conform to the standard.

The key word here is interface. ISDN networking standards do not define applications but provide the tracks on which they run. With ISDN, users should be grateful that *standardized* does not equal *homogenized*.

Ideally ISDN and OSI will systematize elements of communications applications that must be systematized in order for multiple vendors' offerings to exchange data transparently — but still leave users the option of choosing from products offering a range of features and benefits.

By implying that all-embracing communications standards are just around the corner when, in fact, they are two to three years down the road, vendors simply give users one more reason for skepticism regarding product claims. By attaching dubious ISDN or OSI labels to their products and implying that the applications *are* the standards, vendors obscure the real purpose and value of these standards. The practice serves neither users nor, ultimately, vendors.



News item: Delta charges that American Airlines uses its reservation system to display shorter flight times than it intends to achieve.

LETTERS TO THE EDITOR

SDI 'serious errors' claim unfounded

In a recent Reader's Platform [CW, June 2], you published the article "SDI demands trillions of instructions, 99.9999999% reliability" by David Bendel Hertz.

I found it hard, if at all possible, to tell fact from fiction in that article and wonder about the assessment reflected in the title. From my intimate knowledge of the Strategic Defense Initiative research program, I fail to understand the source either of the estimate of trillions of instructions or of the reliability figure of 99.9999999%.

I do not take issue with either of these estimates only because it is evident that they are literary rather than technical statements. I do, however, take issue with what is claimed to be factual. Hertz writes that "an AT&T report last year stated that there were an average of 300 'serious errors' in every 1,000 lines of computer code."

In July 1985, *The New York Times*, in an effort to make this ridiculous figure credible, wrongly attributed it to an AT&T report. AT&T officially told *The New York Times* that there is no such AT&T report. *The New York Times* evidently did not find this correction newsworthy and repeated the error in another story opposing Star Wars.

This type of reporting and total disregard for fact checking and verification could be expected from a newspaper with its own political agenda. However, it is not acceptable from a distinguished professor nor from *Computerworld*.

Danny Cohen
Director, Systems Division
University of Southern California
Information Sciences Institute

Computers give power to the people

The distance between a voting citizen and the final decision to enact a federal law is so great — and the difficulties in understanding issues and politically maneuvering and funding bills so complex — that the actual influence of each voter is virtually nil. The loyalty of citizens aware of increasing powerlessness tends to decrease.

Hope for revival of citizens' power is possible through adoption of a system resulting from the computer revolution. Employment of computers by voters, to obtain information and participate in computer-calculated voting on national as well as state and local issues, can restore "town meeting" directness to the legislative process.

Although computers are used already in many government agencies, adoption of a system of legislation based on increased computer use will promote demand for computer services that will benefit computer manufacturers, distributors, repairmen and many software producers.

Although many third-world countries have not yet entered the computer age, awareness of increasing possibilities for participating in a democratically computerized world government should arouse interest in hastening computer acquisition and stimulate computer business interests.

Archie J. Bahm
University of New Mexico
Albuquerque, N.M.

Technology can enhance civil liberty

The technology of data processing and networks has clearly approached the level of technical sophistication at which it can either begin to threaten our basic liberties and national security or provide the public with both greater services and much stronger safeguards.

Computers contain tax, financial, credit, medical, insurance, arrest, employment, government and other records on virtually all Americans. Data bases are sold by businesses or exchanged by governmental bodies with little control.

In addition, penetration of these data bases by hackers and criminals seems all too frequent. Clearly, the situation will soon be out of control unless national policies are made based on a total view of these systems.

At a minimum, the federal rules that require a statement of the purposes for which data is being collected and used must be made to apply to all data bases storing personal data.

Taking a positive view, service and security could be improved. For instance, the public should be able to access information on the government from any library or post office to obtain data on legislation, regulations or benefits.

Computers have made our income tax system far more intrusive than originally intended. It is time to seriously consider automated tax computation with the data being privileged. The current personal income tax system should be replaced with a value-added tax to facilitate this.

Geoffrey T. Flanders
Springfield, Vt.

VIEWPOINT

Government computing: Costly, incompatible and obsolete

Skepticism within Congress and the scientific community about the Reagan administration's push for an advanced missile defense system and problems with the manned space program have forced the White House to name a new presidential science advisor.

With information technology gaining in importance in these programs and throughout the federal government — and with a vast and proven potential for costly mistakes — maybe it is also time to name a separate, top-level federal computer czar.

How many mistakes can we afford like the breakdown last year at the Internal Revenue Service, which fouled the processing of millions of tax returns? More recently, according to a congressional report, the Immigration and Naturalization Service violated federal regulations and wasted taxpayers' money in awarding a $61.3 million computer contract.

The big picture is worse

Those are among the few publicized problem cases. The big picture is actually worse, and much of it is buried within the hefty two-volume President's Private Sector Survey on Cost Control, also known as the Grace Commission Report, named after J. Peter Grace, chairman of W. R. Grace & Co., who served as chairman of the commission. A few highlights include the following:



By RON SCHNEIDERMAN

- Fifty percent of federal data processing hardware is obsolete. Within the Navy, for example, most systems are virtually obsolete by the time they are brought on-line.
- The average age of federal computers is 6.7 years — twice that in the private sector — and in five years will rise to an average of 10.1 years under current replacement plans.
- Federal government agencies are riddled with incompatible computer systems. The cost of maintaining these systems is not known because the government's accounting systems do not provide such data. Furthermore, because these systems are not compatible, the government cannot verify the income levels of recipients in needs-based programs. In New York alone, the regional office of the Department of Health and Human Services uses 10 different brands of incompatible computers.
- Virtually all administrative areas of the federal government — payroll, personnel, accounting and asset management — have developed independent information systems.
- The Small Business Administration receives information on loans that are more than 30 days past due five to six weeks after the delinquency is noted.
- The Department of Education does not have accurate and timely data to ensure the integrity of its educational grant programs, which amount to $14.5 billion annually.

Those are the highlights. Meanwhile, the federal government has become the biggest customer for personal computers. By 1990, all 1.4 million white-collar federal employees could have a personal computer on their desks, according to the General Services Administration (GSA), which believes that about 100,000 PCs were in use in federal offices at the end of 1984.

That is an estimate because the GSA is not sure how many PCs the government has purchased: Agencies have discretionary budgets for data processing that range from $2.5 million to $10 million that may not show up as part of the federal government's annual $15 billion data processing budget.

Census Bureau most blatant offender

One of the most blatant examples of inefficiency found by the Grace Commission was, ironically, at the Census Bureau, which required nearly four years and $1.1 billion to process the 1980 census. It is ironic because one of the first commercially successful systems was designed and built for the 1890 census.

The task was assigned to Herman Hollerith who solved the bureau's problems with a punched-card machine. Hollerith, of course, went on to form his own company, the Tabulating Machine Co., which later changed its name to International Business Machines.

With government agencies turning more to systems integrators to handle their information management contracts, things should improve. But this trend in itself seems reason enough to name a full-time, independent national information technology advisor or advisory committee on a level with, but separate from, the President's Science Advisory Committee and to give it power to objectively analyze, monitor, oversee and propose federal information systems.

Schneiderman has been covering the computer and electronics industries as a reporter and editor for more than 20 years.

Creating a new image of workplace productivity

READER'S PLATFORM

By L. KURT ENGELHART

Business productivity today is considered by some to be at its worst in years. Technology, especially computer technology, is touted more and more as the solution to the country's poor productivity, but, so far, it does not seem to be working.

Productivity specialists define productivity as the accomplishment of work on which the success of the business depends.

But what does productivity mean to those who are doing the work? Our understanding of the enterprise — in other words, the organizational culture — determines what we consider productive behavior in a particular setting.

Improve individual productivity

Technology cannot increase organizational performance unless we, the members of the organization, choose to employ it to improve our individual productivity.

As individuals in the workplace, we define what it means to be productive by what we observe to be the kind of behavior that eventually benefits us. The image we have of what constitutes productive behavior is not necessarily the image that others in the workplace would like us to have.

When it is obvious to us there is a better way to do something, we change as quickly as we can to the new method. What causes such change?

The image of productivity is always shared to some degree with other members of the organization. The first step in changing the image is to make the image visible to members, including management, and determine if it is shared. Where it is shared it is more easily changed throughout. Where it is not shared, the next step is to get it to be generally shared. As you might imagine, this is not a purely rational process. Although some may object to the concept, it is what we call "political."

If we can share an image of what constitutes productive behavior in an organization, then we more easily accept the necessary justifications for change. In the case of computers, we must see how computers expand our intellectual power and eliminate a great deal of simple mechanical drudgery.

Shaping images that work

In shaping new images of productivity, we must first capture these images in logical rather than physical terms. We want to get right to the heart of the matter of why something is done and break away from a particular physical way to do it. When people have a solid logical foundation to stand on they are much more able to cope with necessary physical changes. The only way to deal with these images is to use methods that have been proven effective in shaping cultural change.

For a new image of productivity to be accepted, the real leaders of the group must be committed to it. Identifying these leaders and getting this commitment is not something that can be done by sending out memos based on the chart of the organization. Leadership must reach to the very top of the organization if it is to be felt all the way to the bottom.

For a new image of productivity to have a strong impact on organizational performance, it must be clear and obvious to everyone. It must be focused on a single aspect of performance and address it everywhere in the organization. It must be flexible to change and evolution. And the most important factor in the desired performance must be the extent of payoffs.

Rosabeth Moss Kanter, in a recent issue of *Management Review*, calls for computers to be perceived as head tools not hand tools. She says that increasing productivity is not as simple as increasing mechanical production.

Increasing productivity requires improved decision making in use of an organization's resources. According to Kanter, there are cultural barriers to the full use of computers in this capacity.

Computers are not yet associated strongly with idea power. There is a logical resistance to changes in roles that would give lower level employees autonomy and decision making responsibilities that are now reserved for higher management. The new roles might demand some involvement of top executives in business activities they have traditionally avoided.

Management seems to understand neither the nature of the work nor the potential of computer technology well enough to clearly see the benefit of change. Perhaps the strongest of the barriers is that the marketing of computer technology has been directed at mechanical efficiency rather than organizational effectiveness.

We look for fad fixes

We have a way of looking for quick, simple remedies to complex problems in business. To a certain extent this is justifiable based on the need for experimentation. However, we have tended to substitute fad fixes that we can have today for complete fixes for which we must wait until tomorrow.

Two major complexities associated with computers in business cannot be ignored. One, it is people who do the work, not technology, so implementation of technology must be approached as a people problem.

Two, it is abstract descriptions of the problem where we find the most solid footing, and we must accept the difficulties involved in creating these abstractions.

The real problem here is learning how best to use machinery in doing our jobs without becoming mechanical ourselves.

Engelhart is an information technology and strategic planning consultant based in San Francisco.

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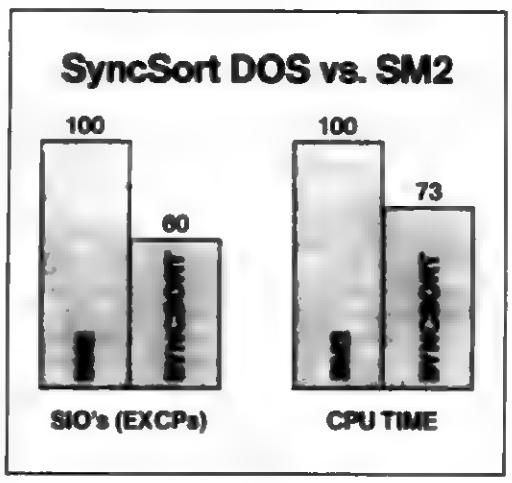
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SOFTWARE & SERVICES

SOFTALK
Charles Babcock

DB2 part of IBM repository

A rumor circulated through the booths and aisles of the 1986 National Computer Conference that IBM was going to require DB2 to accompany future purchases of its MVS operating system.

Not so, says Marilyn Bohl, IBM's DB2 advocate in San Jose, Calif., who spoke recently at a Gartner Group, Inc. conference on the role DB2 will play in customer sites in the future.

IBM is working on a central data management facility that it calls a repository. The repository would function something like a data dictionary but on a broader scale.

It would manage not only data definitions but also terminal definitions served by IBM's IMS, CICS and other mainframe systems.

Such a repository would need a data base management system; in the still-to-be-announced IBM version, according to Bohl, that DBMS would be DB2.

Although not every MVS site would choose to use the repository, Bohl said, those that did would probably want the accompanying copy of DB2 to be dedicated to repository functions.

A repository customer could use whatever DBMS he wanted, presuming that the many independents' products that are being rejiggered to work with DB2 would also work with the repository. At the same time, DB2 would have its foot in the door of many large MVS sites.

It's a little hard to understand how some people were able to believe the rumor that DB2 would be forced on MVS users. Imagine what it would mean for IBM to bundle its operating system or systems, in which it has a virtual monopoly, with a major software product, in which it does not. Handing some future Ramsey Clark an issue of that

See DB2 page 24

Babcock is Computerworld's senior editor, software & services.

Arbiter offers LU6.2 ability

PC-to-mainframe link first Tangram product

By James A. Martin and Charles Babcock

CARY, N.C. — Tangram Systems Corp. announced last week its first product, Arbiter, a micro-to-mainframe software system that offers peer-to-peer communications capabilities similar to those anticipated with IBM's LU6.2.

Arbiter functions as a VTAM application on an IBM mainframe. It is capable of using the mainframe's disk drive system to create "remote disks" that can be accessed by the IBM PC-DOS operating system of an IBM Personal Computer.

To a PC user, these remote disks are used in the same manner as physically attached floppy or hard disks, said Michael Camp, Tangram president.

Available in July, Arbiter resides on both the mainframe under MVS and on the micro under PC-DOS or a compatible operating system. Access to remote disks is controlled by standard PC-DOS commands, Camp said.

Because it is a VTAM application running in its own address space, Arbiter uses mainframe resources efficiently, according to Camp. With an IBM 4341 dedicated to communications, it can serve 250 PC users, allowing them to swap information with mainframe data bases. Data can also be written to, read from and erased from remote disks using applications such as Lotus Development Corp.'s 1-2-3 and Ashton-Tate's Dbase III.

Most micro-to-mainframe links make connections to IBM operating system subsystems such as CICS or TSO. Arbiter can function with both of these but also functions as its own subsystem, governing how connections will be made and how data and files will be transferred across them, Camp claimed.

For that reason, a PC user can access remote disks on a mainframe without knowing CICS procedures or TSO commands, he said.

Tangram officials said the product was designed with the LU6.2 standard in mind, even though that protocol is not yet widely available for microcomputer networking configurations. LU6.2 and "host attached, token-ring networks are the building blocks of cooperative processing," said Art Ingram, Tangram vice-president.

Tangram, whose principals include several former officers of the SAS Institute,

See ARBITER page 22

SOFTWARE NOTES

Burroughs testing MCPIX update

The operating system for the **Burroughs Corp. V series** mainframe, to be available in the third quarter, has been undergoing beta tests since May 17 in Columbus, Ohio. The **MCP/VS 1.0** expands the capabilities of the **MCPIX** system. MCP/VS 1.0 can address up to 40M bytes of memory, compared with 5M bytes on the previous system. The city of Columbus is testing it on its three V 380s and is satisfied so far with the results, said Tony Bachman, administrator of information services.

■

The Carnegie Group, Inc. will offer its **Knowledge Craft** artificial intelligence system development software on

See NOTES page 24

Software pros set up 'factory'

By Rosemary Hamilton

LAS VEGAS — Software development, through the use of reusable subroutines and other methods, can be produced in a manner resembling the assembly of hardware from standard components, according to three software professionals at the recent 1986 National Computer Confer-

Speaking at a session titled, "Can You Actually Manufacture Software?," Mario Barbacci, a founder of Carnegie-Mellon University's Software Engineering Institute, said the institute is involved with a project called The Software Factory. Commissioned by the U.S. Department of Defense, the project is a "mechanism to define and automate the software life cycle," Barbacci said.

"The analogy of a factory doesn't apply

See SOFTWARE page 22

INSIDE

Computer Associates International announces versions of Scheduler, Converter/**24**

NEW THIS WEEK

- Harris Data upgrades its accounts payable package
- Network Innovation's Multiplex now supports HP Spectrum

■ For more on these and other new products, see pp. 77-91

INSTANT ANALYSIS

"The similarities between hardware and software production are increasing."
— **Yoshiro Matsumoto, principal engineer, Toshiba Laboratories in Tokyo**



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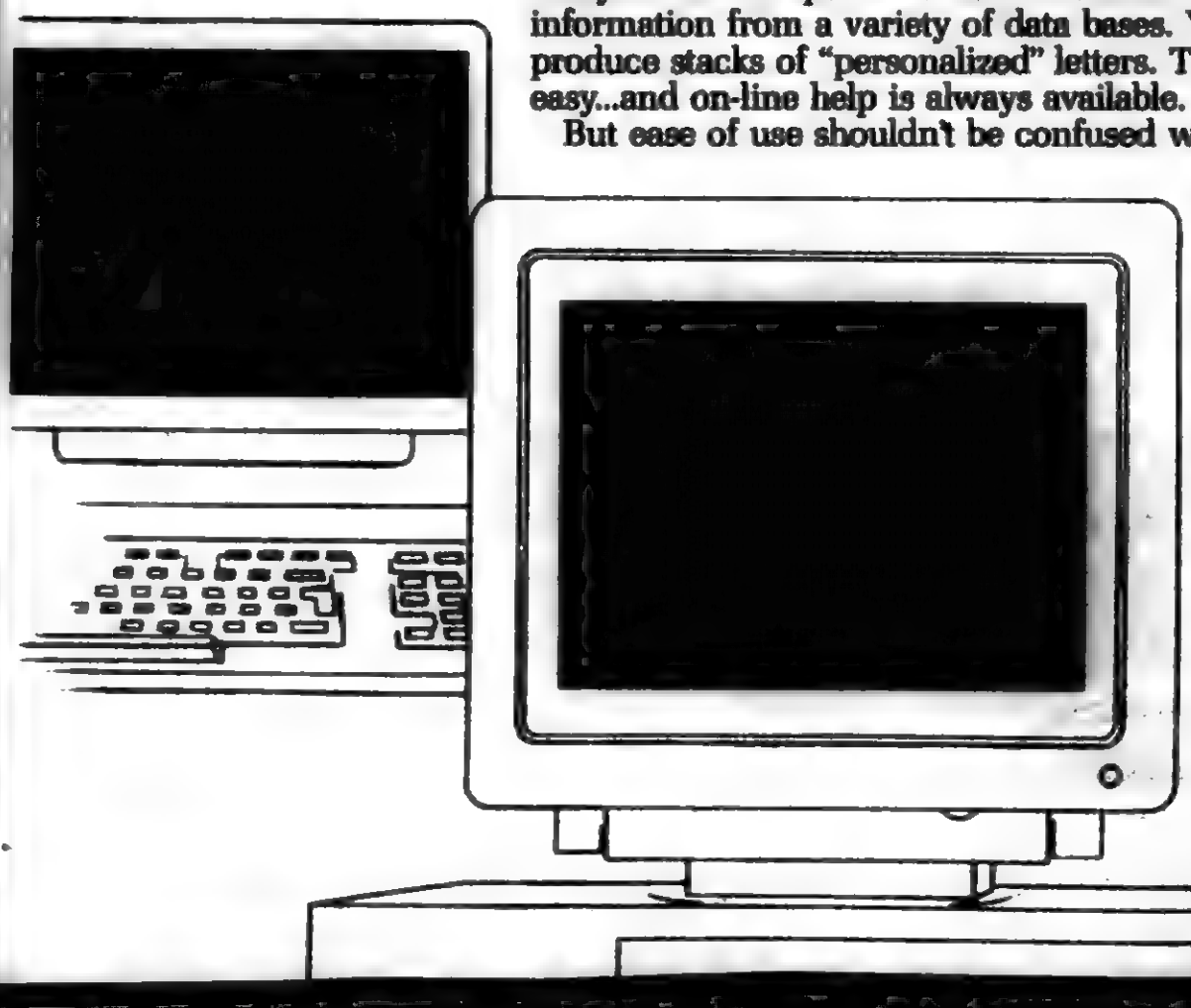
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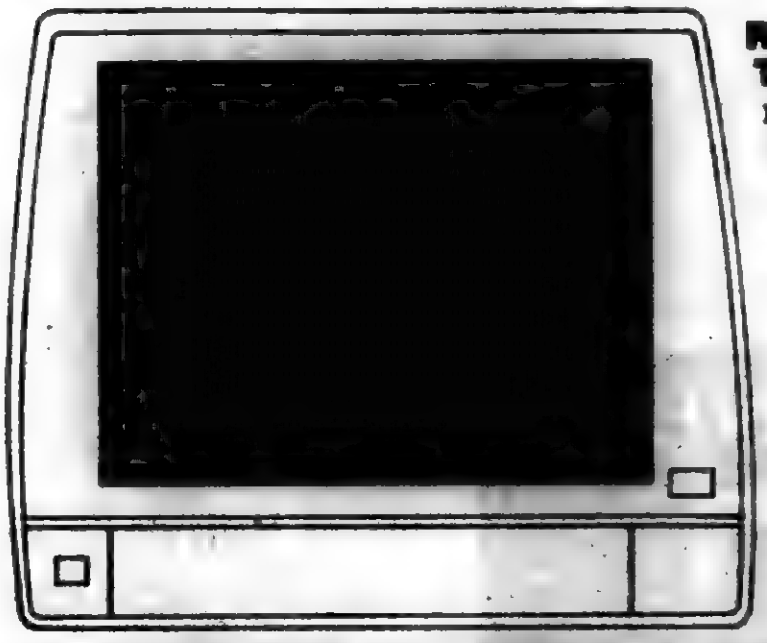


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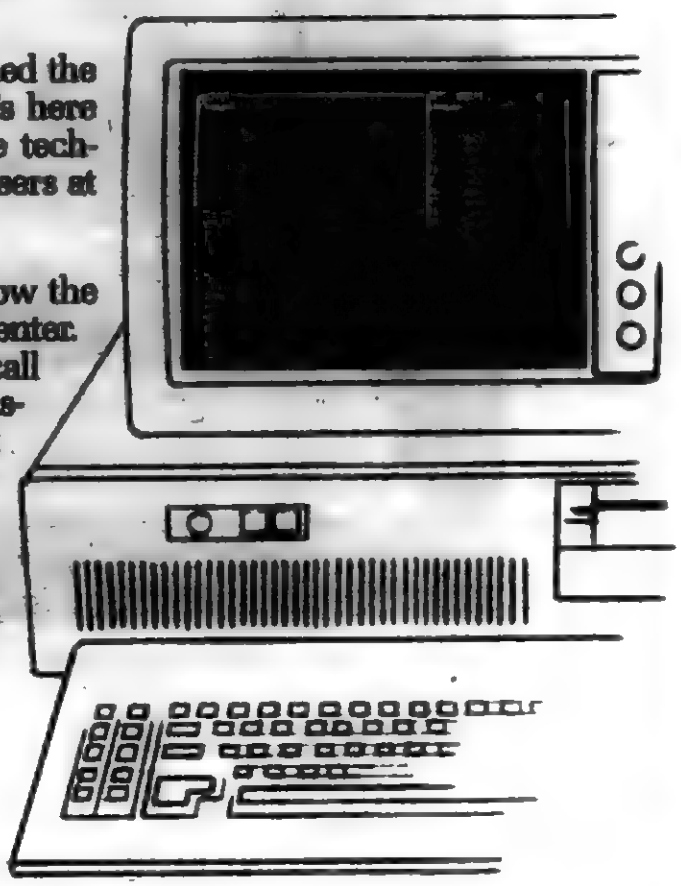


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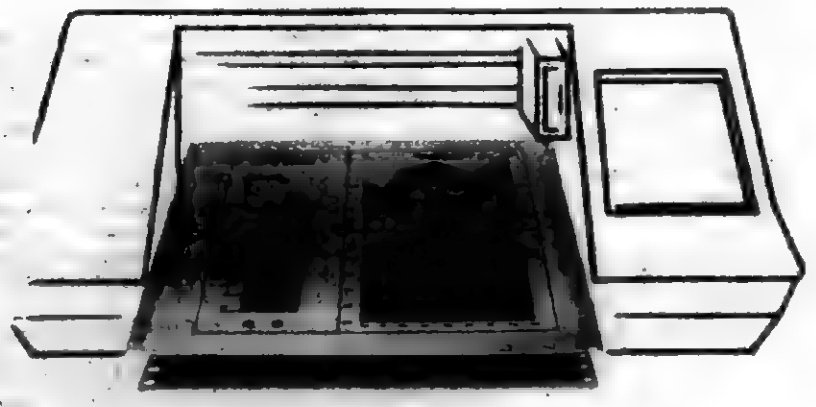
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Arbiter offers LU6.2 ability

From page 19

Inc., also in Cary, is marketing Arbiter as a "cooperative processing environment." But when asked for examples of cooperative processing, Camp said, "You're talking about a generation of software that doesn't exist yet."

The product, he claimed, is a substructure "on which applications on a mainframe can be written."

Arbiter operates under an installation's security software, such as IBM's RACF or Computer Associates International, Inc.'s Top Secret, so management can restrict users' access to remote disks.

The External File Interface allows authorized PC users to submit prewritten applications to the mainframe for processing. MIS operators may use it to transfer data between production files and remote disks. It also serves as an interface for standard languages such as Cobol, Pascal and PL/I.

Interactive Session Relay is an optional component that enables a personal computer to log on to another subsystem such as IBM's CICS or TSO while maintaining an Arbiter session.

Arbiter is available through site licensing, based on the million instructions per second (MIPS) size of a processor. The fee ranges from $12,500 per CPU for IBM mainframes that process 2 MIPS and up to $32,500, including options, for 4-MIPS processors. There is no fee for the microcomputer software license.

Tangram was founded in March 1984. Camp is the former senior vice-president at the SAS Institute. Ingram is the former vice-president of sales and marketing at SAS.



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The Freedom ONE is the one terminal for all of your ASCII needs. With the Freedom ONE you don't pay more for advanced features. With the Freedom ONE you don't sacrifice features just because you pay less. At $449 the Freedom ONE gives you the best of all worlds—in one terminal.

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Software pros set up 'factory'

From page 19

100%, but many of the issues are the same," he explained, including product consistency.

Yoshiro Matsumoto, a principal engineer at Toshiba Laboratories, a division of Toshiba Ltd. in Tokyo, said the procedures for "software manufacturing sprouted from hardware manufacturing" at his firm.

"The similarities between hardware and software production are increasing," Matsumoto said.

Explaining that the four software manufacturing facilities in his organization are integrated with the hardware manufacturing divisions, Matsumoto said each department manager is responsible for hardware and software development.

Within the software manufacturing facility, the critical concept is "reusable components," Matsumoto said. Each project has a "parts center" or a data base that stores reusable code. Designers and programmers can retrieve software modules from the parts center when applicable to a project.

They, in turn, send new code to the parts center when it is completed to be used by other designers and programmers on new projects.

NEC Corp. also applies certain hardware manufacturing methods to its software development. But Kiichi Fujino, general manager of the microcomputer software division, emphasized that the key component in software manufacturing is the "human factor."

Following this ideology, the company places importance on motivating its programmers and designers in ways it motivates employees in other areas of the organization. For example, NEC holds a semiannual Software Quality Control conference for programmers. To stress their importance to the organization, NEC's president always attends these meetings.

"Humans are our greatest source to improve things," Fujino said. "Our philosophy is to ask for quality, and production will follow."

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Converter, Scheduler utilities aid VSE users

By Charles Babcock

GARDEN CITY, N.Y. — Computer Associates International, Inc. has announced enhanced versions of its CA-Converter and CA-Scheduler system utilities.

CA-Converter Release 1.1 helps VSE operating system customers convert applications to MVS. Its facilities aid VSE programmers in organizing and documenting the VSE programs they wish to convert and instruct them on the incompatibilities between VSE and MVS.

These procedures help VSE programmers learn to write MVS programs while still in the VSE environment, company officials said.

CA-Converter converts VSE Cobol and basic assembler language programs to MVS and supplies side-by-side equivalent MVS listings of source code and job control language.

The release implements the conversion, monitoring its status and maintaining a Conversion Control File or data base containing information needed for the conversion, spokesmen said.

It can be leased for three months for $16,900, six months for $27,900 or 12 months for $38,000. It also has an assembler language option that can be leased for an extra $5,500.

Computer Associates also announced the availability of CA-Scheduler Release 7.0, the production control and job execution utility for VSE. The release lets the user select a calendar or criteria method of work load scheduling, depending on his needs, said Computer Associates spokeswoman Laurinda Hoffman.

While calendar scheduling derives from calendar time periods, criteria scheduling allows customized job control based on events and processing periods. Criteria-based job control can be invoked using simple English phrases and key words, Hoffman said.

The product also monitors work flow, enables operators to redirect the work flow sequence and anticipates future work flow through simulation based on the gauging of past performance, she added.

There's a superb PC network hidden inside your VAX.

The problem.

The problem is finding a way to build a PC network that can integrate your PC systems with the backbone of your computing environment—your VAX.

A network that will *amplify* the effectiveness of your VAX system commitment, not *conflict* with it.

So you can get the considerable benefits of PC networking *without* investing in a PC network that isn't part of your VAX solution.

The solution.

Our new V-Drive™ lets you build a superb PC network, using the resources of the VAX as a file server and traffic manager.

Benefits: Your PC users really have nothing new to learn. The network, and the VAX server, appear simply as a separate drive on their already familiar DOS system. The network user interface is fully menu driven. The result is simple, and effective.

And now your new network runs in the already well-managed VAX. So file backup, system maintenance, and network management don't require that *you* change your current operation.

Building the network is easy: V-Drive software on the PC you want to attach, V-Drive software on the VAX host. Presto: All the PC users you connect have an instant, easy-to-use network, AND access to the resources of the VAX system.

No other vendor offers such a simple, elegant solution. Consider, for example:

- Users can *toggle* between MS/DOS™ and VMS® with a single keystroke.
- Users can *send, read, and receive VAX mail* while in a PC application.

Naturally, V-Drive integrates with our Bridge,™ the system that lets VAX terminal users run PC software.

V-Drive is certainly worth a try before you commit to any other PC networking solution, especially since the trial is free.

The offer.

Call and we'll ship you V-Drive host software and software for your PC systems, good for 30 days.

You can see for yourself how easy it is to install, how easy it is to manage, and how easy it is to use.

And we're also offering a 30% discount on any V-Drive products you order during the 30-day trial period. That's to encourage you to try out the package quickly.

There is no obligation. You have nothing to lose. You have everything to gain. As you will see, when you compare the benefits of the PC network now hidden in your VAX against those of any other PC networking solution.

And you can try it free for 30 days. Call 415-841-9594.

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DB2 key to IBM repository

From page 19

magnitude would scarcely be in IBM's best interest.

To move on to another matter that surfaced at NCC, Relational Technology, Inc. disputed performance claims made by its fellow Californian, Oracle Corp.

In citing Oracle's performance claims [CW, June 16], *Computerworld* had hoped to spur some discussion of relational data base performance, but instead it received testimony to the growing rivalry between these two small companies: Both companies are pioneers of relational data base technology, both will be pioneers of distributed data base management, and both have become engaged in a messy side debate.

Oracle's performance claims were based on tests conducted by a Finnish company, Nokia Information Systems, which, it turns out, has a business relationship with Oracle. Nokia's results mean very little unless they can be duplicated by an independent tester. And when Relational Technology attempted to duplicate them, it achieved results that favored its own product, Ingres.

At this point, the two companies are down to debating when Nokia, also a distributor of Oracle products, purchased Ingres for use by its subsidiary, Telenokia. Oracle claims the purchase was made before the test; Relational Technology claims it was made after the test. Clearly, someone isn't trying very hard to tell the truth in this instance.

Without pursuing the matter further, both of these companies should remember something. It's true that they may have marketed products with genuine relational capabilities before IBM did. And they may be developing their performance characteristics quickly. But that doesn't mean they can afford the luxury of fighting between themselves. After all, when you're the size of a terrier and you step into the bullring, it's best to keep your eye on the bull.

Notes: Ingres agreements inked

From page 19

the **Hewlett Packard Co. 9000 Model 320** workstation. The software aids AI programmers in developing knowledge-based systems.

■

Relational Technology, Inc. has signed five agreements to market its **Ingres** relational data base management system with other vendors. They include BBN Communications Corp. and Sequent Computer Systems, Inc.

■

The stock of **General Automation, Inc.**, producer of the **Zebra** line of business systems, is being traded once again on the NASDAQ over-the-counter exchange under the symbol, GENA.

Trading was suspended April 29 when the stock was delisted for dropping below shareholders' equity requirements.

SYSTEMS & PERIPHERALS



HARD TALK
David H. Andrews

IBM barrage defends turf

IBM went into the 1986 National Computer Conference on June 16 with guns blazing. In a broad series of announcements, it took aim at its competitors in the hotly contested market for mid-range systems.

When the smoke began to clear, three things were apparent: The System/38 and the System/36 are the keys to IBM's mid-range strategy; the products are being drawn together; and IBM will cut prices to keep its share of the mid-range market.

The announcements included replacement of the entire System/38 product line with a series of aggressively priced models, top-end models for the System/36, a disk family for the System/36 and System/38, terminals, printers, a variety of software features and an architecture for distributing files among the System/36, System/38 and IBM 370 families.

The aggressive pricing of the System/38s, disks and terminals came as a surprise. IBM effectively lowered the cost of using a System/38 by 30%.

The new System/38 CPUs cost 15% to 20% less than the models they replace, are more powerful and cost less to maintain. Memory on the new models costs 33% less than on current ones and the cost per megabyte of disk storage has dropped by more than 45%.

At the top end, System/38 main memory increased from 16M to 32M bytes and disk capacity increased from

See HARD TALK page 27

Andrews is president of Andrews, Duerr and Manteghian, Inc., a Cheshire, Conn., consulting firm that specializes in the IBM mid range.

Tolerant claims power gain

Says P200 multiprocessor ups throughput by 45%

By Eddy Goldberg

SAN JOSE, Calif. — Tolerant Systems, Inc. is expected today to announce the P200, a high-end multiprocessor computer for its Eternity Series on-line transaction processing system.

The P200 uses National Semiconductor Corp. 32032 very large-scale integration processors to boost performance by 45% over Tolerant's original NS32016-based P100 for a 13% higher cost, according to the company.

Tolerant also will introduce the P200 System Building Block (SBB), an option to link together approximately 40 P200s in a multicomputer system. The previous theoretical limit to linear growth was 16 SBBs, according to Shirley Henry, director of marketing.

In addition, Tolerant is scheduled to announce that it is in the process of installing a fault-tolerant distributed system composed of 33 P200 SBBs for the Online Computer Library Center in Dublin, Ohio, as part of the center's $40 million modernization project. Ten SBBs are installed now, with 23 on the way.

The system will be used to manage Online Computer Library's 80G-byte data base. In 1985, the center's Online System processed an average of more than 55 transactions per second and 2.2 million transactions a day.

Tests conducted by Tolerant for one of its customers using the TP1 benchmark (a debit/credit transaction benchmark also known as ET1) showed the P200 can process 8 TP1 transactions per second with an average response time of 1.5 seconds. A fully expanded P200-based system of 30 to more than 40 SBBs can process from 240 to more than 320 transactions per second and support more than 7,500 users, according to Tolerant.

Each SBB has three dedicted CPUs. One NS32032 processor is dedicated to executing user application programs; another for the real-time processing unit, which executes operating system functions; and an NS32016 I/O Processor to manage the SBB's 3M byte/sec. I/O channels. Users may also add an optional second NS32016 I/O Processor. Communications interface processors outside the SBB offload data

See TOLERANT page 26

IBM printers tie to System/36, 38

By James Connolly

RYE BROOK, N.Y. — IBM has introduced six new models of its 4224 Printer and 4245 Printer, a touch-sensitive video display system and extended warranties for selected terminals.

The announcements were part of the company's recent introduction of more than 100 products.

The four new models of the 4225 attach to IBM 3270 controllers and 4300 series processors. The printers are serial, bidirectional matrix printers with graphics and color support and print speeds of up to 400 char./sec. They range in price from $4,200 to $6,700 and will be available in the fall.

The new models of the 4245 are the Models T12 and T20, which feature print speeds of 1,200 and 2,000 line/min. They were designed to attach to IBM System/36 and System/38 processors via twinaxial cable or the IBM Cabling System. According to IBM, the T12 can be upgraded to the T20 at the customer's site. The T12 costs $31,000, and the T20 costs $35,000. Both are scheduled to be available in September.

The IBM Infowindow Display is an interactive presentation system for full motion and still displays. IBM officials said it is suited for use in situations such as visitor information booths at conventions or tourist attractions and for education or training. The officials said that prototypes are in use at the Baseball Hall of Fame in Cooperstown, N.Y., and Expo '86 in Vancouver, Canada.

See IBM page 26

INSIDE

ITT Qume and Pacific Mountain States Corp. offer letter-quality printers for IBM minicomputers/26

NEW THIS WEEK

- Plexus Computers, Inc. announces an optical-disk storage drive
- For more on this and other new products, see pp. 77-91.

INSTANT ANALYSIS

"IBM notwithstanding, the 14½-in. disk drives will start to have some of their market share eroded by the 8-in. and 9-in. drives."

— James Moore, analyst at Dataquest, Inc.

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TOWER SYSTEMS INTERNATIONAL

Tolerant claims gains

From page 25

communications processing.

Both the P100 and P200 SBBs are available immediately, each with 4M bytes to 12M bytes of memory and one or two I/O channels.

An entry-level, fault-tolerant configuration based on the P200 consists of two SBBs, 4M bytes of main memory for each SBB, two 168M-byte disk drives and disk controllers, one tape drive and tape controller, 24 communications ports with line adapters as well as two copies of Tolerant's TX Unix-based operating system and application generation software. It sells for $215,000.

IBM printers introduced

From page 25

The Infowindow display costs $4,195; the graphics adapter costs $40. Software costs $180 for the Infowindow Control interface and $7,200 for the Video/Passage Multimedia Authoring and Presentation System.

The extended warranties announced recently apply to the IBM 3191 display station, the 3196 display and 3160-type ASCII displays.

ITT Qume, Pacific Mountain States printers out

Give IBM minis letter-quality type

By James Connolly

SAN JOSE, Calif. — Pacific Mountain States Corp. and the ITT Qume unit of ITT Corp. have announced that they have jointly developed letter-quality printers for use with the IBM System/34, 36 and 38.

The Pacific Mountain States Models 11/40, 11/55 and 11/90 were designed to emulate IBM's Model 5219 printer.

An ITT spokesman said the companies hope to use the printers to penetrate what has been a "captive IBM market for the 5219 with IBM Displaywrite and Text Management software."

Transparent to users

The companies claimed that the printers are transparent to IBM system users.

The systems are said to offer print speeds of 40, 55 and 90 char./sec.

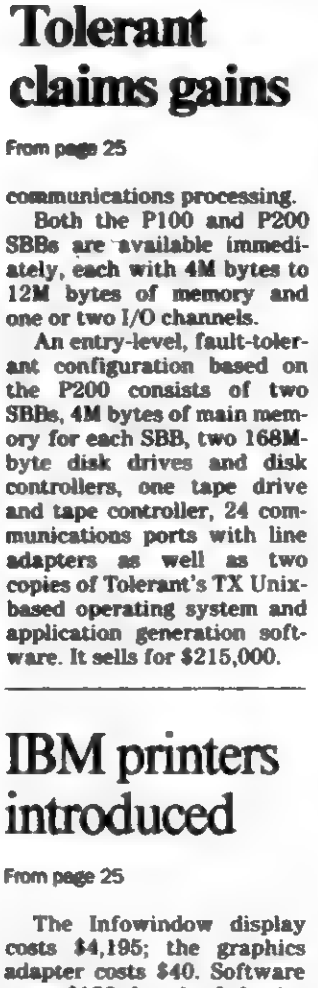
According to a spokesman, the printers use thin axial interface modules.

The Model 11/40 printer is priced at $2,490, and the Model 11/55 printer is priced at $2,790.

The Model 11/90 printer is priced at $3,190.

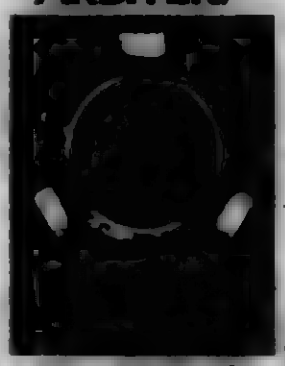
Pacific Mountain States markets peripherals and communications equipment.

ITT Qume markets peripherals.



PEACE BREAKS OUT IN THE MICRO-TO-MAINFRAME CONFLICT.

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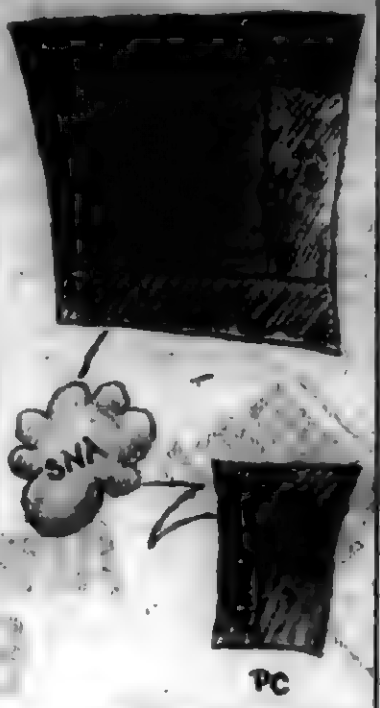
If the microcomputer revolution has you manning the data center barricades...if your communications network is besieged by armies of PCs...if you are fighting running battles over access and data formats and training...

It's time to install Arbiter,™ and declare peace.

Much more than a micro-to-mainframe "link," Arbiter is a Cooperative Processing Subsystem. It operates as a VTAM application, capable of supporting hundreds of PCs without interfering with the performance of your essential development and production subsystems. It is fully compatible with SNA, with a carefully planned growth path into IBM's LU 6.2 protocol and Advanced Program-to-Program Communications.

Arbiter interfaces directly with VTAM and executes in its own address space, where it presents none of the performance or integrity exposure problems associated with CICS- or TSO-based link products.

Because Arbiter is a VTAM application, there are fewer layers of software between the PC user and the information, saving processor overhead. Even more efficiency is gained by Arbiter's advanced data compression scheme that uses your network more effectively than other products that transfer and receive data as 3270 screens.



As a subsystem, Arbiter is fully compatible with RACF and other popular security software. It also feeds data into IBM's SMF—data you can use to tune Arbiter. Or use for network capacity planning, usage accounting and auditing.

Barrage defends turf

From page 25

6.6G bytes to 14G bytes. The low-end System/38 model offers 30% more CPU power at a 20% lower price than its predecessor.

As a result of the announcements, the System/36 and System/38 product lines overlap to a much greater degree than before. The overlap between the System/38 and the IBM 4300 series has increased as well.

What do the announcements imply in terms of IBM's strategy for mid-range systems? First, the added capability and lower prices give credibility to IBM's statements that the System/38 is a strategic product.

IBM made it clear that the System/38 line will continue to grow. The System/38 will be IBM's preferred offering for medium-size organizations, distributed processing for mainframe users, departmental systems and large office automation projects.

The announcement of added capacity for the System/36 line reinforces IBM's commitment to this product as well. Its role will be as an entry-level commercial system, a remote front end to the System/38 and mainframe and as IBM's main office automation offering.

A disk that will run on both the System/36 and System/38 further brings the products together. While IBM did not change the pricing of existing System/36 models, the top-end D series models offer improved price/performance.

As the System/38 and System/36 become IBM's strategic mid-range products, what will happen to the 4300 series? Its main role will be to allow mainframe IBM MVS applications to be distributed onto remote air-cooled computers. It also will continue as IBM's leading scientific and engineering minicomputer using IBM VM.

The most significant software enhancement was the announcement of the Distributed Data Management (DDM) for the System/38. DDM allows applications on the System/36 and System/38 to process files stored on other computers. With DDM, the application program and the user are unaware that a remote file is being used.

DDM is part of IBM's plan to offer a variety of computer architectures without sacrificing the ability to network them. IBM has been criticized for having limited networking capability. The combination of DDM, System/36 and 38 display station pass-through and other communications enhancements makes IBM's products easier to network.

CPF Release 8

The price cuts and hardware tended to overshadow the announcement of CPF Release 8, the System/38's operating system and relational data base management system. The more significant of its features are enhanced availability and recovery capabilities, which promise to reduce the time required to restore files after a failure, and the availability of a check sum protection option that allows the system to quickly recover from a single disk failure.

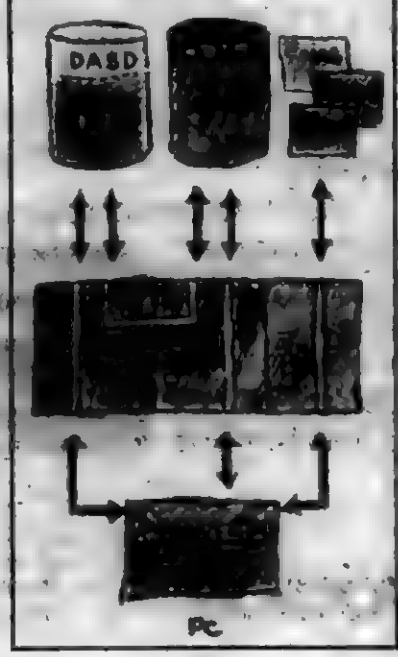
IBM appears to be slowly making the System/38 fault tolerant. If it does, Big Blue would have the option of dropping the fault-tolerant System/88. It is normal, however, for IBM to offer more than one product to cover a particular market.

The blitz of announcements makes it difficult to quickly determine what it all means. IBM's commitment to both the System/38 and System/36 is clear, as is the trend to bring them closer together. It remains to be seen if IBM can realize its objective of a single computer capable of replacing both.

The combination of lower price, increased capacity, enhanced networking and increased functionality make the System/38 and System/36 tough competitors. When the smoke finally clears, it will be interesting to see who has and hasn't been hurt by IBM's latest shoot-out.



Arbiter has three components. The Remote Disk Environment (RDE) provides a seamless interface to remote disks on the host, which may be accessed by PC users or host application programs. The External File Interface (EFI) transfers data to and from files on the host and the remote disks. The Interactive Session Relay (ISR) allows "power users" to connect a PC to another mainframe subsystem—for example, TSO or CICS—without disconnecting from Arbiter.



Arbiter not only gives the data center more control over the micro/mainframe environment, it increases the ease with which PC users can access mainframe data. Instead of time-consuming file transfers and data reformatting, Arbiter allows the PC user to access corporate data via remote disks—already formatted for Lotus 1-2-3,* dBase II or III,* or other popular software. Remote disks are accessed exactly like the A, B or C disks attached to the PC.

Arbiter enables your information center to extract data from any host-formatted file structure (e.g., IMS or VSAM) using its existing tools—whether they're COBOL, Pascal, PL/I, SAS* or FOCUS.* That data is delivered onto the remote disks in standard PC formats like DIF, WKS and CSV.

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INFOTRON SYSTEMS

COMMUNICATIONS

Third-party token-ring products bow

By Elisabeth Horwitt

Close on the heels of IBM's announcement of the 3174, a terminal controller that can interface asynchronous devices to its IEEE 802.5-compatible token-ring network, Bridge Communications, Inc. and Ungermann-Bass, Inc. revealed their readiness to ship products with similar capabilities.

Bridge and Ungermann-Bass representatives both said that their companies' products are complementary to IBM Token-Ring products. "No question but that IBM has left lots of room for the Bridges and Ungermann-Basses of the world," said Lee Doyle, senior communications analyst at International Data Corp. "IBM would love to have third parties support the ring because it can't cover all of the niches."

Bridge announced the Communications Server 1/Token-Ring (CS/1-TR) and Token-Ring Controller Board/Multibus (TRC/M) at the recent 1986 National Computer Conference. TRC/M links Intel Corp. Multibus-based computers to the token-ring. Priced at $2,000, it is available 30 days after receipt of order.

According to Bridge Executive Vice-President Judith Estrin, the two products target "IBM-influenced" users who want to use the IBM Cabling System and Token-Ring to connect not only IBM products but also non-IBM asynchronous hosts and terminals.

The CS/1-TR enables up to 64 asynchronous or 3270 terminals, hosts and other devices to communicate over a token-ring network. The product is available 60 days from receipt of order and is priced at $16,000, or $250 per port for the 64-port version.

IDC's Doyle noted, "CS/1-TR does compete with IBM's 3174 controller because it

See TOKEN-RING page 30

Siemens, Infotron to design ISDN terminal interface

By Elisabeth Horwitt

Adapters that will provide terminal users with Integrated Services Digital Network (ISDN) capabilities are scheduled to be designed by Siemens Communications Systems, Inc. and manufactured and sold by Infotron Systems Corp., the two companies announced recently.

The adapters will implement the ISDN basic interface, which defines two Clear 64K bit/sec. channels for digital voice or data transmissions, and a separate 16K bit/sec. channel for signaling and packet switching. Two terminals or personal computers can share a board, giving each one access to a 64K bit/sec. channel.

"The adapters give users access to ISDN services," said Gary Bacon, Infotron director of carrier marketing. "For example, they can dynamically reallocate bandwidth on a call-by-call or line-by-line basis."

Adapters to ship first-quarter 1987

According to the companies' joint agreement, the adapters, which are scheduled to ship in the first quarter of 1987, will interface only with Siemens EWSD digital central office switches during the first year of production. The switches will be installed at several regional operating company premises in 1987, said Daryl Eigen, Siemens technical marketing manager.

After the one-year agreement between the two companies lapses and the standard has been finalized, the adapters will interface with any central office switch that supports the standard, Bacon said.

Eigen said that Siemens chose T1 switch vendor Infotron as its manufacturer and distributor because "Infotron really understands the data communications world. They'll provide marketing input so that we'll have the right technology to meet users' needs." Infotron is currently working on an ISDN interface for its T1 equipment, Bacon said.

The Siemens-Infotron agreement is a good strategy, according to International Data Corp. senior market analyst Jeffrey Kaplan. "Adapters are the name of the game right now, because users won't want to give up their installed terminal base just to get ISDN."

The adapters will incorporate "existing ISDN terminal interface specifications, plus what we thought the remaining specs would be," Eigen said. "The trouble with ISDN in the U.S. is that the T1D1 committee [of the Exchange Carrier Standards Association] can't reach an agreement on the remainder of the standard. Every other switch vendor is in the same boat."

'Wandering in the dark'

Kaplan agreed that "switch companies are wandering in the dark, creating interfaces that they hope will work with everyone else's." The standards committees are still arguing, "because everyone has an ax to grind, wanting the specifications to be closer to his own company's existing architecture."

Eigen said he expected all switch vendors to have implemented a consistent ISDN by 1988, "unless AT&T does something funny."

The adapters are designed so that when the remaining specs are finalized, they can be updated "with just a software and maybe a programmable read-only memory change," Bacon said. "The adapter protects customers' existing investment."

In addition to the Clear 64K bit/sec. channels defined by ISDN, the adapters will support restricted 64K bit/sec. channels used by many existing network services and devices. Restricted channels use 8K bit/sec. for signaling, leaving 56K bit/sec. for voice and data transmissions.

The adapters will also have an optional interface to AT&T's Digital Multiplexed Interface, which connects computers and

See FIRMS page 30

INSIDE

GEISCO offers a computerized service for processing and transmitting international trade documents/**30**

NEW THIS WEEK

- VM Personal Computing enhances its communications software line

For more on this and other new products, see pp. 77-91.

INSTANT ANALYSIS

"All of IBM's talk about offering an open standard for the Token-Ring is fine — except they haven't come up with an implementation yet. They have the outline but not the content."

— **Darrell Miller, director of product marketing, Ungermann-Bass, Inc.**

Joint development effort spawns optical-fiber PC networks

Codenoll puts 3Com, Sytek LAN on fiber

By Peggy Watt

LAS VEGAS — Expansion cards that implement 3Com Corp.'s and Sytek Inc.'s local-area network (LAN) systems on optical fiber were introduced recently at the 1986 National Computer Conference by Codenoll Technology Corp. The offerings are the first fruits of a joint development agreement by the three companies, which was also announced at the conference.

The advantages of optical fiber over other network media, as reported by Codenoll, include immunity to electrical interference and grounding problems, insensitivity to cable shorts, up to five times greater maximum distance between nodes, increased data security and virtually unlimited bandwidth.

Based on Codenoll's optical-fiber interfaces and the other two vendors' personal computer boards and software, the jointly developed network systems reportedly can support more than 64,000 computers, servers and peripheral devices.

"Fiber is up and coming," 3Com OEM Marketing Manager Jack Moses said. "We were looking for an experienced company like Codenoll to jump start us." The agreement moves 3Com closer to implementing an optical-fiber version of the IBM Token-Ring, he added.

Codenet-3051 PC Linkup is an optical-fiber version of 3Com's Etherlink, an Ethernet expansion card for IBM Personal Computer, Personal Computer XT, AT and compatibles. PCs equipped with the card can run 3Com's 3+ and Etherseries network operating systems and Etherlink software over an optical-fiber network. The card is priced at $995.

Codenet-3061 PC Network Fiber Optic Adapter Card incorporates Sytek's PC bus and Netbios interface, enabling IBM PCs to run all Netbios-compatible software over an optical-fiber network. Up to 64 IBM PCs equipped with the card can be connected to a Codestar Passive Optical Star Coupler. More than 1,000 Codestar clusters can be networked using Codenet-3037 Fiber Optic Repeaters.

Codenet-3061 is priced at $1,195. The PC Network version will be available within two months, according to Codenoll.

Both Codenet-3061 and PC Linkup support transmission rates of up to 10M bit/sec. The cards incorporate Codenoll's Codenet-3030A, an optical-fiber transceiver that conforms to the Ethernet IEEE 802.3 standard. Codenet-3030A is compatible with fiber-optic versions of the IBM Cabling System, AT&T Premises Distribution System and Codenet Fiber Optic Cabling Universal System (FOCUS).

Optical-fiber versions of the entire line of 3Com and Sytek network products will be sold by Codenoll, President Michael Coden said. The agreements with 3Com and Sytek, he added, open up a new retail market for Codenoll, which, according to Coden, has been primarily an OEM and vertically integrated manufacturer of fiber-optic communications systems. "We're at the point now where fiber-optic technology is cost-effective, especially when you put it on something like a token-ring LAN."

Network analyst Eric Killorin called the agreements a good step for all three companies toward tying into an important technology.

"Optical fiber is the next frontier," said Killorin, who publishes the "PC Netline" newsletter in Hanover, Mass. The Codenoll-3Com-Sytek alliance should "make fiber-optic cable a more viable option for LAN customers, but that market's not going to take off overnight," he added. While the new boards are reasonably priced, he explained, high installation and labor costs associated with optical fiber continue to make the medium an expensive choice

Firms design interface

From page 29

private branch exchanges over 1.54M bit/sec. T1 lines.

The two companies will produce a series of adapters designed to interface a range of equipment, including asynchronous and synchronous terminals and IBM cluster controllers, Bacon said.

GEISCO service aids processing of trade documents

By Mitch Betts

Trade Express System, recently introduced by General Electric Information Services Co. (GEISCO) of Rockville, Md., is a computerized service for creating, processing and transmitting international trade documents among exporters, shippers and trade brokers.

The vendor said the service is intended to help companies involved in international trade increase the accuracy, speed and efficiency of processing and communicating data related to international shipments.

The offering is part of GEISCO's foray into electronic data interchange (EDI), automated clearinghouse and point-of-sale systems [CW, May 5], company spokesmen said.

Trade Express uses the vendor's EDI Express, a worldwide teleprocessing service for the electronic exchange of business documents. Trade Express workstation software acts as an intelligent gateway to the teleprocessing system.

The system also includes Spex US software for export document processing. Spex US is an export consignment and invoice processing system. It is priced on a per-order basis, with a graduated pricing scale that ranges from $2,500 for the first copy to $1,200 per copy above the quantity of 10.

The workstation software costs $150 per copy. It reportedly includes easy-to-use interfaces for document processing, word processing, EDI and electronic mail.

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Token-ring products bow

From page 29

enables users to interface more devices onto the network." The IBM 3174 large cluster model supports up to 32 terminals, and is priced starting at $9,950.

Among future token-ring offerings from Bridge are network management and IBM Personal Computer communication software, a Bridge spokesman said.

Recently, Ungermann-Bass announced commercial availability of four of the token-ring products, which the company announced last October when IBM first unveiled its Token-Ring network. One of these, the Personal Network Interface Unit (NIU), $895, is an IBM PC adapter card that interfaces with a token-ring net.

Another, the Distributed Wiring Concentrator, $1,000, is a hub that links up to 10 IEEE 802.5-compatible NIUs. A third, the Ring-to-Ring Bridge, $8,995, interfaces two or more token-ring networks. And lastly, the NIU 180/Token-Ring, $3,600, is an asynchronous token-ring network server that supports up to eight devices.

Future Ungermann-Bass products include token-ring versions of the NIU 74, a network interface for the IBM 3274 controller, and NIU 78, an interface for IBM 3270 terminals.

Token-ring network offerings from both Bridge and Ungermann-Bass currently support Xerox Corp. Network Systems communications software. The firms announced future support for Transmission Control Protocol/Internet Protocol.

Spokesmen from both firms said they intend to implement networking software protocols backed by the International Standards Organization and by IBM — as soon as these are available.

"IBM talks about an open standard, which is fine, except that they haven't come up with a software implementation yet," complained Ungermann-Bass Director of Product Marketing Darrell Miller.

MICROCOMPUTERS

Add-on for PC AT offers ports, EMS

By Eric Bender

HILLSBORO, Ore. — A multifunction add-in board for the IBM Personal Computer AT and compatibles that combines expanded memory features with serial and parallel ports was introduced last week by Intel Corp.'s Personal Computer Enhancement Organization.

Intel also lowered prices by up to 28% on its Above Board expanded memory products.

Supporting the Lotus/Intel/Microsoft Expanded Memory Specification (EMS), the Above Board PS/AT eliminates the need for conventional multifunction boards, according to Intel.

The add-in comes in two models, both of which can be expanded to 1.5M bytes on the card, or to 3.5M bytes using a "piggyback" card. A 128K-byte version costs $545, and a 512K-byte model is priced at $695.

The PS/AT board can boost conventional memory up to 640K bytes. The product comes with software utilities including random-access memory disk support and print buffer. According to the vendor, a free copy of Microsoft Corp. Windows is available to Above Board buyers on request.

Among price cuts, the cost of the Above Board/PC with 64K bytes of memory was dropped from $395 to $345, and the price of the Above Board PS/PC multifunction board with 64K bytes of memory decreased from $445 to $395. In addition, the price of the Above Board/AT with 128K bytes of memory was dropped from $595 to $545, according to Intel.

Also last week, Intel launched an 8-MHz version of its 80287 math coprocessor, intended to work with 80286-based accelerator boards with clock speeds exceeding 8 MHz. The $410 80287 is available now, the company said.

Additionally, through Sept. 30, a free 8087 or 80287 coprocessor will be bundled with any Above Board purchase, the company said.

Javelin tool runs on LAN

Software boosts capacity, accepts files from 1-2-3

By Douglas Barney

CAMBRIDGE, Mass. — Javelin Software Corp. recently announced a version of its $695 Javelin financial analysis software that supports expanded memory, accepts files from Lotus Development Corp.'s 1-2-3 and Symphony and runs on local-area networks.

With support of the Lotus/Intel/Microsoft Expanded Memory Specification and the Intel Corp. Above Board expanded memory board, Javelin can now access up to 8M bytes of random-access memory.

"Our capacity has gone up sixteenfold. That puts us at a greater capacity than most of the mainframe financial modeling packages that I know of," said Robert L. Firmin, Javelin chairman. Javelin models can now contain up to 16,000 variables.

One user said he is not concerned with memory limitations. "It will be important in the future, but our data bases haven't built up that high yet," said Don Smith, a partner with Price Waterhouse & Co. in Chicago.

Javelin also announced a greater ability to exchange files with Lotus' 1-2-3 and Symphony. Javelin now reads and writes WKS files and ASCII text files and also writes Data Interchange Format files. "We can now write out a Lotus 1-2-3 file," said Christopher F. Herot, vice-president of engineering for Javelin.

The newly announced version, which is available to registered users for $20, also runs on local-area networks, including those from Novell, Inc., 3Com Corp. and Banyan Systems, Inc. as well as the IBM Token-Ring network.

Each node needs its copy of Javelin in order to work, or it can be accessed via a file server. "If someone gets a site license from Javelin, he can install it on a network," Firmin said. Only unprotected versions of Javelin can be installed on a file server.

See JAVELIN page 32

Desktop scanner market to feel impact of Big Blue's entrance

By Douglas Barney

Earlier this month, IBM introduced several desktop optical scanning products, including the $1,095 IBM 3117 Scanner and the $2,350 IBM 3118 Scanner, both designed to digitize documents that can be displayed on IBM Personal Computers and 3193 workstations.

Observers say they believe the IBM systems, which are scheduled for September delivery, will put pressure on other image scanner vendors.

"This is going to validate the scan-graphic marketplace," commented Jonathan Seybold, editor of "The Seybold Report on Publishing Systems." "It puts IBM into a very competitive pricing situation."

The IBM 3117 Scanner works with IBM PCs and host systems and can digitize a variety of document types. A one-page document is scanned in 30 sec.

When coupled with the $700 Extension Unit, the system can compress image data, resulting in faster transmission time and fewer storage requirements. For example, an 8½- by 11-in. page stored at the maximum resolution of 240 by 240 pixels can take up 700K bytes of memory before the image is compressed. The Extension Unit, however, provides a compression ratio of 27 to 1.

"I am a little bit surprised by 240," said Larry Lace, an imaging consultant based in Thousand Oaks, Calif. Many scanners offer resolution of up to 300 by 300 pixels, he added.

The Extension Unit, based on an Intel Corp. 80186 microprocessor, also allows the 3117 to attach to various IBM commu-

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INSIDE

IBM enhances its Displaywrite and Assistant micro application packages/32

NEW THIS WEEK

- Sharp Electronics introduces IBM Personal Computer AT compatible

For more on this and other new products, see pp. 77-91.

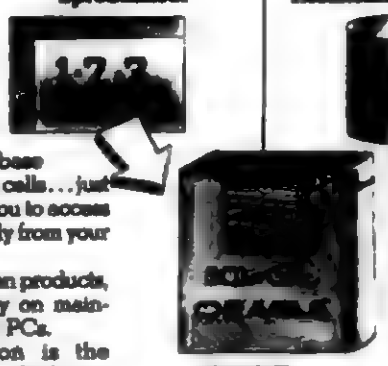
INSTANT ANALYSIS

"It's the only word processor that responds if you yell at it."

— Jeffrey Tarter, editor, "Softletter," on the voice-annotation features built into IBM's Displaywrite 4

Oracle's SQL★Calc makes a relational DBMS as easy as 1-2-3.

Oracle Corporation has developed a Lotus 1-2-3 compatible spreadsheet and integrated it with its ORACLE® relational database management system (DBMS). The new product, SQL★Calc® is the first to combine a mainframe-class relational DBMS with an easy-to-learn and familiar PC spreadsheet user interface.



SQL★Calc is designed for 1-2-3 users who've run out of memory, flexibility and patience. SQL★Calc allows you to put SQL database commands into spreadsheet cells...just like formulas. This permits you to access large amounts of data directly from your spreadsheet.

Like all Oracle Corporation products, SQL★Calc runs identically on mainframes, minicomputers and PCs.

SQL★Calc's foundation is the ORACLE relational DBMS, which provides users with a complete set of SQL commands through which they can create, retrieve, modify and otherwise control their data. SQL is the industry standard database command language for large computers. The SQL commands available in ORACLE are identical to the SQL commands in IBM's premier mainframe relational DBMS products, SQL/DS and DB2.

Built on this powerful DBMS foundation is a Lotus 1-2-3 compatible spreadsheet that allows users to put SQL commands into spreadsheet cells in the same way as they enter formulas. When a SQL command for data retrieval is entered into a spreadsheet cell, information is automatically retrieved from the database and placed into the spreadsheet. SQL★Calc also permits users to modify the database—and even create new database tables—directly from the spreadsheet.

SQL★Calc is easy to learn because its menu and command structure are compatible with those of Lotus 1-2-3. And SQL★Calc's ORACLE DBMS requires no supplement: It is vastly more powerful than the database components of 1-2-3, Symphony, Framework, dBase II, dBase III, or any other PC DBMS.

SQL★Calc is available immediately for IBM PC/XTs and ATs for $995.* SQL★Calc will soon be available on a wide variety of systems, including IBM mainframes, DEC, DG, and other superminis, and most UNIX systems.

For further information, or to order your copy of SQL★Calc, call 1-800-345-DBMS. Or write Oracle Corporation, Dept. CS, 20 Davis Drive, Belmont, CA 94002.

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Javelin tool runs on LAN

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"Part of the volume purchase arrangement allows you to get an unprotected copy of Javelin, which you can install to your file server," Herot said.

Users can either make their own copies from the file server or share them on the file server. "Most people with hard disks are better off copying the program to their hard disk because it runs faster, and if the network is down, it still works," Herot added.

Although Javelin runs on local-area networks, Herot said that some networking features are not included in the package. "One thing that we didn't do is put in a lot of fancy stuff to lock things on a record level because we found that every network is slightly different about how it deals with that. It also gets complicated when you explicitly lock things because people forget to unlock them," Herot noted.

Although the ability to run on networks is becoming increasingly important, it is still not a crucial feature. "We are just starting to see a bunch of networks installed. It is not a significant problem yet," Smith noted.

Javelin has shipped more than 10,000 packages in the 7½ months that the Javelin package has been available, Firmin said.

IBM micro upgrades debut

Displaywrite, Assistant add System/36 interface

By Eric Bender and Doug Barney

IBM recently announced a number of microcomputer application debuts, headlined by upgrades to the Displaywrite word processing program and the Assistant series of productivity software.

The $495 Displaywrite 4 package, scheduled for fourth-quarter availability, enhances Displaywrite 3 with a new "streamlined" user interface that provides extensive on-line Help facilities along with enhanced text processing features and voice/audio annotation capabilities.

Additionally, a System/36 interface built into Displaywrite 4 links with the PC Support/36 Organizer software that also made its debut last week. IBM has also changed Displaywrite/36 screens to give greater consistency with the micro software, a company spokesman emphasized.

Both 5¼-in. and 3½-in. formats will be supported, with the latter allowing Displaywrite 4 to run on the PC Convertible. Upgrades from Displaywrite 3.1 will cost $75, and those from Displaywrite 3.0 $175.

IBM also dropped a number of earlier versions of its Assistant Series microcomputer software, added new versions of some of those packages and introduced a project scheduling package and Displaywrite Assistant word processing software.

Dropped effective Sept. 16, but replaced with more recent versions, were the IBM Filing Assistant Version 1.00, Reporting Assistant Version 1.00, Planning Assistant Version 1.00, Graphing Assistant Version 1.01 and Writing Assistant Version 1.01. All upgrades are available until May 15, 1987.

"The new versions replace the old versions. They do all the things the Version 1.00 programs did, but they have additional features such as contextual Help and pop-up windows," noted Joy Milne, an IBM spokeswoman.

Pricing for the Assistant series now ranges from $175 to $195 each.

IBM's $195 Displaywrite Assistant combines the features of IBM Writing Assistant with some of the functions of Displaywrite and will be available next month. The key feature of Displaywrite Assistant is its ability to communicate with other IBM hardware and software, according to IBM's Milne.

The $195 Project Assistant package is a project-scheduling program that works with other members of the Assistant family. The package supports projects of up to five years and displays or prints project diagrams using Gantt horizontal bar charts. Project Assistant will be available next month.

Scanner market feels Blue impact

From page 31

nications adapters.

IBM's 3118 Scanner offers more than twice the speed of the 3117 at nearly double the price. The 3118 Scanner can scan an 8½- by 11-in. page in 12 sec. and has image compression features built in that provide a compression ratio of 27 to 1.

IBM also announced two software packages that support its new scanners. The $95 Image Support Facility 2 provides image handling facilities and an application programming interface for image applications. The Image Support Facitity 2 package also permits images to be compressed and decompressed.

The $240 Personal Computer Image Document Utility, which requires Image Support Facility 2, gives print support for captured images and allows the transfer of image documents to IBM System 36s, System/38s and 370s.

The IBM offerings drew some criticism as well. "This class of scanner is relatively low priced but very slow. . . . Thirty seconds is ridiculously slow," said Edward S. Rothchild, chairman of Rothchild Consultants, publisher of "Optical Memory News," based in San Francisco.

In contrast, Ricoh Corp.'s FS410 scans both sides of an 8½- by 11-in. document in 2 sec. or less, Rothchild said.



Executive Report

Edited by Janet Fiderio and Becky Batcha



ILLUSTRATION BY PETER PERRY

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Integrated OA systems

New software reflects needs in multivendor shops

By MICHAEL SULLIVAN-TRAINOR

In the year 1996, the average manager, secretary or professional in the average Fortune 500 company might be able to do what Marilyn Gruen of Westinghouse Electric Corp. can do today.

Using a Sun Microsystems, Inc. workstation and Applix, Inc.'s Alis integrated office automation program, Gruen can create text, graphics, spreadsheets and freehand drawings in a compound document. Through icons and multiwindowing, she can rearrange the presentation, change the graphics or recalculate the spreadsheet without leaving the original screen. Using a style selection guide, she can choose a predetermined text format with multiple fonts and can change formats as she creates the document.

Once she finishes, Gruen can mail the document to a distribution list of other Alis users or can store it in a multilevel filing system. Data base access and the option of using a mouse or keyboard also lie at her disposal.

Gruen, an administrative assistant, is one of the first employees at Westinghouse to use Alis, a Unix-based package. The firm's product and quality center has recently decided to recommend the program for some employees who use engineering workstations.

Gruen and fellow Westinghouse employees can consider themselves fortunate. Most companies cannot yet afford to give everyone workstations powerful enough to run such a highly sophisticated integrated office system. Right now, most data processing managers face the problem of providing access to corporate data and integrated office automation applications in an environment dominated by IBM mainframes and assorted incompatible personal computers and terminals.

Proprietary packages like DEC's All-In-1, Data General's CEO and Wang's Wang Office are changing to satisfy the MIS manager's desire for flexible office solutions.

Major new product announcements made this month by IBM, Wang Laboratories, Inc. and Honeywell, Inc. address the challenge of providing integrated OA functions in a multivendor environment. Each of the three vendors will be providing increased connectivity between hardware systems and making its office applications easier to use.

Currently, these vendors are among a small group that offers combinations of hardware and software that provide a standard list of office applications in a networked environment. Com-

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Sullivan-Trainor is a Computerworld *senior writer.*

Software reflects needs in multivendor shops

Continued from previous page

mon functions include word processing, a spreadsheet, personal computer- and host-based data base management, graphics, filing and library services, a calendar, a calculator, electronic mail and third-party business applications. Some vendors also offer a minimal level of integrated voice and image processing.

These solutions are based on proprietary mainframes or minicomputers with dedicated terminals and an ever-improving amount of PC integration. Different vendors' systems succeed to varying degrees in meeting the three major criteria of today's users:

- **Integration of applications** — including common user interfaces that provide easy access to well-developed functions.
- **Connectivity among systems** — allowing transparent file transfer and conversion between hosts and workstations.
- **Support for personal computers** — especially IBM Personal Computers and compatibles.

Leaders in the market include Digital Equipment Corp., Data General Corp., Wang, IBM, Sperry Corp., Hewlett-Packard Co. and Honeywell.

All the vendors are moving toward the complete integration of new technologies like voice and imaging (see story page 38), and all increasingly support networking standards and IBM Personal Computer integration.

Each vendor, however, focuses its products differently, based on its proprietary systems. Similarly, each depends on a different strategy for attempting to achieve a seamless integration of office applications and data processing functions.

AT A GLANCE

digital

Digital Equipment Corp.'s All-In-1 is one of the strongest products on the market, with a comprehensive set of office automation applications and good connectivity within its architecture and with other vendors' systems. All-In-1 also offers some support for IBM Personal Computers, but they can only access the host system as dumb terminals, missing their full potential.

DEC's All-In-1: A front-runner in connectivity

One of the strongest integrated office automation products on the market, particularly on the networking side, is Digital Equipment Corp.'s All-In-1.

All-In-1 comes with electronic mail, calendar management, basic word processing and desk management. It also supports DEC's Business Operations Support System, which links spreadsheet, report generation and graphics functions. Additional software options, which most users choose, include Decalc, WPS Plus, Decgraph, Decslide and Datatrieve. Users can also purchase a videotex package. All-In-1 also provides consistent user interfaces and an interrupt function that allows easy movement between applications.

In addition, DEC offers links to the IBM world through External Document Exchange (EDE) Disoss software. EDE-Disoss allows All-In-1 to exchange revisable text documents with an IBM Distributed Office Support System (Disoss) library over a DEC VAX/IBM Systems Network Architecture (SNA) gateway.

DEC accommodates IBM Personal Computer users through Decnet-DOS, a version of Decnet that allows the PC to communicate with other machines on a DEC network without acting as a slave to one host. In addition, DEC has made WPS Plus available in an IBM PC version.

The company is currently looking at integrating new technologies into All-In-1, while continuing to focus on connectivity within the VAX architecture and operating system, according to Richard Loveland, manager of product planning for DEC's Office and Information Systems department. At the same time, the firm plans to keep introducing vertical market applications, such as a recently announced sales and marketing package, for integration within the network. A new version of All-In-1 is due out at the end of the year. The product is currently in its second release.

DEC's ability to connect with other systems and provide integrated applications were key reasons why United Telephone Co. in Florida chose All-In-1 and a VAX-11/785 minicomputer in 1982 when it decided to acquire an integrated office system. The company needed a system that could connect with IBM mainframes and minicomputers and Hewlett-Packard systems on both corporatewide and departmental networks, according to DP manager William Gainey.

United Telephone evaluated systems from IBM, DEC, Wang, Data General and HP based on price, performance, functionality and network capability. "We found that there was less than a 10% variation in cost between the systems," Gainey says. "So it boiled down to a couple of key issues: Can the vendor provide the support required? And which one could do the job for our company?

"All-In-1 came out on top, and DG's Comprehensive Electronic Office was a close second," he recalls. "The other three vendors were quite a ways back."

Since deciding on the DEC system, United Telephone has implemented it in a network of more than 300 users at 12 locations. The firm runs two departmental Microvax IIs to take some of the processing load off the VAX.

Altogether, the OA system encompasses 120 Decmate word processors, 73 VT240 graphics terminals and 23 Rainbow PCs. Through the host, these DEC machines communicate with each other and with 19 IBM micros, including Personal Computer XTs and 3270 Personal Computers, which are equipped with VT100 terminal emulators.

Users can also access the system via phone lines. When users dial-in, Dectalk software converts electronic messages to voice messages. Ultimately, United Telephone plans to install Version 2.0 of DEC's VAX/VDT Videotex software, which will allow users to hear a Dectalk recitation of requested videotex pages.

Gainey says he is satisfied with United Telephone's choice of OA systems but feels that DEC and other vendors could come further in their willingness to connect with each other's systems.

Currently, for example, IBM PC users can only communicate with a DEC host in the limited role of networked terminals, which is a problem because it does not tap the full processing power of the PCs.

Gainey says he would like to see enhancements that will allow PCs to communicate with the system as casual users.

"As a buyer of equipment, we would like to see the walls broken down between vendors to allow bidirectional communication. The vendors have to meet this need so that we are not trapped in one set of equipment," he says.

Nevertheless, Gainey says his company is committed to All-In-1 for the foreseeable future. "The decision we made was correct at the time, and I would make the same decision today. The market principals are IBM and DEC, and they will continue to be."

AT A GLANCE

Data General

Data General Corp.'s Comprehensive Electronic Office (CEO) offers a single applications environment, with well-integrated functions and a consistent user interface. The company has recently developed connections to IBM equipment, including the Personal Computer. PCs primarily access the CEO system as dumb terminals, but users can download applications.

Data General's CEO: A backbone for integration

Another company that can boast a well-developed product is Data General, with its Comprehensive Electronic Office (CEO), one of the first integrated office automation systems on the market.

CEO is best known for its well-integrated

Continued on page 37

Expert's Opinion



IDC's Gabrielson

Choosing the right system

By HEIDI GABRIELSON

Companies that are looking to buy an integrated office automation system need to remember one important point: No matter how advanced the system, it makes poor business sense unless it can save the company money.

Managers choosing a profitable system should undertake three distinct efforts:

1. **Needs assessment.** The first step is to define the company's strategy for competing in its marketplace and then determine specifically how an integrated office automation system will help achieve strategic goals.

Managers charged with choosing the system should also consider which tools specific departments and individuals need if they are to contribute to corporate goals.

The office system can then achieve both corporate and departmental ends.

This approach resembles Hewlett-Packard Co.'s Goal Achievement Analysis, a cost-justification methodology in which HP justifies office systems the same way it justifies the hiring of a new employee:

Managers set short-term goals, then buy equipment to meet the goals. The bottom line is planning and budgeting for reasonable levels of functionality.

2. **Cost-justification.** In end-user computing, no one has yet established paybacks or quantitative cost-justification methodologies that surpass common sense. Still, most managers need to show return-on-investment projections in order to justify buying an integrated office system.

Managers can determine where profitability might increase, even if they cannot say by how much.

They can point out, for example, that savings may accrue from reductions in the number of personnel required for a task or the amount of overtime or seasonal help required.

[illegible] page 37

Gabrielson is a research manager in the office automation systems group at International Data Corp., a market research firm based in Framingham, Mass.

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The Plot Thickens:

Four different types of equipment were involved in processing the data: a DEC 2060, a DEC VAX, a Honeywell microcomputer, and a small army of IBM PCs. These systems, located in several different laboratories, needed easy input and access to a single database. Data accuracy had to be *guaranteed*. And the database architecture had to provide commonality among the systems.

What To Do?

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Continued from page 34

applications, which offer all the standard functions. But its developers say they are also concerned about networking issues.

"A year ago, the buzzword was 'integration,' and now it's 'connectivity,' " according to Chris Stone, DG's CEO project manager. "It's been a big secret, but we've been focusing on connectivity for years." As an example, he points out that DG offers an SNA link that allows an IBM mainframe to serve as the backbone for DG MV series processors.

CEO offers a single applications environment that runs over all the company's 32-bit MV machines. It features application integration and consistent user interfaces. "It's a backbone for other environments, such as personal computer integra-

> ***'A year ago, the buzzword was "integration." Now it's "connectivity." It's been a big secret, but we've been focusing on connectivity for years.'***
>
> — Chris Stone
> Data General Corp.

tion and IBM integration through a Disoss connection," Stone says.

Recent enhancements include a voice messaging feature, a software tool kit and a Disoss interface. DG also announced an enhanced version of CEO/Document Exchange Architecture, providing peer-to-peer document distribution via IBM's Systems Network Architecture Distribution Services (SNADS) [CW, June 16].

Features that are under development right now include personal computer integration, fourth-generation development languages, support for communications standards and compound document creation.

Stone feels that technologies like image editing and processing, voice recognition and speech-to-text translation lie beyond practical consideration for the time being, as do user interface designs based on artificial intelligence.

Users at Deutsche Credit, Inc., a commercial credit corporation in Chicago, are looking forward to whatever DG comes up with. The company was a beta site for the initial introduction of CEO back in 1980 and currently supports about 80 users with the product. About 30 of these employees work at remote sites in cities outside Chicago. Users' Data General

Continued on page 40

[illegible] from page 34

Managers can also expect to see improved productivity, which is a somewhat intangible benefit that comes from increased efficiency and the wider availability of more timely business information.

3. Product evaluation. After a company identifies its requirements and justifies the cost of a system, the last step is to evaluate specific systems.

Managers should keep in mind that different workers need different system functions and should look for appropriate tools.

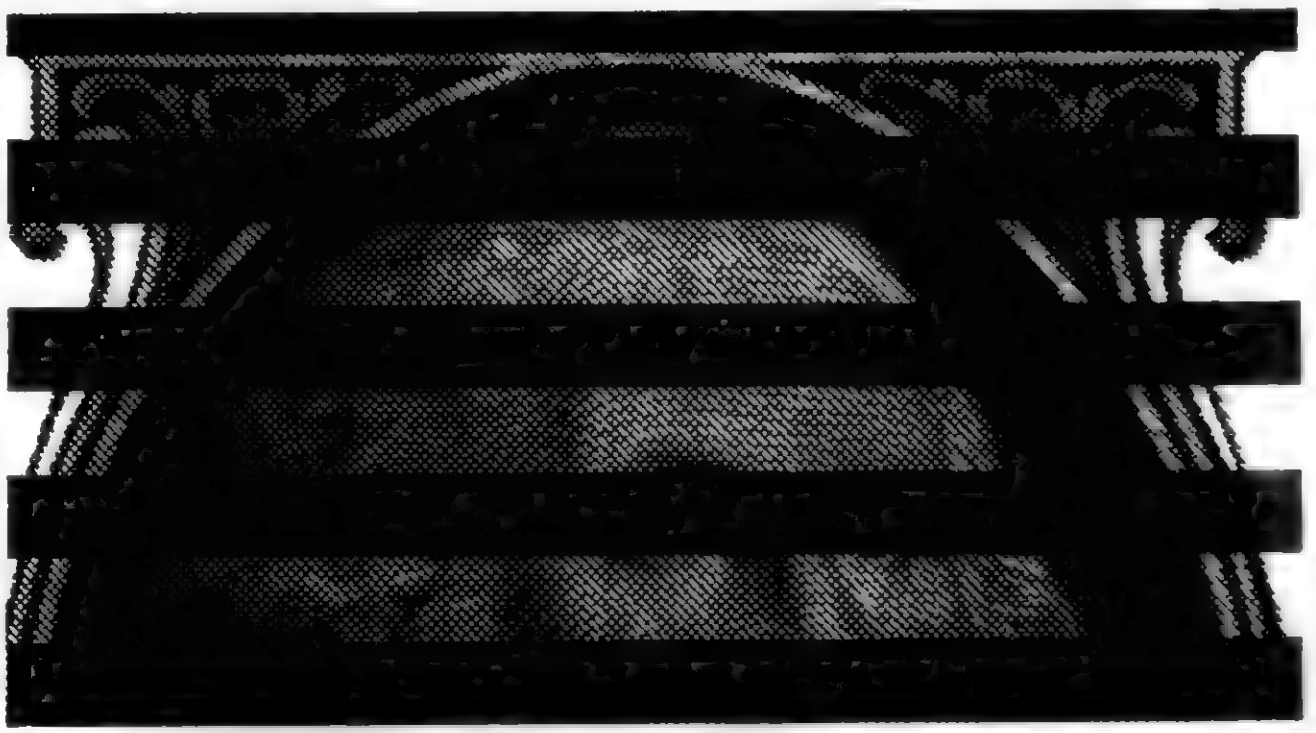
A good way to get a feel for employees' requirements is to distribute a questionnaire that asks workers to define their tasks and gauge what type of equipment they need.

Once a manager understands these requirements, he can then begin to identify and contact appropriate vendors.

He should begin by eliminating systems that do not offer necessary functions and should continue by performing more extensive evaluations of all remaining packages.

As part of this in-depth evaluation, the manager will need to consider each of the following system characteristics:

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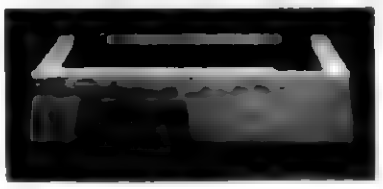


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Voice, image processing, AI likely additions to OA systems

By JANET FIDERIO

MIS managers will see exciting new technologies creep into integrated office automation systems in the next five years, industry watchdogs agree.

Voice integration — including annotation, synthesis and recognition — will increase the options users have to communicate with computers. Image processing will change the way users archive and input mammoth amounts of data and images. Bit-mapped graphics terminals will become standard integrated office system components and will give users the ability to use color and black-and-white graphics more effectively. And the steady adoption of transparent artificial intelligence techniques will increase the ease with which users can access and manipulate information.

Patty Seybold, editor and publisher of "Patty Seybold's Office Systems Report," predicts that OA vendors will provide users with new technologies in three major waves.

Voice integration will be the first technology to be incorporated into office systems such as Data General Corp.'s Comprehensive Electronic Office and Digital Equipment Corp.'s All-In-1, Seybold says.

"I expect to see increasing integration of voice, store-forwarded to electronic mail, and increasing integration of private branch exchange capabilities into office systems, so that we really get a true merger of one system on the desktop. I think that that's going to be the first and foremost priority."

Voice integration, to Seybold, includes voice annotation, recognition and synthesis.

Seybold says that the second technological wave to hit the integrated OA user will be systems with a much higher emphasis on graphics than currently exists. These will bring users compound documents with malleable interactive graphics and higher quality business graphics in both black and white and color.

The third wave will be that of image processing. "I don't personally feel that there is as strong an applications demand on the part of end users for image-related integration outside of the publishing world," Seybold says. "I think it will come within five years, but I don't think it will be in the first two waves."

Not all observers agree. John J. Connell, executive director of the Office Technology Research Group based in Pasadena, Calif., predicts image processing will be the next big breakthrough in office technology.

According to Connell, image processing, based on optical disk technology, will present end users with a "magnificent opportunity to get a lot of paper out of the processing stream and archived." He says image processing will bring major change to the way office work is done.

"In fact," Connell says, "it has far more significance than voice, because users will be able to go back and look at every computer system in place that has paper associated with it and rethink whether or not some of the paper processing can be taken out of the loop."

Connell also claims that image processing will initially play a role in businesses that are involved in high-volume, dedicated applications, such as the banking and insurance industries. Eventually, it will come into more general use.

Molly Upton, editor of Framingham, Mass.-based International Data Corp.'s "Software Watch" newsletter, sees image processing moving into large companies through corporate publishing groups. She mentions voice annotation of text as another technology to watch in the next five years.

Upton, however, sees a stumbling block to the adoption of new OA options, namely that most vendors have adopted IBM's Document Content Architecture as a standard.

The specifications for handling image and voice are not yet available, she says. "IBM has every intention of handling compound documents — voice, data, graphics, image or text — but it's just not there presently," Upton says.

Upton, Seybold and Connell all agree that artificial intelligence, including the use of expert systems, will play an important role in the integrated office automation system of the future.

According to Connell, expert systems and other AI technologies will be so transparent that users will be unaware that they are being used to accomplish the job.

Seybold says expert systems with natural language interfaces will not only provide more friendly end-user interfaces but also the ability for end users to do their own programming. These techniques would give an average businessman the ability to sit down, describe a business problem he wants to solve and have a program automatically generated using a natural language interface. ■

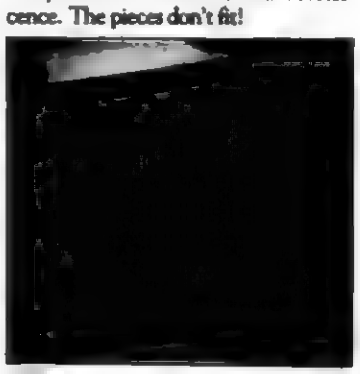
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AT A GLANCE

WANG

Wang Laboratories, Inc.'s Wang Office runs on a broad family of VS processors, offers standard applications and supports some image processing. Its ease of use is impressive, but Wang's connection with other vendors' equipment is relatively weak. Wang has been improving its applications integration and IBM connectivity, with new products in both areas.

Continued from page 37

terminals and IBM Personal Computers link to two MV/8000s, which run CEO as well as DP applications. The PCs on the network operate largely as terminal emulators.

Bobbie Pressman, Deutsche's manager of administrative services, says CEO has come a long way since her company first acquired it. Still, she hopes for continued enhancements.

Pressman says that CEO's filing system needs additional security at the folder and document levels and that the system takes up too many resources when it downloads word processing to personal computers.

Wang's Wang Office: Toward full functionality

Wang Laboratories has maintained one of the largest installed bases of office automation equipment since it introduced the VS Integrated Information System in 1979,

> ***Often, hardware investments and familiarity with Wang word processing and office automation keep users in the Wang camp.***

but now the company is facing a new market, shared with minicomputer makers like DEC and Data General and dominated by IBM PCs and compatibles.

Recognizing this changing environment, Wang is trying hard to catch up to the market leaders. Having built its reputation on word processing, the company is struggling to make the transition to incorporating other applications.

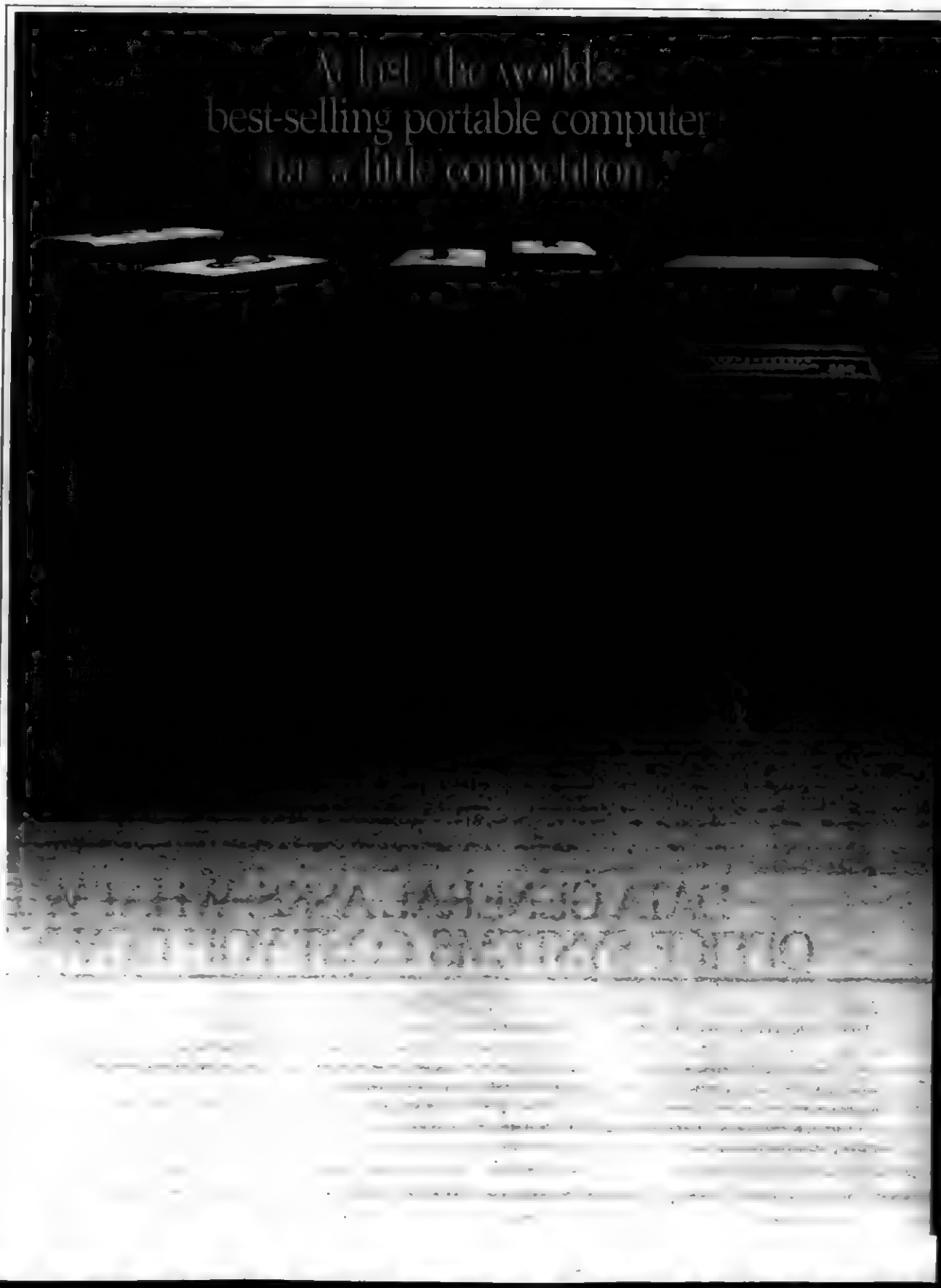
Wang's integrated product, Wang Office, runs on a broad family of VS processors and encompasses the standard applications. It also works with Wang's Professional Image Computer image workstation, allowing partial access to image files. The company also markets an integrated voice/data workstation and a networking environment that supports image, voice and data.

Through the Wang Local Office Connection, Wang supports the IBM Personal Computer AT and PC XT, allowing access to VS-based Wang Office applications and files. In addition, Wang plans to add a virtual disk feature in July that will allow the PCs to treat a VS disk as a local disk drive. Data conversion enhancements for transferring files between VS and IBM's PC-DOS are in the planning stages, as are multiwindowing features that create a VS window on the PC screen.

Moving to close the gap between itself and other vendors, Wang introduced an array of Wang Office enhancements this month [CW, June 2, June 23], improving its word processing applications and adding capabilities for communications with IBM equipment. The highlights of the announcements include the following:

- Versions 1.5 and 2.0 of the Wang Office/Disoss Gateway to include LU6.2 and Information Distribution Services connection as VS-to-IBM mainframe transport options.
- Version 2.0 of the Wang/Profs Gateway, which will allow Wang Office users to exchange messages between Wang Office and IBM's Professional Office System (Profs).
- Version 2.0 of Wang Office, which includes Office Indexer, a document indexing and searching function.
- Version 2.0 of WP Plus high-end word processing software, available immediately for the VS system, providing integration with Wang Office and adding line drawing, image integration, automatic hyphenation, line numbering, enhanced footnoting, repagination and spelling verification. Wang Office integration includes the WP Plus text editor and a two-keystroke transition from WP Plus word processing to Wang Office applications.
- The Applications Program Interface, which allows users and independent software companies to integrate their software applications with Wang Office.
- The Integrated Application Program, an effort to integrate third-party packages. So far, 24 vendors have made their software available for integration with Wang Office.

The new products will be available next month, except for the Dis-



oss gateway Version 2.0, which will be available in the fourth quarter of this year.

Within the recent announcement, Wang promised to add enhancements to include SNADS and IBM Token-Ring connections. The products are under development, and Wang would not say exactly when they would be available.

"We have quite a list of things we're looking at in the user interface, networking and ease-of-use areas. We realize there are other desktops out there," says Edward McHugh Jr., senior product manager. "The key is that you build your integrated information processing system as a foundation and use that as a base for new technology to be folded in."

Future announcements should include an integrated spreadsheet, the closer integration of image processing and decision support features and the continued improvement of the IBM connection.

Users face the decision of waiting out Wang's development process or moving to another vendor that offers a more mature integrated office automation system. Often, hardware investments and familiarity with Wang word processing and OA keep users in the Wang camp.

A good example is the law department of Ryder Systems, Inc., the Miami-based parent company of Ryder Truck Rental, Inc. The department supports 31 users on a VS system that is linked to terminals and personal computers.

"We had a Wang word processing system, and when we wanted to add office automation applications, we looked at IBM and DEC as well as Wang," says Judith Chozianin, the department's administrative manager. "Ease of use was one reason we chose Wang."

Kieth Fogleman, program manager for Input Output Computer Services, Inc. of Washington, D.C., is also committed to Wang Office, though he would like to see some improvements.

"We've been running Wang equipment since 1974," Fogelman says. He finds fault with the system's message transmission but considers it a minor problem. "When I send a message or document and key in a name, there is no way for me to determine if the message got there. There's no confirmation unless someone on the other end reads it."

AT A GLANCE

IBM

IBM cannot match the applications integration or the multivendor connectivity of any of its competitors in this market, but its installed base makes Big Blue a market leader nonetheless.

At the least, IBM seems committed to the office automation arena, especially with its Disoss framework. The company provides a number of hardware and software choices for integrated OA.

IBM: A leader by default

One of the ironies of the integrated OA systems market is that IBM — which has not even approached its competitors' level of applications integration and equipment connectivity — is a leading market presence.

The firm's popularity rests largely on its size and stability. "IBM is the default leader," according to Mark Hayward, manager of office systems consulting for Walter Ulrich Consulting, Inc. in Houston. Hayward feels that IBM's integrated OA offerings are among the least mature and comprehensive in the market.

> ***Despite its current shortcomings, IBM does provide a wide range of products that indicate a commitment to integrated OA.***

Despite its current shortcomings, however, IBM does provide a wide range of products that indicate a commitment to integrated OA.

IBM is currently advocating Disoss as a framework for integrated applications. The actual office applications are provided by IBM's Personal Services software within this Disoss framework.

By the end of the decade, Disoss will probably boast more users than any other integrated OA system, according to International Data Corp., a market research firm in Framingham, Mass. Moreover, every vendor in the market either offers products that provide connectivity with Disoss or has stated intentions to do so.

IBM also markets Profs, which offers basic word processing and document and message distribution for large systems. Some analysts speculate that Profs may one day become a subset of Disoss. But IBM continues to talk about a Profs bridge to Disoss, and it recommends that the

Continued on page 44

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Continued from page 41

products be used in different operating environments: Profs for VM environments and Disoss for MVS environments.

In what many analysts see as a response to competitors' more tightly integrated OA offerings, IBM this month announced a host of new products, including enhancements to its office systems [CW, June 23]. The announcements included the following:

- A new line of System/38 minicomputers available in August, replacing the current line, with 30% more processing power at the low end (Model 100) and twice the memory at the high end (Model 700).
- Three System/36 models, which support increased memory and an increased number of users per system.
- Updated versions of the System/36 and System/38 operating systems, with aspects of the System/36 version and the complete System/38 version to be out in the fourth quarter of this year. The enhancements include facilities for communications without a controlling host and access to Profs and Disoss files through connections to the IBM 370 mainframe family.
- A Personal Computer-to-370 connection and closer links between the Personal Computer and both System/36 and 38, with the PC-370 link available as a total package in the third quarter of 1987.
- An enhanced PC word processing program, Displaywrite 4 (to be available in the fourth quarter of this year) and greater consistency for Displaywrite/36 menus. Displaywrite 4 offers simplified user interfaces, enhanced text processing and improved System/36 compatibility.
- A voice/audio annotation feature included in the Displaywrite 4 release, enabling users to store verbal comments, instructions or statements within a document for revision.

The announcements lay the groundwork for systems connectivity and improved performance for IBM mid-range systems, but even with the new products IBM's users still need to operate in different, incompatible environments.

Despite the need for improvements, many companies remain dedicated to IBM's office products. Fireman's Fund Insurance Co., which keeps headquarters in Novato, Calif., is one of them.

The company uses Disoss on a nationwide SNA network. Regional offices support 60 IBM 8100 DPPX distributed processing systems, which are tied to host mainframes at headquarters.

End users access the system through IBM workstations, mostly 3180 terminals and Personal Computers. Software packages include Personal Services/370, Personal Services/PC and Profs.

Fireman's Fund supports the IBM solution because it is the most compatible with the firm's IBM equipment, according to programming

Continued on page 46

Survey

Managers take steps to secure their integrated office data

Add password levels, support re-education

By JOANNE KELLEHER

It seems strange to say it, Jack Arthur notes, but all things considered, the U.S. Forest Service was probably lucky that an outsider managed to breach the security of the organization's office system in December 1984.

The occurrence served as an early warning, according to Arthur, director of the Forest Service's computer science and telecommunications staff in Washington, D.C.

After the breach, he and his staff knew that extra security measures were in order for the Data General Corp. Comprehensive Electronic Office (CEO) system that the organization had begun to install 15 months before.

Arthur's realization may have arisen out of dramatic circumstances, but it is by no means unique.

Other current users of integrated office automation systems are finding that the systems are not as fully equipped for security as they should be. These users are taking special measures to keep their office data safe.

Even before the break, the Forest Service considered extra security a high priority for OA. When the organization put out a contract for its system, it insisted that all bidders agree to make a number of security modifications.

The system was to handle only nonsensitive tasks at first, taking on more vulnerable applications later, but the Forest Service wanted to protect itself from the start against all foreseeable risks, according to Arthur.

"That's one good argument for having an implementation plan that allows you to start with an area that's not too critical," he says. "As our experience shows, you can't really know what your vulnerabilities are until you have a system in place."

After the brush with the intruder, an incident Arthur characterizes as unsettling but minor, the Forest Service added further locks to its CEO system. Arthur and his staff enhanced CEO's ignition logging function.

In addition, they created programs that required extra system passwords before they permitted access from a remote system and requested special privilege passwords before they allowed certain functions to proceed.

Adding these extra layers of protection took roughly one man-year, according to Arthur, but he feels the added security justified the investment.

The Forest Service runs CEO at 600 sites, where 2,500 employees use it for tasks like data analysis, decision support and data base management.

Another user firm in Washington spent a great deal of time and money getting security up to par on Wang Laboratories, Inc.'s Wang Office integrated OA system. The Federal Systems Division of Input Output Computer Services, Inc., a consulting firm, had installed Wang Office on a networked configuration



"You can't really know what your office system's vulnerabilities are until you have the system in place."
— Jack Arthur, U.S. Forest Service

of three VS 100s and one VS 300 in July 1984.

Afterward, the division's program manager, Kieth Fogleman, discovered what he considered serious security problems. "Security within Wang Office itself is very [illegible]," Fogleman says.

"Unless you make a specific notation every, nobody can delete your files. You can put levels of sensitivity on your electronic messaging and mail," he explains.

Unfortunately, he says, security drops off badly when unsupported data processing and word-processing applications on the VS run off the mainframe. This posed a large problem for his firm, which devotes about 80% of its system time to DP tasks.

In order to get the proper limitations and audit trails that Fogleman deemed necessary for word processing and data processing, Fogleman had to force it into place with [illegible] software. Fogleman finds Office

Kelleher is a Boston-based free-lance writer who specializes in high technology.

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With these programs layered between the operating system and the applications, Fogleman says he feels a comfortable amount of control over system security. The price for control was high, however.

In order to obtain the security he says should have been built in from the start, Fogleman had to pay license fees to two extra vendors. He also had to transfer 40,000 documents and re-educate more than 1,000 users. The re-education proved especially difficult. Users had become comfortable with the system and resisted change, Fogleman says. "No one is going to be happy about having new controls imposed after they've gotten used to operating in a certain way."

Still other user companies have discovered that despite their efforts to expand security features, integrated office automation systems remain vulnerable because of employees' attitudes. Few system deficiencies represent a threat as great as staff members' lax views of security.



"The first thing that you run into with a pervasive office automation system is a behavioral problem that shows up particularly in connection with electronic mail," says Scott Teissler, director of systems at Spectrum Services, a telecommunications consulting subsidiary of Pacific Telesis Group located in Walnut Creek, Calif.

Spectrum makes extensive use of Digital Equipment Corp.'s All-in-1 integrated office system for electronic communications among 150 staff members in six locations throughout the country, so Teissler has had ample opportunity to observe the phenomenon he refers to as "the electronic mail hazard." The hazard, according to Teissler, lies in the fact that people do not alter their habits when they move from paper office communications to electronic ones.

"They don't increase their discretion when a switch is made to an electronic environment, where communication is not only easier but also much more widely circulated," he says. "Messages go out over an office system that wouldn't be sent if that system weren't there, and some secrets that would otherwise be kept no longer are."

Sensitive information gets circulated in ever-broadening and nearly untraceable patterns, as users copy portions of documents into other documents and store originals and copies in widely dispersed files, Teissler adds. "Regardless of what systemic protections you've got to keep information secure, this kind of wide dispersal is a hazard."

> ***'You can't force a security policy down users' throats without considering whether it makes sense to them or how it affects the way they work.'***
>
> — Jerry Michael, Grumman Data Systems Corp.

Getting personnel to understand the reality of how an integrated office system changes the impact of their work habits may be the most important security issue of all.

Obtaining meaningful participation from users in maintaining the security of an integrated office system requires more than simply laying down a new set of rules, according to Jerry Michael, assistant manager of integrated professional systems at Grumman Data Systems Corp. in Woodbury, N.Y.

"You can't just force a policy down users' throats without considering whether it makes sense to them or how it may affect the way they work," Michael says. "Any company that tries will find out how worthless that approach is."

Instead of imposing rules arbitrarily, he says, companies that feel concerned about security should educate users about the risks and draw them into process of drafting a corporate security policy.

That was the approach at Grumman Data Systems, where Michael estimates that between 2,000 and 3,000 users rely to some extent on more than 30 installations of integrated office systems from Wang, DEC and IBM.

Michael's group recruited key users from every department to help formulate a realistic program for the protection of data on integrated OA systems.

The result, he says, was "a policy that not only made sense from the corporate point of view but was something users could live with."

Despite all that a company might try in its efforts to educate users, however, experience is sometimes the best teacher. After the breach at the Forest Service, for example, employees understood the potential for trouble and acted responsibly.

"In our case, it was somewhat easy because, from relatively early on, we could cite a case where a breach had actually happened," Arthur says. "So, although I hate to say it, I guess it is good if a minor incident does occur, because it brings some reality to the discussion."



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AT A GLANCE

SPERRY

Sperry Corp.'s Sperrylink is younger than many other integrated office automation products, and it has some catching up to do in meeting industry communications standards. Still, it offers most typical office applications and supports voice integration. In addition, the firm's UTS 30 terminals provide a good platform for DP as well as office automation.

Continued from page 44

manager Dan Eubanks, but the system has its drawbacks.

"One of the most difficult things is the variety of formats," Eubanks says, noting that Profs' word processing is not compatible with IBM's Displaywrite word processing software, which Fireman's Fund operates on the Personal Computers, or with Displaywrite/370, which the firm runs on the 8100s.

In addition, managing directories over multiple computer systems tends to be difficult because senders need to know receivers' user identifications. The master directory resides in Disoss and must be transmitted weekly as a document to users, who create their own distribution lists. Because the information is a document and not a system file, there is no way to incorporate the master directory into the electronic mail system.

To make other aspects of the system more user-friendly, Eubanks' staff created a master menu that allows users to move among applications without logging off the system. The programming department is also working on a program that will let managers specify who can look at their mail messages without giving out their user names and passwords.

"Some people who felt they were above using a terminal have been giving their user names and passwords to their secretaries," he says. The practice produced a serious breach of security, because it allowed unapproved access not only to OA tasks but also to DP applications.

Eubanks hopes IBM will offer an integrated directory management system as a future enhancement. He also wants to know the future of the 8100, which IBM is reportedly phasing out of its product line, because he says the System/36 — which IBM suggests for departmental OA — is a weak alternative.

"We looked at System/36, and we found that it would take multiple System/36s to replace our 8100s," he says. "Now, our largest 8100 accommodates 125 users, and the System/36 can only manage 20 users."

Eubanks would also like to see improvements in the Profs bridge to Disoss, including the addition of a library management facility. IBM is reportedly working on such enhancements as well as new developments in image processing technology. The firm is also expected to support voice under the Disoss library.

Like many IBM users, Eubanks is content to wait and see what the company will come out with rather than move to another vendor. "We may be ready to do some things sooner than they are, but we don't like the idea of ending up with equipment from 500 different manufacturers."

Sperry's Sperrylink: Support for OA and DP

Sperry's Sperrylink provides a full list of standard integrated office system applications. The software runs on 1100 series mainframes, which users can access either through UTS 30 and UTS 40 terminals or with Sperry Personal Computers in terminal emulation mode. In addition, the terminals and PCs can be linked through Sperry's departmental Distributed Office Processing Stations.

With a Personal Information Connection, IBM PCs can also gain access to Sperrylink in terminal emulation mode. Sperry's Microsoft Corp. MS-DOS-based Personal Computers can be connected as a workstation in an IBM network.

A Diskette Subsystem and Sperrylink Document Reader are also available for the UTS terminals, which supports voice integration through Sperry's Voice Information Processing System (VIPS).

Sperry is moving toward making its office products more compatible with industry communications standards and with IBM through Disoss, according to Howard Kearns, director of Sperry's Office Information Systems Division. "We are offering a proprietary system as a beginning place for us," Kearns says. "Office systems are a new venture."

Kearns admits that Burroughs Corp.'s recent acquisition of Sperry may affect Sperry's product strategies, but he cannot say how. "We will continue to support our customer base," he insists.

Even though the future may bring change, some users prefer Sperry's young line to other, more mature integrated OA systems. The City of Scottsdale, Ariz., for example, chose Sperry from among eight vendors, including DG, DEC and IBM, accord-

Continued on page 50

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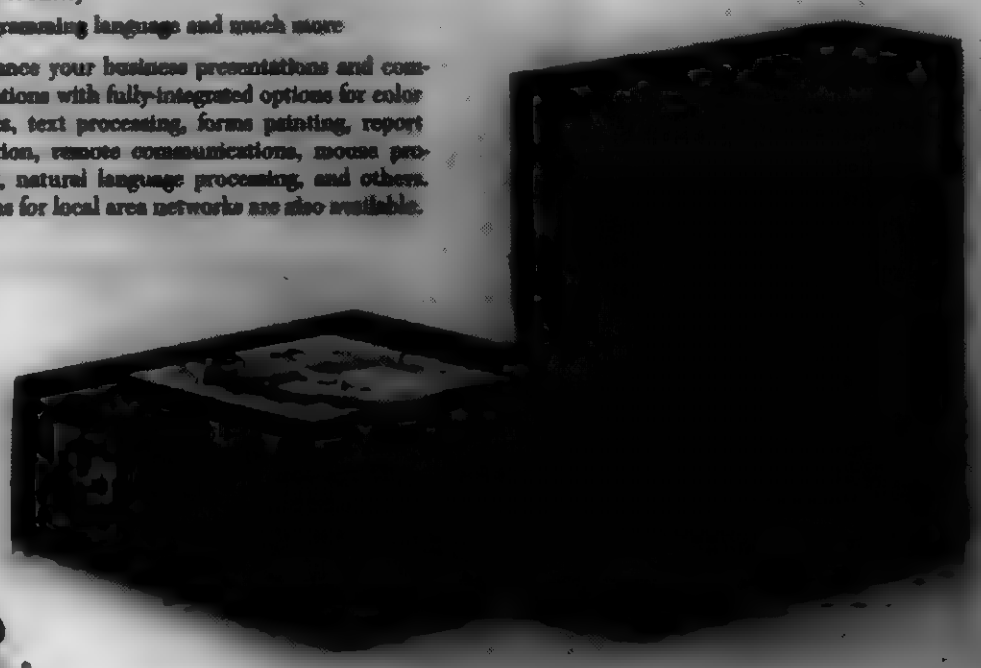
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Integrated OA vendors bow to PC's enormous popularity

Micros gain access to mini, mainframe tools

Integrated office automation system vendors are becoming reluctant recruits in the personal computer revolution.

Faced with the loss of countless corporate desktops to the IBM Personal Computer and compatibles, companies with a significant share of the office market are providing PC access to their mainframe- and minicomputer-based systems.

Users of IBM PCs can now access integrated office applications in modes ranging from terminal emulation to rudimentary bidirectional communications in a large system network.

With a well-established installed base of word processing equipment, Wang Laboratories, Inc. is the vendor that has been most strongly affected by the popularity of the Personal Computer.

"The popularity of Personal Computers forced us to evolve an IBM PC strategy," according to Edward McHugh Jr., Wang Office product manager. "It caused us to open Wang Office and redirect our thinking toward an open architecture desktop."

> ***Users of IBM PCs can now access integrated office applications in modes ranging from terminal emulation to rudimentary bidirectional communications.***

For more than a year, Wang has focused on selling Wang Office software for use on other vendors' equipment. Its first move came in January 1985 with the introduction of the Local Office Connection. The product allows IBM Personal Computer XTs and ATs to operate as workstations attached to Wang's VS hosts. The connection allows the downloading of applications, such as word processing, and gives the Personal Computers the ability to work with other VS peripherals.

Wang plans enhancements that will allow data conversion, local disk drive storage and possibly windowing between the VS and PC environments. The disk drive capability will be introduced next month, but no date has been set for the other announcements.

Wang also markets a micro, the Wang Professional Computer, and offers the PC Office package, which resembles Wang Office. PC Office also connects multiple Professional Computers with each other and with the Wang Office system. The Professional Computer is not compatible with the IBM PC.

Data General Corp., another traditional OA vendor, is taking a different tack. Coming from a minicomputer-based environment, DG is relying on the open architecture of its Comprehensive Electronic Office (CEO) software to accommodate IBM Personal Computers.

"The personal computer did not cause us to change our thinking from the software point of view," says Chris Stone, CEO project manager. "We've always had an open architecture."

PC users can access CEO applications through CEO Connect, which works with the Microsoft Corp. MS-DOS operating system, and can download certain applications such as word processing or spreadsheets. The downloading is menu-driven, and the move from CEO's native operating system to MS-DOS is transparent to the user.

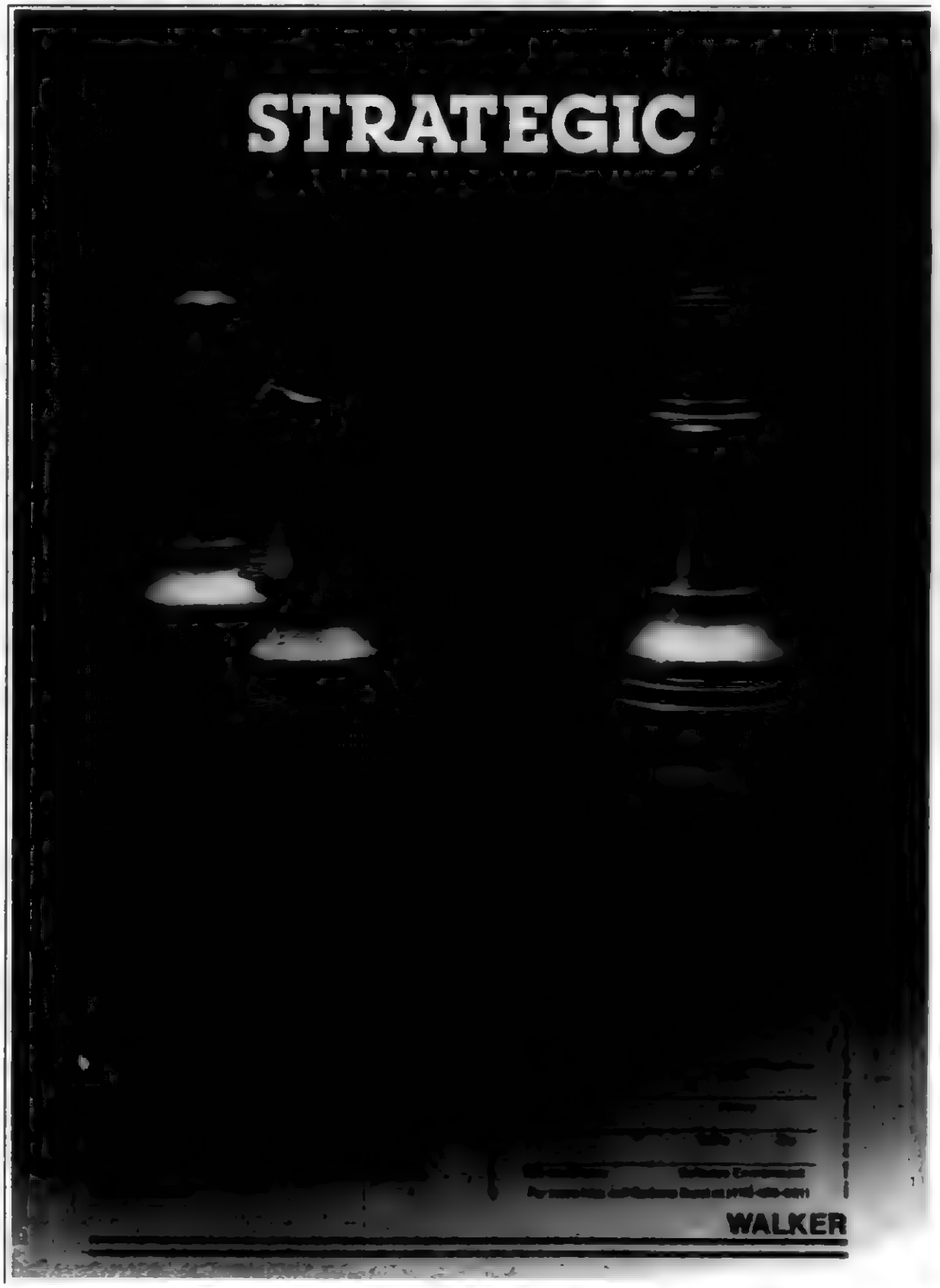
Just as Data General's approach to the IBM PC resembles its applications-driven OA strategy, Digital Equipment Corp.'s connections with the PC world mirror its tightly networked approach to office automation.

"Five years ago, everyone in the industry was surprised at how quickly the PCs were absorbed," according to Dick Loveland, manager of product planning for DEC's office and information systems. "But once it started to flow, it was integrated into what we were doing."

In April 1985, the company introduced Decnet-DOS, a network option that opened DEC's VAX-based architecture and allowed IBM PCs to access DEC's All-In-1 functions. The connection allows the PCs to communicate with hardware throughout the network. Users can move documents, access files and create and send mail across the system.

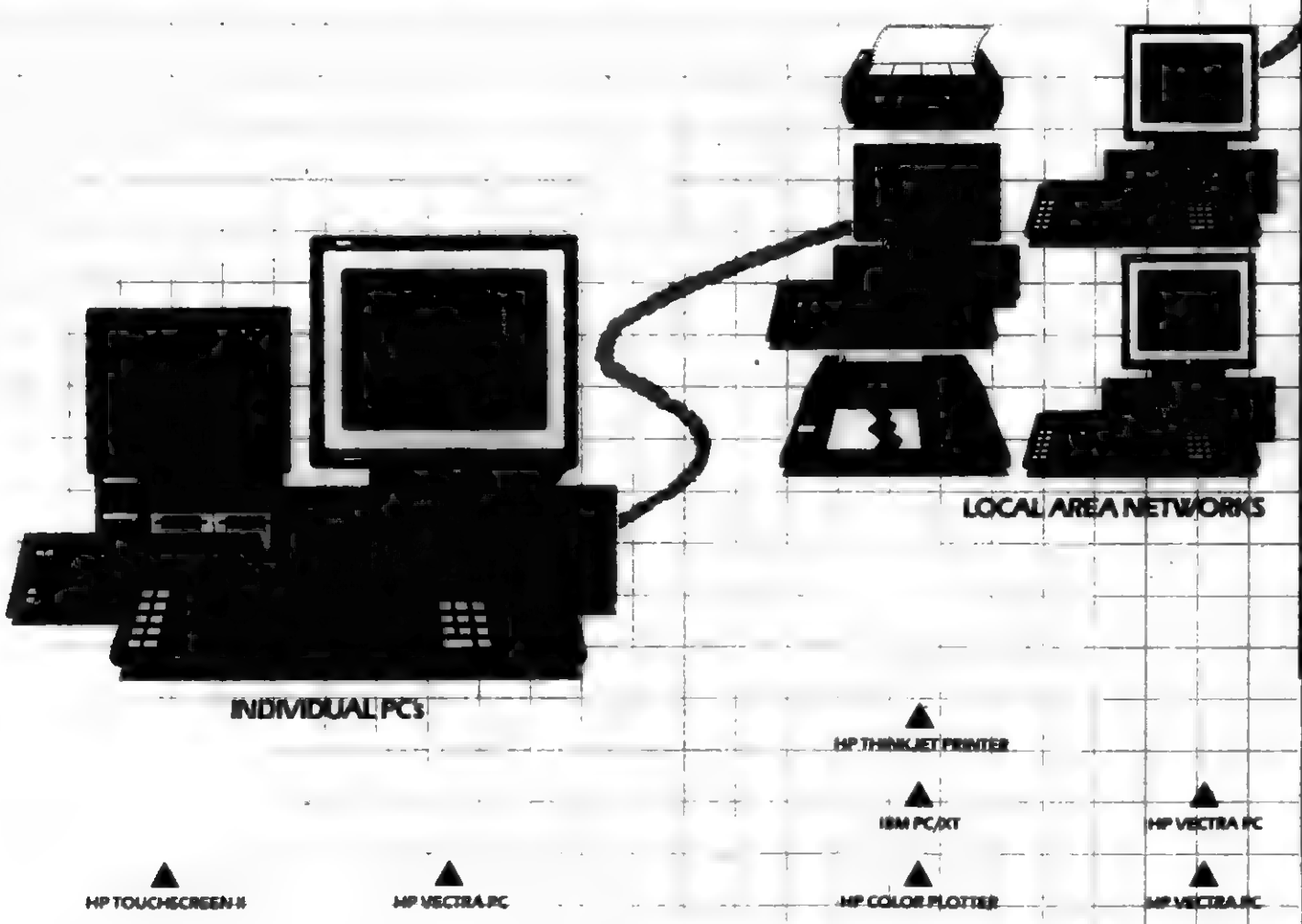
WPS Plus, DEC's main word processing software, debuted in an IBM PC version in October 1985. Decnet and WPS Plus options are also available for DEC's Rainbow personal computer.

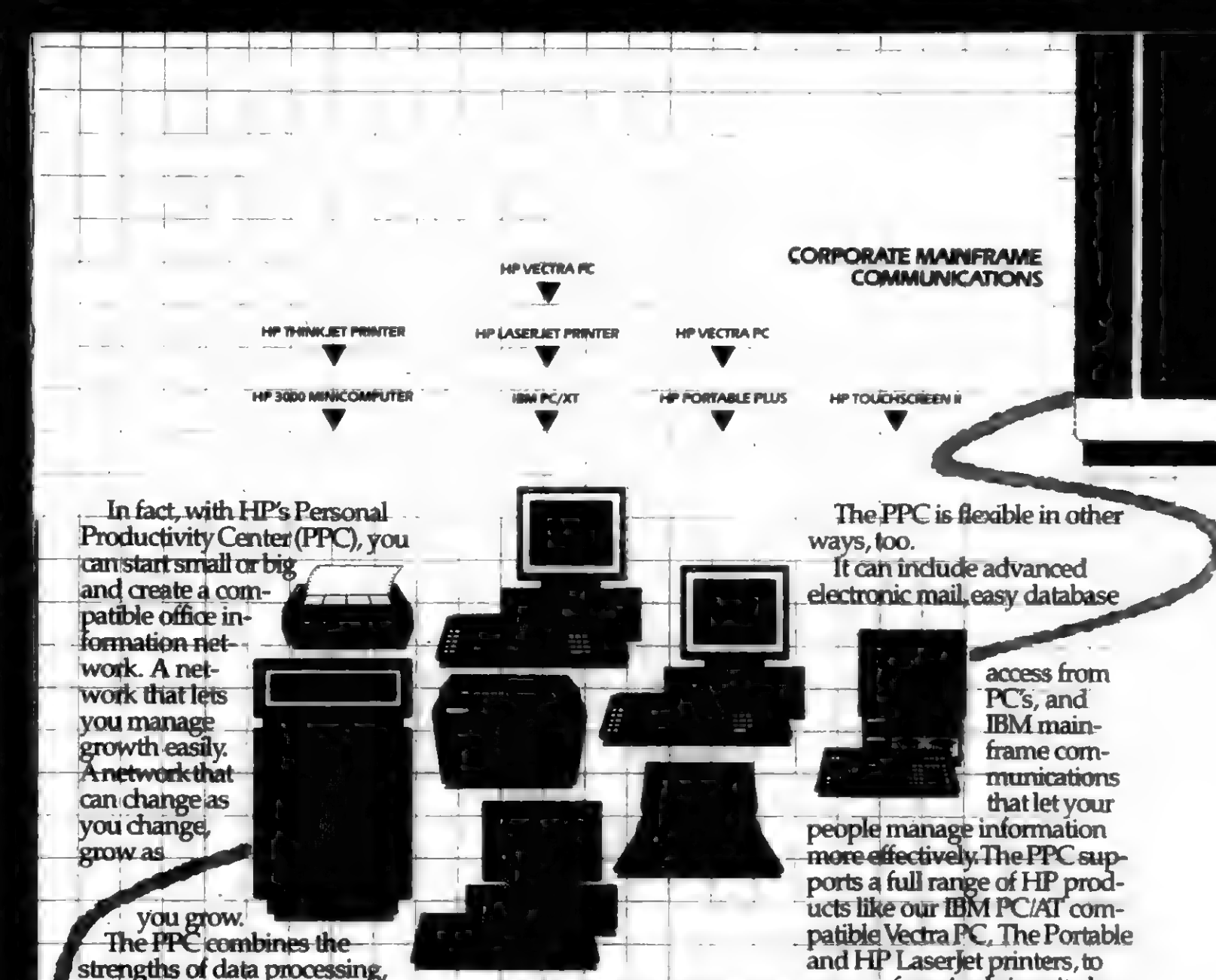
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Continued from page 46

ing to Jeff Denning, manager of systems administration. "Part of our specifications were not only for office automation types of applications, but also for on-line data processing," he says. "Sperry provided a terminal that did everything."

Scottsdale runs a Sperry 1171 processor, which acts as a host for 150 UTS 30 terminals that provide access to the full list of integrated office automation applications and third-party software on the Sperrylink system. The city has also installed Sperry's VIPS voice system.

Denning notes only one drawback of the Sperrylink system: To allow the distribution of software from the host, users need to install diskette drives underneath their UTS 30 terminals.

Hewlett-Packard: Betting on PCs

Hewlett-Packard, another latecomer to the game, approaches the office by focusing on the personal computer and providing functionality beyond terminal emulation. Its electronic mail application, for example, allows users to communicate through a network without having to switch out of personal computer mode.

"You can continue to use the personal computer as a stand-alone device," according to HP office systems group spokesman Bob Kadarauch. "A lot of office systems started out as basically terminal-based word processing systems connected to the host," he explains. "We wanted to be able to mix and match personal computers and terminals."

HP's system, the Personal Productivity Center, provides links between office capabilities and data processing applications. It includes software packages such as the HP Deskmanager, which provides electronic mail and word processing. Future plans include further integration of personal computers and a new release of HP Deskmanager

Continued on next page

AT A GLANCE

HEWLETT PACKARD

Hewlett-Packard Co.'s Personal Productivity Center, a latecomer to the game, focuses on the personal computer and allows users to communicate through an office network without switching to terminal mode. HP offers most typical office applications but has far to go to make its PC-based strategy competitive with the integration and connectivity of the minicomputer vendors.

Conferences offer assistance

Managers who want to learn more about today's integrated office automation systems may find the following events helpful.

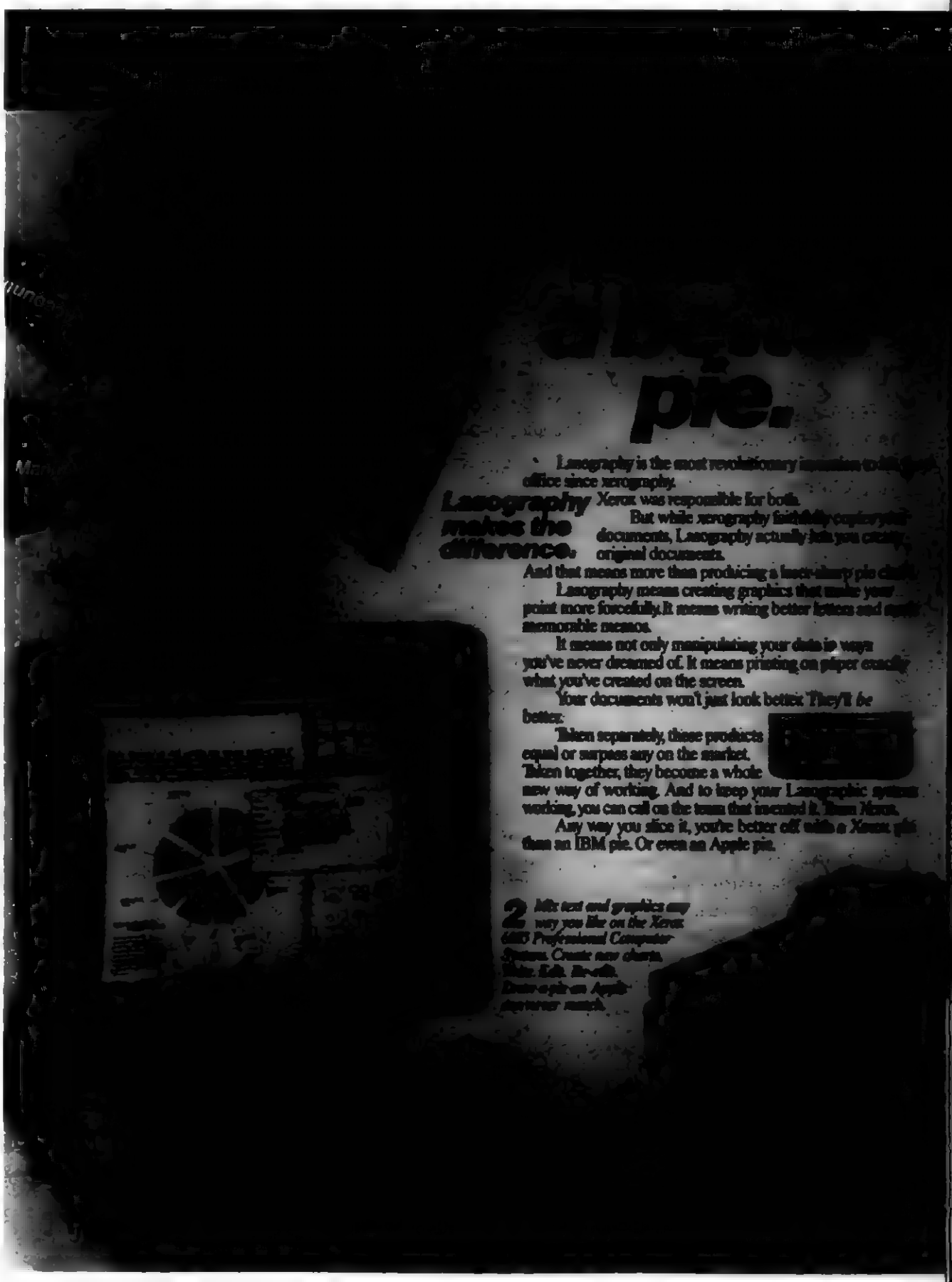
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OCTOBER 6-9, NEW YORK — **Information Management Exposition and Conference.** Contact: Cahners Exposition Group, P.O. Box 3833, Stamford, Conn. 06905.

OCTOBER 14-16, WASHINGTON, D.C. — **National Office Automation Conference.** Contact: National OA Conference, P.O. Box N, Wayland, Mass. 01778.

OCTOBER 15-17, WASHINGTON, D.C. — **Federal Office Automation Conference.** Contact: National OA Conference, P.O. Box N, Wayland, Mass. 01778.



AT A GLANCE

Honeywell

Honeywell, Inc. has traditionally been strong in multivendor connectivity, and recent ISO OSI and SNA connections have added to its strength. In addition, the firm has recently introduced its ONE Plus integrated office-automation software, which combines popular data processing and OA functions. ONE Plus supports the IBM Personal Computer and gives it the ability to exchange revisable documents with other systems.

Continued from previous page

next month. It is set to include time scheduling and calendar capabilities.

Honeywell: A new direction

Honeywell, one of the more experienced vendors in the market, signaled a new direction on June 3 with the announcement of a line of 32-bit minicomputers and the Office Network Exchange (ONE) Plus, an integrated OA system [CW, June 9]. ONE Plus is designed similarly to All-In-1 and CEO and is expected to become a significant competitor, particularly because of Honeywell's strong focus on multivendor connectivity.

The announcements included the following:

- The first two members of the DPS 6 Plus line of 32-bit virtual memory minis.
- ONE Plus, a modular system combining previously available office applications with a new, common menu-based interface. ONE Plus runs on the DPS 6 under the GCOS 6 operating system. The package is initially being marketed with file management, electronic mail, time management and document processing applications.
- The Onexchange Document Library, which allows users of different vendors' systems to exchange information and collaborate on document creation.
- Onebase, a departmental data base that runs on the DPS 6. Using Oracle Corp.'s Oracle relational data base management system, the application lets IBM PCs and compatibles query Honeywell and other mainframes and minis. Oracle's system also acts as a bridge to mainframe and mini data bases.
- Onelink, an enhanced IBM Disoss connection, which is scheduled to become available in early 1987.
- An enhanced SNA gateway and International Standards Organization (ISO) Open Systems Interconnect (OSI) connections, as well as an expanded Ethernet link, including a local-area networking capability for attaching Honeywell's Personal Computers and IBM PCs with a network card.

The first group of ONE Plus products, including electronic mail, document processing, time management, spreadsheet, list processing and asynchronous communications, will be available in September. Onexchange and Onebase will be available in December.

ONE Plus and its companion introductions represent Honeywell's continued focus on communications, but they also signal a strong move into the integrated applications environment and toward additional multivendor connectivity.

Even before these announcements, the company boasted a common operating system and hardware environment and claimed one of the largest SNA networks in the non-IBM environment. Moreover, its DSA architecture was a precursor for the ISO OSI model, according to David Cleary, vice-president and general manager of office marketing systems at Honeywell.

"The market is playing to our inside cards," Cleary says. "We've tried to pick what would become standards and make them accessible in our environment."

This effort has included the integration of popular software packages, including Oracle. Enhancements in the areas of artificial intelligence and the integration of voice and image processing are also in the works. ■



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In Depth

Anatomy of a master programmer

Computerworld's Executive Report recently profiled four master programmers. Now read how to become or manage the best.

By ROGER SOBKOWIAK

The April 7 edition of *Computerworld* carried a report summarizing interviews with four "master" programmers: David Achmann of Monsanto Co., Jeff Gibbons of Palladian Software Corp., Jim Miller of Arthur Andersen & Co. and Dan Bricklin of Software Garden, Inc. Each of them, with a mix of technical skills, knowledge base and career route, has risen in different organizational settings to be singled out as an exemplary model of programming excellence.

These lengthy interviews revealed a number of clues about the "right stuff" of master programmers. What follows is an analysis of the ingredients of that right stuff, for their success can be duplicated by others.

Readers can perceive from the interviews specific behaviors that master programmers drew upon when they were successful. Why concentrate on the behaviors? Because so often how you do something is critical to whether you get it done at all.

For example, a certain systems analyst had all the credentials for a specific job: the right project experience and the right programming skill. But he just was not effective on the job. Why?

Or perhaps the following scenario hits closer to home: You have to select someone to head up a project team. You know worker A is technically competent about all aspects of the work; worker B is less technically able but knows how to get around obstacles to get things done. Your management gut feeling tells you to choose worker B.

In both examples you were consciously or subconsciously dealing with behaviors. You knew instinctively or because of some training that there is a significant and important difference to recognize — even though you might not be able to articulate or describe the difference. You simply know that in the end, one worker will get the work done and another will not.

From each interview in the *Computerworld* article, direct quotes have been extracted (below) with an eye toward isolating some of the behaviors that enable the master programmers to perform in a superior fashion.

People management

David Achmann is "the problem solver." His competencies are derived from his comments and observations as follows:

Efficiency orientation. "I'd see people hanging around their plotters, trying to kill time while they were waiting for their hard-copy output."

Causal thinking. "I'm convinced that any time people have to wait to do something, there's a problem that could be solved."

Developing others. "If they're interested in programming as a career, it shocks them a little when I tell them it's more important to do well in English classes than to take a lot of math courses."

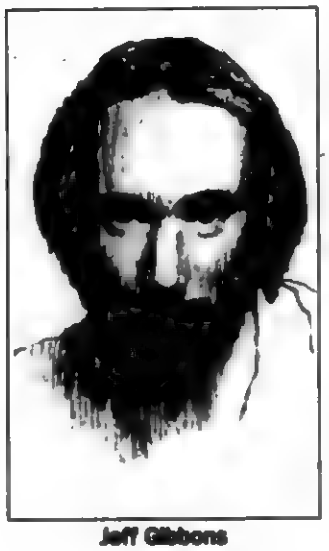
Interpersonal diagnosis. "You sometimes have to pay attention to what isn't being said."

Rational persuasion. "You usually

Sobkowiak is the founder of Software People Concepts, Inc. in New Haven, Conn., specializing in general management and human resources issues of MIS organizations.



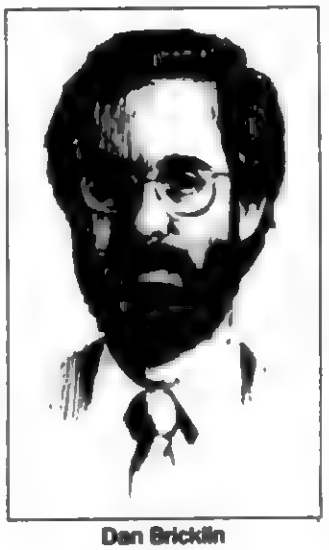
David Achmann



Jeff Gibbons

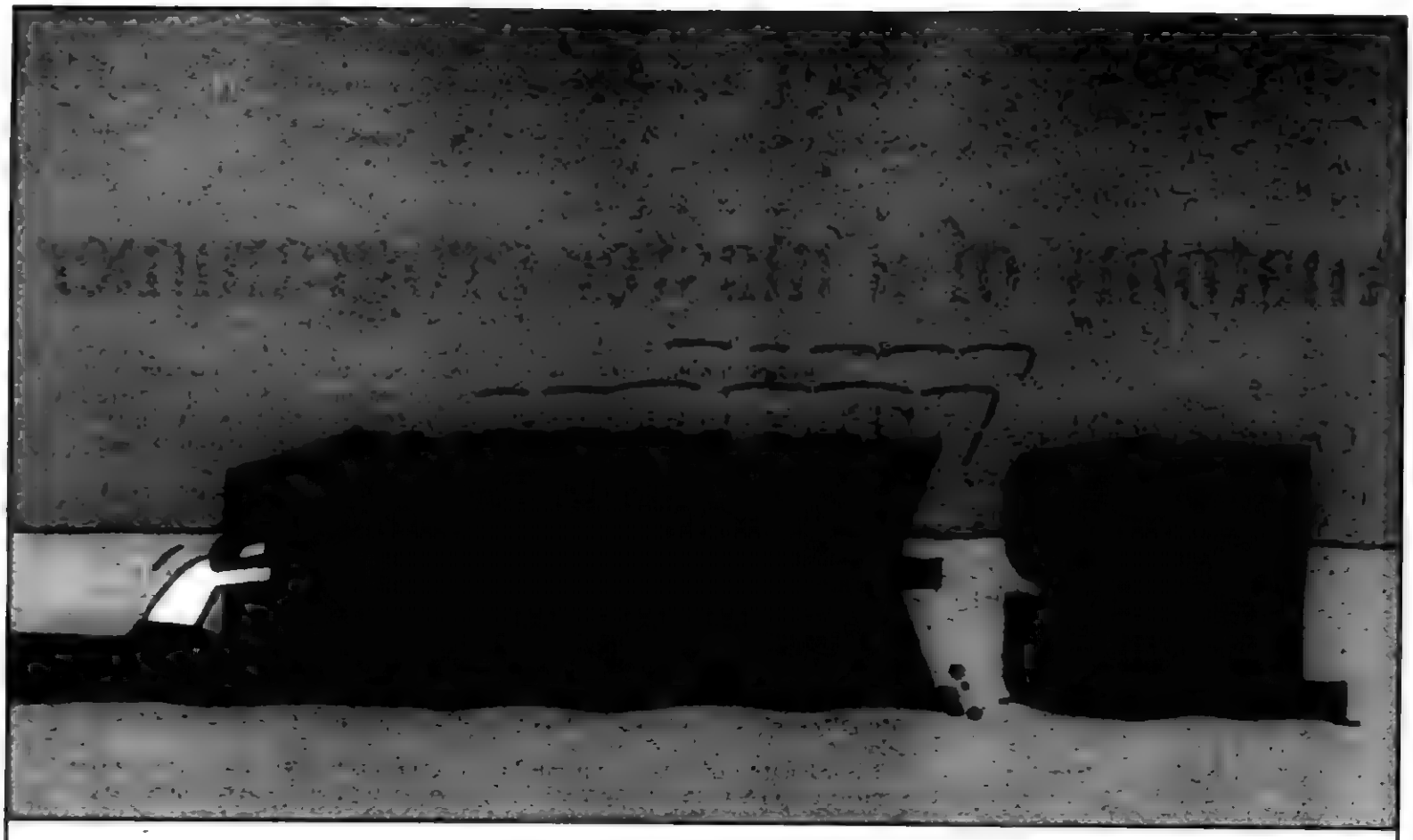


Jim Miller



Dan Bricklin

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have to sell the user on the idea that your solution is the right way to go."

Self-evaluation. "I've done some people management myself, so I know how hard it is."

Very involved

Jeff Gibbons is "the trail blazer." His remarks and competencies show a get-ahead attitude:

Problem involvement. "I tend to get involved in just about every aspect of the system."

Personal role power. "So the ideas come out the way I want."

Personal commitment. "We're all working this hard because we're creating something new and important."

Results orientation. "I'm the kind of person who gets frustrated when I can't see tangible results."

Self-evaluation. "What you think about performance bottlenecks on a project like this often turns out to be completely wrong."

Efficiency orientation. Gibbons is already beginning to think about redesigning a financial product's entire internal system "so that it won't be as hard to build other products."

Coping well

The "project manager," Jim Miller, leans toward managerial roles, according to his interview statements:

Self-confidence. "Now we have a lot of credibility."

Coping with ambiguity. "If you asked who works for whom, you'd probably get 13 different answers. The organization really depends on what we're working on at the time."

Efficiency orientation. Project members must document what they do, "so individuals don't lose a week of their time because somebody else made an unannounced change."

Personal role power. "Finally, over Christmas, I set him loose. He whipped through it in about four days."

Conceptualization. "People do their best work when they have a major upheaval in their lives every three years or so."

Clear thinking

The "entrepreneur" is Dan Bricklin, whose comments show a creative, winning attitude:

Concern for impact. "Too many good programmers in large companies end up in obscurity."

Conceptualization. "I thought, wouldn't it be nice if we had an electronic blackboard?"

Bricklin sketched out what he thought the human interface for his visible calculator should look like, "then I tried to figure out how to make it work."

Analytical thinking. "But I happen to like creating small, very personal tools. And I've noticed that a lot of the biggest hits in personal computer software have been put together by one person."

Concern for clear communications. "What the prototype should let you do is get across the core idea that distinguishes the product. The key to this process is usually only about one page of code."

High standards. "If you really want the job to come out right, you spend the time at the beginning figuring out how to do it."

Use of analogies. "If you take a good football team and put them on a basketball court, they're not going to score well until you show them how the game is played."

> ***The goal is to make the desired behaviors habitual. At the beginning, gimmicks, crutches or reminders can help activate the process.***

The question is, If you aspire to be a master programmer, how do you develop and manifest the behavior of a master programmer?

Cause and effect

As an example, let's assess the competency called "results orientation." By definition, results orientation is concern with attaining concrete outcomes within established deadlines and planning activities in order to achieve goals on time. Typical behaviors growing out of a results orientation include the following:

- Pushes self and others for results.
- Talks about work activities in terms of concrete results.
- Establishes and works toward deadlines or milestones.
- Develops a clear game plan for achieving results.

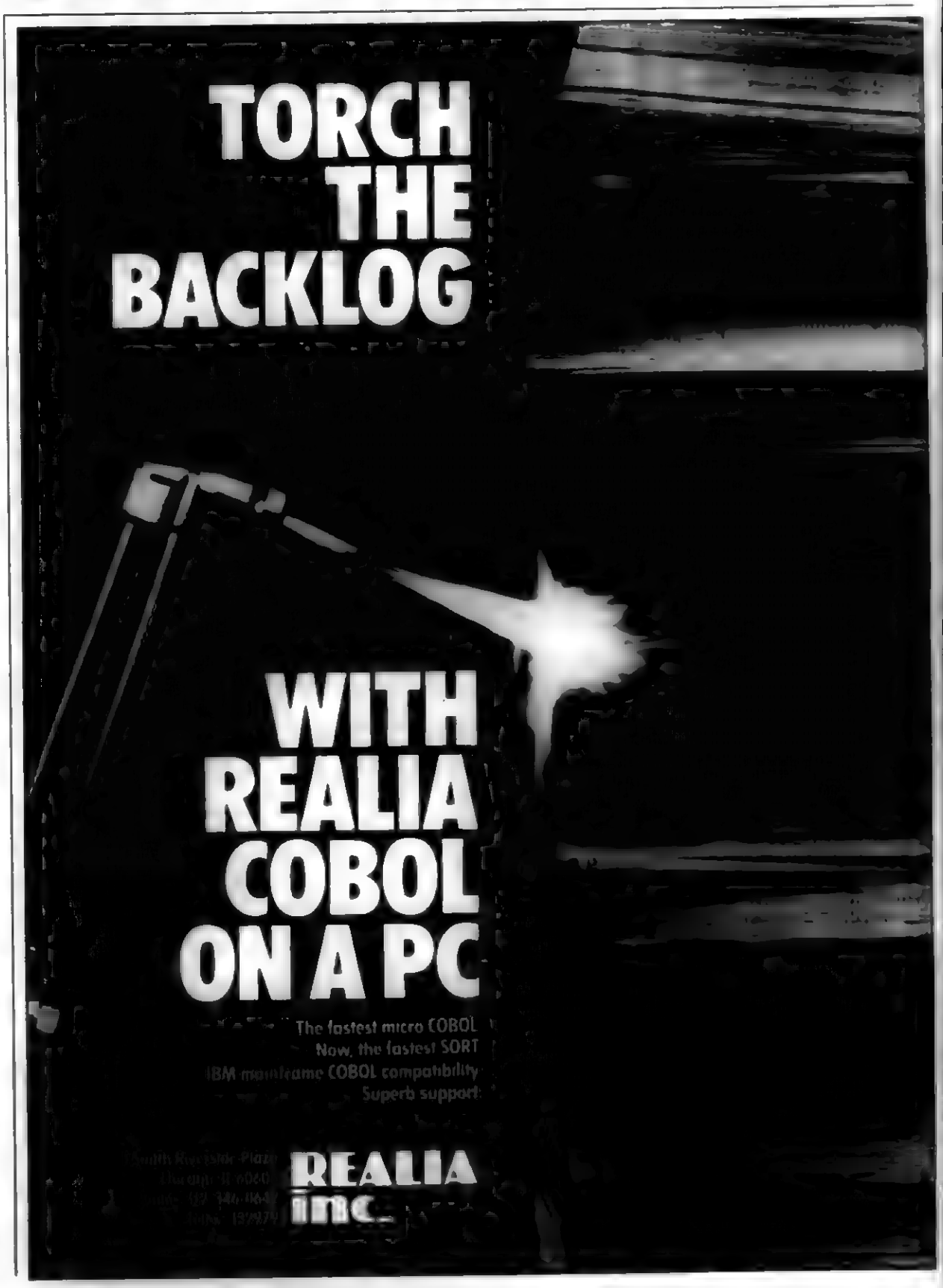
Four concrete actions come to mind as suggestions for anyone seeking to develop this competency — again, using results orientation as an example of a competency that you may wish to acquire. First, discipline yourself to write down goals and objectives. Then offer target dates and milestones to your manager before they are requested.

Third, stand back from a project you are currently involved in and ask how others are contributing to the accomplishment of the goal. Last, for a week, maintain a diary of daily distractions that take you away from a project.

You have what it takes

For any competency, you should be able to come up with a definition, examples of typical behaviors and examples of how those behaviors might be tested, applied or played out in your own work situation.

The concept of competencies



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comes from the applied research of David McClelland, the noted Harvard University researcher. McClelland's fundamental premise is that all successful performers in a specific job tend to call upon and use the same skills, knowledge and behaviors. By watching the people who are successful, we can isolate the behaviors that lead to successful job performance and mimic them.

McClelland notes that most people are capable of the behaviors; some just tend to demonstrate them more often, and that accounts for their enhanced success compared with their peers. Therefore, in reading about the master programmers, you must know that you, too, have the right stuff.

While these behaviors may be latent or underdeveloped, with a good road map you can begin to use them more frequently. By using the competencies identified in the master programmers, you have a good road map for starting to think about your own performance.

Establishing habits

The goal is to make the desired behaviors habitual. At the beginning, gimmicks, crutches or reminders can help activate the process. It is somewhat like weight-loss programs in which people eat less, eat the right food and eventually change their eating habits. The last is often the most difficult, because it involves how people think about food, and thinking patterns are tough to reform.

By the same token, to aim work behaviors toward success takes a concentrated emphasis. As in Weight Watchers or Alcoholics Anonymous, the more support an individual receives from peer groups, managers and the organization as a whole, the faster and more lasting the behavior changes can be.

A simple exercise can put you in touch with why change is difficult. Fold your arms. Note which arm is on top. Now unfold and refold your arms, placing the other arm on top. Notice how it feels: uncomfortable, conspicuous, silly, not normal — just not right. That's a simplistic way of demonstrating how difficult it will be to change established behavior.

New behaviors will feel uncomfortable at first, but after time they will become easy. Probably at the outset you will need to exaggerate the altered behavior and then take a good look at it. Supporting gimmicks often help in these early stages. For example, dieters post messages for themselves on the refrigerator, exaggerating and reporting behaviorial modifications.

In an organizational setting, a staff member, manager and organization can work together or independently to foster competency development. All three working in harmony is the ideal state . . . although in practice it is rare. However, lack of corporate harmony is not a good reason to let the individual off the hook if he truly wants to move toward successful behavior.

Expectations

It is the job of the MIS director and the personnel department to communicate and make very clear the expected levels of performance for employees. Superior performance must be defined and articulated — not in generalized "motherhood" statements but rather in behaviorally anchored statements.

For example, if the MIS director wants his staff to relate better to customers (end users), he might exhort his staff:

"I want to see you in customer meetings, as invited participants of customer task forces, perceived as value-added thinkers whom end users call upon."

With this strong statement, the director specifies the behaviors that he believes are mandatory for someone to exhibit the competency of customer orientation.

For any job description, an organization needs to spell out three dimensions: knowledge, skills and competencies required for successful or superior performance.

Most forward-thinking companies do a good job of explaining knowledge and skills, but they do a less-than-adequate job of defining competencies, that is, how to do the job.

Dramatic shifts in the organization, although infrequent, offer a powerful means of setting and achieving obvious competency goals. For example, establishing within an MIS



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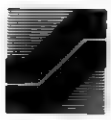
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organization a group dedicated to end-user relations would surely imply to the staff, "This is important, and it's different from what we have been doing. This takes a special set of knowledge, skills and competencies."

What to watch for

As an individual who wants to develop, you can take specific steps to help yourself. You should pay particular attention to certain factors:

1. Assignments you take: Do they stretch your competency repertoire?
2. Whom you work with or for: What role model is available?
3. What you read: What nontechnical reading is important?
4. Meetings or conferences you attend: Have you ever attended a non-computer industry conference?
5. Peer feedback: Do you ever ask your fellow employees for feedback?
6. Think about when you are successful and carry out a self-audit of your behaviors: Can you get in touch with what you are doing?
7. Practice in a safe environment: Do you create opportunities to change?
8. Set high standards for yourself: Can you choose something that you want to be the best at?
9. Be attentive to other perspectives: Can you look at the next problem you tackle from the end user's shoes?
10. Enlist your manager's support: Are you aggressive in getting your manager to help you?

This discussion has purposely been an overview of competency identification and development. For any one competency, we could take all the examples and questions above and direct them to developing a specific competency. That is really what you need to do once you take an audit of where you are and set a goal of where you want to be.

> ***"The important thing is to view achieving a desired change as a multifaceted, continuous, frontal attack."***

It is highly unlikely that the four master programmers used a well-defined process to establish goals and map out a strategy to get there. Maybe they did this intuitively and never were asked to write down how they approached their own career development.

In any case, all of us who want to improve and succeed need to know that change is possible, and that there are things we can do to bring about the changes. A set of examples helps us to get there faster.

The initial *Computerworld* story contributed greatly to an understanding of the characteristics of master programmers. Now you have a better idea of how you or your subordinates can at least approach the idea of becoming masters at work. ■

Sow goals, reap masters on staff

If you are a manager, innumerable approaches can help your programming staff develop specific competencies and aspire to being programming masters. The last implementation tool you should reach for is a course.

Instead, to promote behavior changes, incorporate the acronym CRAM: coach, recognize, assign, mentor.

In addition, you should call upon a bevy of methods to communicate and reinforce the message about specific competencies that you feel are critical. These could include, but are not limited to, the following:

1. What your subordinates read, see, hear in their work environment.
2. What meetings, conferences and symposia you encourage them to attend.
3. Assignments (permanent or temporary) you give them.
4. What you talk about at meetings or in passing.
5. Content of performance reviews.
6. Who you want your staff members to meet.
7. What you recognize, value and reward.
8. What role models you provide.
9. How you make opportunities for subordinates to practice competencies.
10. How tolerant you are of honest mistakes.

The important thing is to view achieving a desired change as a multifaceted frontal and continuous attack. Bring in reinforcements from all sides to accelerate the process. Change in performance will come about by communicating, stressing and reinforcing those competencies that you know are displayed by superior programmers.

Encourage receptiveness

Because there will always be people who do not want to change or excel, resist the temptation to become discouraged by them. It is unrealistic to believe or expect that everyone will become a superior performer.

That mind-set prevents many managers from even beginning to encourage their staffs.

Instead, aim to encourage those who are receptive, who have exhibited some of the competencies some of the time.

With a little effort these staff members can substantially improve their performance — and consequently the output of the organization.

— ROGER SCHERKENBACH

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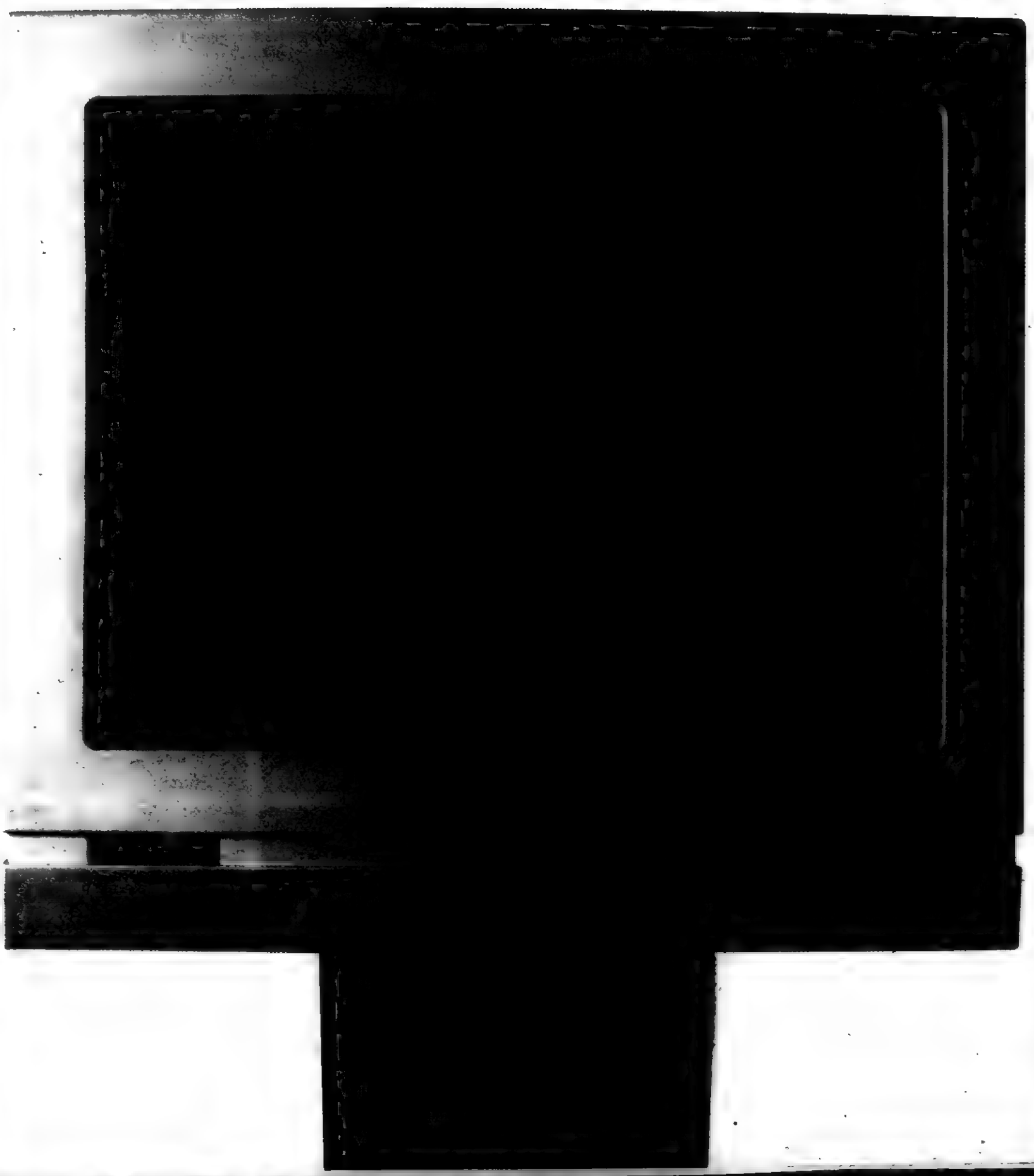
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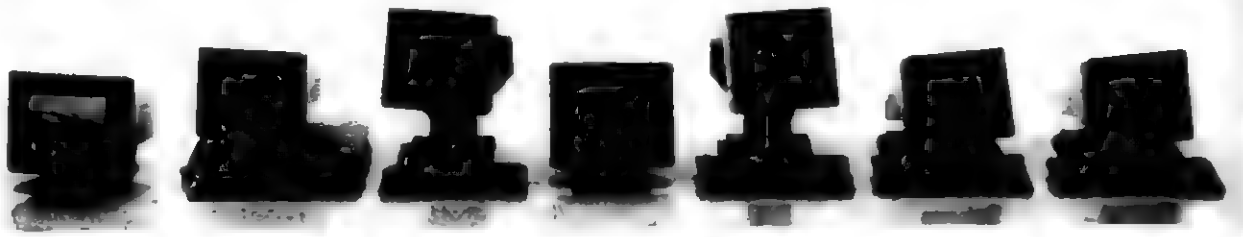
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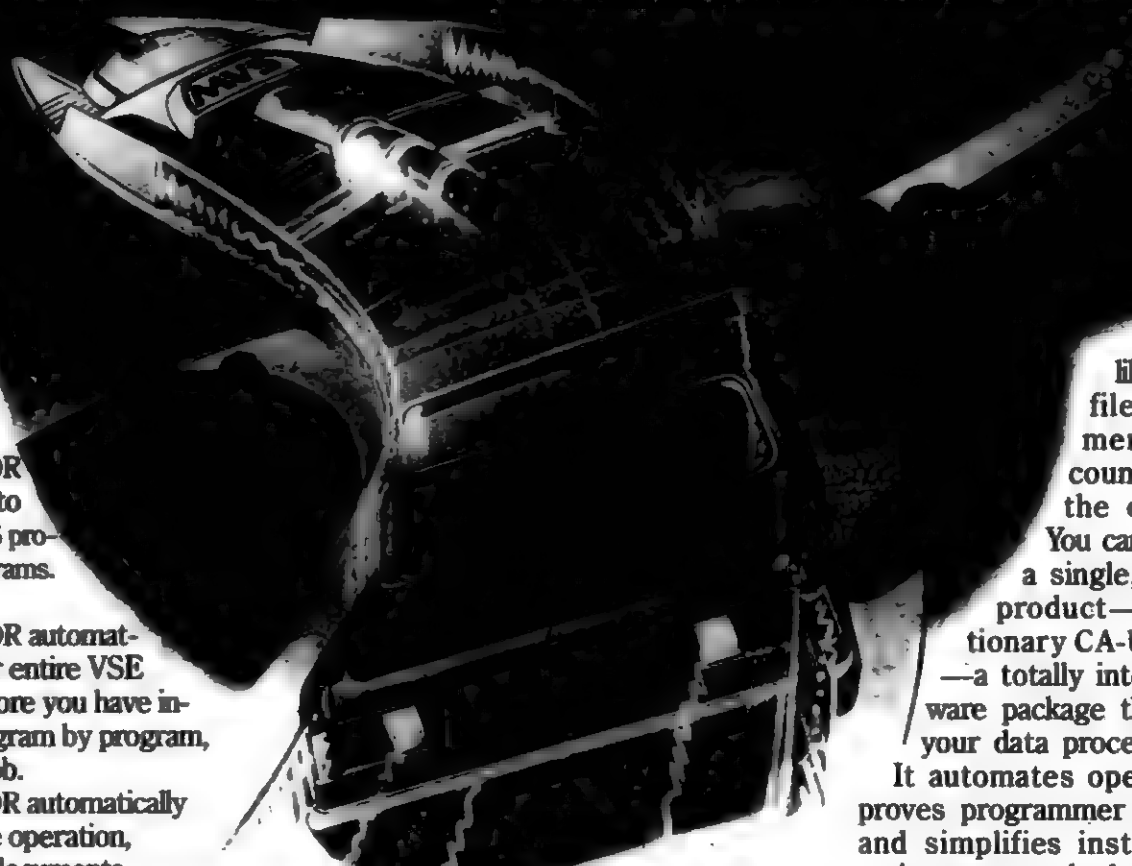
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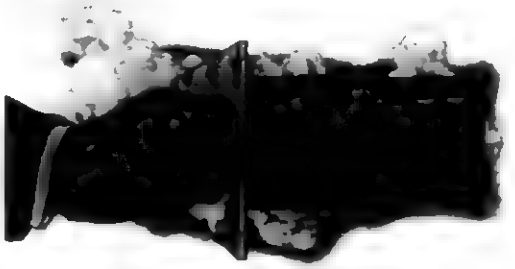


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In Depth

Struggling for harmony in writing applications

MIS seeks to control new applications; end users fight to write their own using corporate data. It's up to MIS to end the era of divided software development.



ILLUSTRATION BY CHRIS DEMAREST

By ERIC NEIKRUG

Powerful and contradictory forces are clashing in a battle to shape tomorrow's applications development environment in larger companies. To steer an organization on the path most appropriate and beneficial to it, the savvy MIS manager needs to understand and appreciate the technological forces and trends at work.

Depending on the relative strength of these forces and the response to them by large organizations, we can envision three kinds of applications systems development environments, or scenarios, for large organizations within the next two to five years:

- Highly centralized MIS control over all applications systems development, using both mainframe and micro development tools, for delivery to corporate and individual end users through a variety of mechanisms. We can call this centralized applications development.
- MIS controls the development and delivery of mainframe and corporatewide data and access to that data. But once end users have the data on a micro, they control the development of applications systems that manipulate that data. Let's call this centralized data access control with shared applications development.
- A continuation of today's divided applications development world, in which MIS controls mainframe and corporatewide applications on the mainframe but leaves end users to do their own thing on micros without any consideration for data integrity. Call this one trouble.

To a certain extent, the split applications development environment of today was forced on MIS. The rapid emergence of micros and micro applications software allowed end users to bypass MIS — for a while, at least.

Wave of the future

For the past year or two, however, MIS has started to more forcefully shape — if not control — end-user applications development. MIS now has a good chance to shape and also control tomorrow's applications development environment, but MIS management must understand and evaluate these technological forces and trends to be effective.

It is difficult to envision the third split applications development environment as the wave of the future. Large organizations simply will not tolerate uncontrolled access to

---

Neikrug is director of Nomad development for D & B Computing Services, Inc. in Wilton, Conn.

corporate data. There will always be individual end users developing their own applications, but these users will be limited to resident data.

So that leaves us with the first two scenarios, in which MIS has different levels of control over applications development. These environments share the concept of distributed application systems, which is a key point.

Larger companies increasingly emphasize data as a corporate resource. They realize that data must be made available to management at all levels — not just for control, as in the past, but also for anticipation of and rapid reaction to economic and market changes.

This growing emphasis on data as a corporate resource is the main reason that shared MIS and end-user development of distributed applications — in either of the two scenarios — is the wave of the future.

> ***Larger companies increasingly emphasize data as a corporate resource. They realize that data must be made available to management at all levels — not just for control, as in the past, but also for anticipation of and rapid reaction to economic and market changes.***

Micro as tool

Whether MIS has complete control over corporatewide applications development or end users develop their own applications for the use of MIS-controlled corporate data, the microcomputer will play an increasingly important role.

MIS will specialize in new corporatewide systems that take advantage of the need to distribute data — and the tools to manipulate that data — throughout the organization. It will continue to use the mainframe as the major development tool for the heart of such systems.

But MIS will use the micro for the development of the end-user portions of such systems. This offloading not only will speed applications development but will also reduce communications costs. Systems integration of widely used micro applications — with the aid of active data dictionaries and other applications development controls, tools and aids — will be conducted on the mainframe.

Where we are now

Currently, applications systems development is split into two camps. MIS personnel use terminals attached to the mainframe to develop the large corporatewide systems. End users, with their personal computers, control the development of most micro applications systems. These applications are primarily one of a kind, sometimes involving ad hoc reports or applications that have limited lives for individuals or small groups of individuals.

MIS sometimes aids end users in micro applications systems development, often through the semiautonomous information center. There is also a growing trend toward end users requesting MIS help in accessing complex corporate data bases. But for the most part, these two applications development environments operate quite independently of each other.

But this situation is likely to change. Why? Because technology, both mainframe and micro hardware and software, continues to change — rapidly — and the data processing needs of large organizations are changing as well.

Accelerators and brakes

Let's review some of the major forces — both positive and negative — that are affecting applications development on the micro. I call the positive forces "accelerators," the negative forces "brakes." Accelerators can be seen as forces for change and progress, brakes as forces that tend to preserve the status quo of applications systems development.

In some cases, a particular factor may appear as both an accelerator and a brake. For example, the perception of an untested technology as promising or emerging, on the one hand, can serve as a goad to change and progress among enlightened — or more daring — MIS management. On the other hand, the perception of more cautious MIS managers — who see only the absence of this technology — can serve as a brake or a deterrent to progress.

There are, of course, brakes and accelerators affecting applications development in general — regardless of the particular environment. The brakes include the following:

- The applications backlog: the need for MIS to improve programmer productivity, leverage its efforts or reduce software maintenance costs.
- The need for large corporations to provide real-time, standard data to several levels of management and to obtain, from different segments of an organization, real-time data in a standardized format for use in such areas as consolidation and forecasting.

Accelerators to progress include such factors as the following:

- Micro hardware and software technology developments, including more powerful features for programming micro applications: high-bandwidth screens, windows and

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Several key factors are slowing changes in micro applications development. There are key differences between the mainframe and micro end-user environments.

Mainframe applications are usually geared to operators specifically trained in complex data operations. End users are not always taken into consideration, since they do not have to learn the mainframe operations to access and manipulate the needed data.

On the microcomputer, the end user is also the operator; applications developers cannot isolate the end user from operations requirements. The micro end user must be able to learn and handle start-up, backup and recovery as well as use the system.

Micro operating systems, which are quite limited as professional programming tools, constitute a drag on any serious use of micros by professional applications developers. Micro memory limitations provide a situation analogous to an automobile with a 1,000-horsepower engine and a 5-gallon gas tank.

The lack of local-area networking and other communications standards is holding back advancements in applications development. Additionally, problems of resource control, data integrity and security are handicapping applications development across the board.

> ***On the micro, the end user is also the operator; applications developers cannot isolate the end user from operations requirements.***

Centralized control

Now let's look at the forces affecting the two future applications development environments that will survive.

Centralized MIS control offers the following accelerators:

• IBM's support of relational data base technology and the emergence of SQL as an industry standard.

• The emergence of data base machines, which promise to reduce mainframe overhead and support data bases beyond the capacity of current technology.

• The need for greater MIS control of dispersed data and DP resources and the companywide system standards to permit that control.

• Improved capabilities for the delivery of distributed applications systems, such as robust fourth-generation languages, and advancements in communications technology and standards.

Such systems will be much easier for technically naive end users to operate. They will also make it easier to collect data closer to its source, thus reducing errors and mainframe loads as well as communications costs.

Several factors are slowing the use of micros in centralized applications development.

Radical differences between the micro and mainframe environments make it difficult to support cross-system development — building an application system on either a mainframe or a micro for the other environment. Programming languages may be similar, but support structures are not at all alike.

Control languages are widely different — there is no job control language on the micro, and micro executive utilities are only beginning to emerge. There are differences in data base management systems (DBMS), memory management, multitasking — the list goes on and on.

Another brake is the difficulty of developing large systems on the microcomputer. This is primarily because of currently limited main memory and disk storage, speed and reliability.

In addition, rapidly changing micro hardware and software environments weaken MIS' willingness to make significant investments in the development of systems that may become obsolete, that will be difficult to convert or that will require special interfaces as new technology arrives.

Shared development

MIS is gaining a growing understanding of end-user environments, needs and applications, primarily through the information center. This growing awareness, the applications backlog and the need to reduce end-user reinvention of the wheel on common applications are forcing MIS to spread the applications development work load.

The need for greater control of DP resources — machines and people — is a serious prod for change, as are swiftly developing technological advancements in communications, standardized mainframe DBMS and more sophisticated applications development tools.

The emergence of fourth-generation languages that can extract data from many different DBMS environments, such as IBM's IMS, SQL/DS, DB2 and so on, also are accelerating change.

One hurdle to shared applications development is the lack of development controls — for example, active data dictionaries that can provide MIS with increased control over data integrity and security.

Another brake is the lack of control for concurrent updating of shared files through a local-area



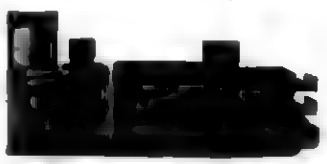
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network. The lack of a microcomputer fourth-generation language that is powerful and efficient enough to permit the development of significant applications that are easy for end users to apply also hinders shared MIS and end-user applications development.

Development micro wish list

Speculation on what tomorrow's applications systems development micro will look like takes the form of a wish list. Here's what programmers and end users both need in the way of hardware and software:

- A very large internal memory of 16M bytes and up. The current 640K-byte limitation must be removed if serious development work is to take place on the micro. Also, memory should be virtual.
- High-capacity, reliable hard-disk storage must be available. The speed of these devices must increase proportionately with their storage capacities.
- Excellent applications development tools, such as better Help and debugging facilities, are desperately needed.
- A true fourth-generation language or DBMS, one that combines comprehensive procedural and nonprocedural language facilities.
- The software should be screen-oriented, with language facilities to control displays and develop windows, menus and Help features.

Clearly, we need easy-to-use, flexible micro-mainframe links that can deal with many different communications protocols; one goal for such capabilities is unattended file transfer.

Other communications software requirements include standardized local-area network capabilities and seamless communications between microcomputer DBMS and mainframe DBMS.

Finally, we must develop software portability so that applications can be transferred easily to future enhanced hardware and other operating systems. To achieve this, the micro fourth-generation language or DBMS must be written in a popular language, such as C, with compilers for many different kinds of hardware.

Cohesive environment

What kind of applications systems development environment will emerge as the leader within the next two to five years depends on several factors. One is the ability and willingness of major vendors to provide programmers and end-user applications developers with the tools they need to aid in accelerating development.

Perhaps the greatest need of all is for IBM, as the industry leader, to come up with a rational, cohesive systems environment. The large-company MIS world is waiting for IBM to develop a decent operating system, one that can handle multitasking and window management. This system will provide standardized communications interfaces between various levels and kinds of hardware, from mainframes through minicomputers to micros.

Another factor affecting progress or the speed with which it occurs is the way large organizations, MIS management and programmers respond to technological advances. Even when new technology comes into an organization, MIS tends to take a conservative approach that delays actual use of the technology until it is tried and tested elsewhere or sanctioned by an outside industry guru.

> ***It's important that the new systems place strong controls on the access to corporate data and at the same time allow users a great deal of flexibility in manipulating that data. End users will not tolerate delays in finding solutions to their information processing problems.***

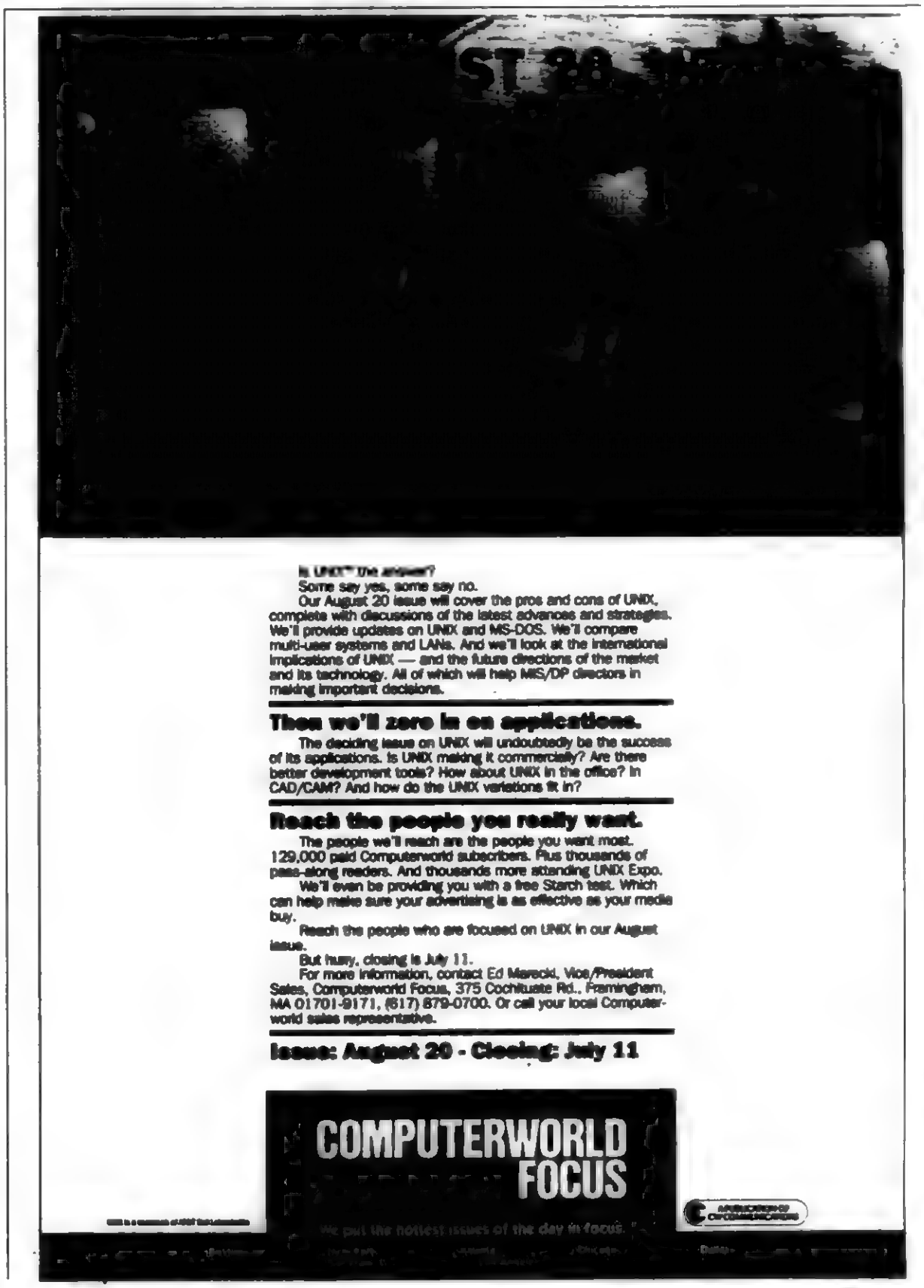
But the most powerful force will be the need of large organizations to control the flow of data — and the need of end users to control their own use of that data.

MIS management can no longer tolerate the hodgepodge collection of makeshift applications development tools they must somehow assemble and integrate if they are to meet the disparate and conflicting needs of corporate management and end users.

MIS must take charge — not only of applications development but of corporate data and of all of the technologies and tools for accessing and manipulating that data.

It's important that the new systems place strong controls on the access to corporate data and at the same time allow end users a great deal of flexibility in manipulating that data. End users will not tolerate delays in finding solutions to their information processing problems.

For these reasons, and because of the other positive forces, shared applications systems development will be more popular than the centralized applications development. I think that MIS management in large organizations will respond positively to the accelerators, ignore the brakes and move swiftly toward more highly controlled development of distributed applications, using improved micro hardware and software. ■



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MANAGEMENT

TAKING CHARGE
Alan E. Brill

Take the audit by the horns

Several weeks ago, this column was concerned with ways of preparing for the data processing audit. This week, we will look at the result of the audit: the management letter and report.

The audit report can be traumatic even in the best of circumstances, but it can be worse if your boss sees the report before you do. It is worse yet when the report contains errors that are your responsibility to explain.

Don't let this happen. In my view, it is you, the DP manager, who has the right to see the draft report first.

When the auditors finish their DP audit work, they prepare a report and a series of findings and recommendations that are recorded in the companywide "management letter." This information is then prepared as a draft report, and you as the DP manager should receive a copy of the draft and have an opportunity to comment on it. Don't pass up the chance to do so. (There are rare exceptions to this, such as an indication of DP management involvement in unauthorized or criminal activity. But if you're in that much trouble, seeing or not seeing the draft isn't going to matter.)

When you do receive the report, you should list each finding and its associated recommendations on a separate sheet of paper. Then, review each finding, considering the following questions:

• Is the finding accurate? If it is not,

See TAKE page 70

Brill is director of computer security services for the New York City Department of Investigation.

Arco melds user, MIS needs

Aims to balance control, dispersal of information

By David A. Ludlum

Atlantic Richfield Co. (Arco), the Los Angeles-based oil giant, has launched a range of services aimed at balancing computer users' needs with central control of information technology.


Smith

The initiatives include a week-long seminar for executives, centralized distribution of equipment and supplies, a "Help desk" for end users and close scrutiny of requests for new equipment.

Future steps could include coordination of systems planning with related functions, appointment of a high-level executive as systems integrator as well as the introduction of a client advisory service.

Most corporations have no organizational strategy for addressing the dispersal of computing power outside of central information systems departments, according to John J. Connell, executive director of Office Technology Research Group in Pasadena, Calif., and a former Arco vice-president.

Connell said he believes that companies should "manage the move of the technology [out of information systems departments], not just let it happen." How the move is managed, he added, will affect information systems managers' careers.

The strategy should strike a balance between serving users' needs and at the same time maintaining central control, Arco's manager of corporate systems, Allen N. Smith, said in a recent interview.

A major thrust of Arco's efforts is to sponsor a seven-day seminar for educating information systems managers on the impact of the dispersal of computing power throughout the corporation.

"Their job is changing. They're going to have to get more service-oriented," Smith

See ARCO page 72

Tighter budgets force hard-nosed attitudes in computer managers

By Alan Alper
and David Ludlum

Budget constraints are adding to the pressure for information systems managers to think like businessmen, according to an informal survey of managers on the exhibition floor of the 1986 National Computer Conference.

The need to sidetrack some system or software development due to tighter budgets is forcing managers to take a harder look at the value of the projects to their companies, managers told *Computerworld*.

That pressure adds to the push for information systems managers to better understand their company's business in order to help it gain a competitive edge through information technology. This was also the topic of the conference's keynote address.

"Definitely there are budget constraints throughout the company. We're looking at making a much better business case for any product we install," said Michael S. Adler, director of information systems development support and technology at Fluor Engineers, Inc. of Irvine, Calif.

"We are running our department as a business and satisfying our customers, which are the company," Adler said. The department has always charged back users, he added.

Similarly, at Ohio State University, information systems managers work with user committees to set priorities and "do the best we can" in light of budget con-

See TIGHT page 73

Organization, communication keys to successful DP project

Plans should include flexibility, slack time

By David Bright

Your company has just acquired a new subsidiary. As manager of data processing at company headquarters, your job will be to merge the new outfit's information flow into the existing operation. Naturally, corporate management wants this not-so-easy project performed immediately. What should you do?

For this and other projects to be successful, the key is to organize carefully, according to data processing managers and consultants who specialize in management training. Plans should be flexible and communicated well. Packaged software can also help in managing projects, the managers and consultants say. Finally, it is important to watch for common pitfalls.

"The whole trick for a good project manager is to have an organizational scheme for a project," says Andrew Langlois, an assistant controller in charge of MIS operations at Moore McCormack Resources, Inc. of Stamford, Conn. Such a plan will enable the manager "to track where he is, adapt it as changes come in — because they most assuredly will — and communicate that both upwards and downwards. To do their best work, people have got to know where they are and where they're going."

Data processing projects can be particularly difficult when people handling them come from other departments and are unsure of what to do, says management consultant Arnie Roberts, president of ADC Associates of Palo Alto, Calif. Therefore, Roberts also heavily stresses organization. He says it is essential to diagram each project in order to see the logical flow. The time spent in constructing the diagram will be well spent, he promises. And every such chart needs some slack time built in, Roberts says.

As a further aid to successful project management, Roberts recommends such microcomputer software programs as Timeline, Inc.'s Timeline and Harvard Software, Inc.'s Harvard Total Project Management.

Charts and software can present difficulties. Ray Barron, information center manager at Michigan Consolidated Gas Co. in Detroit, finds them helpful but has had difficulty getting others to use them, especially the software. He explains that many people consider it to be "overkill and time-consuming." And while Roberts recommends project management software, he warns managers not to rely totally on a package, because "the package won't do your job."

Doing the best work also involves being aware of the common elements that cause failures, says management productivity consultant Lois Zells of Lois Zells & Associates, Inc. in Phoenix. All companies have some of these elements, Zells says.

Managers should recognize the elements pertinent to them, correct as many as they can and try to "understand the implications of those that they can't fix," Zells explains. The

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INSIDE

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Calendar: Conferences, shows, seminars/**70**

INSTANT ANALYSIS

"Courtesy is always a business virtue."
— **Robert L. Crandall, chairman, American Airlines, in his National Computer Conference keynote address**

Take the audit by the horns

From page 69

document the actual situation.

• Is the finding complete? While a specific finding may be accurate, it may not be the entire story. If, for example, a system is found to be lacking controls, it may be that the review was too brief to permit the audit team to completely understand the system. The auditors may simply not have known about controls that are in operation. If the finding is incomplete, document it.

• Does the finding address a problem that existed when it was noted, but which has since been corrected? Often, in the course of an audit, the auditors will detect a problem and tell you about it.

You immediately take some action to solve the problem. If this is the case, the report should include the fact that the problem has already been taken care of or that a remedy is in the works. If the auditors have failed to report such action, document what you've done and what you are doing.

• Is the finding still relevant? I've seen cases where the auditors make comments about systems that have been replaced with new ones. They can still make their comments, but the fact that the system is no longer in use must be stated.

• Are the recommendations appropriate? There have been cases where the recommended actions were completely out of proportion to the problem. Do you really need a fire extinguishing system, for example, that costs twice as much as the computers you are protecting?

Look for findings that recommend consulting work by the auditing firm. While this practice is not unethical, the degree to which the recommendation represents the auditor's marketing devices must be carefully evaluated.

Once you've analyzed the draft audit report, set up an appointment to discuss it with the audit executive (and the internal auditor, if the audit was done by an outside firm). Then you can assist the auditors by pointing out matters that, because of the time constraints of audit work, do not paint a fair or full picture of the current situation.

At the meeting, review each finding and recommendation. Where you agree with the finding, say so. Where you have initiated or completed remedial or corrective actions, request that this be noted in the report. Where you have judged the findings to be incomplete or incorrect, point it out.

Neither you nor the auditors want to issue a report that is factually incorrect. Wherever possible, suggest wording that you feel is suitable for the report.

Document disagreements

If, after the meeting, issues remain in dispute between you and the auditors, it is appropriate to suggest that the disagreement be documented in the report and that your position be represented, at least briefly.

There is no question that this review process is time-consuming, but the time taken is one of the best investments you can make. The end result is a better product — an accurate audit report. Where there are problems, you can initiate actions to solve them. And your remedy can appear in the report. Where there are professional disagreements, you will have a prepared case for management.

As long as DP managers feel powerless to affect audits, there will be unpleasant surprises in audit reports. But when you see yourself as an equal participant in the auditing and reporting process, the reports will help you to more effectively manage your resources and to build and operate well-controlled systems.

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CALENDAR

WEEK OF JULY 6

JULY 7-9, WASHINGTON, D.C. — **Deregulated Centrex vs. PBX.** Contact: Telestrategies, Suite 100, 1355 Beverly Road, McLean, Va. 22101.

JULY 8-11, COLUMBIA, MD. — **The Technical Manager in a Changing Environment.** Contact: Continuing Education Institute, Suite 102, 21250 Califa St., Woodland Hills, Calif. 91367.

JULY 9-10, NEW YORK — **Online: The Information Connection.** Contact: The Information Systems & Technology Division of the American Management Association, 135 W. 50th St., New York, N.Y. 10020.

JULY 9-11, NEW YORK — **The Fourth Annual PC Expo.** Contact: PC Expo, P.O. Box 1026, Englewood Cliffs, N.J. 07632.

JULY 10-11, LOS ANGELES — **Knowledge Engineering.** Contact: Education Foundation of the Data Processing Management Association Seminars, Dept. KE, P.O. Box 3608, 3420 Kashiwa St., Torrance, Calif. 90510.

WEEK OF JULY 13

JULY 13-18, CHICAGO — **Guide 65.** Contact: Guide International Corp., 111 E. Wacker Drive, Chicago, Ill. 60601.

JULY 14-17, BOSTON — **Software Trends for Executive Planning and Strategy.** Contact: Software Institute of America, Inc.,

See CALENDAR page 73



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Arco melds firm's needs

From page 69

said of the information systems managers. "They're going to have to change the way they think."

Arco had held the seminar for 250 key managers but then was forced to suspend it due to budget cuts following the recent plunge in oil prices. "The most frequently asked question I've had since we dropped that seminar is, 'When are you going to have it again?' " Smith said.

Arco also centralized the purchasing and distribution of computer equipment and supplies — from personal computers to printer ribbons — by creating a supply store. This new method, Smith maintained, has eliminated the standard, bureaucratic procedure for procuring goods and has cut costs through volume discounts.

The store did $1.2 million worth of business in 1985, its first full year, and may do $2 million this year, Smith said. It has paid for the costs of its implementation 10 times over, he added.

In an effort to maintain some standardization of equipment, Arco established an architectural review board for new projects and adopted an "approved products concept," Smith said.

The review board makes technical recommendations on whether proposed systems fit the headquarters' overall architecture. The final decision on a product includes management considerations, Smith said.

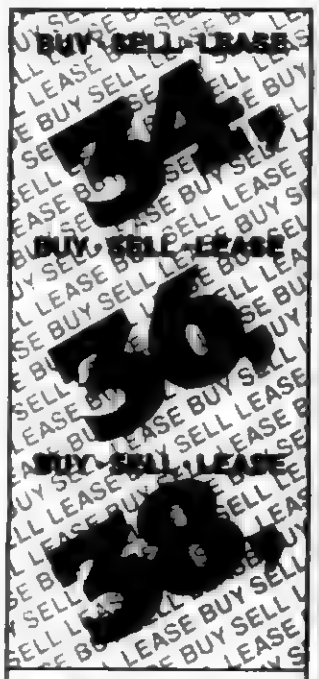
The approved products concept offers the user support by providing installation, maintenance and training as well as assurance of compatibility. While the process of approval may not be as simple as "a rubber stamp," Smith said that efforts are made to streamline the process.

Arco's efforts to support and control end-user computing also includes a "Help desk," which fields users' questions. This service has been effective enough to attract questions from customers and others outside the company, Smith said.

Ideas for future initiatives might include installing a project review panel made up of managers who oversee communications, facilities and systems. "They don't talk [to each other] very well," Smith commented.

Another possibility is to appoint a high-level information systems executive who would act as systems integrator in an effort "to give management new kinds of information," Smith said.

A third idea is to establish a client advisory service that would both educate users on what they can accomplish with computers and offer ways for them to fulfill their individual needs.



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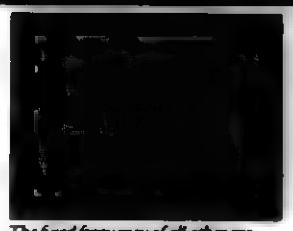
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Tight budgets force changes

From page 69

straints, said Martin Solomon, the school's director of academic computing.

The majority of information systems managers questioned on the floor said their departments are facing tighter budgets due to company cost cutting. However, another likely indication of budget tightening was the dearth of computer users amid the vendor exhibits on the floor. The official estimate of attendance at the show was 40,000, down from 70,000 the year before.

Budgets are tighter at Bell Communications Research Corp., which develops software for the telephone operating companies, as the phone companies cut their own budgets, according to Assistant Vice-President William J. Carlisle.

"They prioritize. We're having to cut back on deliverables and extend project dates. Some marginal projects get put on hold," Carlisle noted.

Southern Company Services, Inc. of Atlanta, the data processing arm of a group of utilities in the Southeast, is seeing budgets squeezed by the costs of bringing nuclear plants online, according to Jeff Booker, manager of client support.

But the impact of a tighter information systems budget is alleviated somewhat by falling hardware prices, according to Booker. "It's easing the burden to some extent," he noted.

The sharp economic downturn in U.S. agriculture has forced cutbacks of computer purchases at Deere & Co., said Daniel Himes, the company's manager of computer equipment.

On the other hand, Aetna Life & Casualty Co. of Hartford, Conn., like other firms in its information-intensive industry, cannot afford to cut back on investments in computers, said applications manager Robert Ashocki. "Computer technology helps us keep our costs down and remain competitive," he said.

Because its clients are doing well and exploring future capabilities, there are also no budget constraints at Applied Information Technologies Research Center, which does research for on-line data base publishers, said Richard S. Dick, the center's president.

Budget constraints are also minimal at the Solon, Ohio, medical imaging firm, Technicare, Inc., said Vice-President of Engineering Robert Wake. They might be offset somewhat by the firm encouraging its programmers to take home terminals and modems to finish work in their spare time.

CALENDAR from page 70

8 Windsor St., Andover, Mass. 01810.

JULY 16-18, WASHINGTON, D.C. — **SNA Architecture and Implementation Seminar.** Contact: Communications Solutions, Inc., 92 S. Saratoga-Sunnyvale Road, San Jose, Calif. 95129.

JULY 17-18, PALO ALTO, CALIF. — **CD-ROM Product Development: What Does It Take?** Contact: Claudia Isaacoff, Information Industry Association, Suite 800, 555 New Jersey Ave. N.W., Washington, D.C. 20001.

WEEK OF JULY 20

JULY 20-23, TORONTO — **Directions at Toronto.** Contact: Cincom Systems, Inc., 2300 Montana Ave., Cincinnati, Ohio 45211.

JULY 21-22, SAN JOSE, CALIF. — **Computer-Aided Logistics Support.** Contact: Education Foundation of the Data Processing Management Association Seminars, Dept. CALS, P.O. Box 3608, 3420 Kashiwa St., Torrance, Calif. 90510. Also being held July 24-25 in Los Angeles.

JULY 23-25, BOSTON — **Microtrends '86, Education: Redirecting the Revolution.** Contact: Bobbi Hunt, International Communications Industries Association, 3150 Spring St., Fairfax, Va. 22031.

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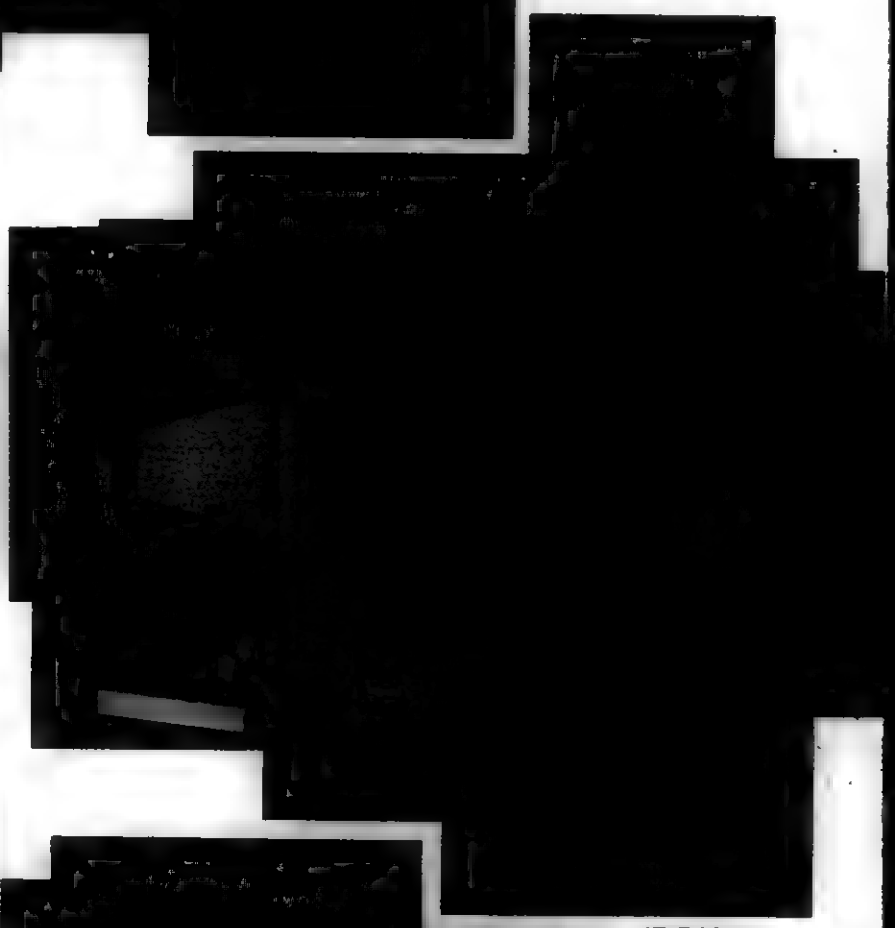




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BOOK REVIEWS

INFORMATION AND THE CRISIS ECONOMY
By Herbert Schiller

In this slender but wide-ranging volume, Professor Schiller takes issue with a variety of developments on the information front. They include the displacement of workers by modern automation, the use of high-tech communications equipment to thwart third-world insurgencies and the privatization of national telecommunications networks.

Schiller, who teaches communications at the University of California at San Diego, contends that the world capitalist system is strained and possibly on the brink of collapse, as evidenced by the displacement of workers through automation, the arms race, third-world debt and other ailments.

He goes on to argue that the use of information technology is driven by capitalistic interests as the means to ease the crisis. And that is a problem, given his socialistic outlook.

Schiller goes further, arguing that capitalistic interests, including some in governments and academia, flood people's minds with messages intended to "persuade and cajole" them into thinking such uses of information technology are for the good.

The book seems somewhat lacking in focus except in its contention that "to what extent a social perspective can regain prominence in the politics and the conciousness of Americans is the transcendant question."

Paperback, 125 pages, $6.95, ISBN 0-19-520514-6, Oxford University Press, 200 Madison Ave., New York, N.Y. 10016.

ARTIFICIAL INTELLIGENCE ENTERS THE MARKETPLACE
By Larry Harris
And Dwight Davis

Many books written about artificial intelligence insult the intelligence of the reader, providing murky technical explanations or unrealistic treatises on the virtues of machines that can think.

Such works do more harm than good for AI acceptance by nontechnical users. Recognizing this problem, Harris and Davis portray AI clearly and concisely as a developing technology that has far to go before becoming a practical part of daily business operations.

Addressing the market pitfalls encountered by current and past AI vendors as well as the technical foundation and future of AI, the authors cover everything from programming language hierarchies to Japanese and U.S. fifth-generation projects.

Citing the inherent difficulties of bringing AI to market, the authors note that, unlike other already accepted technologies, there is no guarantee that AI products will be marketable. There may be no return on the investment of top development talent required to build such a product.

In addition, many AI vendors are former academic researchers trying to break into the business world, according to the authors. Their academic mindset makes the transition difficult and sometimes leads to pursuing goals that are irrelevant to market realities, while ignoring the need to fine-tune a specific application.

Both Harris, the founder and president of Artificial Intelligence Corp. and the author of Intellect, a commercially available natural language processing system, and Davis, senior editor of *High Technology* magazine, have vested interests in the development of computer technology.

Therefore it is not at all surprising that one of their predictions for the future is that almost all of the computers sold by the end of this century will likely rely upon AI to some degree.

Paperback, 194 pages, $16.95, ISBN 0-553-34293-2, Bantam Books, Inc., 666 Fifth Ave., New York, N.Y. 10103.



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Keys to DP's project success

From page 69

chief elements are organizational expectations that do not match reality, a lack of management understanding of project development, conflicting organizational objectives and a lack of communication.

Very often, Zells points out, companies will have as many as 15 projects going on at once, each with top priority. That is not very efficient. And to make the individual projects successful, it is important to "partition the work into manageable pieces," she adds.

One management instructor, DeAnne Rosenberg, of Lexington, Mass.-based DeAnne Rosenberg, Inc., maintains that human relations is the single most important aspect of effective leadership and project planning. Rosenberg promotes the direct method of communication. In order to avoid misunderstandings, the manager must be extremely clear, she says. Such clarity is particularly crucial when assigning work and setting deadlines.

If a project should fail, Zells adds, people commonly look for someone to blame. Because the project development process can be a "terrible beast," the people involved should "point their fingers at the beast, not at each other," she says.

NEW PRODUCTS

TI unveils 120M-byte Business-Pro

Texas Instruments, Inc. recently expanded its line of Business-Pro computers to include a 120M-byte version.

According to the vendor, the 120M-byte Business-Pro is suited for multiuser Microsoft Corp. Xenix applications or for acting as a file server in a local-area network. An additional 120M-byte drive can be added to provide the Business-Pro with a total of 240M bytes of formatted storage.

The list price is $15,495 for a Business-Pro with a formatted 120M-byte Winchester drive, a 60M-byte tape backup, 2M bytes of random-access memory (RAM), an IBM Personal Computer AT-mode CRT controller, a monochrome monitor and the Xenix V operating system. With a color monitor, the price of the 120M-byte configuration is $15,840.

Price reductions also announced

Along with the announcement of the 120M-byte Business-Pro computer, TI announced price reductions on some of its other Busines-Pro configurations.

The Xenix 40 Mono System with 512K bytes of RAM, a 1.2M-byte floppy, PC AT-mode CRT controller, 40M-byte Winchester disk with 60M-byte tape backup, monochrome monitor and Xenix V operating system is now priced at $8,635.

The Xenix 40 Color System, with the same configuration as the Xenix 40 but with a color monitor, is now priced at $8,980.

Also reduced in price is the Business-Pro with 512K bytes of RAM, a 1.2M-byte floppy disk drive, a 40M-byte Winchester disk with 60M-byte tape backup and CRT controller, which is now priced at $7,365.

The Xenix 72 Mono System with 512K bytes of RAM, 1.2M-byte floppy disk drive, 72M-byte Winchester disk with 60M-byte tape backup and monochrome monitor is now priced at $10,625. The Xenix 72-Color System now costs $10,970.

The Business-Pro offers 14 expansion slots and RAM capacity of 3M bytes that is expandable to 15M bytes.

Sharp adds AT compatible featuring Intel processor

Sharp Electronics Corp. of Mahwah, N.J., has added the PC-7500, an IBM Personal Computer AT-compatible desktop model, to its computer lineup.

The standard PC-7500, priced at $2,995, is said to feature an Intel Corp. 80286 processor, which is capable of running at either a 6-MHz or 8-MHz clock speed. The desktop features a combination of double-density or high-density half-height floppy disk drives and 512K bytes of on-board random-access memory (RAM), which can be expanded to 640K bytes or 1M byte on the main board, with 16M bytes addressable on expansion boards.

Other standard features of the PC-7500 include a keyboard with IBM Personal Computer and Personal Computer XT software interfaces, a 16-bit hard disk controller board, a clock and calendar with battery backup, serial and parallel ports on the main board and a socket for an Intel 80287 math coprocessor. Microsoft Corp.'s MS-DOS 3.1 and GW-Basic 3.1 software are included.

Sharp has also announced its CE-700P silent transfer printer, which reportedly can print directly onto overhead projector transparencies. The CE-700P attaches directly to Sharp's PC-700 IBM-compatible personal computer. It prints in text or 480-dot/in. graphics mode and costs $399.

Also introduced was the PC-1600, a hand-held computer with random-access floppy disk storage. The PC-1600 has an optional 2½-in. micro floppy disk drive with 128K bytes of mass storage and also includes a fiber-optic interface. The model is software compatible with Sharp's PC-1500A.

Said to measure 3½ by 8 in. and to weigh slightly less than 1 lb., the PC-1600 features a four-line, 26-char. display. A standard configuration includes 16K bytes of RAM, expandable to 80K bytes. The unit also has an analog input and an RS-232C serial port. In addition to the micro-floppy drive, an optional four-color plotter printer/cassette interface, able to print on 8½-by 11-in. paper, also attaches to the unit.

The PC-1600 pocket computer costs $345; the CE-1600F micro floppy drive option costs $210. The CE-1600P four-color plotter/cassette interface costs $315, and the CE-1600M 32K RAM module is priced at $155.

Novell updates operating system

Novell, Inc. of Orem, Utah, has announced Release 2.0A of its Advanced Netware operating system designed to support IBM's Token-Ring network.

Advanced Netware 2.0A is said to replace the IBM PC Network Program V1.1 on the Token-Ring net. According to a company spokesman, Advanced Netware 2.0A provides increased performance of IBM's file server software, as well as added security. Also, the Netware server function can be used on an IBM Personal Computer AT in 286 mode to provide more memory and file sharing capabilities as well as support for more disks and disk caching.

The software is said to transparently bridge the Token-Ring network to 18 other brands of network hardware. Each bridge supports up to four networks simultaneously, the vendor said.

The 2.0A release is said to be compatible with IBM's PC-DOS and Microsoft Corp.'s MS-DOS 3.1 and 3.2 and will also run applications designed for multiuser nets available for Advanced Netware.

Advanced Netware 2.0A is priced at $1,500. Current users of Version 2.0 can upgrade to 2.0A at no charge.

Novell is also introducing failure resiliency for local-area networks with System Fault Tolerant versions of Netware. Users of Advanced Netware 2.0A for the Token-Ring network will be able to upgrade to the SFT Netware at any time, the vendor said.

INSIDE

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VM Personal Computing revamps communications line

Upgrades tools for PC converters, boards

VM Personal Computing, Inc. of Danbury, Conn., has announced new releases of its software communications products — Relay Gold, Relay/VM and Relay/TSO — and introduced Relay Silver.

Relay Gold 2.0 is said to support most protocol converters, the Digital Communications Associates, Inc. (DCA) Irma 3278/3279 and Forte Communications Co. PJ emulation boards and the IBM Personal Computer 3278/3279 emulation adapter.

According to the vendor, Relay Gold 2.0 allows users to toggle between IBM 3270 screens and PC applications software such as Lotus Development Corp.'s 1-2-3.

Other features of the release include an application program interface that allows users to run Relay Gold from within their own programs, the ability to be completely memory resident, new script commands and variables and a new installation program.

Relay Gold runs on all versions of the IBM PC and compatibles, Data General Corp.'s DG/One and Hewlett-Packard Co.'s HP 150. Version 2.0 costs $250 and will be available in August.

A network version of Relay Gold 2.0 is also available. One copy on the file server can be accessed by all members of the network. It is compatible with the IBM Asynchronous Communications Server, allowing users to share modems as well. The network version is priced at $250 plus $75 per node.

Version 2.2 of Relay/VM and Version 2.2 of Relay/TSO are said to allow error-free file transfer from mainframes to personal computers running Relay Gold that are equipped with emulation boards and connected to protocol converters.

Relay/VM runs on IBM mainframes under the VM/SP operating system. Version 2.2 is priced at $5,000. Relay/TSO runs on IBM mainframes under the MVS/TSO operating system. Version 2.2 costs $7,500. Both will be available in August.

VM Personal Computing's Relay Silver is a personal computer software package for PC-to-PC and PC-to-information service communications. It was designed for stand-alone PC communications and Digital Equipment Corp. VT100 terminal emulation.

According to the vendor, Relay Silver provides all of the features available in Relay Gold, including the learn mode, script language, background operation and the application program interface, but it does not communicate with the vendor's mainframe software products.

Relay Silver suports the Xmodem and Kermit protocols as well as the bidirectional Relay protocol. Modems supported include the AT&T 2224B, the Prentice Corp. Popcom, the 9.6K bit/sec. Telebit Corp. Trailblazer and DCA's Fastlink as well as modems from Hayes Microcomputer Products, Inc., Penril Datacomm Co. and Racal-Vadic, Inc.

Relay Silver is priced at $150 and will be available in September.

SOFTWARE & SERVICES

Systems software

Harris Data Service, Inc. has announced **Version 2.1** of its multicompany, multilocation **34/36 accounts payable package** for IBM System/34 and 36.

Added features include one-time vendor payment processing, a vendor open/paid item inquiry, a period-to-date check register and a period-end reconciliation report.

The accounts payable module is part of a series of integrated or stand-alone accounting and distribution packages. It costs $3,500. To upgrade the existing version costs $300.

Harris Data Service, 11629 W. Dearbourn Ave., Milwaukee, Wis. 53226.

■

System Software Associates, Inc. has introduced its **Multicurrency** module for the Business Planning and Control System (BPCS) software package, which runs on IBM's System/38 and 36.

Multicurrency for BPCS/38 and BPCS/36 is said to provide a company with the ability to calculate pricing, billing and order entry in a range of international currencies.

Features include sales applications, purchasing applications and accounting.

The Multicurrency for BPCS/38 costs $10,000 and $5,000 for BPCS/36.

System Software Associates, 200 W. Madison, Chicago, Ill. 60606.

■

Network Innovations Corp. has announced that its **Multiplex** software package supports Hewlett-Packard Co.'s Spectrum engineering system.

Multiplex works with HP's HPSQL and Oracle Corp.'s Oracle data bases. It resides on both an IBM Personal Computer and the host system and uses a Lotus Development Corp. 1-2-3-like interface to transfer data from the HP 9000 Series 800 Model 840 to PC applications.

Using IBM's Data Interchange Format, the software is said to change automatically the extracted information into the particular style of the PC application.

Prices start at $695.

Network Innovations, 20863 Stevens Creek Blvd. Cupertino, Calif. 95014.

■

System Software Associates, Inc. has announced its **Distribution Resources Planning** (DRP) module for its Business Planning and Control System (BPCS) software package that runs on IBM's System/38 and 36.

The DRP module for BPCS/38 is said to provide planners with visibility of actual demands on warehouses or distribution centers and anticipate their effect on resupply facilities.

Features reportedly include transportation planning, item and warehouse planning data and distribution network visibility.

The DRP for BPCS/38 costs $10,000.

System Software Associates, 200 W. Madison, Chicago, Ill. 60606.

System Software Associates, Inc. has announced the addition of the **Performance Measurement** module to its business and manufacturing application software package, the Business Planning and Control System (BPCS).

The software runs on IBM's System/38.

According to the vendor, Performance Measurement for BPCS/38 enables management to review performance against plan to identify problem areas before they impact bottom-line results.

The Performance Measurement module reportedly includes 13 months of history for each measurement, two sets of budgets for each measurement and user-defined tolerance as well as 26 performance measurements.

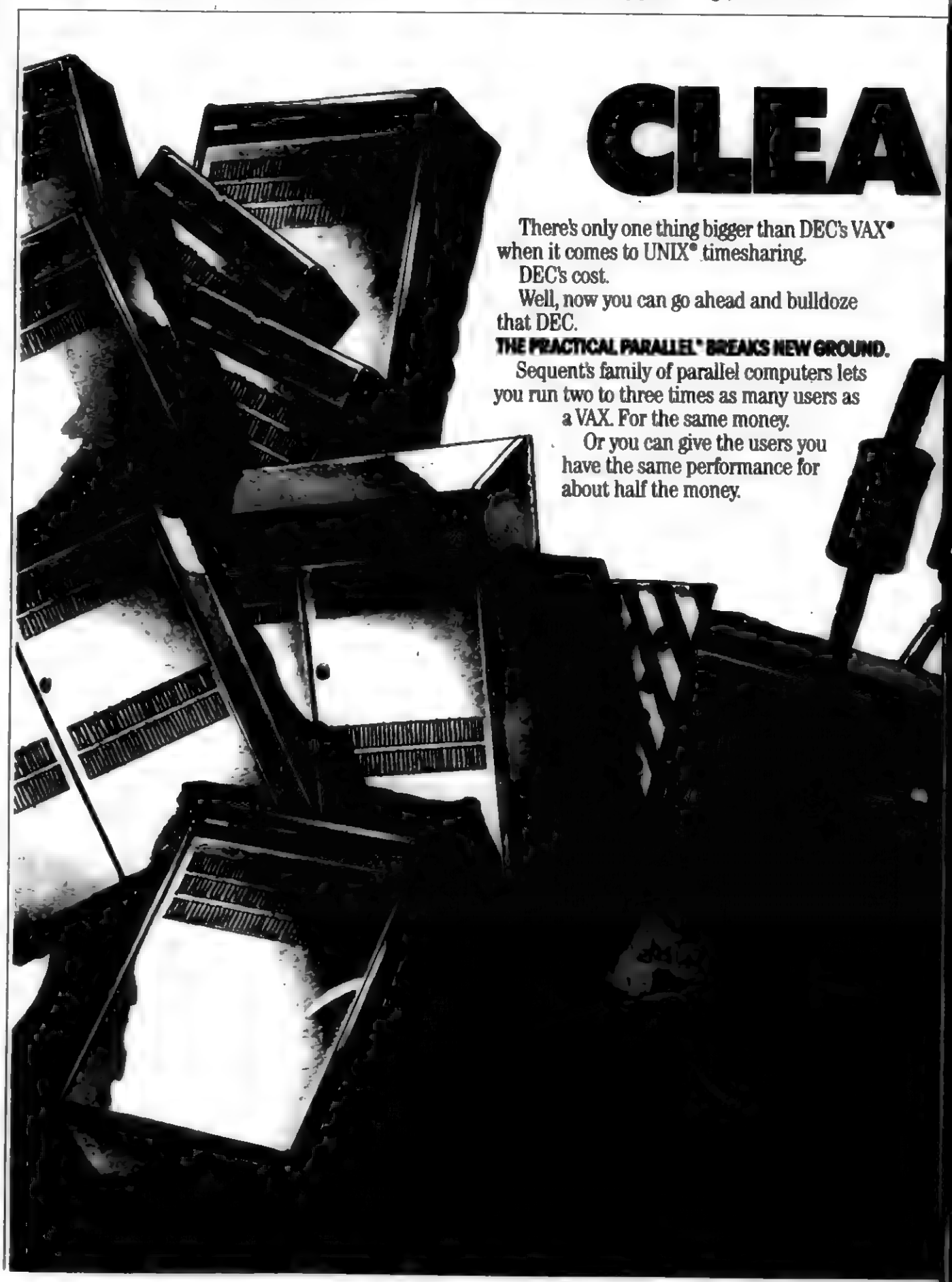
Performance Measurement for BPCS/38 is priced at $6,000.

System Software Associates, 200 W. Madison, Chicago, Ill. 60606.

CORRECTIONS

The Paperjet 2000 by Ziyad, Inc. [CW, June 2] is priced at $4,495.

Swanson Analysis Systems, Inc.'s Ansys software [CW, May 26] is priced from $1,500/mo to $2,100/mo.



NEW PRODUCTS/SOFTWARE & SERVICES

Whitesmiths, Ltd. has announced its **Co-Idris** operating system that runs under VMS on Digital Equipment Corp's VAX system.

Co-Idris runs as a VMS process in supervisor mode, and all Idris utilities and user programs operate under control of the Idris executive. Co-Idris is said to provide real-time, multitasking capabilties for software development and embedded systems.

Co-Idris' IPC facility permits arbitrarily long messages to be passed at a fixed system overhead.

Co-Idris costs $3,500.

Whitesmiths, 97 Lowell Road, Concord, Mass. 01742.

■

Honeywell, Inc. has enhanced its **Software Toolkit** software programs for use with Mentor Graphics Corp.'s Idea 1000 workstations.

The Software Toolkit consists of Stats and Delay programs, a common macrocell library and a product-specific technology table.

The Stats program is said to detect technology-dependent design errors and produce an output report with information such as loading violations, power dissipation and cell count. The Delay program is said to modify propagation delay time based on loading, junction temperature and wire capacity.

Software Toolkit is priced at $25,000.

Honeywell, 1150 E. Cheyenne Mountain Blvd., Colorado Springs, Colo. 80906.

■

M. Bryce & Associates, Inc. has enhanced **Pride**, an integrated software product.

Pride is now available in subsets that can be purchased separately.

It includes a Project Management System, an Information Systems Engineering Methodology and an Information Resource Manager.

Each product comes in both manual and automated versions.

Pride reportedly operates in IBM MVS and MVS/XA and Digital Equipment Corp. VAX/VMS environments.

The Pride products range in price from $10,000 to $150,000.

M. Bryce & Associates, 777 Alderman Road, Palm Harbor, Fla. 33563.

Applications packages

PLC Systems, Inc. has introduced **Sales Link**, a computerized sales force management software package for IBM 370, 4300 and 3000 series mainframe computers.

Sales Link reportedly has more than 50 customized programs that allow field sales representatives to access individual customer-related data instantly.

Sales Link provides such features as direct order entry, data base inquiries, electronic mail and security.

The Sales Link package costs from $100,000 to $200,000. Time-sharing options are also available.

PLC Systems, 1250 State St., Springfield, Mass. 01133.

■

MCBA, Inc. has announced its **Master Scheduling** software package written in Texas Instruments, Inc. Cobol for TI business systems.

Master Scheduling's functions include forecasting through the use of planning bills of materials, maintaining orders by exact date and allowing detailed or summarized reports in user-defined periods.

The program also displays or prints how much of each inventory item is available and supports what-if analysis by projecting future adjustments to quantities.

The Master Scheduling package costs from $3,000 to $4,500, depending upon the hardware model used.

MCBA, 425 W. Broadway, Glendale, Calif. 91204.

■

Holland Systems Corp. has released **Version 3.0** of its **Strategic Systems Planning** (SSP) information planning product.

Enhancements to Version 3.0 include a current systems inventory function; an information resource directory; interactive, multiuser, menu-driven operation; additional reporting options, including graphics display; and tighter integration with other Holland Systems products.

SSP Version 3.0 runs on IBM or plug-compatible mainframes under MVS/TSO.

Version 3.0 costs $73,000.

Holland Systems, 3131 S. State St., Ann Arbor, Mich. 48104.

R THE DECS.

The Practical Parallel never runs slow because it's based on parallel technology.

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MICROS

Systems

Compu Add has introduced its **Career Starter Kit**, a complete microcomputer hardware and software system.

Career Starter Kit hardware includes a Standard Turbo-88 microcomputer, one diskette drive, a monochrome monitor, a dot matrix printer and all necessary cables. The software includes Microsoft Corp. MS-DOS operating system and GW-Basic programming language, a word processor with spelling checker, a spreadsheet and communications link. Career Starter Kit also comes with 10 diskettes, documentation and all necessary cables.

Career Starter Kit costs $949.

Compu Add, 12303-G Technology Blvd., Austin, Texas 78727.

■

Fortune Systems Corp. has introduced the **Multiplier**, a package said to bring multiuser Unix to an IBM Personal Computer XT or AT.

The Multiplier consists of the Fortune Unix coprocessor card featuring an 8-MHz Motorola, Inc. 68010 microprocessor and the 68451 memory management unit.

The Multiplier also includes 512K bytes of expandable main memory and the Host operating system, which supports the interface between Microsoft Corp. MS-DOS and Unix.

The package also includes a keyboard, keyboard handler software, the For:Pro/PC operating system and the Fortune:Word Unix-based word processor.

The package costs $1,995.

Fortune Systems, 300 Harbor Blvd., Belmont, Calif. 94002.

■

Term-Tronics, Inc. has announced the **78-Mate**, a 16-bit Microsoft Corp. MS-DOS-based IBM-compatible personal computer.

The 78-Mate was designed to upgrade existing IBM 3278, 3279, 3178, 3180 or 3179 display stations to a personal computer level of computational capacity. It attaches to any type-A coaxial display station to allow both IBM Personal Computer and 3270 communication.

The base 78-Mate is priced from $1,995.

Term-Tronics, 4990 Viewridge Ave., San Diego, Calif. 92123.

■

Philips Information Systems has enhanced the **Philips P5040** universal workstation.

Added features include memory capacity to 256K bytes, automatic footnoting, English spelling verification, paragraph selection, scientific symbols and document outlining. The P5040 reportedly offers two-way communication with other Philips word processors.

The P5040 is priced from $5,495 to $9,990.

Philips Information Systems, Suite 300, LB 35, 15301 Dallas Pkwy., Dallas, Texas 75248.

Software applications packages

Stilwell Software Products has announced **Software Starter Kit** for users of IBM Personal Computers.

Software Starter Kit includes word processing, spreadsheet and data base programs. Features from the word processing program include search and replace, page breaks displayed on the screen and a spelling checker.

Some of the features of the spreadsheet program include column widths of 0 to 70 characters, the ability to export spreadsheet to other programs and a word processing mode, according to the vendor.

The word processing, spreadsheet and data base programs are menu driven. Software Starter Kit costs $59.95.

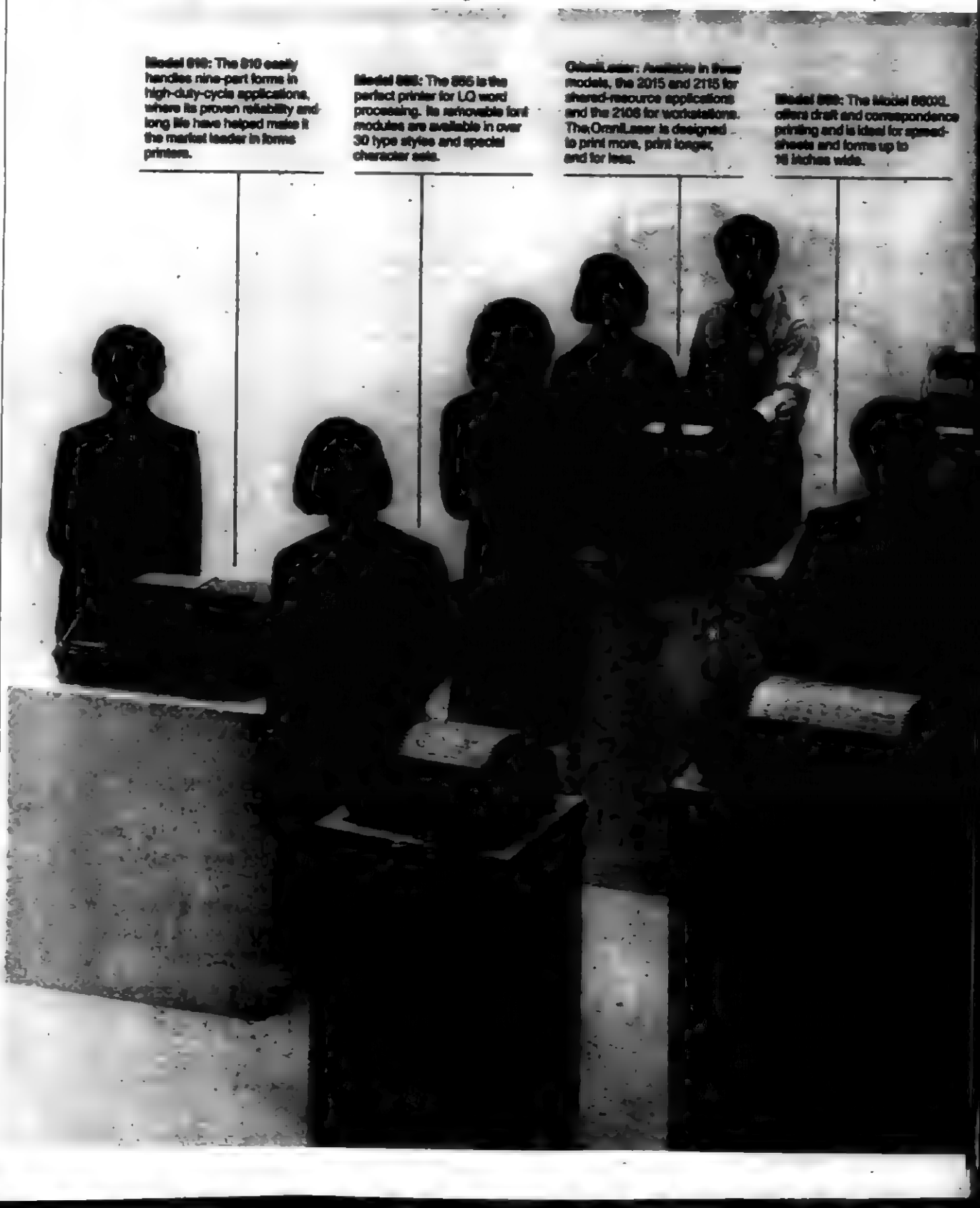
Stilwell Software Products, 16403 N. 43rd Drive, Glendale, Ariz. 85306.

Core Analytic, Inc. has introduced **4Cast/2**, a statistical analysis software package said to give access to more than 25 analysis and forecasting techniques.

The package integrates forecasting techniques with presentation graphics. It is said to offer such analysis methods as curve fitting, seasonal decomposition and stepwise, multiple regressions and model simulations.

The 4Cast/2 package offers instant graphical repre-

The printers of Texas
The printers you need when



sentations of data, model summaries and forecasts. 4Cast/2 runs on the IBM Personal Computer, Personal Computer XT, AT and compatibles with 384K bytes of random-access memory.

4Cast/2 costs $350.

Core Analytic, 674 Rt. 202-206 N., Bridgewater, N.J. 08807.

■

Systems Compatibility Corp. has introduced its **Softscan** word processor document converter for IBM Personal Computers and compatibles.

Softscan uses rule-based software to interpret ASCII files and insert appropriate word processing function and format codes.

Softscan inserts soft and hard carriage returns, centering, regular tabs and decimal tabs, titles, line spacing, headers and footers.

Softscan is priced at $249.

Systems Compatibility, Suite 1320, One E. Wacker Drive, Chicago, Ill. 60601.

■

Lassen Software, Inc. has introduced **Financial Ratios**, a budget consultant program for the continual analysis of financial statements.

Designed for use with IBM Personal Computers and compatibles, the program computes 13 comparisons from the individual's financial statement in groups of liquidity, asset management, debt management, profitability and market value.

Financial Ratios costs $34.95.

Lassen Software, P.O. Box 1190, Chico, Calif. 95927.

■

Simon & Schuster Software has announced the **Webster's New World Writer** word processor software for the IBM Personal Computer family.

The software incorporates Webster's New World Spelling Checker and Webster's New World On-Line Thesaurus. Features include format options such as automatic insertion of headings, subheads and page numbers on any page; the ability to draw tables or boxes around copy; adjustable margins; and on-screen Help.

The software costs $150.

Simon & Schuster Software, Gulf & Western Building, One Gulf & Western Plaza, New York, N.Y. 10023.

■

Micromain Systems, Inc. has announced its **Production Distribution System**, designed to run under Cosmos, Inc.'s Revelation on IBM Personal Computers in a single-user or multiuser networking environment.

The product features accounts receivable, inventory control and order entry. According to the vendor, it accommodates an unlimited number of users, accounts, transactions and open files. File size is limited only by disk space.

A one-user system costs $1,195.

A multiuser system costs $1,595.

Micromain Systems, Suite 4100, 33 W. Higgins Road, South Barrington, Ill. 60010.

■

Lassen Software, Inc. has announced **Power of Attorney/Statement of Guardianship**, one of a series of four programs that makes it possible for users of IBM Personal Computers and compatibles to create legal documents.

Power of Attorney/Statement of Guardianship program asks the user a series of questions and analyzes each response. Once all questions are answered sufficiently, the program prints out the appropriate information.

The Power of Attorney/Statement of Guardianship program costs $69.95.

Lassen Software, P.O. Box 1190, Chico, Calif. 95927.

■

Lassen Software, Inc. has introduced **Personal Lawyer/Promissory Note**, a software program that allows users to create legally binding documents.

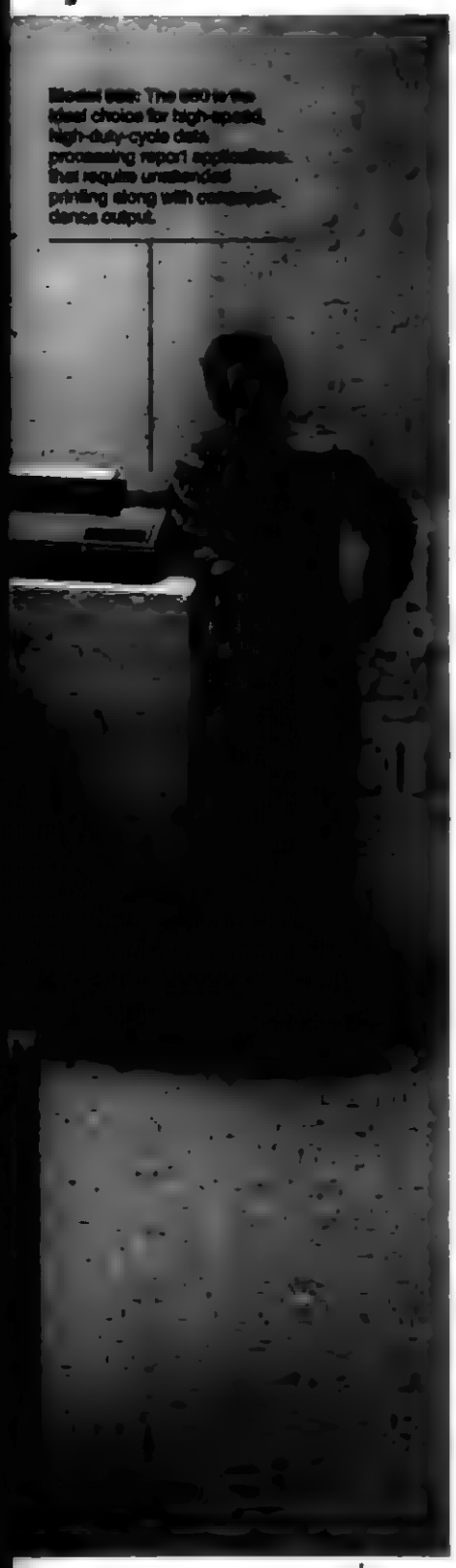
The Promissory Note program is said to be able to ask questions so that when the right answers are given, a legal document is then created, taking into account the legal requirements of each state.

The Promissory Note program handles interest requirements, installments, balloon payments and prepayment of principal.

The program costs $69.95.

Lassen Software, P.O. Box 1190, Chico, Calif. 95927.

Instruments. your needs are demanding.



Premium performance and industrial quality. That's what TI printers are known for. Their reliability has always been standard-setting. Their throughput, consistently high. And their quality surpasses the needs of their applications. Which means few, if any, failures and a minimum of downtime. In fact, about all the service a TI printer needs is a paper or ribbon change.

The reason is simple — every TI printer is made to do its job very well, for a very long time.

The Model 810. The workhorse.

For almost a decade, the Model 810 heavy-duty 150 cps system printer has been printing forms and data reports in virtually unattended operation. Its performance has been so reliable that it's the choice of most of the world's major airlines for ticket counter service for one reason. If they aren't printing tickets, they aren't making money. We even took the 810's field-proven architecture and put it to work in our Model 880 system printers. You can't argue with success.

The Model 880 Series. The 300 cps heavy-duty system printers.

Our 880s are the perfect upward migration and high-speed complement to the Model 810. They're twice as fast, fully compatible with the 810, offer correspondence-quality printing, raster graphics, and come in three models — the standard 880, the 880DP and the 880AT. The DP model offers the higher throughput necessary for high-speed data processing forms and report printing applications. And the AT model is ideal for multi-user environments because it is both hardware- and software-compatible with AT- and XT-class personal computers.

TI's micro-printers. They make more out of any PC.

Dual-mode, letter-quality, color printing and graphics, too. However you use your PC, there's a TI micro-printer to match. Our micro-printers feature front plug-in fonts, easy-to-use control panels and a long service life. They're also compatible with virtually all PC hardware and third-party software. Available in both 80- and 132-column carriage models.

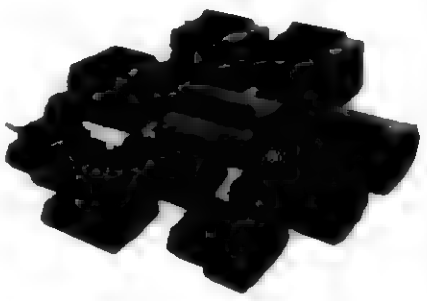
Now, our OmniLaser™ Printers. TI's answer to the shared-resource laser environment.

The TI OmniLaser family of printers is the very first of the second generation of laser printers. Why did we wait? Laser printers of the first generation couldn't live up to our standards for function, quality and reliability. In fact, our OmniLaser printers are documented to last up to 15 times as long as their first-generation counterparts, with the lowest cost per page in the industry.*

To be TI printers, the OmniLaser had to print unerringly at incredible speed with unrivaled quality. And they had to be simple to use. The OmniLaser Model 2015 will last in shared-resource work environments where lesser printers fail. They had to be the "810" of laser printers.

So if you're equipping a computer system with printers, or replacing those you already have, demand the printers that fit your demanding needs. **Call 1-800-527-3500.** For the printers of Texas Instruments.

TEXAS INSTRUMENTS



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*As reported in the March 1986 edition of DataQuest.



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while controlling costs."

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The multiple personalities of MAGNA 8* help you face the needs of programmers and non-technical users alike—while you control costs.

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With MAGNA 8, you can use a single product for data management; prototyping, application and code generation, report writing, and ad hoc queries. All this from an advanced language that's easy to use.

With this one 4GL to meet diverse needs, you not only can save the cost of multiple products, you can save multiple training and support costs.

And because it's for Honeywell GCOS 8 large systems, MAGNA 8 is backed by a tradition for excellence, and a superior worldwide service network.

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Together, we can find the answers.

Honeywell

*MAGNA 8 is a registered trademark of MAGNA Business Systems Corporation

NEW PRODUCTS/MICROCOMPUTERS

Data Translation, Inc. has announced the **PC Semper Image Processing Operating Environment** for IBM Personal Computers, Personal Computer XTs and ATs.

The PC Semper environment is said to provide more than 100 image processing and analysis functions implemented using IEEE 32-bit floating-point arithmetic. The three principal components are an interpretive command language, a file management system and a system expansion facility.

Features include facilities for executing commands, writing programs, archiving images in a data base and developing new processing algorithms for addition to the system.

PC Semper costs $1,995 supporting the vendor's DT2851 frame grabber or $1,495 supporting its DT2803 frame grabber.

Data Translation, 100 Locke Drive, Marlboro, Mass. 01752.

■

Arrix Logic Systems, Inc. has introduced **APS/MicroDCF**, a text processing system that works on IBM Personal Computers and compatibles.

According to the vendor, APS/MicroDCF consists of a text editor, a text formatter and a printer manager. Using the text editor, users mark the source text with imbedded commands that direct the formatting program. Functional capabilities of APS/MicroDCF include multicolumn formatting, list of illustrations, footnotes and figures and back-of-book index.

APS/MicroDCF costs $695 per single copy.

Arrix Logic Systems, Suite 514, 4002 Sheppard Ave. E., Agincourt, Ont., Canada M1S 1S6.

■

Com Squared Systems, Inc. has introduced **Unisearch**, a computer-assisted retrieval system.

Unisearch is said to be able to integrate the indexes of all files including microfilm, microfiche, cabinet or open-shelf file folders and computer or word processing disks.

Unisearch has such optional communications as IBM synchronous protocols and a resource sharing local-area network. Unisearch's disk storage capability is from 10M bytes to 10G bytes.

Unisearch for IBM Personal Computers or compatibles costs $3,000.

Com Squared Systems, 2520 Pilot Knob Road, Mendota Heights, Minn. 55120.

■

Jonsog Associates has introduced its **Demo-Graphics Writer** software package for use on IBM Personal Computers and compatibles with graphic cards.

According to the vendor, Demo-Graphics Writer enables the user to create prototype demos of software systems during the design phase of a project. Demo-Graphics Writer includes color graphics, windows, animation and timing, color hard copy and two types of text.

Demo-Graphics Writer comes in two versions. The 80-char., high-resolution graphics system costs $149, and the 40-char., low-resolution graphics system costs $70.

Jonsog Associates, 8334 Sperry Court, Laurel, Md. 20707.

Software utilities

Micro Logic Corp. has announced **Tornado Notes**, random-access memory-resident software for IBM Personal Computers and compatibles.

Tornado Notes allows users to process random information, according to the vendor.

The software is based on a system of parallel text processing in which windows of text are simultaneously viewed, moved and accessed by content.

Features include a built-in editor, flexible search capability, a pile-of-paper simulator, a forms capability and a note joining function. The software can import and export files and screens.

Tornado Notes is priced at $49.95.

Micro Logic, P.O. Box 174, 100 2nd St., Hackensack, N.J. 07602.

CE Software has introduced its **Macbillboard**, a graphics editing and printing package for Apple Computer, Inc.'s Macintosh computer.

Macbillboard incorporates full CE Software Macpaint-style editing and file compatibility wih multiple levels of enlargement for detail work, the vendor said.

With Macbillboard, users are able to create and print personalized greeting cards, signs, banners and stationery.

Printing capabilities of Macbillboard include enlargements up to 32 times the original size for signs and displays as well as greeting card alignment and envelope templates for printing four-panel greeting cards.

Macbillboard costs $35.

CE Software, 801 73rd St., Des Moines, Iowa 50312.

Lassen Software, Inc. has enhanced **Diskette Manager Plus**, a diskette library management program.

According to the vendor, Diskette Manager Plus automatically reads the directory from each diskette and prepares a catalog using a combination of that information and user-provided comments. Each catalog diskette stores information for up to 200 diskettes.

Diskette Manager Plus also prints labels containing diskette name, creation date and amount of disk space remaining.

Diskette Manager Plus runs on IBM Personal Computers and compatibles.

Diskette Manager Plus costs $59.95.

Lassen Software, P.O. Box 1190, Chico, Calif. 95927.



Harvey Invisible Software has announced **Firstmenu**, a software program designed to allow users to invoke personal computer commands, utilities or applications via a system of menus.

Firstmenu is said to allow users to create, save or change menus to run applications as well as perform Microsoft Corp. MS-DOS or IBM PC-DOS operations. According to the vendor, users can also select other menus with a keystroke.

The system includes on-screen Help, an index and a paging facility. According to the vendor, this random-access memory-resident program runs on IBM Personal Computers and compatibles.

Firstmenu software is priced at $39.95.

Harvey Invisible Software, P.O. Box 1863, Cape Coral, Fla. 33910.

Metro Associates has announced the **PC Master** menu system for IBM Personal Computers and compatibles.

The PC Master menu system allows users of systems with fixed disks to create simple menus from which up to 10 applications may be selected by a single keystroke.

PC Master is priced at $19.95 for a single copy, $100 for up to 10 personal computers and $500 for unrestricted use at a single location.

Metro Associates, P.O. Box 985, Simpsonville, S.C. 29681.

■

Finch, Inc. has introduced **File Minder**, a file storage management system for IBM Personal Computers and compatibles.

File Minder is a window-oriented file utility system providing a comprehensive collection of tagging functions and commands, including copy, rename, archive, procedure generator, disk cataloging and control commands for four Microsoft Corp. MS-DOS or IBM PC-DOS file attributes.

File Minder is priced at $69.50.

Finch, P.O. Box 56, Frederick, Md. 21701.

COMMUNICATIONS

Controllers

DEI-Teleproducts Division has announced its **Model 1700 port sharing unit**.

The Model 1700 unit is said to be equipped with V.35 interfaces. The unit allows up to four IBM 3270 or compatible controllers to operate at 56K bit/sec. through a single computer port or communications device.

According to the vendor, the Model 1700 unit works with internal or external clocks and provides the control signals required by the terminal devices to operate in a polled multidrop environment.

The Model 1700 costs $910.

DEI-Teleproducts, 230 N. Market Place, Escondido, Calif. 92025.

■

Raycom Systems, Inc. has introduced its **Raycom 5200 series**, a fiber-optic IBM channel extender.

Raycom 5200 is said to operate up to a distance of 8,000 ft, permitting more than eight I/O control units, such as printers and tape drives, to be remote from the host.

The Raycom 5200 is said to require neither software nor hardware changes to the CPU or I/O control units. It operates by simulating Tag line responses and has a throughput rate of 25M bit/sec.

Raycom 5200 costs $35,000.

Raycom Systems, 6395 Gunpark Drive, Boulder, Colo. 80301.

■

HVE Engineering, Inc. has announced its **Syner-System Repeater 2100** interface, which allows the integration of multiple Intel Corp. Multibus systems.

Syner-System Repeater 2100 uses a dual, synchronized state-machine architecture to control bus mastership of primary or expansion chassis. Signal transfers are asynchronous and bidirectional.

User-configured jumpers permit selection of clock signals from primary or expansion systems and independent interrupt control to prevent retransmission to other chassis.

Syner-System Repeater 2100 costs $1,495.

HVE Engineering, 1684 Dell Ave., Campbell, Calif. 95008.

Voice/data communications

Ztel, Inc. has enhanced **PNX**, its integrated voice/data private branch exchange communication system.

Enhancements include the addition of account codes, voice-mail capability, IBM 3270 terminal support, expanded tenant partitions and increased attendant console support.

The voice-mail enhancement is said to add a combination voice processing, storage and messaging peripheral to the PNX 5300 and 5400 series with a full set of voice processing functions.

The enhanced PNX system is priced from $15,000.

Ztel, 181 Ballardvale St., Wilmington, Mass. 01887.

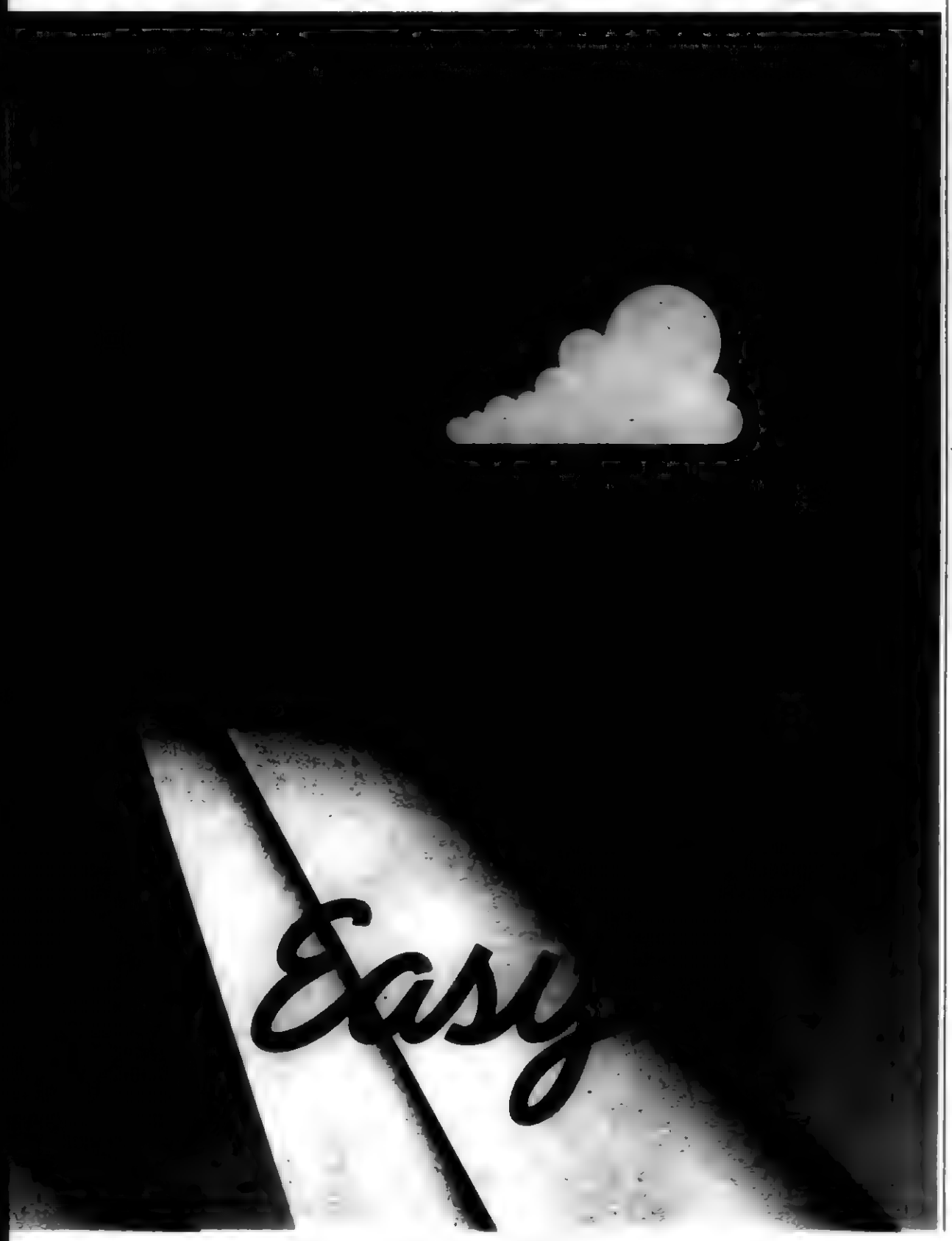
■

Canon U.S.A., Inc. has introduced its **Faxphone 10**, a desktop G3 facsimile that combines facsimile capability with an autodialing telephone

Faxphone 10 is equipped with an autodialing function that enables users to reach up to 16 telephone numbers. One-touch overseas dialing and the use of long-distance services are possible. Additional features include on-hook dialing with automatic redial, tone or pulse compatibility and monitor speaker.

Faxphone 10 is said to send letters in 17 seconds at a transmission speed

Continued on page 84



NEW PRODUCTS/COMMUNICATIONS

Continued from page 85

of 9.6K bit/sec. over regular phone lines. Faxphone 10 is compatible with a broad range of facsimiles, including G2 and 6-min. FM units.

Faxphone 10 costs $2,495.

Canon U.S.A., One Canon Plaza, Lake Success, N.Y. 11042.

■

Teledex Corp. has introduced **MLT-E, MLT-S** and **MLT-C**, a line of microprocessor-controlled feature telephone sets.

The MLT-E is said to provide one- or two-line usage. It can be used for stand-alone operation or within a network of Teledex MLT sets. Features include an integrated speakerphone and speed dialing.

The MLT-S identifies the extension being answered and provides intercom access and secretary messaging to all networked MLT-E telephone sets.

The MLT-E is priced from $495, the MLT-S from $595 and the MLT-C from $625 to $1,745.

Teledex, Suite 200, 25 E. Trimble Road, San Jose, Calif. 95131.

■

Octel Communications Corp. has introduced **Aspen Maxum**, a 72-port voice message system.

The Aspen Maxum system is said to provide up to 312 hours of message storage and to support up to 7,500 users.

Aspen Maxum integrates with private branch exchanges such as Rolm Corp.'s CBX 7000, 8000 and 9000 and Northern Telecom, Inc.'s SL-1.

The Aspen Maxum system costs from $155,000 to $631,000. A 64-port, 175-hour system costs $418,000.

Octel Communications, 890 Tasman Drive, Milpitas, Calif. 95035.

■

Interstate Voice Products has introduced **Vocalink**, a module said to add voice-recognition capabilities to most cellular telephones.

Vocalink is said to be capable of responding to more than 50 different voice commands. According to Interstate Voice Products, Vocalink allows the user to enter call numbers at the time the call is placed. The user may also prestore the numbers, according to the vendor.

Vocalink responds to two users, each of whom may store up to 20 numbers in Vocalink's memory. Vocalink also features a call referral mode.

The Vocalink module is priced at $349.

Interstate Voice Products, 1849 W. Sequoia Ave., Orange, Calif. 92668.

Software

GTE Communication Systems Corp. has announced the **GTE PD-2000 Linkup**, a software communications package that is said to allow business personal computer users to transfer text and graphics between personal computers by way of GTE's Omni SII and SIII private branch exchange.

According to the vendor, the GTE PD-200 Linkup enables personal computer users to implement the transfer of standard text files and specially encoded data such as spreadsheets and word processing files as well as program modules and graphics by means of simple menu selection.

The GTE PD-200 Linkup is priced at $5,000. The Linkup is free for those who already have the GTE PD-200 system.

GTE Communication Systems, 2500 W. Utopia Road, Phoenix, Ariz. 85027.

Western Union Corp. has announced its **customized communications package**, a security system for electronic funds transfer.

According to the vendor, the system provides control and security by performing such tasks as restricting access to the system through user identification and passwords.

The customized communications system also is said to monitor all communications activities to and from the personal computer.

It also provides the communications manager with a comprehensive record of transmissions, according to the vendor.

The customized communications package plugs into an IBM Personal Computer, Personal Computer AT, XT or compatible.

The communications system costs $1,800.

Western Union, One Lake St., Upper Saddle River, N.J. 07458.

What corner will he be working when you find out your automatic scheduling package isn't as automatic as he claimed?

NEW PRODUCTS/COMMUNICATIONS

Multiplexers/Modems

Adaptive Computer Technologies, Inc. has introduced **ACT-153**, a modem based on artificial intelligence.

The ACT-153 is a full duplex AT&T 212A modem said to provide a data transmission speed of 3,600 bit/sec. over standard 1,200 bit/sec. asynchronous data lines.

Also featured is full CRC-16 error correction.

The ACT-153 is priced at $820.

Adaptive Computer Technologies, Suite 103, 97 Boston Ave., San Jose, Calif. 95128.

■

Micom Systems, Inc. has introduced **Linesaver**, a statistical multiplexer.

Linesaver is said to allow as many as eight terminals to share a single line to the host computer. Linesaver's configuration options are said to permit separate selection of flow control and data rates at each end of each channel.

Linesaver is available in two-, four- and eight-channel models for $890, $1,190 and $1,890, respectively. Each model is available with an integral 2,400 bit/sec. modem that is CCITT V.26 compatible for an additional $600 or a 9.6K bit/sec. modem that is CCITT V.29 compatible for an additional $1,600.

Micom Systems, P.O. Box 8100, 4100 Los Angeles Ave., Simi Valley, Calif. 93062.

IC Engineering, Inc. has announced its **Modem Security Enforcer**, designed to meet data security needs that are related to dial-up modem lines.

The Modem Security Enforcer provides separate security restriction and does not depend upon software and passwords contained in a private branch exchange or computer system for safeguards.

Modem Security Enforcer connects between the RS-232 port on the modem and the RS-232 port on the data terminal equipment.

According to the vendor, the Modem Security is said to work with all stand-alone modems that can dial out.

The Modem Security Enforcer costs $300 for single-line installations.

IC Engineering, P.O. Box 321, Owings Mills, Md. 21117.

Local-area networks

Northern Telecom, Inc. has enhanced its **Meridian SL-1N and Meridian SL-1XN** integrated services network.

According to the vendor, Meridian SL-1N with the NT option and Meridian SL-1XN with the XT option provide extra processing power, increased random-access memory and disk storage and greater configuration flexibility.

According to the vendor, Meridian SL-1N with the NT option costs $10,000, and the upgrade kit costs $19,000; Meridian SL-1XN with the XT option costs $10,000, and the upgrade kit costs $39,500.

Northern Telecom, 2305 Mission College Blvd., Santa Clara, Calif. 95050.

■

Standard Microsystems Corp. has introduced **Active Hub-01**, an eight-port active hub addition to its local-area network products.

According to the vendor, Active Hub-01 can be used to join both the Datapoint Corp. Arcnet-PC200 serial coaxial topology and the Arcnet-PC100 free-form coaxial topology.

Active Hub-01 is also said to provide proper termination for the RG-62/U cable and signal regeneration to maintain data integrity over 2,000 ft., according to the vendor.

The Active Hub-01 costs $885.

Standard Microsystems, 35 Marcus Blvd., Hauppauge, N.Y. 11788.

Test equipment

Electronic Industries Association has enhanced its **EIA-455-87A** fiber-optic cable knot test.

The EIA-455-87A cable knot test is said to determine the self-limiting protection built into the cable that prevents the optical fiber from being bent to the point of mechanical and optical failure

Potential failure modes for the EIA-455-87A test include optical performance degradation and cracking, splitting or tearing of the cable jacket, according to the vendor.

The EIA-455-87A costs $5 per copy.

Electronic Industries Association, 2001 Eye St. N.W., Washington, D.C. 20006.

It's anybody's guess. You turn around and he's gone. And you're all alone with one of those totally automatic, look-Ma-no-hands scheduling or rerun management packages. The kind that are never as automatic as some fly-by-night salesperson claimed they'd be. The kind that roust you out of bed at 3 AM to handle a scheduling foul-up.

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UCC-7 controls, schedules, monitors and tracks all processing activity online. Then generates status reports by job, system or work area: so you get realtime control over your ever-changing workload. And the power to make processing less labor-intensive. Less error-prone.

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UCC-7 continuously reacts schedules. Instead of relying on anticipated daily plan methods (which a single change can make instantly irrelevant) it schedules and initiates production automatically, using realtime feedback. It constantly adjusts to the dynamics of your data center and balances job stream priorities with your hardware resources. Increasing throughput and ensuring consistent productivity. It also sequences jobs and provides timely and accurate status, forecasting and history data.

Most importantly, UCC-7 is easy to use. Simply "checking the boxes" on a menu automatically implements your job definition. And eliminates the need for daily batch schedules.

Our *UCC-7RPT: Report Distribution/Tracking System* offers the most extensive tracking facilities of any report management system on the market.

It manages, archives (to tape or disk) and retrieves reports: reducing errors and providing up-to-the-minute status information as well as historical data. Online. It centralizes all distribution, documentation and print-control information in a realtime database. So making changes becomes quick and easy. And batch run updates become a thing of the past. UCC-7 also handles end-user inquiries online. Generating additional report copies without a job rerun and keeping you current with end-user requests.

When jobs are networked from one data center to another, our *UCC-7NCF: Network Communications Facility* provides the automatic feedback you need to maintain host site control. It allows follow-up jobs to be run without delay or intervention. And makes the realtime status of each job available online.

Only UCC-11 can automate all manual mainframe processing tasks.

UCCEL's exclusive *UCC-11: Automated Job Management/Rerun System* is the only MVS package with sophisticated tracking/analysis functions that automate all error-prone manual tasks. It not only prevents many reruns, but reduces the resources consumed by those which can't be avoided. Results: fewer missed deadlines, reruns and errors; increased control, throughput and productivity; and enhanced user satisfaction.

UCC-11 prevents the inevitable job reruns from disrupting processing or consuming valuable resources. It automates your recovery process, so aborted jobs can be restarted with a single command. It performs step reruns and reruns without JCL changes, and automates associated data set and OS catalog maintenance. It prevents "NOT CATLGD 2's" and reruns of reruns: increasing the productivity of your resources.

UCC-11 also collects all pertinent job status data automatically, making it available as needed. Its flexible reporting system helps you to isolate the causes of reruns, and assess resource productivity and spoilage.

When they're teamed, UCC-11 gives you automatic control of jobs scheduled and submitted by UCC-7. Reruns and restarts can be set up via UCC-7's [illegible] screens. And UCC-11's functions can be accessed through any terminal defined to UCC-7.

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UCCEL's highly regarded professionals stand behind each package we sell, providing complete pre-purchase and on-going consulting. Installation services. Training and maintenance services.

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You'll always be able to find someone peddling software cheaper than UCCEL's. Even if you have to scour every street corner in town. But he can't come close to UCCEL's high standards of support. And he certainly won't come close to you when problems crop up. With those guys, you're on your own.

For more information on UCCEL's complete line of MVS software, call UCCEL Corporation at 800-527-5012. We'll show you how making our high standards your standards can ensure consistent data center productivity.







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NEW PRODUCTS/COMMUNICATIONS

TITN, Inc. has announced the **Experdata E20 Ethernet tester**, a portable test tool for checking the physical elements of an Ethernet local-area network.

According to the vendor, Experdata E20 is said to allow systems administrators to check Ethernet components, check conformance to Ethernet 1.0, 2.0 or 802.3 standards and measure traffic on the network.

The product also reportedly allows systems administrators to simulate different types of traffic for capacity planning and troubleshooting and maintain the network efficiently.

The E20 is priced at $4,500.

TITN, 5591 W. 78th St., Edina, Minn. 55435.

■

Telenex Corp. has announced that its **Autoscope protocol analyzer** now supports intelligent monitoring and analysis of the Universal Terminal System protocol.

According to the vendor, the analysis software graphically depicts the performance measurements of the network, including response-time calculations and utilization statistics.

The results are reported on both an overall line activity and individual device basis.

Autoscope protocol analysis package for Univac Universal Terminal System is priced at $900.

Telenex, 502 Pleasant Valley Ave., Moorestown, N.J. 08057.

■

Mod-Tap System has introduced its **Mod-Test Set**, a tester for quick examination and verification of twisted-pair wiring used with the Mod-Tap Communications Wiring System.

According to the vendor, Mod-Test Set is used to test 2-, 4-, 6- or 8-wire channels for shorts, opens and miswires. The Mod-Test set reportedly operates by continuously sequencing the pairs under test.

The Mod-Test Set and the Mod-Tap Communications Wiring System are said to interconnect with compatible equipment using standard, twisted-pair wiring.

The Mod-Test Set is priced at $115.

Mod-Tap System, Harvard, Mass. 01451.

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Two Executive Drive, Fort Lee, NJ 07024

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Or in New Jersey call 201-592-0009.

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SYSTEMS & PERIPHERALS

Turnkey systems

Silicon Solutions has introduced the **Mach 1000F** fault accelerator.

The system was designed to develop test vectors by enabling users to simulate manufacturing defects by introducing deliberate faults into the net list logic description of computer systems, printed circuit boards and integrated circuits.

According to the vendor, the machine has a capacity for a logic description of more than 64,000 modeling elements, expandable to more than 1 million.

The Mach 1000F with both fault and logic simulation capabilities is priced at about $200,000.

According to the vendor, fault simulation is available as a field ugrade to the Mach 1000 Logic Accelerator for $80,000.

Silicon Solutions, 1380 Willow Road, Menlo Park, Calif. 94025.

Processors

Comark Corp. has announced the **Executive Tower**, a multiuser, multitasking supermicrocomputer.

The Executive Tower is said to come with 1M byte of random-access memory (RAM), a 10-MHz Intel Corp. 8086 CPU, a 20M-byte hard disk, 50K bytes of disk RAM, a 360K-byte floppy disk, a 24M-byte floppy tape backup and a CCP/M operating system.

The system can handle up to 32 tasks divided between 16 terminals via its terminal/modem ports.

Other features include file password protection, data/time stamps, automatic boot and code load/execute, centronics-type printer port and personal computer mode for reading Microsoft Corp. MS-DOS disks.

The Executive Tower costs $11,995.

Comark, P.O. Box 474, 93 West St., Medfield, Mass. 02052.

■

Standard Memories, a division of **Trenddata Corp.**,

has announced **Pincomm 630SX**, a semiconductor add-in memory for use in all Digital Equipment Corp. Microvax II computers and Microvax II workstations.

The Pincomm 630SX memory module provides 8M bytes of storage capacity on a single board, using 256K bytes of random-access memory.

According to the vendor, the Pincomm 630SX features an on-line/off-line switch that allows the memory to be put off-line as an aid to troubleshooting or configuring a system.

The memory module is said to allow up to 16M bytes of memory.

Pincomm 630SX costs $2,495.

Standard Memories, 3400 W. Segerstrom Ave., Santa Ana, Calif. 92704.

CAD/CAM/CAE

Xerox Corp. has introduced its **6085 expert designer workstation** for design automation.

Said to be compatible with Xerox's EIS 8000 and 6080 systems, the 6085 increases main memory to as much as 3.7M bytes and runs the vendor's Expert software.

The basic 6085 system comes with a monochrome display, a 40M-byte, 5¼-in. hard drive, a 500K-byte, 5¼-in. floppy drive and 1.1M bytes of main memory, expandable to 3.7M bytes.

Options include IBM Personal Computer and Personal Computer XT software capability, a 20M- or 80M-byte hard drive and an Ethernet interface.

Prices for the 6085 range from $7,000 to $12,000.

Xerox, 2945 Oakmead Village Court, Santa Clara, Calif. 95051.

Graphics systems

Genisco Computers Corp. has introduced **HS-40**, an entry-level expandable graphics station.

The HS-40 series features high-resolution, 16-color graphics in three rack-mount or tower models. All three models feature parallel host interfaces, dual-channel independent outputs and double-buffered refresh memory capabilities.

Other features of the HS-40 series include 1M to 4M bytes of display list memory and high-speed graphics transformation pipeline.

The HS-40 series ranges in cost from less than $15,000 to $21,950.

Genisco Computers, 11611 San Vincente Blvd., Los Angeles, Calif. 90049.

■

Bettex, Inc. has introduced the **Bettex 3000**, a graphic workstation for symbolic processing.

According to the vendor, the Bettex 3000 provides symbolic processing through direct interpretation of resolution- and device-independent data.

According to the vendor, the Bettex 3000 is built around the IBM Personal Computer AT, which allows all applications software available for the PC AT to use a window on the Bettex.

Bettex 3000 costs $50,000 for the single-workstation version; the five-workstation version costs up to $125,000.

Bettex, 410 Amherst St., Nashua, N.H. 03063.

Data storage

Applied Data Communications, Inc. has introduced the **CD-2500** duplicator for ¼-in. streaming tape cartridges.

The duplicator is said to allow users to integrate up to 16 drives running QIC-24 or QIC-11 format.

According to the vendor, it writes and verifies data from a Winchester disk-based microcomputer to blank cartridges using bit-map verification.

All drives are said to operate at 90 in./sec. and transfer data at a rate of 5M bit/min. Tapes can be copied with either four or nine tracks.

The basic unit, including an IBM Personal Computer XT-type microcomputer and four drives, costs $39,995.

Applied Data Communications, 14272 Chambers Road, Tustin, Calif. 92680.

Data General Corp. has announced its **Model 6363 160M-byte Winchester disk drive**.

According to the vendor, the Model 6363 160M-byte disk drive increases the maximum storage capacity of the company's packaged office systems and engineering workstation products from 240M bytes to 320M bytes.

The Model 6363 160M-byte disk drive expands the memory options on DG's

Continued on page 91

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NEW PRODUCTS/SYSTEMS & PERIPHERALS

Continued from page 89

Eclipse MV/2000 DC, MV/4000 DC and DS/7500.

The Model 6363 160M-byte Winchester disk drive costs $9,500.

Data General, Information Systems Division, 4400 Computer Drive, Westboro, Mass. 01581.

■

Plexus Computers, Inc. has introduced its **Plexus optical disk storage drives** for nonmainframe computers.

According to the vendor, the 12-in. optical disks store up to 2G bytes of data for up to 50 years and are guaranteed for 10 years.

The optical disk drive comes with a device driver and software interface that allow users to subdivide the optical disk into partitions of definite or indefinite length.

The Plexus optical disk drive is priced at $39,500.

Plexus Computers, 3833 N. First St., San Jose, Calif. 95134.

Terminals

Sperry Corp. has presented its **Sperry 600/73** automated teller machine (ATM).

The 600/73 ATM features a large-capacity dispenser unit and can handle up to 5,000 transactions before replenishment. Other features of the 600/73 ATM are its ability to handle four currency denominations, optional voice response, an enhanced privacy screen, direct-connect or fully programmable software as well as an advanced 16-bit technology for processing capability.

The 600/73 ATM is priced from $16,500, depending on features and configuration.

Sperry, Blue Bell, Pa. 19424.

Printers/Plotters

Western Graphtec, Inc. has introduced its **MS 8603** high-speed plotter/printer.

The MS 8603 uses a vector-to-raster conversion system. The output process is said to take 30 sec. from start to finish. Said to print with a density of 200 dot/in., the MS 8603 can also be used as a high-speed printer, printing 500 char./sec.

Models are available with RS-232C and Centronics Data Computer Corp. interfaces. The MS 8603 is also available with both the Graphtec protocol and Hewlett-Packard Co.'s emulation commands.

The MS 8603 costs $2,950.

Western Graphtec, 12 Chrysler St., Irvine, Calif. 92718.

■

Intermec Corp. has announced the **Model 8635 Turbo** bar code printer.

The printer is said to print on labels from less than 1 in. to more than 3 in. in height with a printing speed of up to 2 in./sec. The printer is plug-compatible with minicomputers and CRT terminals via RS-232C, RS-422, RS-485 and 20mA current loop interfaces. It can print eight major bar codes in three standard text fonts or six user-definable fonts.

The Model 8635 Turbo is priced at $4,495 for the 2.24-in. printhead and $4,895 for the 3.20-in. printhead.

Intermec, P.O. Box 360602, 4405 Russell Road, Lynnwood, Wash. 98046.

General Business Technology, Inc. has upgraded its **6610XP ion printer** for the IBM System/34, 36 and 38.

According to the vendor, the speed of the 6610XP ion printer has been increased from 60 page/min to 80 page/min.

Also added to the 6610XP ion printer is a 500-sheet hopper reportedly able to upgrade the input from 1,500 to 2,000 sheets. This dual-bin feature also provides a job separator program.

According to the vendor, the 6610XP produces horizontal and vertical print on both letter- and legal-size paper.

The price of the 6610XP printer is $61,300.

General Business Technology, 1891 McGaw Ave., Irvine, Calif. 92714.

Auxiliary equipment

Valley Craft, Inc. has introduced the **Q.I.C.** module for organizing data cartridges.

The module stores three Porta-Drawer storage drawers for 5¼-in. and 3½-in. cartridges and Bernoulli Box flexible disks. The Q.I.C. for 5¼-in. cartridges holds 12 cartridges, the 3½-in. model holds 30 cartridges and the Bernoulli Box module holds three cartridges.

The 3½-in. and 5¼-in. models cost $64.95 each. The Bernoulli Box model costs $64.95.

Valley Craft, S. Highway 61, Lake City, Minn. 55041.

PRICE REDUCTIONS

Perfect Terminal, Inc. has reduced the price of its **P210** terminal.

The P210 is said to emulate the Data General Corp. 210 and 211 terminals. It features a 14-in. screen, 132-col. capability, 32 programmable function keys, soft setup and a buffered printer port.

The P210 is now priced at $649.

Perfect Terminal, 3319 Seldon Court, Fremont, Calif. 94538.

■

Tallgrass Technologies Corp. has reduced the price of its **Backtrack** automatic backup software.

Backtrack backs up from hard disk to tape, floppy diskette or a second hard disk. It automatically backs up files when the computer is idle.

Backtrack is priced at $129.

Tallgrass Technologies, 11100 W. 82nd St., Overland Park, Kan. 66214.

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. . . then you need Renex protocol converters. Do what no conversion board can: interface your host with up to 32 devices at one time—at one price. Choose from over 150 async terminals. *That's flexibility.*

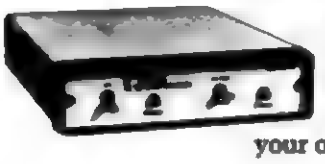
The RT51 Protocol Converter. Adapts ASCII devices or PC's to your IBM System 34/36/38, using SNA/SDLC protocols. Supports 125 types of async terminals, KSR devices, and personal computers.



The TMS-one Asynchronous Communications Controller. The first controller that lets async terminals and PC's communicate as interactive (3270, 3290, and 5250) and batch (3767 and 3770) devices in SNA/SDLC or Bisynch protocols, all simultaneously.



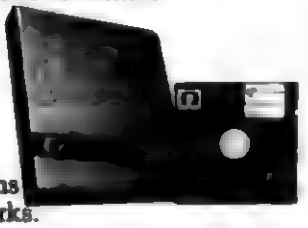
The BI-PATH Reverse Protocol Converter. Allows IBM 3278, 3178, and look-alike terminals to access the ASCII asynchronous world. Access public data bases, service bureaus, packet networks, electronic mail systems, and of course your own in-house system.



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COMPUTER INDUSTRY

Section begins on page 118

Micropro battles back, targets desktop publishing market

Wordstar maker tries to regain financial footing

By Peggy Watt

SAN RAFAEL, Calif. — The old lady of word processing is not just sitting on the front porch in her rocking chair.

In 1979, Micropro International Corp. released Wordstar, which can be called, with little argument, the first word in microcomputer word processing. Now, after selling more than two million copies of that package and battling to regain its profitability, Micropro says its flagship product is not its last word.

Instead of branching out to data bases and spreadsheets, with which Micropro once experimented unsuccessfully, the firm is sticking with what it knows best — document processing. The target is desktop publishing.

"We have the strength to bring the desktop publishing market alive," says Glen Haney, Micropro's president and chief executive officer. "We have no ambition to go beyond word processing, but we want to extend that definition."

The question remains, however, whether desktop publishing can help Micropro rebound from a loss of $2.4 million, or 19 cents per share, on revenue that plunged 33% to $6.8 million in the third quarter ended May 31. Earnings for the same quarter last year were only 2 cents per share, or $267,000, on revenue of $10.2 million.

In the first three fiscal quarters, Micropro was $900,000 in the red on revenue of $27.7 million. Sales were down 13% from the comparable nine-month period a year earlier, when Micropro lost $1 million.

Haney blames the third-quarter loss largely on the bankruptcy of Micropro distributor First Software, Inc. First Software owes Micropro $1.4 million, plus an undetermined loss of inventory, which First Software may sell at bargain-basement prices to raise cash quickly.

Financial analyst Harvey H. Bundy III of William Blair Co. in Chicago says the loss is less a result of First Software's bankruptcy than of Micropro's general troubles.

"They no longer have the leading position in the market that they once had," Bundy says. "I didn't think they would continue to be a major player in the industry."

But Jeffrey Tarter, editor of industry newsletter "Softletter," of Cambridge, Mass., is rooting for the pioneer. "That company amazes me," he says. "Everybody considers them almost out of business, but our sales ranking showed them as still the fifth largest software company in the country with $40 million in sales — down 17% last year, but still a $40 million company. They've proven remarkably resilient."

> ***'In the public's mind, perhaps we have had an identity crisis. But in the last 1½ years, we've clearly focused and decided on our approach.'***
>
> — Glen Haney
> Micropro International Corp.

Haney acknowledges that the word processing market has become very crowded. "Competition is good," he says. "It makes everybody work like hell. And that's good, because the industry has slowed down for a while."

The company is nurturing compatibility with several players in the desktop publishing market already. It has added a driver to its word processing programs for Postscript, Adobe Systems Inc.'s page description language for mixing text and graphics. Micropro has also joined in Hewlett-Packard Co.'s desktop publishing promotion and has an OEM agreement bundling Wordstar 2000 with Cordata, Inc.'s laser printer.

Analyst Bob Lefkowits of market research firm Infocorp in Cupertino, Calif., says such a move is simply a matter of survival.

"I think in two years all high-end word processing packages will have desktop publishing capabilities built in," he says. "Anyone who stays around long-term has to look at those options."

Even Micropro cofounder and Chairman Emeritus Seymour Rubenstein, who blames some of Micropro's recent problems on previous attempts to diversify, is hopeful about the company's latest leanings.

"The company had become so successful with word processing that we didn't have the time or attention to promote other products," says Rubenstein, who still sits on the Micropro board. He warns that the company has to move fast, with a plethora of DOS-based page layout programs promised this year from other vendors.

While Micropro is not abandoning its flagship Wordstar, its new publishing efforts focus on the high-end Wordstar 2000, released in 1985. Its entry-level product, Easy, has not

See MICROPRO page 93

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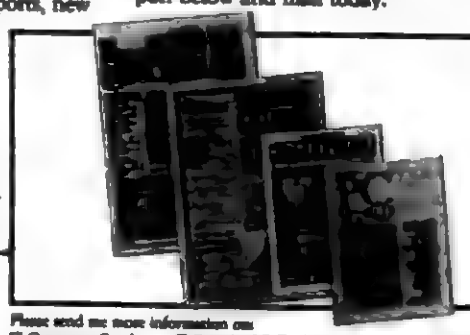
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Senate bill proposes FCC authority over AT&T divestiture

May aid entry into computer mart

By Mitch Betts

WASHINGTON, D.C. — The regional telephone holding companies could be released from most restrictions prohibiting their entering the computer business under a bill recently introduced by U.S. Senate Majority Leader Robert Dole (R-Kan.).

The bill, backed by the Reagan administration, would take from U.S. District Court Judge Harold Greene the regulatory power over business ventures of the regional holding companies.

Greene has generally prevented the companies from entering the computer market, while Federal Communications Commission Chairman Mark S. Fowler has supported removal of most restrictions.

Computer industry section begins on page 118.

Dole's bill would transfer authority over the AT&T divestiture agreement from Greene to the FCC.

Observers said the bill, if passed, would enable the FCC to free t' e regional holding companie. from court-ordered restrictic 's against entry into equipment manufacturing, long-distance service and a variety of enhanced telecommunications and information services.

Dole said regulation of telecommunications belongs in the hands of the FCC, with Congress overseeing the proceedings, not in the antitrust regulatory regime of the court and the U.S. Department of Justice.

"Congress never intended that the antitrust enforcement machinery be used for the long-term, day-to-day regulation of industries," Dole said.

Critics of the FCC's deregulation efforts immediately attacked the bill.

A joint letter from ADAPSO, the Electronic Industries Association and communications vendors warned that freeing the regional holding companies from the business restrictions would allow them to use their monopoly power over local telephone service to impede competition in the new markets.

Fowler issued a statement supporting Dole's bill and said that the FCC would continue to consider the advice of the Justice Department on policies dealing with telecommunications.

Fowler said the FCC is "committed to ensuring that only full and fair competition be permitted."

Douglas H. Ginsburg, the Justice Department's chief antitrust official, endorsed the legislation and said the Reagan administration will work for its passage.

He said telecommunications regulation belongs with the FCC.

Dole said he plans to seek passage of the bill before the end of the current session of Congress, though he said that will be "a daunting task."

Micropro battles back

From page 92

drawn the interest Micropro wanted.

Wordstar is now the middle step in Micropro's three-tiered roster of word processing products.

"In the public's mind, perhaps we have had an identity crisis," Haney says. "But in the last 1½ years, we've clearly focused and decided on our approach to meeting the full prospects for word processing. I think the company has matured to the point that its major interest is building a profitable business. Market share is secondary to that."



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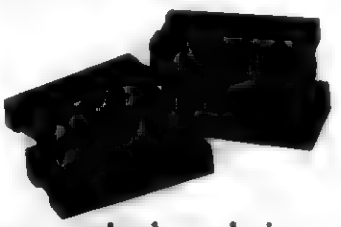
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Centralized decisions

ing requires a salesman to wine and dine a potential customer at regular intervals, often over a period of years, in order to keep the customer's door open for a sales pitch.

In the U.S., according to Fujitsu spokesman David Gould, few customers require a long-term relationship. "In America you can do more cold calling," he observes.

Another advantage for the foreign vendor in the U.S. is that few American corporate buyers exhibit a loyalty to American products. The desire to buy American is rarely exhibited by U.S. business customers, say Tim Pondiller, vice-president of marketing for Bull Peripherals Corp., the U.S. subsidiary of France's Groupe Bull, and Lalita Tademy, director of marketing for Alps America, one of the four U.S. divisions of Tokyo-based Alps Electric Ltd. "I don't see a backlash against Japanese products," Tademy says.

What foreign vendors in the U.S. often lack is name recognition, a necessity in a market where even soft drink vendors spend millions to keep their names in the public eye.

To overcome that obstacle while avoiding massive advertising costs, many foreign vendors have opted to sell exclusively to the U.S. OEM market. Pointing to the high proportion of Japanese parts in U.S. computers, IDC analyst Hart says that there is "more Japanese penetration into the American computer industry than would meet the eye."

If Japanese and European vendors have had success selling to the OEM market, why do they invariably have difficulties in direct marketing? IDC's Anderson says one problem lies in the sellers having to clear major marketing decisions with their Tokyo headquarters, which usually cannot be reached until 8 p.m. Eastern Standard time in the U.S.

Tademy of Alps disputes that claim, noting that an American management team is in charge at Alps America and that "it's up to us to define what our requirements are and what our performance will be." But at C. Itoh Electronics, all of the upper-tier managers are Japanese and many major decisions must be approved by C. Itoh's Tokyo headquarters, according to Jack Hermanson, a regional sales manager in C. Itoh Electronics' OEM marketing group.

Hermanson defends C. Itoh's centralized decision making, saying it is no different from what IBM expects out of each of its far-flung U.S. divisions.

Recent currency trends may make the U.S. market even more difficult for overseas vendors. With the U.S. dollar dropping in value against the yen and most major European currencies, foreign-made goods are becoming increasingly expensive.

An even greater worry on the minds of foreign vendors in the U.S. is the direction that the winds of protectionism are blowing in the U.S. Congress. Although a protectionist bill that would place tariffs on imported high-tech has been scoffed at in the past, Washington observers now say that passage of such a bill is likely this year.

IBM to close Calif. federal systems site

WESTLAKE VILLAGE, Calif. — IBM recently announced that it will close its Westlake Village Federal Systems Division office, transferring 450 jobs to a larger facility in Boulder, Colo.

The Westlake Village facility, one of six federal systems locations in the U.S., is involved with classified systems integration for the U.S. Department of Defense as well as other federal agencies.

IBM has had an office in Westlake Village for the past 18 years.

Employees will transfer from the leased facility to a 15-building, IBM-owned complex in Boulder. The move will begin in October and is expected to be completed by the end of 1987.

The Boulder site currently employs about 5,000 people in making printers and copiers or working in product development.

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Towels tell IBM tale

From page 118

domestic employment declines for the first time in 11 years. Manufacturing employees are clearly bearing the brunt of the reassignments.

IBM is considered a U.S. industry paradigm in its use of factory automation, with its production facilities in Charlotte, N.C., and Lexington, Ky., constantly cited as "factories of the future." During the recent San Jose tour, reporters and securities analysts were shown advancements in robotics and laser technology that would eliminate even more human functions.

Interestingly, almost all of the advanced manufacturing techniques being researched at San Jose are not used within IBM, because so much of its component production is done by subcontractor vendors. IBM may not lay off its own employees, but its oft-repeated mantra of being the industry's low-cost, high-volume producer clearly implies the selection of suppliers that can cut labor costs, and therefore prices, to the bone.

Within IBM, Akers outlined several specific cost cuts that add up to some major savings. He said the company will cut more than $700 million from its travel and meeting budget and that U.S. sales and administrative expenses are running 9% below last year when IBM allotted nearly $40 billion to the cost of sales worldwide.

IBM will increase its $4.72 billion research and development budget (the world's largest) but only by 7%, compared with a 12% increase last year. Spending on plants, property and equipment will remain flat.

But what is happening on the other side of the ledger? If IBM is saving so much money on paper towels and automated production, why is there no profit growth? The answer is obviously found in revenue, which in the U.S. is actually trailing 1985 levels.

According to Akers and other top executives, IBM's fortunes will turn around when the U.S. economy revs up again. It is not likely to happen soon.

Capital spending increase

Capital spending by the nation's largest 1,000 manufacturers, presumably all of them IBM customers, is estimated to increase a mere 1% this year, according to the Conference Board, Inc., which earlier forecast a growth rate of 8%.

IBM claims to be satisfied with order rates for its Sierra line, so the current malaise cannot be blamed on a trough phase of the IBM product cycle. In fact, Akers' comment that IBM's rebound will coincide with the economy's essentially tosses the product cycle theory out the window.

IBM salesmen are pushing the 3090 extremely hard, but you can't shove your entire product line down the customers' throats in a slow buying period.

Practically since the invention of the mainframe computer, IBM's enviable and untouchable strength has been its unquestioned presence in the minds and MIS shops of the world's largest corporations. But that presence becomes a temporary liability when capital spending slows to a trickle.

When a monolith slows down, it cannot regain momentum quickly. IBM is not likely to step up its purchases of paper towels again for a while.

■

Industry gurus have long overlooked a major source of analysis on the state of the industry: Las Vegas cab drivers.

There was no better barometer of the unfulfilled expectations of the recent 1986 National Computer Conference than the disgruntled cabbies, whose dispatchers had overestimated the NCC attendance of 30,000 by 100% — and put extra cabs on duty to handle a nonexistent ride load.

The mistake was corrected on the second day of the show, but business remained light, and any taxi rider seeking an opinion on computer trade shows received an earful.

The best comment came during an airport ride on the last morning of NCC, as one cabbie anticipated the weekend crowd of high and not-so-high rollers from Boise, Idaho, Phoenix and Los Angeles: "We're better off without the show than with it."

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SUPERSHORTS

Westinghouse Electric Corp. has become the newest shareholder in the **Microelectronics and Computer Technology Corp.** As a shareholder, Westinghouse will participate in the research program entitled Computer-Aided Design for Very Large-Scale Integration.

The research program is addressing a wide variety of problems in the design of highly complex electronic systems, with the general goal of providing significant improvements in the computer assistance systems that are available for system designers to use.

Micro-Integration, Inc. and **IE Systems, Inc.**, both privately held, have jointly formed **Micro-Integration Corp.** The combined firms had $3.1 million in 1985 sales. Micro-Integration is one of the industry's original personal computer communications software companies, having produced its first PC-to-mainframe product in 1978.

■

Xidex Corp. has consolidated its rigid disk operation following its recent acquisition of rigid disk manufacturer **Charlton Associates**. The facilities and product lines that were formerly part of Charlton and other Xidex acquisitions are being unified in the new Data Disk division. This new division, which replaces the Rigid Media division, manufactures and markets single, rigid 8-in., 5¼-in. and 3½-in. disks for Winchester drives. The Data Products division now includes 14-in. rigid disks, disk packs and cartridges.

■

Wespercorp reports that **Wang Laboratories, Inc.** has filed suit against it for alleged infringement of a patent held by Wang. The complaint alleges, among other things, that certain products distributed or sold by Wespercorp, including its DLP-4400 Printer Controller, infringe on a patent that is owned by Wang.

Wang seeks temporary and permanent injunctions as well as damages against Wespercorp. Wespercorp says it has reason to believe that the patent in question is not a valid patent and that it is not infringed upon by any of its products. Accordingly, Wespercorp currently intends to vigorously defend this action.

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EXECUTIVE CORNER

William E. Linn has been appointed senior vice-president, software technology, at Cullinet Software, Inc. Linn, who has been with the company for 10 years, is responsible for establishing an advanced research projects group made up of Cullinet employees. The group will conduct research on emerging software technologies.

■

Jack W. Blumenstein has been named vice-president of the business communications group at Rolm Corp. He is responsible for the divisions that directly sell, install and service Rolm telecommunications systems. Previously, he was vice-president and general manager of the communication system division.

Rolm also named two company executives to newly created vice-presidential positions. **George Harvey**, formerly president of Rolm Canada, becomes vice-president of marketing, responsible for a variety of marketing policy, pricing, strategy and communications programs. **Richard J. Zaliak** becomes vice-president of the business development group, which is responsible for a number of Rolm's rapidly growing businesses.

■

David Caplan, president of Tolerant Systems, Inc., has become the company's chief executive officer on a permanent, full-time basis. For the past 16 months, Caplan has served as a general partner of Adler and Co., the New York-based venture capital firm that is Tolerant's principal investor.

■

Robert M. White has been named to the newly created position of chief technical officer and vice-president for research and engineering at Control Data Corp. White's responsibilities include establishing a corporate technology strategy and coordinating the firm's research investments supporting this strategy.

■

Michael D. Campbell, formerly American Satellite Co.'s senior vice-president for law and administration and company secretary, has been named president of the government systems division.

■

David B. Pratt has joined Quantum Corp. as senior vice-president and chief operating officer. Pratt will be responsible for all operations of Quantum's OEM business, including the manufacturing, engineering, marketing, human resources and accounting functions.

■

Gerald W. Thames has been appointed Martin Marietta Corp.'s vice-president of communications systems for its information and communications systems company.

■

James E. Allen has been appointed president and director of Hammer Computer Systems, Inc. Allen is also president of Certified Software, Inc., Hammer Computer Systems' wholly owned subsidiary. All of Hammer Computer Systems' operations will be transfered to Certified's office in Lake Oswego, Ore., where Allen will be supporting and selling Hammer Computer Systems' Ez-DOS-It.

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✓dBase III Plus 1.0 ... call
✓Framework II 1.0 ... call
Best Programs *(not copy-protected)*
✓PC/Tax Cut *(1986 version for 1985 taxes)* 119.
✓PC/Fixed Asset System 3.1 ... 299.
Bible Research *(not copy-protected)*
✓THE WORD 3.1 *(KJV Bible)* ... 159.
✓THE WORD 3.1 *(NIV Bible)* ... 159.
Borland International *(not copy-protected)*
✓Turbo Tutor 1.0 ... 19.
✓Turbo Database Toolbox 1.2 ... 33.
✓Turbo Graphix Toolbox 1.0 ... 33.
✓Turbo Editor Toolbox 1.0 ... 41.
✓Turbo Gameworks 1.0 ... 37.
✓Turbo Newpak *(Gameworks and Editor)* ... 52.
✓Turbo Lightning ... 57
✓Sidekick 1.5 ... 49.
✓Traveling Sidekick *(req. Sidekick)* ... 45.
✓Traveling Sidekick w/Sidekick ... 73.
✓Reflex 1.1 ... 59.
✓Superkey 1.1 ... 41.
✓Superkey/Sidekick Package ... 67.
✓Turbo Pascal 3.0 ... 41.
✓Turbo Prolog 1.0 ... 66.
✓Turbo Holiday Pack
(Pascal 3.0, Tutor, and Database Toolbox) 67.
✓Turbo Family Jumbo Pack
(Pascal 3.0, Database, Editor & Graphix Toolboxes, Tutor and Gameworks) ... 135.
Breakthrough *(not copy-protected)*
✓Timeline 2.0 ... 239.
Broderbund *(copy-protected)*
✓Graphics Library 1 ... 22.
✓Print Shop ... 35.
Computer Associates *(not copy-protected)*
✓SuperCalc 3 Release 2.1 ... call
Dac Software *(not copy-protected)*
✓Dac Easy Accounting ... 45
Evergreen *(not copy-protected)*
✓One Write Plus 1.01 ... 159.
Executive Systems *(not copy-protected)*
✓XTREE 2.0 *(file & directory manager)* ... 37
5th Generation *(copy-protected)*
✓Fastback 5.03 ... 97.
Funk Software *(not copy-protected)*
✓Sideways 3.11 ... 39.
Infocom *(not copy-protected)*
✓Cornerstone 5.1 ... 65.
Lifetree *(not copy-protected)*
✓Volkswriter 3 1.0 ... 147.
Living Videotext
✓ThinkTank 2.1 *(copy-protected)* 105
✓Ready 1.0 *(not copy-protected)* ... 49.
Micro Education (MECA) *(copy-protected)*
✓Managing Your Money 2.0 ... 115
Micropro *(not copy-protected)*
✓WordStar 3.31 ... 179.
✓WordStar 2000 Plus Release 2 ... 285.
Microrim *(not copy-protected)*
✓Extended Report Writer 1.3 ... 85
✓Clout 2.0 ... 135
✓R base 5000 1.01 359
✓R base 5000 Multi-user 1.0 ... 719
Microsoft *(not copy-protected)*
✓Multiplan 2.0 ... 119
✓Microsoft Word 3.0 ... 247
✓Windows 1.01 ... 65
✓Quick Basic 1.02 ... 69
✓Project 2.0 ... 239
Microstuf *(not copy-protected)*
✓Crosstalk XVI 3.61 ... 95
✓Remote 1.3 ... 95.
Migent Software *(not copy-protected)*
✓Ability 1.0A ... $65
MultiMate International *(not copy-protected)*
✓MultiMate 3.31 ... call
✓MultiMate Advantage 3.6 ... 269
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✓Clipper *(Winter '85 version)* ... 349.
Paperback Software *(copy-protected)*
✓VP-Planner 1.0 ... 57
Peter Norton *(not copy-protected)*
✓Norton Commander 1.0 ... 36.
✓Norton Utilities 3.1 ... 59.
Quarterdeck *(not copy-protected)*
✓DESQView 1.2 ... 85.
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✓WordPerfect 4.1 ... 239.
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✓Enable 1.1 ... call
Software Publishing *(copy-protected)*
✓PFS:File B:01 ... 84.
✓PFS:Write C:01 ... 84.
✓Harvard Total Project Manager 1.1 ... 289.
Not copy-protected versions due to be released soon—call.

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✓*SKILL BUILDER PROGRAMS*
Intro and How to Use:

Data Bases	MS-DOS	
Compaq	PC-DOS	
IBM-PC	BASIC ...	each 33.

✓*TRAINING POWER PROGRAMS*
How to Use:

dBase II	dBase III	Lotus 1-2-3
Multimate	Framework	Displaywrite 3
Multiplan	Wordstar	
WordPerfect	Symphony	... each 43.

Individual Software *(copy-protected)*
✓The Instructor II ... 26.
✓Professor DOS ... 33.
✓Tutorial Set *(both items above)* ... 49.
✓Typing Instructor ... 26.
✓Training for Lotus 1-2-3 *(for vers. 1A & 2)* ... 37.
✓Training for dBase III ... 37.

HARDWARE

Manufacturer's minimum limited warranty period is listed after each company name. Some products in their line may have longer warranty periods.

AST Research *(1 to 2 years)*
SixPakPlus 64k *includes Sidekick vers. 1.5 not copy-protected & DESQView* ... 189.
SixPakPlus 384k *(fully populated)* ... 219.
✓AST-5251-11 ... 579.
✓AST-3780 ... 579.
✓Advantage 128k ... 369.
RAMpage! *upgrades to 2Mb* ... call
✓RAMpage! AT *upgrades to 2Mb* ... call
Both RAMpage boards support EMS and fully support EEMS.
Amdek *(2 years)*
✓Video 310A mono monitor *(amber)* ... 159.
✓Color 722 - RGB *(EGA compatible)* ... 519.
Curtis *(lifetime)*
ACCESSORIES
✓Low Profile Tilt and Swivel Pedestal ... 25.
✓PC Pedestal *(for IBM Mono or Color)* ... 27
Portable Pedestal *(for portable computers)* 36
✓Printer Stand ... 16.
System Stand *(for IBM-PC & XT)* ... 19.
✓Universal System Stand ... 25.
CABLES
Smartmodem to IBM Cable ... 17.
✓Keyboard Extension Cable *(3 to 9 feet)* ... 27.
✓Extension Cables for IBM Mono Display ... 33
SURGE SUPPRESSORS
✓Diamond *(6 outlets)* ... 29.
✓Emerald *(6 outlets; 6 ft cord)* ... 36.
✓Sapphire *(3 outlets; EMI/RFI filtered)* ... $47.
✓Ruby *(6 outlets, EMI/RFI filtered; 6 ft cord)* 55.
✓Command Center ... SPECIAL ... 79.
DCA *(1 year)*
✓Smart Alec ... 639.
✓Irma ... 769.
Epson *(1 year)*
We are an authorized Epson service center.
✓LX-80 printer *(80 column)* ... call
✓FX-85 printer *(80 column)* ... call
✓FX-286 printer *(136 column)* ... call
✓LQ-800 printer *(80 column)* ... call
✓LQ-1000 printer *(136 column)* ... call
Hayes *(2 years)*
✓Smartmodem 300 ... 139.
✓Smartmodem 1200 ... 389.
✓Smartmodem 1200B *(w/Smartcom II)* ... 349.
✓Smartmodem 2400 ... 579.
✓Smartmodem 2400B *(w/Smartcom II)* ... 539.
✓Smartcom II 2.1 *(software)* ... 69.
Hercules *(2 years)*
✓Hercules Color Card *(parallel port)* ... 159.
✓Hercules Graphics Card *(parallel port)* ... 299.
Intel *(chips: 1 year; boards: 5 years)*
Above Board PC 64k *(upgrades to 2 Meg)* call
✓Above Board AT 128k *(upgrades to 2 Meg)* call
Above Board PS 64k C/S/P *(upgrades to 1.5 Meg)* ... call
8087 *(for IBM-PC & XT)* ... 129
8087-2 *(works on 8 Mhz computers)* ... 177.
✓80287 *(for 6 MHz IBM-PC AT)* ... 225.
✓80287-8 *(for 8 MHz IBM-PC AT)* ... 269.
Kensington Microware *(1 year)*
✓Masterpiece ... 94.
key tronic *(90 days)*
5151 keyboard *(deluxe)* ... 169.
✓5153 keyboard *(with touch pad)* ... 279.
Mouse Systems *(3 years)*
✓PC Mouse with PC Paint+ ... 139.
✓PC Mouse with Ready and PC Paint+ ... 149.
NEC *(90 days)*
✓Multisync monitor *(EGA compatible)* ... 549.
Orchid Technologies *(1 to 2 years)*
Conquest Multifunction Board 0k *upgrades to 2Mb, fully supports LOTUS/INTEL expanded memory specification (EMS)* ... 264.
Tiny Turbo 286 ... 459.
PC Turbo 286e w/1 Meg ... 749.
✓Ecosll Multifunction Board for the AT 0k *upgrades to 1 Meg, fully supports LOTUS/INTEL expanded memory specification (EMS) and Error Correction Code (ECC), serial and parallel ports optional* ... 399.
Paradise Systems *(1 year)*
✓Color/Mono Card ... 149.
✓Modular Graphics Card ... 275.
Princeton Graphics *(1 year)*
✓MAX-12E Amber monochrome monitor ... 179.
✓HX-12 RGB monitor *(690 x 240)* ... 449.
Quadram *(1 to 2 years)*
Expanded Quadboard 0k *(upgrades to 384k)* ... 169.
384k *(fully populated)* ... 219.
Silver Quadboard 0k *(upgrades to 576k)* 249.
✓Microfazer Printer buffer *(parallel) w/copy MP 64 (64k) upgrades to 512k* ... 159.
✓QuadEGA+ *(half-card)* ... 369.
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✓DOS/Basic 3.0-3.1	WordStar
✓Lotus 1-2-3	✓WordStar 2000
✓Symphony	Turbo Pascal
Framework	✓WordPerfect
dBase II	✓dBase III

✓MultiMate ... each 12.
Toshiba *(90 days)*
All Toshiba printers listed are 24 pin dot matrix.
✓P321 serial/parallel printer *(80 col.)* ... 519.
✓P351 serial/parallel printer *(136 col.)* ... 1089.
Video 7 *(2 years)*
✓VEGA *(half-card)* ... 369.

DRIVES

IOMEGA *(90 days)*
✓Bernoulli Box 20 Meg w/PC2 card ... $1999.
✓10 Meg cartridge ... 51.
✓Bernoulli Box 40 Meg w/PC2 card ... 2499.
✓20 Meg cartridge ... 99.
Mountain Computer *(1 year)*
Drive Card 20 Meg ... call
PC Connection *(1 year)*
20 Meg Hard Drive Card ... 489.
Seagate *(1 year)*
20 Meg Internal Hard Drive *(w/controller and cables)* ... 449.
Toshiba *(90 days)*
PC, XT 360k Drive *(5¼" half-height)* ... 109.
✓AT 360k Drive *(5¼" half-height)* ... 117.

MEMORY

64k Memory Upgrade Set for IBM-PC or XT system board or any memory board
150 nanosecond *(set of 9)* ... 15.
200 nanosecond *(set of 9)* ... 12.
✓128k Memory Upgrade Set for IBM-AT System Board *(9 chips piggybacked)* ... 39.
✓256k Memory Upgrade Set for any IBM-AT memory board *(9 chips)* ... 39.

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DS/DD Disks for the PC & XT (40 TPI)
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✓Verbatim Datalife ... 17.
✓Maxell MD-2 ... 19.
DS/High Density Disks for the AT (96 TPI).
10 disks per box.
✓Fuji ... 27.
✓Maxell ... 34.
✓Verbatim ... 34.

✓Flip Sort *(holds 75 disks)* ... 15.
✓**Floppiclene** Disk Drive Cleaner *(5¼")* ... 18.

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Word-a-holics unite!

Trying to decide which word processor to buy is like trying to decide which college to go to. The decision will change your life forever, but you may never know if it was the best one. Here are five tried and proven professional packages. They all have spell checkers. None are copy-protected. And hard drives are recommended for all. See PC Magazine 1/28.



MultiMate Advantage 3.6 with Graphlink and On-File $399
Originally designed to emulate the WANG word processor, MultiMate is often referred to as the corporate word processor. It offers sophisticated networking capabilities, and, with two free-for-a-limited-time software programs (Graphlink and On-File), also has built in graphics and database.

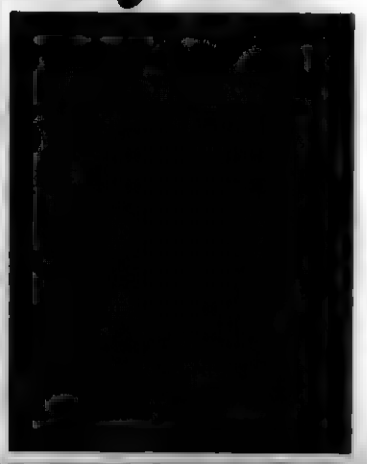
MicroSoft Word 3.0 with Outline $347
With a mouse and a graphics card, MicroSoft Word lets you move words around without touching the keyboard, and see what you got without squinting. Without a mouse or a graphics card it's still a powerful word-processor, with "Style Sheets" that simplify formatting, and a built-in outline program.

WordPerfect 4.1 ..... $289
We have a friend who writes for computer magazines. At one time or another he has used and reviewed virtually every major word processor. He now swears by WordPerfect and swears at all the others. Use this program for a while and you'll be able to touch type most of your commands with your eyes closed and your right hand tied behind your back.

WordStar 2000 Plus Release 2 ..... $285
WordStar has had some trouble shedding its image as the lumbering dinosaur of the microcomputer age. But hundreds of thousands of people use it. There are a lot of programs out there to back it up. And this new version gives it the same advanced features as any top-quality word processor. Even the control keys are starting to make some sense.

...$147
...old performance with a reasonable price continues to be ...bsetter's claim to fame. It's fast, and boasts one of the ...original what-you-see-is-what-you-get screens. With the new ...ersion's spell checker and more sophisticated print formatting, it is now able to compete functionally with the other high-end word processors. (Our new low price is pretty persuasive too).

Buy one. Get two.



Hey, got a friend? Don't know? Check your database! What? No database? Have we got a deal for you (and your friend). Until June 30, Microrim will send you a *complete* second copy of R:base 5000 free when you send in your warranty card and a copy of our sales invoice. So you can get together with your friend, split the cost for one and get two! Or, you can keep the extra copy at home, at a branch office, or down the hall. R:base 5000 is easy to learn and operate, and has the custom reporting features most users need. Remember, the two for one offer is only good from April 15 till June 30.

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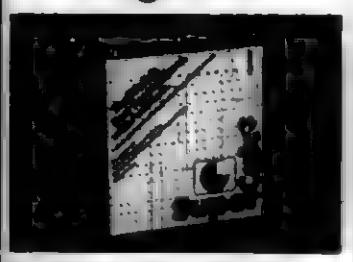
64K (200Ns)	$12 ea. set
64K (150Ns)	$15 ea. set
128k or 256k (150Ns)	$39 ea. set

Bernoulli Berserk!

We've got a problem. The prices we're able to offer on Bernoulli boxes are changing about 10 times faster than we can change this ad. Probably because the machines are selling about 10 times faster than anyone ever dreamed they would. The 20 Meg and 40 Meg versions feature two ½ height drives with removable cartridges. There's a 90 day warranty, and we're an authorized Bernoulli service center—turnaround on repairs is usually 24 hours. Here are our latest up-to-date-but-probably-obsolete-by-now prices!

Bernoulli Box 40 Meg $2499
Additional 20 Meg Cartridges $699
Bernoulli Box 20 Meg $1999
Additional 10 Meg cartridges $51
Bernoulli Care Kit $79

Supercalc ifragilistic!



SuperCalc 3 is the kind of product that you'd be proud to bring home to your mother. Like Lotus 1-2-3 it offers spreadsheet, information management and presentation graphics. But it only needs 128k of RAM, and is not copy-protected. It also is compatible with the Hercules Monochrome Card, as well as the Enhanced Memory (EMS) and Enhanced Graphics (EGA) standards. And you get a free copy of Sideways, the program that lets your printer think horizontal is vertical.

SuperCalc 3 2.1 (with Sideways) .....
30% off our usual unusual low price—call

SixPakPlus Minus$!



AST is so wrapped up in Enhanced Memory and other arcane subjects that they've been letting the price slip on their original claim to fame—the AST SixPakPlus, one of the original and best multifunction cards. So if you're just starting in computing, or outfitting a second unit for home, now's a great time to buy this basic piece of hardware. You get a clock calendar, serial port, parallel port, up to 384k of memory, *and* copies of two classic unprotected programs—Sidekick 1.5 and DESQView. A genuine deal.

SixPakPlus 64k $169
SixPakPlus 384k (fully populated) $219

Herculean rebate!

The Hercules monochrome graphics card has saved hundreds of thousands of PC users from terminal myopia, by supplying crisp clean monochrome graphics. The Hercules color card is the industry standard for color graphics. Both come with a parallel printer port, and a *full two year warranty*. And from May 1 through August 31, Hercules is offering a $50 rebate on either card.

Hercules Monochrome Graphics Card $299
(and get $50 rebate from Hercules)
Hercules Color Card (1/2 slot) $159
(and get $50 rebate from Hercules)

Disks (10 per box)

5¼-PC disks Verbatim DataLife (DS/DD) (limited time offer! 12 disks for the price of 10) $17

5¼-AT disks (96-TPI)

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Maxell	$34
Fuji	$27
(Floppidene 5¼" Head Cleaner)	$18

Tip Sheet



Name: Jennifer Aitken
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Claim to fame: Has eaten several pints of Ben & Jerry's White Russian ice cream at a single sitting.

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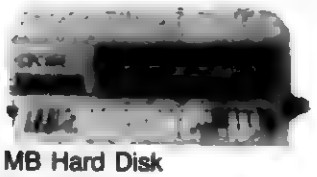
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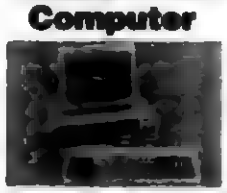
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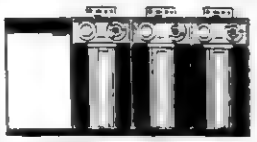
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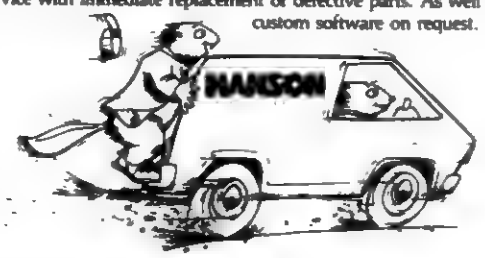
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ADS/O	●				●			●		●	●	●		
HP-3000														●
SOFTWARE ENG.														●
APL														●
DEC VAX	●	●			●						●			
ADR	●				●									
RPG III S/38		●				●					●	●		
CICS		●	●		●		●				●	●		
IMS DB/DC		●			●		●				●	●		
ADABAS		●						●						
FOCUS		●			●		●		●			●		
ADABAS NATURAL							●					●	●	
SQL		●				●								
NOMAD		●				●								
IDEAL		●	●		●									
DB II			●		●		●					●		
RPG II S/36						●								
UNIX/C		●					●					●		
MICRO MAINFRAME LINK							●					●		
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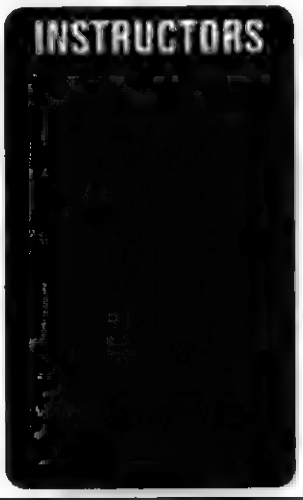
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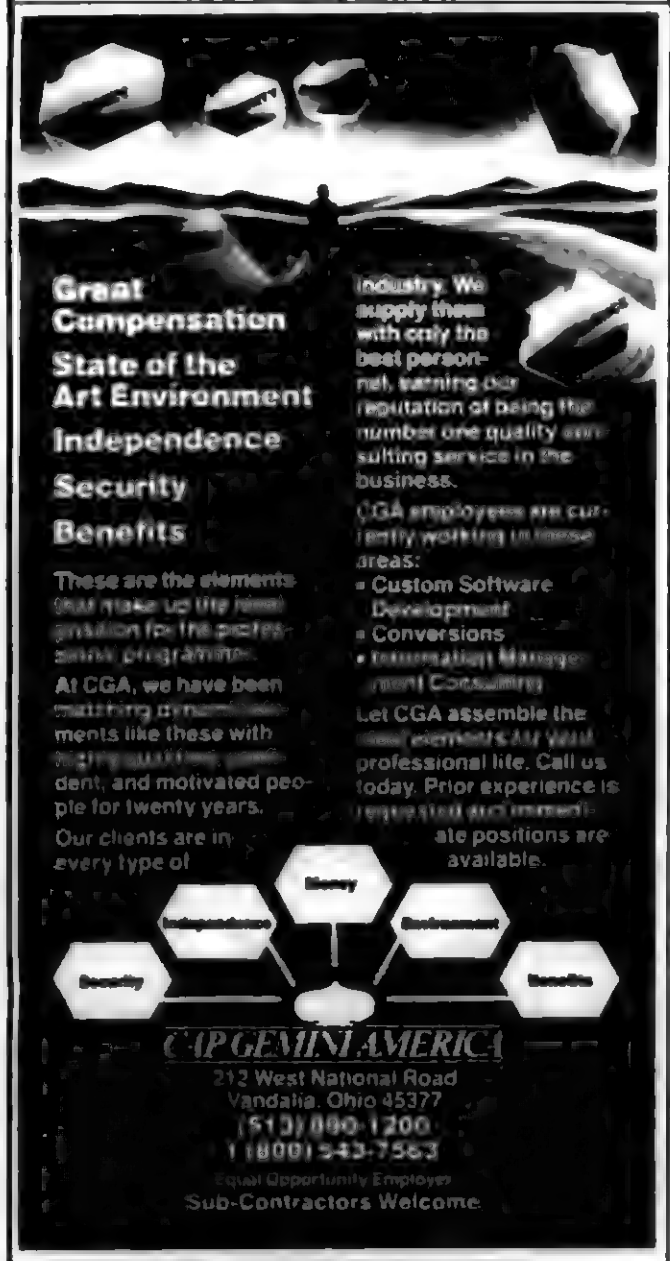
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ITT to sell telecom business

Deal with French firm could net $2 billion

By Edward Warner
Computerworld News Service

NEW YORK — ITT confirmed last week that it is involved in negotiations with France's Compagnie Generale d'Electricite S.A. (CGE), a state-owned telecommunications firm. The talks could result in the sale of a major portion of ITT's telecommunications business to CGE.

The sale would effectively remove ITT from the telecommunications market, focusing the company's business on insurance, hotels and finance. The sale will reportedly net ITT approximately $2 billion and would pose heightened competition for AT&T and for West Germany's Siemens AG.

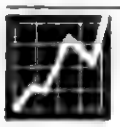
ITT's worldwide telecommunications business reportedly generated $4.6 billion, or 23% of ITT's 1985 sales.

Although ITT now has a much-reduced presence in the U.S. telecommunications products market, it is still far more successful on the international scene than CGE.

"CGE thinks it's getting a bargain if it can get that whole ITT unit for $2 billion," said Ken Bosomworth, the president of telecom research firm International Resource Development, Inc. in Norwalk, Conn.

Bosomworth said U.S. companies other than AT&T will feel little immediate impact from the sale since neither ITT nor CGE are major players in the U.S. telecommunications marketplace. ITT scaled back its U.S. presence earlier this year when it scuttled plans to bring its new System 12 switch to the U.S. market.

Upcoming intros at core of Apple revenue growth



ACTIVE ISSUES
Kathy Porteus

Although no one can criticize Apple Computer, Inc.'s (AAPL — 34¾) six-month stock performance, during which the price per share surged 74%, analysts disagree on whether Apple will continue bearing fruit for investors.

Apple's stock soared as cost-cutting measures caused substantial improvement in earnings and gross margins. Most analysts peg fiscal 1986 earnings between $2.20 and $2.40 a share, compared with 99 cents a share in 1985. Apple's current fiscal year ends Sept. 26.

Future earnings gains depend largely on revenue growth. To stimulate sales, Apple plans to unveil major products, including an Apple II microcomputer in September and an open-architecture version of Macintosh in January. The key area of dissension among analysts is how effectively these products will fuel Apple's earnings momentum.

Michele S. Preston, vice-president with L. F. Rothschild, Unterberg Towbin, recommends purchase of Apple because "the stock does not reflect Apple's earnings potential for next year." Preston estimates Apple could earn $2.85 to $3 a share in fiscal 1987. This means that if the stock traded at its historical multiple of 15 to 20 times earnings, Apple's price per share could appreciate 30% to 35% over the next 12 months.

Preston says she is optimistic about Apple's revenue growth because the company's sales are "now coming in better than expected," despite availability of low-priced IBM Personal Computer clones. Furthermore, she reasons, Apple will be well positioned for Christmas with its Apple II product lineup. "And a good Christmas," Preston says, "will give Apple a lot of momentum leading into its introduction of the new Mac."

"It really doesn't matter," says John Dean, senior securities analyst with Montgomery Securities, "how many guys bring out their own IBM PC clones as far as Apple is concerned, because many customers want an alternative to IBM."

Nevertheless, Dean says he is conservative about Apple's short-term outlook. "Before I'm willing to bid up Apple's stock on a multiples basis, I want to see what the new products are and compare them with the marketplace," he says.

According to Dean, the Macintosh's interface and graphics definitely fit the computer-aided design and manufacturing market, but the new Mac needs added value to attract buyers.

Thomas A. Galvin, analyst with Shearson, Lehman Brothers, Inc., also expects little short-term upside activity from Apple's stock "because visibility of the new products is not there." Galvin says he believes the stock, at current price levels, reflects most positive expectations regarding earnings comparisons and product introductions.

While the wait-and-see attitude prevails among many Apple analysts, Robert Matson, technology analyst with Harvard Management, recently recommended sale of the stock to his firm's money managers. Matson says Apple investors are currently "going on faith" because market acceptance of the company's new products is unknown.

Matson also sees the potential for a "real price war developing before Christmas" as a result of aggressive pricing by Asian microcomputer newcomers. Despite Apple's lesser exposure to such pricing in the IBM PC-compatible market, "this cloud still hangs over all microcomputer makers," Matson maintains. "My question is, Do you really want to own a stock with such a scenario of product uncertainty and pricing pressure?"

Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

Wang expects flat earnings

From page 118

ployment levels through attrition. Since the company's major layoff a year ago, total employment has actually climbed higher than the pre-layoff figures.

"We presently employ 31,700 employees," a spokesman said, "and we were 31,050 last year." The additional employees came on board to bolster the R&D and sales and service sectors, he explained.

But the attrition policy could be hurting development efforts, IDC's Mikita said. "Wang is concentrating on communications and connectivity to help them through the next few years, and I heard recently that there were 70 unfilled positions in those projects. That could hurt, ultimately," he said.

Part of Wang's operating cost layout this year came from purchasing 40% of Telenova, Inc., a small switch manufacturer, and from expenses related to the not-yet-consummated takeover of 100% of Intecom, Inc., the private branch exchange manufacturer based in Allen, Texas. Wang agreed to pick up 20% of the cost of a $12.4 million user lawsuit against Intecom.

Wang will continue its year-old policy to consolidate functions wherever feasible, the Wang spokesman said. In the past year, it has melded some manufacturing functions and moved groups of employees from leased to owned buildings.

Wang will reschedule or eliminate programs that have no positive effect on long-term profitability, but the company would not comment specifically on any plans.

3Com profits, sales up in '86

From page 118

$2.1 million, or 15 cents per share. In the same quarter a year ago, the local-area network (LAN) vendor had revenue of $14 million and profits of $1.6 million, or 11 cents per share.

3Com Chairman Robert Metcalfe said the company has recovered strongly from a period in which "it got confused about itself." He admitted that the last-minute investment bankers' decision that canceled the Convergent merger [CW, March 31] was a blessing in disguise.

"It was widely reported that our employees cheered when the merger was canceled," Metcalfe said in an interview last week. "We learned from our employees that we really do want to focus on internal growth. There is nothing in our business plan for the coming year that says we should go out and get acquired."

Metcalfe attributed 3Com's strong financial performance to shipments of 3+, the growth in multiuser applications software requiring dedicated network servers such as 3Com's 3Server and a resurgence in OEM business of Ethernet-based network components because of increased sales of Digital Equipment Corp. systems. "DEC is booming and taking Ethernet with it," said Metcalfe, who co-developed Ethernet in 1973. "Ethernet may not be dead after all."

Although 3Com is also pushing LAN products based on IBM Token-Ring, AT&T Starlan and Apple Computer, Inc. network architectures, Ethernet-based components still account for more than 90% of 3Com's sales, Metcalfe said.

Metcalfe said the later-than-promised delivery of the 3+ operating system caused a 3Com slump during calendar 1985 and boosted the business of 3Com's competitors, particularly Novell, Inc. Now, 3Com, along with Novell and Banyan Systems, Inc., are riding the crest of the trend to dedicated network servers, he said.

CORRECTION

The headline on Bob Djurdjevic's Industry Insight column [CW, June 23] should have read, "IBM inventory at record high."

Firm to buy Clickart line

By Edward Warner
Computerworld News Service

MOUNTAIN VIEW, Calif. — One week after entering the desktop publishing market, Software Publishing Corp. expanded its presence there last week by announcing that it intends to acquire the Clickart Personal Publisher software line from T/Maker Co., also of Mountain View.

Clickart Personal Publisher would give Software Publishing an entry into IBM Personal Computer-based desktop publishing and would be a good complement to Software Publishing's PFS products, according to Maureen Fleming, president of market research firm Digital Information Group in Stamford, Conn.

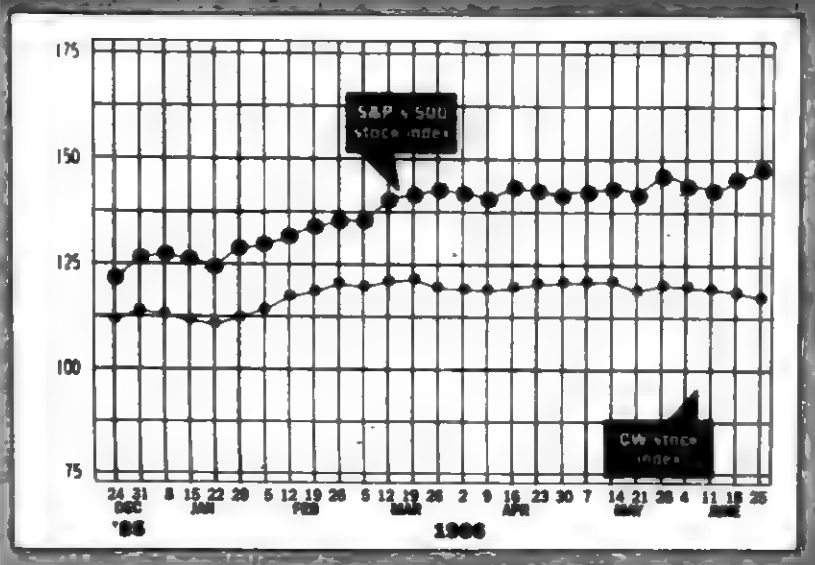
Until this year, sophisticated desktop publishing programs have been available only for the Apple Computer, Inc. Macintosh. This spring, however, T/Maker introduced Clickart Personal Publisher, the IBM PC version of its Clickart program, and analysts say the program will be the first of many desktop publishing products for the PC.

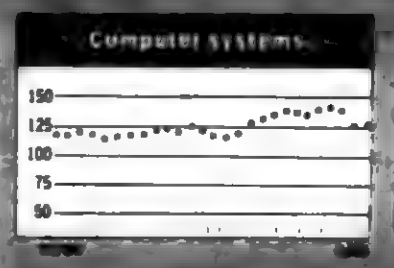
Software Publishing recently said it will license from Bestinfo, Inc. of Culver City, Calif., a still-unfinished PC-compatible program for the high-end desktop publishing market. That product will be included in Software Publishing's Harvard product line.

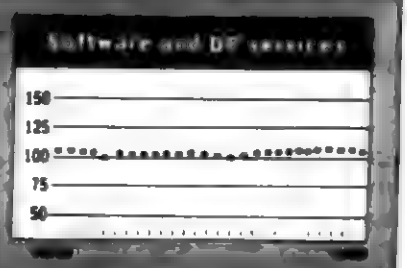
COMPUTER INDUSTRY

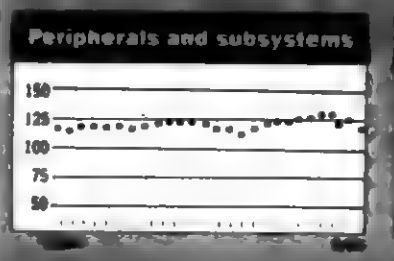
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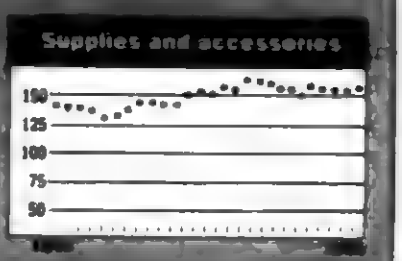
Computerworld stock trading index

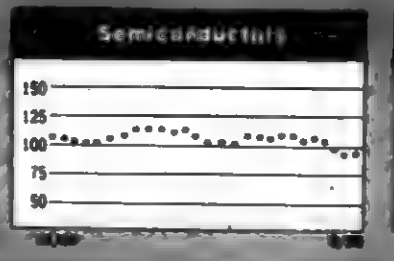














All company indexes, except the CW stock index, are based on a value of 100 on Dec. 31, 1984, and track stock market performance in relation to that base. The CW stock index represents the unweighted average performance of the six companies in all computer industry stocks.

	6/18/86	6/25/86
Computer systems	125.3	125.8
Software and DP services	106.5	106.0
Peripherals and subsystems	125.0	122.2
Supplies and accessories	154.2	154.7
Semiconductors	93.5	93.0
Leasing companies	104.2	104.1
CW stock index	117.2	116.9
Standard and Poor's 500 stock index	146.5	148.9

Computerworld stock trading summary

CLOSING PRICES WEDNESDAY, JUNE 25, 1986

EXCH		52-WEEK RANGE (1)		CLOSE JUN 25 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS					
O	ALPHA MICROSYSTEMS	5-	9	6	+1/8	+2.1
O	ALTOS COMPUTER SYST	9-	19	16	-1/4	-1.5
A	AMDAHL CORP	10-	18	17 3/8	-1/8	-0.7
O	APOLLO COMPUTER	9-	31	11 3/4	-3/4	-6.0
O	APPLE COMPUTER INC	14-	39	35 7/8	+1 5/8	+4.7
N	AT&T	19-	28	25 1/8	0	0.0
N	BURROUGHS CORP	52-	71	61 1/2	+5/8	+1.0
O	COMPAQ COMPUTER CP	5-	16	14 1/8	-1/8	-0.8
O	COMPUTER AUTOMATION	1-	9	3 5/8	+5/8	+20.8
A	COMPUTER CONSOLES	5-	14	10	-1/8	-1.2
N	CONTROL DATA CORP	15-	39	23 1/8	-1	-4.1
O	CONVERGENT TECHNOL	5-	13	7 1/8	-1/2	-6.5
O	CPT CORP	4-	8	4 1/4	-1/8	-4.2
N	CRAY RESEARCH INC	25-	94	91 7/8	+2 5/8	+2.9
O	DAISY SYSTEMS CORP	11-	38	11 1/2	0	0.0
N	DATA GENERAL CORP	31-	76	32 1/2	-4 3/4	-12.7
N	DATAPOINT CORP	5-	22	7 7/8	-3/4	-8.6
N	DIGITAL EQUIPMENT	42-	91	86 5/8	+1 3/4	+2.0
A	EECO INC	13-	20	19 5/8	-1/8	-0.6
N	ELECTRONIC ASSOC	3-	7	5 1/2	+1/8	+2.3
N	FLOATING POINT SYST	18-	42	37 1/4	+1 3/8	+3.8
N	FOXBORO	22-	31	31	0	0.0
N	GOULD INC	20-	38	21 3/8	+5/8	+3.0
N	HARRIS CORP	22-	35	31 1/8	-3/8	-1.1
N	HEWLETT-PACKARD CO	29-	46	42 1/4	+3/8	+0.8
N	HONEYWELL INC	64-	87	75 1/4	-5/8	-0.8
N	IBM	117-	158	147 1/2	+1 1/8	+0.7
O	IFL SYSTEMS INC	1-	4	2 7/8	-1/8	-4.1
N	ITT CORP	28-	49	48 3/8	+4 1/4	+9.4
N	M/A-COM INC	13-	24	17 1/8	+1/8	+0.7
N	MANAGEMENT ASSIST	2-	28	2 1/2		+2.5
N	MATSUSHITA ELEC(ADR)	49-	98	90	+1 1/8	+1.2
O	MENTOR GRAPHICS	13-	30	16 3/4	+3/8	+2.2
N	MODULAR COMPUTER SYS	6-	9	8 7/8	0	0.0
N	MOHAWK DATA SCI	1-	13	2 1/2	-3/8	-13.0
N	NBI INC	11-	20	13 1/2	+1 3/4	+14.8
N	NCR	25-	56	52 3/4	+1/2	+0.9
N	PERKIN-ELMER	22-	36	27 3/8	+3/8	+1.3
N	PRIME COMPUTER INC	15-	27	17 1/8	-1	-5.5
N	SPERRY CORP	39-	76	75 1/2	+3/8	+0.4
O	STRATUS COMPUTER INC	9-	25	22 1/4	+3/4	+3.4
O	TANDEM COMPUTERS INC	13-	34	31 5/8	+1 5/8	+5.4
N	TANDY CORP	24-	44	38 3/8	-1 5/8	-4.0
O	TELEVIDEO SYSTEMS	2-	4	3	-1/8	-4.0
O	TELXON CORP	8-	23	21	+1/2	+2.2
N	TEXAS INSTRUMENTS	86-	141	121	+1 1/2	+1.2
A	ULTIMATE CORP	8-	34	29 1/4	-1 1/8	-3.7
O	VECTOR GRAPHICS INC	1-	1	1/8	0	0.0
A	WANG LABS "B"	15-	29	15 5/8	0	0.0
A	WANG LABS "C"	16-	29	16	+1/4	+1.5
N	XEROX CORP	37-	72	56	-1/8	-0.2
	SUPPLIES & ACCESSORIES					
N	AMERICAN BUS PRODS	21-	38	32 7/8	-1/4	-0.7
N	BARRY WRIGHT	17-	29	21 3/8	-1 3/4	-7.5
A	DUPLEX PRODUCTS INC	13-	22	21 3/8	+1/4	+1.1
N	ENNIS BUS. FORMS	14-	28	27 7/8	+2	+7.7
N	3M COMPANY	74-	111	111 1/8	-1/4	-0.2
N	MOORE CORP LTD	15-	27	25 1/4	+1/4	+1.0
O	STANDARD REGISTER	22-	46	39 1/2	+1/4	+0.6
N	WALLACE COMP SERVICE	30-	48	46	+3/8	+0.8

EXCH		52 WEEK RANGE (1)		CLOSE JUN 25 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & DP SERVICES					
O	ADVANCED COMP TECH	2-	6	5 3/8	+1/8	+2.3
N	ADVANCED SYSTEMS INC	9-	20	17 3/4	0	0.0
N	AGS COMPUTERS INC	10-	25	19 1/4	+5/8	+3.3
O	AMERICAN SOFTWARE	9-	15	13 5/8	+3/8	+2.8
N	ANACOMP INC	5-	11	5 3/4	0	0.0
O	ANALYSTS INTL CORP	2-	6	5 5/8	-1/2	-8.1
O	ASHTON TATE	6-	34	28 3/8	+1 7/8	+7.0
O	ASK COMPUTER SYSTEMS	7-	25	11 5/8	-1/8	-1.0
B	ASTRADYNE COMP IND	1-	3	1 1/2	0	0.0
N	AUTOMATIC DATA PROC	18-	39	35 1/2	+3/4	+2.1
O	COMPUTER NETWORK	5-	9	7 3/4	+1/8	+1.6
O	COMPUTER ASSOC INT'L	9-	25	23 3/4	-1	-4.0
O	COMPUTER HORIZONS	5-	11	13 5/8	-3/8	-2.6
N	COMPUTER SCIENCES	13-	39	38 1/8	+1/8	+0.3
O	COMPUTER TASK GROUP	7-	19	18 1/4	-3/4	-4.4
O	COMPUTER USAGE	1-	3	2 1/2	0	0.0
O	COMPUTONE SYSTEMS	3-	11	3 5/8	+1/2	+16.0
O	COMSERV CORP	1-	6	3 7/8	0	0.0
O	COMSHARE	7-	13	13	-1/8	-0.9
N	CULLINET SOFTWARE	12-	33	12 3/4	-5/8	-4.6
O	CYCARE SYSTEMS INC	13-	27	14 1/8	-1 1/8	-7.3
O	HOGAN SYSTEM INC	4-	12	10 3/4	-1/8	-1.1
N	GENERAL ELECTRIC CO	58-	82	81 3/4	+1/2	+0.6
N	GENL MOTORS E (EDS)	20-	49	47 1/2	-1/4	-0.5
N	GTE CORP	38-	54	52 3/4	+2	+3.9
O	INFORMATION SCIENCE	1-	5	3 3/4	+1/4	+7.1
O	INFOTRON SYSTEMS CP	13-	24	15 3/4	+1/2	+3.2
O	KEANE ASSOCIATES	10-	20	14 3/4	0	0.0
N	LOGICON	25-	43	33 1/8	-1 5/8	-4.6
O	LOTUS DEVELOPMENT CP	15-	38	38 1/8	+1/8	+0.3
O	MCI COMMUNICATIONS	7-	13	10 1/8	+1/8	+1.2
O	MNGT SCI AMER INC	7-	16	14 5/8	+7/8	+6.3
O	MATHEMATICAL APP GRP	1-	8	1/2	0	0.0
O	MICOM SYSTEMS INC	12-	35	12 3/4	-1/4	-1.9
O	MICROPRO INT'L CP	2-	4	2 1/8	-1/8	-5.1
O	NATIONAL DATA CORP	8-	25	19 3/4	+1 1/8	+6.0
O	ON-LINE SOFTWARE INT	4-	16	13 1/4	-1/2	-3.6
N	RANSOPHIC SYSTEMS	14-	35	30 1/4	+1	+3.4
N	PLANNING RESEARCH	11-	23	19 1/4	-1/4	-1.2
O	POLICY MGMT SYSTS CP	16-	35	19 1/4	+1 1/4	+6.9
O	PROGRAMMING & SYS	4-	10	10	+1/8	+1.2
O	REYNOLDS & REYNOLD	30-	65	33 1/4	-1 1/2	-4.3
O	SEI CORP	13-	27	17 3/4	-1	-5.3
O	SHARED MEDICAL SYST	28-	38	34 1/8	+2 3/4	+8.7
O	SCIENTIFIC COMPUTERS	4-	8	4 1/2	-1/8	-2.7
O	SOFTWARE AG	12-	22	19 1/2	-1/4	-1.2
N	URS CORP	10-	18	16 1/8	-1	-5.8
N	UCCEL	11-	23	21 1/2	-1/4	-1.1
O	VM SOFTWARE	17-	31	27	0	0.0
	SEMICONDUCTORS					
N	ADVANCED MICRO DEV	22-	36	21 1/2	0	0.0
O	ADV'D SEMICONDUCTOR	7-	23	9 1/8	-1/8	-1.3
N	ANALOG DEVICES INC	14-	34	18 3/4	+3/4	+4.1
O	ANALOGIC CORP	11-	16	12 3/4	+5/8	+5.1
N	APPLIED MAGNETICS CP	9-	19	15 3/8	+5/8	+4.2
O	AVANTEK	17-	26	17 7/8	+1/2	+2.8
O	HADCO CORP	3-	7	5	0	0.0
O	INTEL CORP	21-	33	24	+1 1/4	+5.4
O	MICRO MASK INC	5-	12	4 7/8	-3/8	-7.1
N	MOTOROLA INC	28-	46	38	+1/2	+1.2
N	NAT'L SEMICONDUCTOR	10-	15	11 1/2	-5/8	-5.1
N	TERADYNE	17-	33	22 3/8	-5/8	-2.7

EXCH		52-WEEK RANGE (1)		CLOSE JUN 25 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	PERIPHERALS & SUBSYSTEMS					
P	AM INTERNATIONAL	3-	8	7 7/8	-1/8	-1.5
A	ANDERSON JACOBSON	2-	5	2 1/8	0	0.0
O	AST RESEARCH INC	7-	33	12 7/8	-7/8	-6.3
O	AUTO-TROL TECHNOLOGY	3-	13	4 1/8	-3/8	-8.3
O	AVANT-GARDE COMPUTING	3-	21	3 3/4	-1/4	-6.2
O	BANCTEC INC	6-	13	9 3/4	+1/8	+10.3
O	BEEHIVE INT'L	1-	2	1/8	0	0.0
N	BOLT, BERANEK & NEW	20-	46	41 5/8	-3 1/8	-6.9
O	CAMBEX CORP	1-	3	1	0	0.0
N	CENTRONICS DATA COMP	3-	11	6 1/2	-1/8	-1.8
A	CETEC CORP	6-	9	7 1/8	-1/8	-1.7
A	COGNITRONICS	4-	7	3 3/4	-1/8	-3.2
N	COMPUGRAPHIC CORP	20-	36	20	-3 5/8	-15.3
O	COMPUTER TRANSCEIVER	0-	1	3/4	0	0.0
N	COMPUTERVISION CORP	9-	44	14 3/4	-1/4	-1.6
N	CONRAC CORP	12-	18	15	-1 3/8	-8.3
A	DATAPRODUCTS CORP	11-	20	15 1/4	-3/4	-4.6
A	DATARAM CORP	4-	17	9 1/4	-1 1/4	-11.9
O	DATA SWITCH CORP	4-	9	8	-1/2	-7.8
O	DATUM INC	5-	9	6	-3/8	-5.8
O	DECISION IND CORP	10-	20	14 3/4	+1 3/8	+10.2
O	ENDATA, INC	2-	8	6 3/4	-3/4	-10.0
O	EVANS & SUTHERLAND	12-	27	22	-5/8	-2.7
O	GANDALF TECHNOLOGIES	5-	13	6 3/4	-1/2	-6.8
N	GEN'L DATA COMM IND	8-	21	12 3/4	+5/8	+5.1
N	HAZELTINE CORP	17-	30	19 3/4	+2 5/8	+15.3
O	ICOT CORP	3-	12	11	-5/8	-5.3
C	INFORMATION INTL INC	10-	17	15 1/2	+1/2	+3.3
C	INTECOM INC	3-	11	5 3/8	0	0.0
O	MEGADATA CORP	3-	8	3 1/8	0	0.0
A	MSI DATA CORP	7-	14	13 3/4	+1/8	+0.9
N	NASHUA CORP	24-	53	49 5/8	-3/8	-0.7
O	NETWORK SYSTEMS CORP	11-	27	12 3/4	-7/8	-6.4
N	NO AMERICAN PHILIPS	32-	47	45 3/8	+2 1/8	+4.9
N	NORTHERN TELECOM LTD	28-	41	29 3/4	+3/4	+2.5
O	OMEX	1-	3	1/2	0	0.0
N	PARADYNE CORP	6-	18	8 3/8	1	10.6
A	PENRIL CORP	7-	14	8 7/8	-1/2	-8.7
N	PLESSEY CO (ADR)	19-	38	35 1/4	1/4	-0.7
O	PRINTRONIX INC	9-	18	13 1/2	+1/4	+1.8
C	QMS INC	6-	16	15 1/4	+3/8	+2.5
C	RAMTEK CORP	2-	7	5 1/2	0	0.0
A	RECOGNITION EQUIP	9-	17	12 3/4	+1/2	-4.0
A	SANDERS ASSOCIATES	29-	44	32 5/8	+3 5/8	+12.5
C	SCAN-TRON CORP	9-	24	23 1/2	+1/2	+2.1
N	SCIENTIFIC ATLANTA	10-	15	10 3/8	0	0.0
O	SEAGATE TECHNOLOGY	9-	13	11 7/8	+1 1/4	+11.7
N	STORAGE TECHNOLOGY	1	5	3 3/8	3/8	10.0
O	SYKES DATATRONICS	0-	2	1/4	-1/16	-16.5
A	T BAR INC	5-	9	5 1/4	-3/8	-6.6
A	TAB PRODUCTS CO	9-	15	14 1/4	1/2	3.3
O	TANDON CORP	3-	9	6 1/4	+1/8	+2.0
A	TEC INC	5-	13	4 3/4	3/8	7.3
N	TEKTRONIX INC	47-	68	59 3/8	1 1/8	1.8
N	TELEX	34-	68	58 1/2	+2 1/4	+4.0
O	TESDATA SYSTEMS CP	0-	3	3/8	1/16	14.3
N	TIMEPLEX INC	15-	23	16 5/8	3/4	-4.3
N	TITAN CORP	4-	11	9 1/2	0	0.0
O	VISUAL TECHNOLOGY	1-	3	1/2	0	0.0
	LEASING COMPANIES					
A	COMDISCO INC	7-	24	21	1/4	1.1
N	CONTINENTAL INFO SYS	5-	12	11 3/4	+1/8	+1.0
O	FINALCO GROUP INC	3	5	3 1/8	0	0.0
O	PHOENIX AMERICAN INC	2-	6	3 3/4	3/8	9.0
O	SELECTERM INC	6-	12	7 1/2	+1/4	+3.4
N	U.S. LEASING	32	46	42	1 1/2	3.4

EXCH: N—NEW YORK; A—AMERICAN; P—PACIFIC; B—BOSTON; L—NATIONAL; M—MIDWEST; O—OVER-THE-COUNTER; S—SPLIT

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COMPUTER INDUSTRY

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IBM will close a federal systems office in California, relocating 450 workers to Colorado/94

ITT is on the verge of selling a large piece of its telecommunications business to a state-owned firm in France/116

INSTANT ANALYSIS

"Semiconductor order sluggishness, excess IBM inventories and continued paring of overhead all reinforce the view that positive order momentum has not yet occurred."

— **Stephen E. Yoken, L. F. Rothschild, Unterberg Towbin, Inc.**

Wang expects to break even

Predicts 10% sales growth, hints at further staff cuts

By Donna Raimondi

LOWELL, Mass. — Wang Laboratories, Inc. will end a lackluster fiscal year with a break-even fourth quarter and 10% sales growth for the quarter, Chairman and President An Wang predicted last week.

An anticipated $700 million in fourth-quarter revenue is expected to give Wang a hike over last year's dismal fourth quarter, in which the company reported a $109 million loss after laying off 1,600 workers. Wang hinted last week that further work force reductions are needed, but company spokesmen refused comment on whether these would take the form of layoffs.

In a prepared statement, Wang announced that, despite soft customer demand and fierce competition in the marketplace, revenue is up about 10% from 1985's fourth-quarter figure of $635.2 million.

The figures indicate a slight downturn from what Wang projected for the business in a March interview with *Access 86*, a Wang users publication, in which he said the company was projecting a 15% sales increase for fiscal year 1986. The actual figures, to be announced July 22, will look more like a 12% increase, with revenue for fiscal 1986 of approximately $2.62 billion.

Earnings per share are expected to climb to between 30 and 40 cents, up from 1985's 11 cents. Before last year's disastrous fourth quarter, Wang earned 88 cents per share for the first nine months, compared with just 14 cents per share so far in fiscal 1986.

Last week's projections were better than some analysts expected, said Richard Mikita, minicomputer analyst at International Data Corp. in Framingham, Mass. "I expected Wang's earnings to be flat," he said. At the end of calendar 1985, however, some analysts were projecting fiscal 1986 earnings as high as 75 cents per share.

Wang's measures to control costs include a continuing effort to decrease em-

See **WANG** page 116

3Com profits, sales up in '86

By Clinton Wilder

MOUNTAIN VIEW, Calif. — Ending an eventful year in which its proposed acquisition by Convergent Technologies, Inc. was aborted at the last minute, 3Com Corp. last week reported a 33% profit growth on a 38% sales increase for both the fourth quarter and the year ended May 31.

Boosted by strong shipments of the 3+ operating system introduced in February, 3Com's sales grew to $64 million for the year, up from $46.3 million in fiscal 1985. Profits were $6.7 million, or 48 cents per share, compared with $5 million, or 36 cents per share, in the prior year.

For the fourth quarter, 3Com posted record sales of $19.3 million and earnings of

See **3COM** page 116

DATA VIEW

JEFF BARNEAU



INDUSTRY INSIGHT
Clinton Wilder

IBM cutbacks: Towels tell tale

Legend has it that famous "gonzo" journalist Hunter S. Thompson received his best inside information on the 1972 presidential campaign by interviewing candidates and aides in the men's room. Although a trip to the rest room during a recent tour of IBM's General Products Division in San Jose, Calif., did not produce any live interview subjects, it did turn up an insight into just how serious IBM's current financial doldrums might be.

Even more telling than Chairman John F. Akers' prediction of a second straight year-to-year earnings drop was the sign on the men's room towel dispenser: "Conserve paper. All paper products are in short supply."

Make no mistake. Big Blue is on an austerity program of major proportions. Claiming to be inextricably linked to a U.S. capital economy that Akers characterized as "dicey," IBM is analyzing and paring expenses so drastically that one leading analyst has compared the monolith to Ebenezer Scrooge himself.

Without breaking IBM's no-layoff policy, the current belt-tightening has resulted in perhaps an all-time volume of what Akers calls "moving work to people and people to work." Whether referring to geography, job function or both, the old quip that IBM stands for "I've Been Moved" is truer than ever.

Akers said Big Blue will add 3,000 to 3,500 marketing and sales positions in the U.S. this year, even as IBM's total

See **TOWELS** page 95

Wilder is Computerworld's senior editor, computer industry.

Centralized decision making hurts foreign firms in U.S. mart

Overseas vendors find quick responses difficult

LAST OF THREE PARTS

By Edward Warner
Computerworld News Service

The president of the C. Itoh Electronics Group in Los Angeles, a U.S. marketing arm of Japan's C. Itoh & Co., is Japanese. So is the president of the Electronics Group's printer marketing operation. At Digital Equipment Corp.'s West German affiliate, however, nearly all top managers are German.

The difference in DEC and C. Itoh's approach is typical of the Japanese vendor's preference for Japanese managers at foreign subsidiaries, according to analyst Fred Anderson.

That strategy, he says, slows decision making at the subsidiaries and helps explain why Japanese vendors have won minimal market share in the U.S.

Anderson, the director of international services for International Data Corp. (IDC) in Framingham, Mass., says Japanese vendors have made major inroads in the U.S. only in semiconductors and peripherals. European vendors, he elaborated, have not had a major impact on any sector of the U.S. computer industry.

"I don't think you'll see any foreign company showing up in any survey of U.S. market share, except [those companies making] printers," says Jack Hart, vice president of international services at IDC.

The mainframe arena, Hart says, is where foreign vendors have been most stymied. As recently as 1983, British mainframe maker International Computers, Ltd. (ICL) was earning only 2% of its total revenue from North and South America combined. Although Hitachi Ltd. and Fujitsu Ltd. both sell their machines through OEM agreements with U.S. mainframe vendors — National Advanced Systems Corp. and Amdahl Corp., respectively — they have a combined share of less than 5% in the U.S. mainframe market, according to IDC statistics.

In the personal computer market, a much-feared Japanese onslaught has not materialized, despite notable attempts by NEC Corp. and Epson America, Inc. European microcomputer vendors Acorn Computers, Ltd. of the U.K. and L. M. Ericsson of Sweden have both achieved negligible U.S. sales, and last year Ericsson quit the U.S. PC market.

The limited impact of the foreign computer vendor in the U.S. cannot be blamed on trade barriers because European and Japanese vendors face far fewer roadblocks to trade in the U.S. market than U.S. vendors encounter in Europe and Japan. "It's no big deal to export into the U.S.," Hart says. "Our markets are open to them, and ours is the biggest computer market in the world."

One welcome advantage to the foreign vendor is that U.S. corporate customers are much less likely to demand relationship selling, a time-honored and expensive tradition in Japanese business. Relationship sell-

See **CENTRALIZED** page 94

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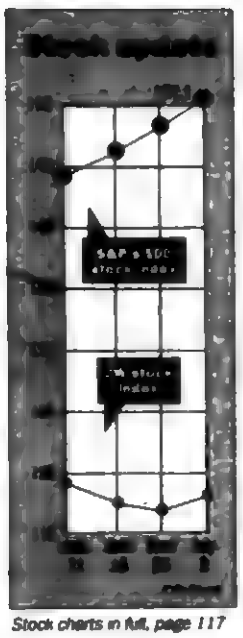
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Surveys show MIS departments continue to pay premiums for data communications expertise. **Page 69.**

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IBM's Information Network ties U.S. companies to overseas data services. **Page 2.**

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MIS executives, waiting for Intel's 80386, call for a new generation of micro software. **Page 45.**

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Computer Corporation of America claims DBMS image storage capabilities. **Page 7.**

■

AT&T rolls out low-end PBX with ties to Systems 75 and 85. **Page 15.**

■

Honeywell and NEC team up to sell Japanese supercomputers in U.S. **Page 6.**

■

Never one to ignore a market established by others, IBM last week announced the creation of the Publishing Systems Business Unit. The group will market and develop computer-aided publishing systems, "drawing largely on products . . . manufactured and developed by IBM," an IBM spokesman said. The systems will utilize a broad range of IBM products, including mainframes.

■

The almost-certain repeal of the investment tax credit [CW, June 30] has already caused one large corporate user to opt for purchase, rather than lease, of an IBM 3090 currently being installed. Merrill Lynch, Pierce, Fenner & Smith decided

See **NEWS** page 7

DG axes 500, slump persists

Sees no improvement in short-term outlook

By Clinton Wilder

WESTBORO, Mass. — In a dramatic reminder that the computer industry slump remains as stubborn as ever for some companies, Data General Corp. last week laid off 500 white-collar employees and predicted no short-term improvement in its business outlook.

DG, which cut 400 manufacturing jobs by closing two plants last month [CW, June 16], said last week's layoffs would affect clerical, administrative and support workers in every area except sales, mar-

See **DG** page 6

Air carriers' fusion breeds MIS spin-off

By David A. Ladkum

HOUSTON — Preparing for a proposed merger with Eastern Airlines, Inc., Texas Air Corp. last week said it plans to form a subsidiary that will combine the internal and commercial computer operations of Eastern and three other airlines operated by Texas Air.

In an interview last week, the top executive of Texas Air's current information systems subsidiary said the company expects to reap economies of scale while making the Eastern reservations system big enough to compete effectively. The company operates Texas Air, Continental

See **AIRLINES'** page 8

Privacy threat seen by agency

By Mitch Betts

WASHINGTON, D.C. — Advances in technology are eroding the federal government's ability to ensure privacy of personal information stored in government computers, a congressional report charged last week. The assessment spurred calls for new legislation to prevent abuse of data collected by the government.

The U.S. Congress' Office of Technology Assessment, in a report released to Congress, claimed little or no direction is

See **PRIVACY** page 14

Links, LANs to rule at PC Expo

By Douglas Barney

NEW YORK — Microcomputer communications-oriented product announcements will dominate this week's PC Expo trade show and will include a combination of personal computer and mainframe software from Lotus Development Corp. that makes use of existing micro-to-mainframe links.

A number of local-area network and file server offerings will be announced by a variety of vendors, but the most anticipat-

See **LINKS** page 6

CW SPECIAL REPORT



Terminal bargains: Commodity market pushes prices down, functionality up

By Maura McEnaney

Terminals, like telephones, have become commonplace on workers' desks, sitting as a reminder of work yet undone. For the more than 40 terminal vendors vying for position in a shrinking market, competition is tougher than ever before.

In a business in which shipments increased only 7.2% in the U.S. last year, compared with an 18% growth rate the year before, terminal vendors are engaged in fierce price wars. Between 1983 and 1986, the average price of an ASCII terminal fell 33%, from $995 to $665. By 1987, the average price tag on these terminals — which use the standard ASCII code for asynchronous communications — is expected to slip to $589, according to one market survey.

The competition has been given a new dimension as the price wars transform terminals into a commodity and vendors pack their products with the most functionality at the lowest prices. Today, most ASCII terminals offer as standard features such items as programmable keys, multiple emulations, 132-column displays and color screens.

For corporate computer managers charged with making volume purchases of ASCII terminals, the current situation offers an excellent opportunity to buy quality products at bargain prices — and to weigh the probable staying power of the leading players in the field.

"It's hard to evaluate terminals on their performance because in many ways, they are all the same," says Ilene Goldman,

See **TERMINAL** page 13

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NEWSPAPER

Service lets multinationals access overseas applications

IBM to link U.S. to foreign data centers

By Elisabeth Horwitt

RYE BROOK, N.Y. — Offering multinational corporations the ability to share information and applications with overseas sites, IBM announced Intercontinental Information Services last week. Users of IBM's U.S.-based Information Network will now be able to access data and applications residing in IBM's foreign-based data centers, a company spokesman said.

The first phase of the two-phased introduction begins July 31 and provides a link from IBM Information Network to international services offered in 15 countries by IBM World Trade Europe/Middle East/Africa Corp. and IBM Japan. Information Network provides DP and networking services to U.S. businesses.

The intercontinental services will enable U.S.-based multinational companies to perform data collection, analysis and consolidation of marketing, accounting, sales or other types of data at an overseas IBM data center in Zoetermeer, Denmark, according to IBM market support administrator Robert Preisser. "There already is a community of IBM data center users in Europe; now U.S. users can share the same applications with European users, who are generally within the same company."

Batch processing

The international services, which have been available outside the U.S. since 1983, offer Application Systems, TSO and MVS batch processing at the Zoetermeer data center and batch processing at data centers in 15 countries, Preisser added. Application Systems is a "fourth-generation language" from IBM that has been available for more than a decade in Europe on a time-sharing basis and for two years as licensed software, according to IBM spokeswoman Ann Boland. Application Systems is used by tens of thousands of customers in Europe, Boland said.

Once the services are in place, authorized U.S. terminal users will be able to access them using the CCITT X.25 packet-switching protocol, IBM said.

"X.25 is the obvious choice," Preisser said. "A lot of European Postal Telegraph and Telephone authorities support it." IBM's networks are primarily Systems Network Architecture, but many user sites have implemented IBM's Network control program, Packet Switching Interface, on their network processors, which converts SNA to X.25, he added.

In Phase 2, which will begin on Oct. 31, IBM is scheduled to introduce a Professional Office System (Profs)-based connection between Information Network and its data center in Zoetermeer. "Users can log onto Profs' services on the Information Network, create a document and send it to an electronic mailbox in Zoetermeer," Preisser said. Zoetermeer acts as a network hub that routes documents between the IBM Information Network data centers in the U.S. and data centers in other European countries. Overseas recipients can usually pick up their mail two or three minutes after it is sent, according to Preisser.

IBM is allowed to offer remote data processing, but not electronic mail transmission services, in all overseas countries except Japan and the UK, Preisser said. As a result, documents cannot be delivered directly to user sites but instead reside in electronic mailboxes at the Zoetermeer facility.

Also introduced in Phase 2 will be bulk data transfer between Zoetermeer and the other IBM data centers. This application targets companies that want to cut back on the cost of sending documents overseas, such as shipping data, sales summaries, invoices, "anything that can be sent in batch mode," Boland said.

The services are "interesting, but not earthshaking," said Lee Doyle, senior analyst at Framingham, Mass.-based International Data Corp. "I see them as primarily a way for IBM to beef up profits from its Information Network, which is not a huge moneymaker."

"I can't think of any business reason to start using the Intercontinental Services, even though we're an international company," said Aetna Life & Casualty Co. assistant vice-president of telecommunications, John Donovan.

He added that Aetna uses the IBM Information Network for "low-level networking — it's a handy transmission facility. But we only need it as a conduit to our own computers. We don't need to time-share on IBM's." Aetna's international communications are "strictly direct-dial," according to Donovan. "The fact that IBM Information Network is going international is strictly ho-hum to us," he added.

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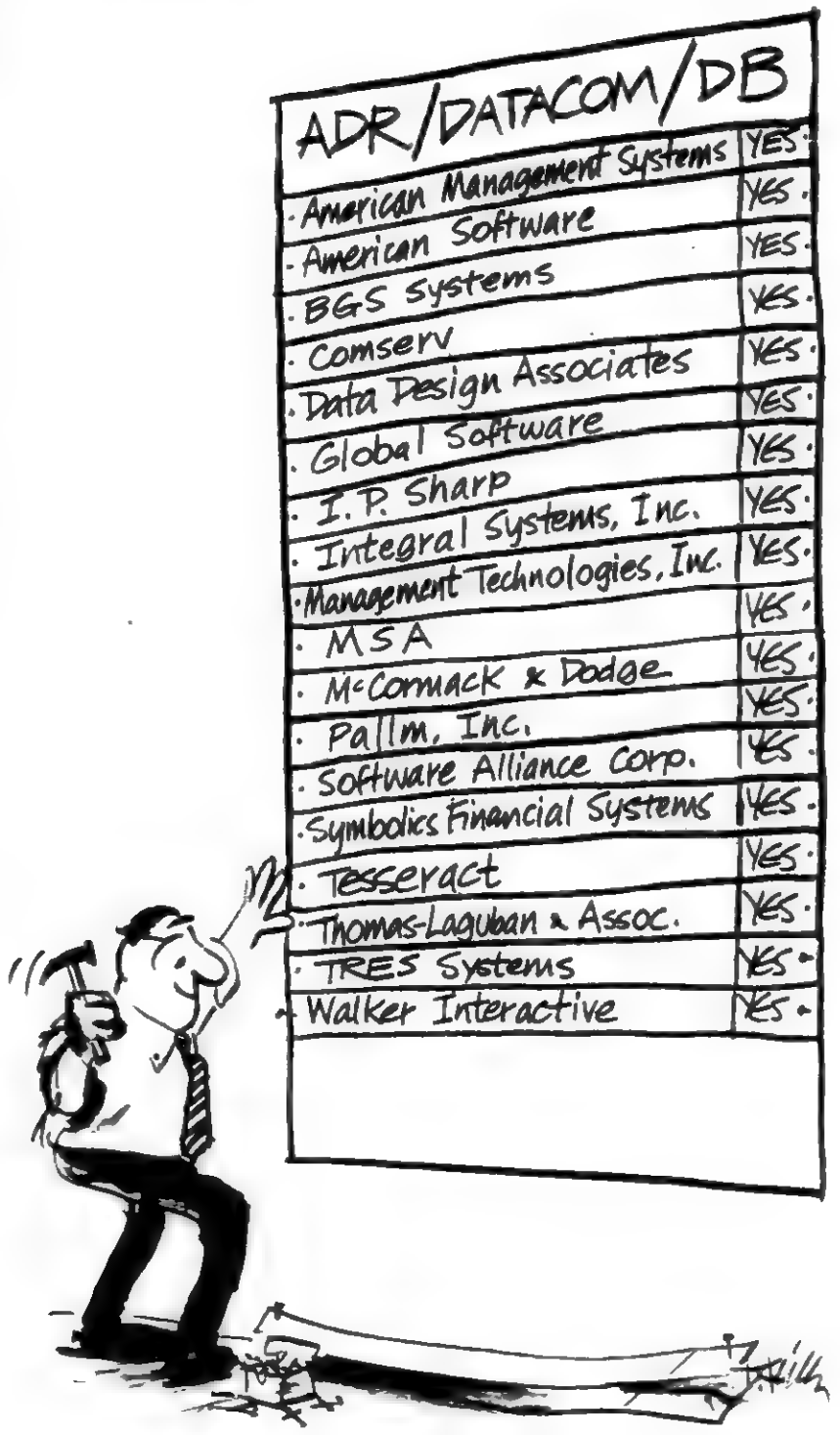


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Butterfly unit boosted with upgraded chips

BBN spins out group to market processors

By James Connolly

CAMBRIDGE, Mass. — Claiming a doubling of performance and expanded memory capacities, Bolt, Beranek & Newman, Inc. (BBN) last week enhanced its Butterfly parallel processing computer.

The company also announced that it has spun off its parallel processing operation into a wholly owned subsidiary known as BBN Advanced Computers, Inc.

Paul A. Castleman, former general manager of the parallel computing operation, was named president of the new company, which he said will use BBN's manufacturing facilities while trying to expand its market share in scientific and engineering high-performance computing.

He admitted that BBN has maintained a low profile with the Butterfly, which has an installed base of 63 systems. "That has been BBN's style. We want to make sure that we really have a product before we go public with it," Castleman said.

Enhancements announced last week include the replacement of the Motorola, Inc. 68000 microprocessor in the Butterfly with an optional Motorola 68020 and the addition of a Motorola 68881 floating-point coprocessor to the system.

BBN also announced the availability of an additional 3M bytes of shared memory for each of the maximum 256 processors, which previously had a memory capacity of 1M bytes, and the availability of Fortran 77 rather than just C. The system-wide shared memory capacity is now 1G bytes.

Castleman said customers can start with a basic configuration of four CPUs and can expand their system in single-processor increments to 256 processors, while gaining almost one million instructions per second in performance for each 68020 added. He said benchmark tests have shown the performance gain to be about 85% for some applications.

A four-CPU system costs about $40,000, and a typical 32-CPU system costs $375,000. The 3M-byte memory option costs $6,500 to $9,500.

"The new enhancements extend the Butterfly's power and versatility in a variety of applications," Castleman said. "One gigabyte of memory allows programmers to address problems they could not previously consider. The availability of both C and Fortran encourages use of the Butterfly computer in a wider range of science and engineering applications," he added.

Castleman reported that most use of Butterfly systems is now concentrated in companies, universities and government agencies that are experimenting with parallel processing.

He claimed that a key advantage for BBN is its use of a proprietary switching technology, in which any single processor can communicate with and access the memory of any other processor through a 32M bit/sec. switch rather than via a bus or cube architecture.

Analyst Jeffrey Canin, who follows the supercomputer industry for Hambrecht & Quist, noted that it remains to be determined whether any of the three technologies — a switch, a bus or a cube architecture — holds an advantage over the other two.

He said of BBN, "The firm has a lot of credibility in the scientific and engineering areas." He also noted that the low-profile approach may hurt if a company is targeting a broad commercial market but that it may have helped BBN because of the firm's narrower focus.

Canin added that BBN is operating in a growing market, saying that parallel processing "is the biggest single breakthrough in computing in the 1980s."

The analyst predicted that by the end of the decade the commercial scientific sector will adopt parallel processing.

HP joins laptop price battle

PALO ALTO, Calif. — Hewlett-Packard Co. joined the portable computer price war last week, dropping the price on its 512K-byte Portable Plus computer 11% to $2,995. The company also introduced an ink-jet printer.

HP's price reductions put the company in line with several other laptop computer vendors that cut product prices after IBM entered the market with a $2,200 laptop in April. HP is hoping the new pricing structure will lure customers away from the 256K-byte version of Portable Plus, which is priced at $2,695. "We're finding the 512K version is almost a minimum requirement for people buying our product," a spokesman said.

The price of the Portable Plus extended memory drawer was reduced to $395 from $495, and its 128K-byte random-access memory card was reduced from $350 to $250.

HP's Quietjet Plus ink-jet printer costs $799 and supports HP computers, Apple Computer, Inc. microcomputers and IBM Personal Computers and compatibles. It prints at 48.5db and reportedly can operate during a telephone conversation without disturbing the caller.

The printer has both draft- and letter-quality capabilities. Available immediately, the printer can handle tractor-feed and cut-sheet paper.

— Maura McEnaney

Digital service plans filed

By Mitch Betts

WASHINGTON, D.C. — Southwestern Bell Telephone Co., in a filing submitted to the Federal Communications Commission, last week disclosed plans for a packet-switched digital transmission service in its service areas of Texas, Oklahoma, Kansas, Arkansas and Missouri.

The St. Louis-based telephone company said the Microlink II service initially will include basic packet-switching as well as protocol conversion on an intrastate basis. Subsequent filings will be made for interstate access services, the company said.

The service initially offers asynchronous-to-CCITT X.25, asynchronous-to-X.75 and X.25-to-X.75 protocol conversions, the company said.

Phil Howard, an assistant vice-president for marketing, said the goal of the service is to provide a local gateway to nationwide data networks.

Likely applications are in the financial, insurance, health and retailing industries in which short bursts of data traffic are typical, he said. "We know that we've got some customers who want it," he said.

Howard said the service, which was tested in-house and at several unnamed commercial sites for about two years, is expected to achieve $16 million to $17 million in sales over three years.

The protocol conversion service requires FCC approval, but Howard said the company is confident it will meet FCC requirements.

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NEWS

Honeywell to market NEC supercomputers in U.S., Canada

Long-rumored venture extends U.S.-Japan tie

By James Connolly

MINNEAPOLIS — In a deal that had long been rumored and reported by analysts to be dead several times, Honeywell, Inc. and NEC Corp. of Tokyo last week agreed to form a joint venture company to market NEC supercomputers in North America.

Honeywell, which already markets NEC mainframes under its DPS 90 label, announced the agreement in principle and said the new company will be established by Sept. 30.

Analysts observed that the deal had been the subject of speculation for many months but that it had appeared dead when NEC itself made its first U.S. sale of the SX II supercomputer to the Houston Area Research Center. That system is scheduled to be delivered this week.

NEC claimed that the SX I and SX II are the fastest supercomputers on the market, with the SX II performing a theoretical maximum of 1.3G floating-point operations per second.

"I think it was critical that NEC find an established marketing group to handle the SX II in the U.S. They will have much better leverage than if they had tried to go it alone," said Jeffrey Canin, supercomputer analyst for Hambrecht & Quist.

Major Honeywell undertaking

Hal Feeney, an analyst with Dataquest, Inc., added, "Honeywell still has to put together quite an effort in terms of training a sales force and support personnel. They will be calling on different types of accounts than their existing customers. Basically they will need new skills — different skills — but they can take advantage of what experience they already have."

Honeywell Group Vice-President Jean-Pierre Rosso, who negotiated the NEC agreement, said no headquarters location has been chosen for the new company and that its staff will probably be a mix of Honeywell, NEC and outside personnel.

Rosso said negotiations began several months ago and that operations should begin in October.

Details not finalized

Rosso said the companies have not finalized details about what each vendor will contribute to the various start-up costs for the equal-equity venture.

He added that NEC has not yet determined whether it will be the new company or NEC itself that provides future support on the Houston contract.

According to Rosso, NEC's decision not to make its SX systems IBM compatible — which rivals what Hitachi Ltd. and Fujitsu Ltd. did with their supercomputers — could prove to be a benefit for NEC and Honeywell because of the strengths of NEC's proprietary operating system.

Links, LANs to rule at PC Expo

From page 1

ed announcement is the enhanced version of Ilink, a micro-to-mainframe link Lotus acquired from Infocenter Software, Inc. earlier this year.

The Ilink package, which will tie micros together into multiple fourth-generation language mainframe environments [CW, June 23], works with many leading mainframe data base programs, including IMS from IBM and IDMS from Cullinet Software, Inc.

Microsoft Corp. will introduce Inport, a single-chip, intelligent device interface that includes a new 40-pin custom integrated circuit and a small, 9-pin connector and works with Microsoft's Mouse. The board with the new chip will be marketed with the Microsoft Mouse.

The mouse chip supports not only the bus mouse but also digitizer pads, joysticks and up to 50K bit/sec. two-way data transfer, according to Michael S. Cooper, manager of Microsoft's hardware group.

The interface contained in the Inport device is being promoted as a prospective standard for both hardware and software developers seeking to integrate graphics input devices such as mouses, Cooper said.

CXI, Inc. will announce PCOX/Graphics-3270 PC, a $395 micro-to-mainframe package that allows a user to access mainframe graphics on a personal computer and provides for multiple sessions. The package emulates the IBM 3270 Personal Computer to obtain its multisession capability and the 3279 Model S3G Color Graphics Display Terminal to access graphics capability on the host. The package, however, requires a $1,995 PCOX graphics board to run. "Now the personal computer can access both host alphanumeric and graphics information at the same time," said CXI spokeswoman Barbara Tobias.

Novell, Inc. is expected to release details of a management reorganization, according to a Novell spokesman. In addition, Novell will announce an OEM agreement with the Interlan division of Micom Systems, Inc. (see story page 8), under which Novell will market Micom's Interlan 5010 PC board. The Interlan board provides a workstation hardware interface for Ethernet networks.

Other scheduled announcements

Other introductions will include Omniserver Professional 75, a new $9,795 version of Corvus Systems, Inc.'s file server. The new Omniserver has 1M-byte of random-access memory, up from 640K bytes, and a 74M-byte internal hard disk, up from 43M bytes on the earlier version of Omniserver. Corvus will also announce that its Omninet local-area network will be able to take advantage of the latest version of Novell's Advanced Netware networking software. With the new version of Advanced Netware, Omninet can handle up to 100 users, up from 63.

Nestar Systems, Inc. will announce an enhancement to its Plan 3000 file server. The upgraded version, which sells for $16,500, comes with 150M bytes of storage and can support up to 255 workstations. The cost of the previous version of Plan 3000, which has 68M bytes of storage, has been reduced 15% to $12,500.

Innovative Software, Inc. will announce its $49.95 Smart LAN Performance Tests program that allows a user to evaluate network hardware to determine speed and pinpoint areas of performance degradation.

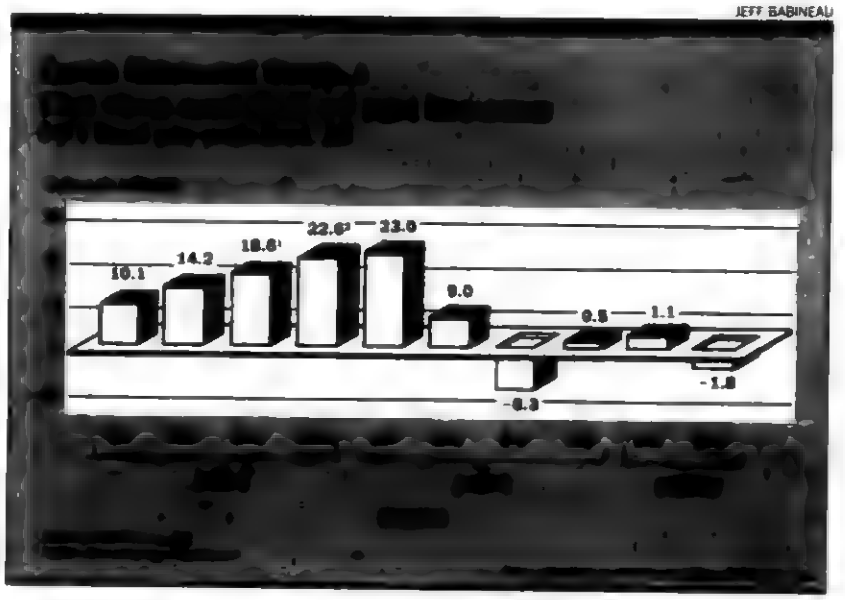
Gateway Communications, Inc. will announce G/Net Plus, an enhanced version of its G/Net baseband coaxial local-area network that is able to support communications servers. The firm will also announce G/Asynch, a $1,440, four-port asynchronous server that supports G/Net Plus. Users can upgrade from G/Net to G/Net Plus for $195. G/Net Plus configurations begin at approximately $2,700.

United Software Security, Inc. will announce Taketwo 1.1, a $165 version of its software backup system that now backs up PC hard disks to both file servers and mainframes in addition to floppy disks, according to Brenda Wheeler, marketing manager for United Software.

Office Solutions, Inc. will announce an addition to its Officelink series, called Officelink/Wordstar. The free product converts Micropro International Corp. Wordstar documents to the Officewriter format and vice versa.

West Coast correspondent Peggy Watt contributed to this report.

JEFF BABINEAU



DG axes 500, slump persists

From page 1

keting, engineering and research and development.

The total reduction of 900 workers will cause DG to take a one-time charge of $11 million, which will probably result in a substantial loss for the third quarter ended June 30. In the third quarter of 1985, DG lost $8.3 million, after one-time charges of $14.5 million, on revenue of $285.5 million.

DG laid off 1,300 workers approximately one year ago in an effort to reduce its break-even point but has yet to regain any earnings momentum (see chart). The firm said last week's downsizing will not result in an improved profit picture until 1987.

Revision of deCastro prediction

The gloomy outlook represented a revision of President Edson D. deCastro's earlier prediction that DG's Eclipse MV/20000 supermini and other new products would spur growth in the second half of 1986 [CW, Feb. 3]. "That was very cautious optimism," said DG spokesman Ken Donoghue. "That was his best-case scenario."

Although deCastro blamed much of the company's sluggishness on "persistent industry weakness," analysts cited several factors within DG itself. Business continues to be strong at Digital Equipment Corp. and, to a lesser extent, at Prime Computer, Inc., DG's traditional minicomputer rivals.

"They blame the economy, but look at DEC and Prime," said George Colony, president of Forrester Research, Inc. in Cambridge, Mass. "DG has structural problems that have been exacerbated by the slowdown."

Colony said DG has lagged in its efforts to refocus from its traditional scientific and engineering markets to be an office automation supplier to commercial organizations. "They have been trying to upgrade the sales force to sell office systems in the Fortune 1,000, but the sales force has continued to be very technology-oriented," he said. "Service and support have been very weak."

"Up to now, there haven't been too many market share gains in their case," said Frederic Cohen of L. F. Rothschild, Unterberg, Towbin. "New customer capture has not been that great."

In an attempt to change that pattern, DG also announced a plan to expand its sales, systems engineering and research and development units in North America by 15% to 20%. It reorganized its sales and marketing organization along vertical market rather than product lines in an effort to sell complete systems to industries such as aerospace, automotive, banking and insurance, Donoghue said.

DBMS image processing claim seen boosting product uses

CCA Model 204 picture storage, retrieval a first

By Charles Babcock

CAMBRIDGE — The Computer Corporation of America (CCA) last week announced that its data base management system, Model 204, has the added ability to process images.

The Cambridge, Mass., software company demonstrated the picture-storing and retrieval capability, along with another new feature of its DBMS — text handling.

Although Battelle Memorial Institute's Basic manipulates text, as do several other specialized mainframe data bases, no other vendor has announced the ability to process pictures on a mainframe, according to William H. Inmon, DBMS specialist with American Management Systems, Inc. in Lakewood, Colo.

"Ten years from now, this will be viewed as one of the major advances in the industry," Inmon said.

Storing pictures

Storing images requires the ability to create large, variable length records — for instance, the typical mug shot, when digitized, consists of 20,000 bytes. While other mainframe data base vendors can also create variable length records, none claim to do so on the scale required to store pictures, particularly with transaction-oriented DBMS, Inmon said.

The picture manipulation capability, dubbed Picture/204, will be available as an add-on to Model 204 in October at a price of $30,000 for the mainframe software and $800 to $950 for picture digitizing and editing software for a personal computer. CCA's micro-to-mainframe link, PC/204, is also required.

Text/204 will be available in December at a price of $47,000, company officials said.

George Schussel, president of Digital Consulting Associates, Inc., an Andover, Mass., consulting firm, said many corporate and research libraries need to store pictures as well as text electronically but have not been able to do so in the past. "There is a big market for picture storage in the various library functions," he said.

The weak link in Picture/204 may be its reliance on a regular micro-to-mainframe link. Because pictures contain many bits of digitized information, their storage and retrieval functions need to operate at high rates of speed, Inmon said.

At a demonstration of Picture/204, the function appeared to run slowly. CCA officials claimed the slow responses were a result of contention for its mainframe. The firm could provide no standard test results on response time.

Text/204 allows a user to search for a document based on the author's name or words appearing in text. It can also perform Boolean operations on document sets, said Marjorie Rigg, a development manager at CCA.

CCA's Model 204 has served niche markets with special needs for selection and access of data, but may now reach broader markets. With an installed base of 500, "they're a small player. They probably don't have more than 4% to 5% of the market," Inmon said.

TOP OF THE NEWS

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that without the cost savings lessors could offer with the investment tax credit, it prefers to assume the residual value risk of the 3090. Merrill Lynch previously leased much of its more than $1 billion DP equipment portfolio.

■

A 73-year-old government decree that became an obscure footnote to Burroughs' takeover of Sperry was lifted last week. A federal court in Detroit officially terminated a 1913 decree that barred what was then the Burroughs Adding Machine Co. from acquiring "controlling stock interest in a competitor" without court approval.

Meanwhile, Burroughs Chairman W. Michael Blumenthal and Sperry President Joseph J. Kroger just ended a four-day European tour to discuss their merger with major European users and employees. According to Blumenthal, the merged companies may consolidate semiconductor operations.

■

Storage Technology's 4,000 employees are scheduled to gather at a company picnic today to hear STC Chairman Ryal Poppa discuss the bankrupt company's plans to repay its creditors approximately $800 million.

■

PC-clone maker nee disk drive vendor Tandon Corp. is formally unveiling its line of IBM Personal Computer XT and AT compatibles tomorrow in New York. Tandon is telling dealers it will be offering PC AT compatibles at XT prices and XTs at PC prices. Dealer sources said Tandon is quoting the retail price for an Intel 80286-based machine with a 1.2M-byte floppy disk and 1M byte of random-access memory at $2,195.

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Government PC purchases jumped in '85

Feds bought at least 67,000 micros; IBM, Zenith provided 42%

By Mitch Betts

WASHINGTON, D.C. — The number of microcomputers in the federal government increased in the past year to between 140,000 and 150,000 units, according to the latest estimate of the U.S. General Services Administration (GSA).

A new GSA survey showed that federal agencies acquired 67,502 micros in fiscal 1985, compared with 37,277 acquired in fiscal 1984 and 7,908 in fiscal 1983.

About 42% of the micros acquired in fiscal 1985 came from just two vendors — Zenith Data Systems Corp. and IBM, the survey showed.

Major changes

GSA predicts that there will be 500,000 micros in the federal government by 1990 and that the technology of end-user computing will result in major changes in the way federal agencies operate.

Frank J. Carr, commissioner of GSA's Information Resources Management Service, said agencies are making big investments in micros to help accomplish more work at less cost with fewer people.

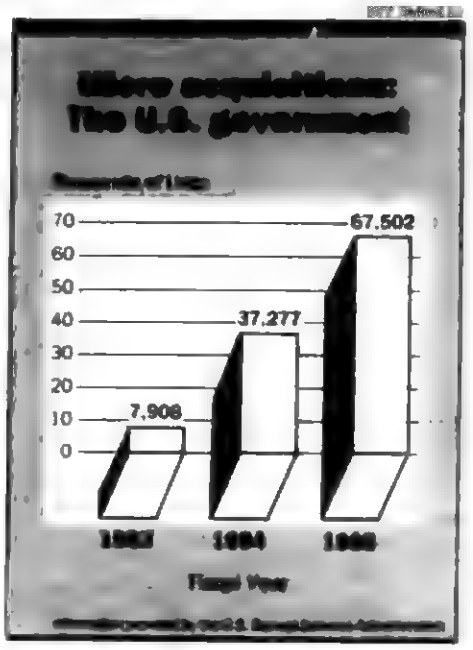
Indeed, a recent GSA survey of 208 micro users in the government showed that they believe micros have helped them to produce more timely work, increase productivity, improve analysis and increase the accuracy of their work, according to Irene S. Bayol, a GSA policy officer who conducted the study.

The user survey found that most have used a micro for less than two years and are frustrated by the lack of continuous training as well as the complexity of micro software.

Mid-level professionals

Bayol said the survey indicated that most users are mid-level professional workers, especially DP professionals. Top-level executives in the government rarely use a micro, she added.

The GSA is undertaking a series of surveys and programs to help prepare federal managers for the next wave of end-user computing.



"To plan for the future, we have to understand how this equipment is being used and what problems and accomplishments agencies are experiencing with it," Carr said.

The big challenge facing federal managers is the need to integrate the micros so that small groups of federal workers can share data and software, according to a draft GSA report on end-user computing.

Instead of dictating microcomputer standards, the GSA said it will encourage "natural integration" among small groups of micro users with common needs at each agency.

The draft report said GSA will also try to improve micro security policies, revitalize the records management program and study software site licensing arrangements.

Technology for federal buildings

One pressing need is to integrate computer technology into federal office buildings, perhaps by creating intelligent buildings, the report said.

"One need only walk through any federal office building in Washington, D.C., to see that end-user technology is making a mess of our buildings," it said, referring to clusters of strung cables exposed in hallways and running along the floors and walls of federal offices.

"Equipment sits on 1940-vintage desks, on bookcases, on window shelves and on top of file cabinets," the report added.

According to the statistical survey, four departments — the U.S. Navy, Air Force, Department of Agriculture and Department of the Treasury — accounted for more than half of the new units acquired in fiscal 1985.

Zenith leads suppliers

Federal agencies bought more micros from Zenith than from any other supplier in fiscal 1985, purchasing 15,406 Zenith units for $42.8 million.

The ranking illustrates Zenith's ability to win large contracts from the military, a GSA official said.

Agencies bought 13,567 units from IBM for $47.7 million and 6,761 units from AT&T for $6 million, the GSA reported.

Big Blue to resell Novell software, add connectivity

By Stanley Gibson

OREM, Utah — Novell, Inc. said last week that IBM will resell Novell's recently released Advanced Netware 2.0A.

The agreement follows a November 1985 agreement that allowed IBM to sell Novell's Advanced Netware/PCN, Advanced Netware/C and Netware Bridge.

"By replacing PC Network operating software with Advanced Netware 2.0A, the user will receive, among other benefits, the ability to connect virtually every other major brand of networking hardware," said Craig Burton, Novell vice-president of corporate marketing and development.

Advanced Netware 2.0A supports a total of 18 network topologies, including the IBM PC Network, the IBM Cluster and the IBM Token-Ring network, according to Novell.

"It does provide the IBM user with a significant degree of flexibility that they wouldn't have otherwise," said David Terrie, president of Newport Consulting in Boston. "The key idea is to have the same software running on Ethernet, Token-Ring and PC Net," he added.

The Novell offering fills a "special case kind of role" for customers that have existing non-IBM networks and who may want to add IBM products, Terrie said.

Separately, Novell said it would expand its OEM hardware offerings by selling Micom Systems, Inc.'s Interlan 5010 PC boards, which provide a workstation with the hardware interface required in an Ethernet network. Novell will offer the boards either individually, for $650, or in combination with its Advanced Netware software.

Airlines' fusion breeds spin-off

From page 1

Airlines, Inc. and New York Airlines, Inc. "It creates a critical mass in a very, very important area," Richard E. Murray said. Murray will become president and CEO of the subsidiary upon completion of the merger.

By operating as a self-sufficient profit center, the subsidiary, System One Corp., can also attract and retain technical personnel and make capital investments without being "encumbered" by its parent company's situation, Murray said.

Hans Plickert, an airline analyst with E. F. Hutton & Co., expressed a supportive view. "Texas Air is not big enough to have [a reservations system] of its own, and it costs too much to develop one," he said.

But the move is basically a defensive one that will put the system in a less distant third place behind American Airlines, Inc.'s SABRE system and United Airlines, Inc.'s Apollo, said John Pincavage, an analyst with Paine Webber.

Texas Air is looking into a partial integration of the three operations that would cost less than complete integration and would provide flexibility and backup capabilities, said Murray, who currently is president of Texas Air's CCS Automation Systems, Inc.

CCS sells computer and telecommunications services and software to other airlines and provides them internally. It will be combined with a similar unit at Eastern and with Eastern's System One Direct Access (SODA) reservation system, which travel agencies use to book flights.

Last Tuesday, Eastern spun off its reservations operations — as System One Direct Access, Inc. — and its services and software unit — as EAL Automation Systems, Inc. Both companies are subsidiaries of Eastern Airlines.

After completing its merger with Eastern — which will probably happen about the end of August — Texas Air plans to combine the three operations into the System One subsidiary.

SODA is the third largest airline reservations system used by travel agents, with about 5,000 installations that account for 10% to 12% of the dollar volume of total flights booked by the airline systems, according to Murray. He said that Eastern Airlines reaps a revenue of approximately $100 million per year in fees from travel agents and from the roughly 200 airlines that book flights through SODA.

EAL Automation generates about $150 million in revenue per year from sales of computer services and software, about 70% of which comes from Eastern, Murray said. By comparison, he said, CCS brings in about $50 million a year, roughly half from Texas Air's airlines. Together the units serve about 200 airlines by providing services such as baggage handling, route planning and maintenance, Murray said.

IBM mainframes

The three operations to be combined in the System One firm run IBM mainframes in three cities. SODA and EAL Automation's systems run on more than a dozen of the machines, including an IBM 3090 Model 180. CCS Automation uses two 3090 Model 180s, a 3081 and a 3083 at its Los Angeles headquarters and two smaller machines for financial tasks at Texas Air's headquarters in Houston.

Texas Air is currently studying a "host interactive concept of lashing together" the three systems, Murray said, to see how the benefits of that approach would compare with those of consolidating them into one. He explained that the partial integration is less expensive and that such a distributed network of mainframes may be preferable due to its flexibility, particularly as the volume of data to be processed grows. It would also provide redundancy protection against catastrophes, he said.

The partial integration would provide the ability to write or read from one system to the other, which is now possible through high-speed links, Murray said. It would also give the ability to "clone" a new record to be deposited in both systems, he said.

Whatever the approach to integration may be, according to Murray, Texas Air expects to lower costs through the ability to move data directly among systems, to reduce the amount of storage space it requires and to reap economies of scale in programming.

Texas Air will compare the redundant operations applications of CCS Automation and EAL Automation — such as weather analysis and aircraft maintenance — and decide which one to use for all the airlines, Murray said.

While System One will be based in Houston, the headquarters for the SODA system and EAL Automation will remain in Miami, while CCS Automation will continue to run from Los Angeles, Murray said.

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Agency employs data network to run job placement service

Enlarged net to promote standards in field offices

By Jeffry Beeler

SACRAMENTO, Calif. — A California government agency last week began testing a statewide communications network that the organization recently expanded and updated to promote standards among the facility's field office nodes.

Since January, the Employment Development Department (EDD) has installed Prime Computer, Inc. Model 2350 and 2450 minicomputers in 18 of its 51 offices.

At the same time, the EDD also linked the recently acquired machines to both its central processor in the state capital and to the 12 Prime 750s and 450s it had in other branches.

The result is an enlarged data communications network that will support the EDD's efforts to run a federally funded vocational training and job placement service for California welfare recipients.

When the network goes into operation in late August or early September, each of the state agency's field locations will collect information about the employment opportunities and job seekers in its jurisdiction. "We plan to keep track of the kinds of training our clients receive and the outcome of that training," said Michael McKinney, MIS manager for the EDD placement program. "We also plan to gather information about the trainees' ethnic origins, educational backgrounds and economic status."

After being captured electronically in decentralized systems, the information from each branch office will be sent periodically over dial-up WATS lines to a Prime 750 at EDD headquarters. The ability to transmit distributed data bases to a single point and then consolidate them will be made possible by Prime's Primenet communications software.

In enhancing its statewide network, the EDD expects to benefit welfare recipients as well as the government agencies that oversee the federal placement project, known as the Job Training Partnership (JTP).

For the EDD, the interconnection of the central and remote locations will aid the preparation of reports and analyses, which state officials require to "track the JTP's effectiveness," McKinney said. From the same headquarters data base, the agency will also be able to produce performance evaluations for the San Francisco office of the U.S. Department of Labor, which funds the JTP.

Another recipient of JTP-related information will be the California legislature, which will gain access to the EDD central system with an IBM Personal Computer XT running a Prime file transfer utility.

Depending on their content, the branch office reports will go to their respective destinations once each month or quarter. The network will also have the ability to respond to impromptu requests for information by selected government users.

"Suppose, for example, the governor wants to find out how many women in Los Angeles County have been placed in a particular kind of job," McKinney hypothesized. "To get the answer, an aide would simply have to run an ad hoc query against one of our remote data bases in Southern California."

For welfare recipients, meanwhile, the EDD network's main virtue lies in its ability to hasten job placement by automatically matching trainees to the employment openings that best suit their skills. "Because the network will allow our branch offices to exchange information about their clients and work opportunities, we'll be able to open the entire state as a job market for each of our prospects," McKinney said.

Systems uniformity

Installation of the 2350s and 2450s will substantially increase the EDD network's degree of systems uniformity. In the past, the department's field locations, often referred to as "service delivery areas," housed a hodgepodge of sometimes incompatible systems that made electronic file transfer difficult.

Now, with the $1.3 million acquisition of the 2350- and 2450-based systems, the EDD is seeking to foster connectivity by removing dissimilar network nodes and standardizing on Prime equipment. Moreover, after the department's headquarters office completes a planned upgrade to a Prime 9950 or 9755 superminicomputer, "we intend to make Release 20.0.3 of the firm's operating system a standard in each service delivery area," McKinney said.

Another consequence of the EDD's network improvements is the advent of automation in certain remote sites from which information has previously been gathered and processed manually.

Designed by Government Systems Group, Inc. and built around the Irvine, Calif.-based vendor's Grants Management System software, the network will be tested extensively before it swings into production in about two months. "One of the things we definitely want to test is user procedures," McKinney said. "We want to learn how well they work and how much we'll have to change them."



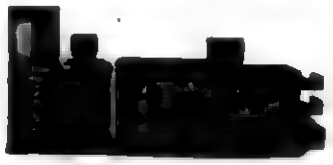
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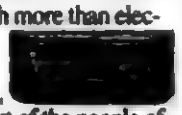
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Terminal bargains

From page 1

an analyst with Framingham, Mass.-based International Data Corp.'s (IDC) workstation market program. "With between 40 and 50 terminal makers in the market, users should consider who is going to be around over the next few years."

"We were pretty clear on the features our terminals needed because of our previous experience," says Maria Koba, who installed a decision support system for the financial planning and analysis department at Dean Witter Reynolds, Inc. in New York a year ago. "From our standpoint, that meant the physical attributes, the functionality and the ever-popular price."

Koba settled on terminals manufactured by Wyse Technology, Inc. of Milpitas, Calif., because, she says, they provided her with the most functionality at the lowest price. But Koba was also attracted by the terminals' look, she recalls. "It's funny to say that it comes down to looks, but then what does the user really see?"

What corporate customers see are dozens of vendors scrambling to maintain a competitive edge and, in most cases, relatively small shares of the market (see chart page 13).

The tenuity of that edge is evident in the battle between intense rivals Wyse and Televideo Systems, Inc., headquartered in nearby Sunnyvale, Calif. Wyse currently leads the independent terminal market, having snatched the top spot in 1984 from Televideo Systems. At that time, Televideo was sidetracked, it now admits, by its entry into the personal computer market.

Today, the seemingly infallible Wyse and a revamped Televideo are ready to do battle again, but this time, the war involves IBM Personal Computer AT-compatible products.

Since it became the nation's largest terminal vendor, Wyse has never looked back. Sales at the publicly held firm reached $166 million last year, twice those of Wyse's closest competitor. Profits grew 121% in 1985, from $5.7 million a year ago.

Wyse's growth (made possible by its decision to manufacture all products in Taiwan), its slick product line and its entrepreneurial management style have earned it a glowing reputation among analysts. "If there was a who's who of terminal vendors, Wyse Technology would have to appear at the top," says IDC in its "ASCII Market Report."

But as Wyse continues to tear up the market, struggling Televideo Systems, recuperating from 1985 losses of $19 million, is preparing a vehement attack on its rival.

"I don't think you should go to a bar and bend your elbow with your competitor. I think you should hate your competitors. I want to see them out of business," says Elliot Wassarman, Televideo senior vice-president of marketing and sales.

Wassarman is one of three new executives to join Televideo after the record losses forced a management reorganization of the company in 1985.

Focus on VDTs

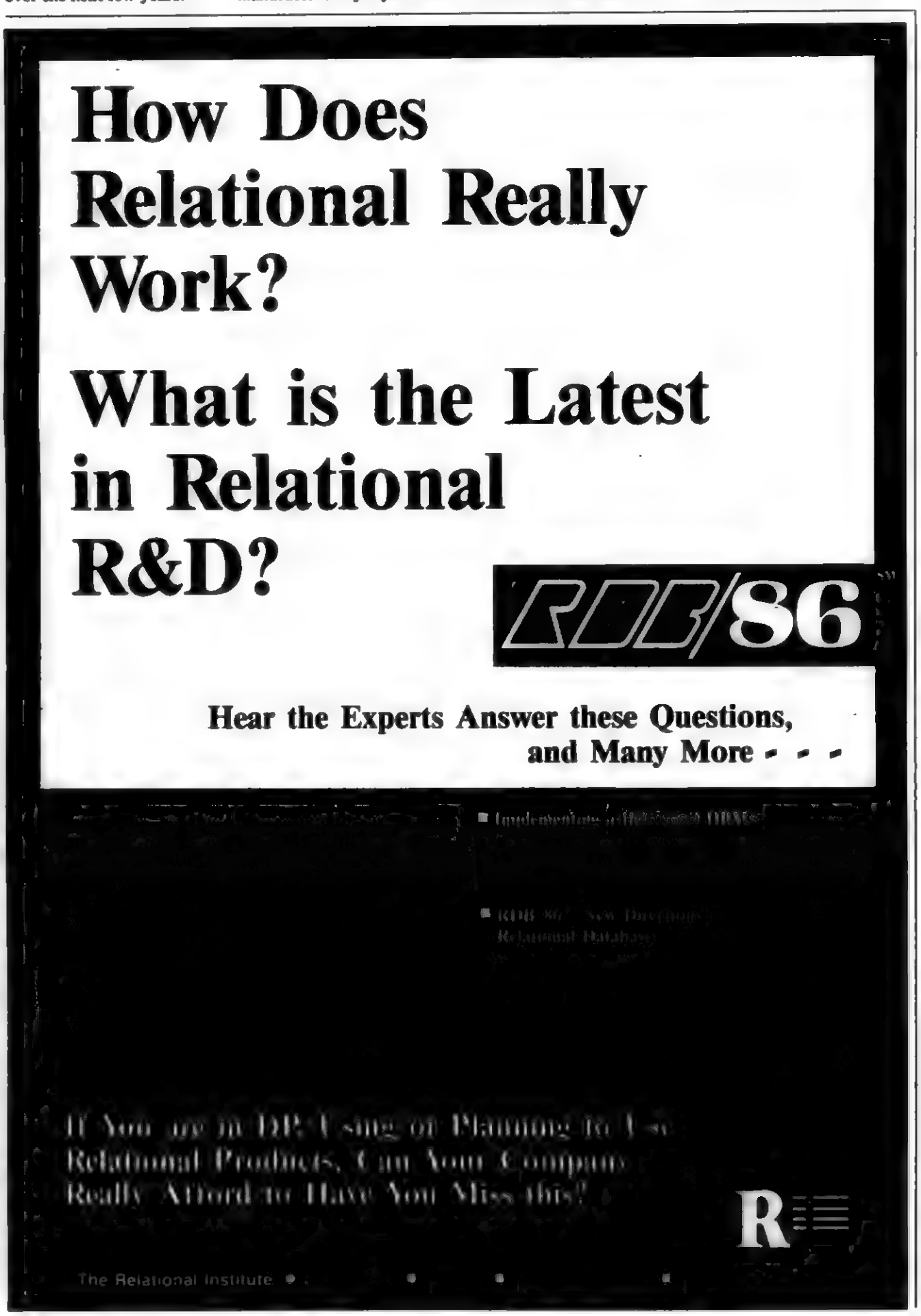
Founded in 1975 by Korean immigrant K. Philip Hwang as a manufacturer of video game monitors, Televideo switched its focus to VDTs in 1978.

The company quickly earned a reputation as an aggressive leader in the low-cost terminal market and was the first to implement a detachable keyboard. In 1981, Televideo was the largest independent terminal vendor in the U.S. terminal market, capturing an 18% market share, Dataquest, Inc. figures note.

Televideo went public in 1983 in what "California Technology Stock Letter" says was "one of the spectacular new issue underwritings of 1983." Sales that year peaked at $168 million, and ground was broken for a luxurious office building in San Jose, Calif.

But in a quest to expand its business, Televideo was lured into the retail personal computer market in 1983 with the introduction of an IBM PC-compatible machine.

To compete with vendors like Eagle Computer, Inc., Victor Technologies, Inc. and Columbia Data Products, Inc., Televideo poured millions of dollars into retail advertising and worked all ends of its distribution chan-



nels, selling to dealers and directly to corporations.

"They and everyone else were trying to become what Compaq Computer Corp. became," says Michael Murphy, "California Technology Stock Letter" editor. "Everybody else went broke. Televideo didn't because it still had its terminal business."

Televideo's infatuation with microcomputers caused it to lose sight of its terminal business, providing ample opportunity for the competition. In 1984, newcomer Wyse introduced its flagship product, the WY50 terminal. At $200 less than the Televideo 925 terminal, the product was the first to provide a 14-in. display and ergonomic features that let users adjust the screen position.

Sales of that product skyrocketed. By 1984, Televideo had dropped to the No. 6 spot in the ASCII terminal market, according to IDC. In 1985, it lost $19 million on sales of $103 million.

Wyse also entered the IBM PC-compatible market in 1984 with the Wyse PC; however, it limited its sales to existing OEM vendors.

Wyse's founding

Wyse was founded in 1981 by 36-year-old Bernie Tse, a former display engineer at Zentec Corp., Tse's wife Grace and Zentec alumni Garwing Wu and Larry Lummis.

Early on, the partners persuaded Altos Computer Systems, Inc. to invest $5 million in the fledgling terminal company.

Although it remains one of Wyse's largest customers, Altos sold its interest in Wyse earlier this year. The relationship between the two companies became even more entangled when Phil White, Altos vice-president of marketing, became Wyse's new president. He replaced Tse, who moved up to chairman.

After finding itself distracted in the terminals market, Televideo is bracing itself for a comeback. "Televideo has made some strides in 1985," IDC's Goldman notes.

Transferred facilities

Last year, Televideo completed the transfer of its manufacturing facilities to Korea, halved its number of employees, moved back to its old building and reduced inventory levels from $81 million to $21 million.

Televideo is also paying more attention to product design, incorporating a look of its own — a popular feature among users who want terminal standardization, and one that gave Wyse a competitive edge.

"A year ago we offered 11 terminals in six case designs. Today, we offer four terminals, three have the same case design," Wassarman notes.

For the second quarter ending May 2, Televideo announced break-even results, posting a $19,000 profit, compared with a $678,000 loss for the same period a year ago.

"We got distracted as the company was getting into the PC business," Wassarman admits. "We took our eyes off our market."

But that market is changing, according to analysts, who say they believe terminal companies must vary their product lines in order to compensate for slow growth.

"The terminal business is a slow growth business. Its markets are blurring," says Joel Hausman, analyst at Robertson Colman & Stephens in San Francisco. Terminal shipments this year are expected to increase 12%, but annual growth will decline 8% by 1991, IDC says.

To compensate, both Wyse and Televideo have introduced IBM PC AT-compatible products that they hope will enhance their existing product lines.

In a break with the past, Televideo is selling its recently introduced Tele-CAT 286 AT machine within its existing channels.

Earlier this month, Wyse introduced its version of the AT [CW, June 9]. The version will be sold through both Wyse OEM customers and in Businessland retail stores.

There is some skepticism about both companies' entrance into the PC market. "The AT clone market is absolutely crowded as hell," says "California Technology Stock Letter" 's Murphy.

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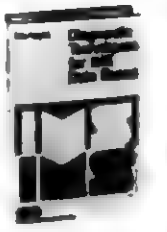
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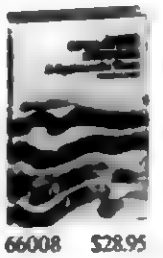

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Privacy threat seen by agency

From page 1

provided by Congress or the executive branch on use of data collected by the government. The privacy protections embodied in the Privacy Act of 1974 are weakened by increased technological capabilities employed by federal agencies, the OTA said.

The government's increasing use of microcomputers, computer networking and data exchanges has in turn increased the opportunities for the improper use or disclosure of personal information, the OTA researchers concluded. (A comprehensive report on these privacy issues appears in this week's Executive Report, page 53.)

For example, the Privacy Act prohibits the government from keeping dossiers whose very existence is secret, but it is not clear whether that rule applies to files kept on microcomputers, the OTA said.

One purpose

In addition, the increasing use of computer matching erodes the Privacy Act's requirement that information used for one purpose not be used for another purpose, the OTA noted. For example, tax records are now used to track down welfare cheaters (CW, March 31).

"These technological advances enable agencies to manipulate and exchange entire record systems, as well as individual records, in a way not envisioned in 1974," the report said. "Moreover, the widespread use of computerized data bases, electronic records searches and matches and computer networking is leading rapidly to the creation of a de facto national data base containing personal information on most Americans," it continued. There are three billion records of personal information stored on government computers, the OTA said.

Despite congressional objections, the ever-present Social Security number has become a virtual "national identifier" that is used in data searches by the government, the OTA report added.

Furthermore, the U.S. Office of Management and Budget (OMB), which has responsibility for governmentwide privacy policy, has failed to provide the needed oversight, the OTA report said.

The OMB is not effectively monitoring such basic areas as the completeness and accuracy of government records, the protection of personal records accessible by microcomputers or the cost-effectiveness of computer matching, the study said.

A survey conducted by the OTA found that 13% of the federal records systems are audited for record quality, and 8% of the federal agencies have privacy policies for records stored on micros. Most agencies have only one staff member assigned to implement the Privacy Act, the survey found.

Since 1974, political attention has shifted away from privacy concerns and toward efficiency and cost cutting, the study noted. "Neither Congress nor the executive branch is providing a forum in which the privacy, management efficiency and law-enforcement implications of federal electronic record system applications can be fully debated and resolved," the OTA concluded.

However, the OTA report may trigger the introduction of new privacy legislation. U.S. Sen. William S. Cohen (R-Maine) said he will soon introduce a bill to establish "more individual privacy and due process protections in data exchanges by the federal government." Sen. Albert Gore Jr. (D-Tenn.) also expressed support for additional privacy guidelines. Cohen and Gore are members of the Senate Committee on Governmental Affairs, which has been pushing for an assessment on the impact of technology on privacy.

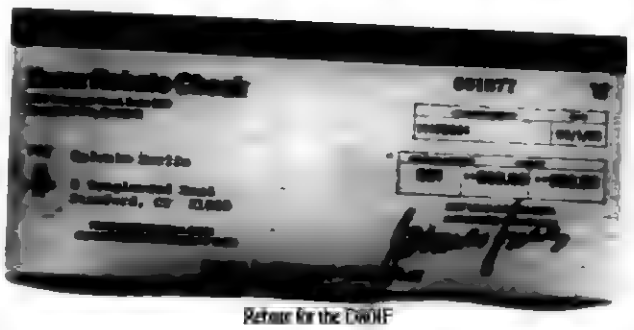
The OTA, an advisory body for legislators, suggested that Congress consider either creating a stronger oversight agency or setting policy itself to resolve specific privacy issues.

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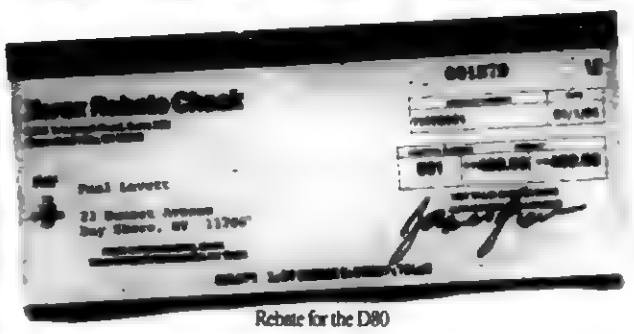
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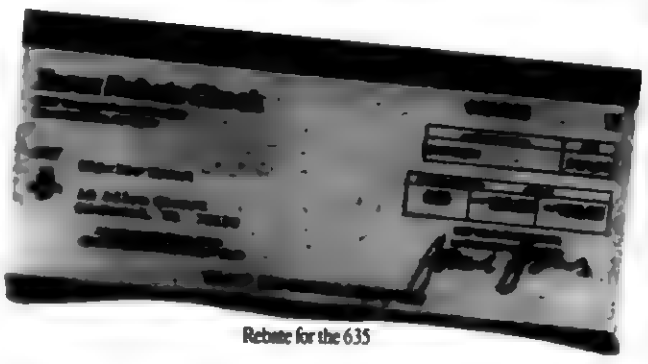
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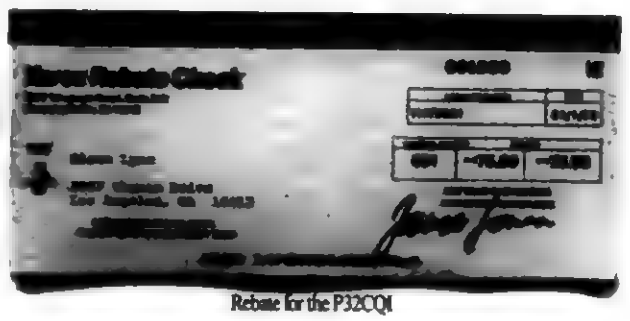
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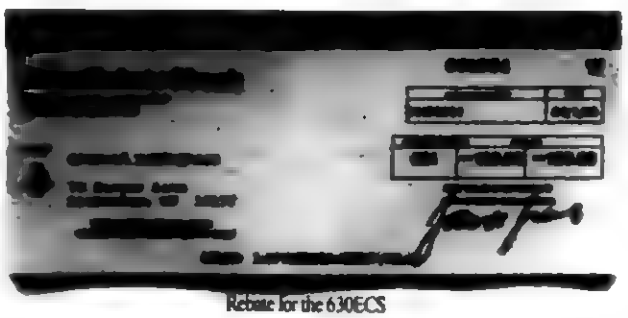
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AT&T System 25 replaces Horizon as low- to mid-range PBX

Fills gap between Merlin, System 75

By Alan Alper

NEW YORK — Filling a gap in its private branch exchange (PBX) product line, AT&T last week introduced a low-end digital switch with voice and data capability aimed at small- to medium-size businesses.

Called System 25, the small PBX is targeted at customers that have 20 to 150 voice terminals. It fits in the market niche between AT&T's Merlin 3070, a voice key system that serves between two and 70 stations, and the System 75, a large PBX that handles up to 700 voice or data stations.

The System 25 essentially replaces Horizon, a key system introduced in the late 1970s that evolved into AT&T's low-end PBX offering. Last year, AT&T said it would phase out production of Horizon in 1986.

"This product unifies AT&T's product line from Merlin through System 75," noted William Rich, an analyst with Northern Business Information, Inc., a New York-based communications market research firm.

Priced from $550 to $750 per voice station, the System 25 is available now, AT&T said. It is being offered only by AT&T's General Business Systems sales force.

The System 25 operates with the same four-pair wiring arrangement as Merlin and the System 75 and can be used with a range of existing voice terminals, from low-end, basic five-button sets to 34-button sets. It also supports Merlin system voice terminals, Horizon 10-button Met terminals and industry standard Touch-Tone sets.

"These compatibilities allow customers to save money when they need to grow from a Merlin to a System 25 and from a System 25 to System 75," said John Blanchard, vice-president of AT&T's General Business Systems group.

AT&T designed System 25 using the same architecture as the System 75. It uses the same protocol and switching devices as the big switch, noted John Gunn, director of product management for the System 25.

Using surface-mount technology, AT&T was able to pack more circuits onto each System 25 printed-wiring board. This enabled AT&T to offer many System 75 features in the smaller switch in a package the size of a microwave oven, Gunn said.

Cost savings

"Because it is highly automated, surface-mount technology is a process that leads to cost savings in manufacturing costs," Gunn added.

Modular in design, the System 25 features 33 universal slots with up to 240 ports that can be configured in a variety of ways. System 25 can accommodate up to 200 voice stations with 104 trunks or 104 data connections or both. Up to 115 simultaneous voice and data connections can be handled, AT&T said.

Other features include automatic route selection, which switches calls to the least expensive circuit, call following, one-touch dialing, hands-free answering, conferencing, automatic call-back and electronic message waiting.

AT&T designed System 25 in such a way that data capability can be added when customers require it. AT&T is charging $400 to $500 per data connection, according to Gunn.

The switch also offers a modem pool feature that provides for personal computers and terminals to share modems.

Blanchard said that with the System 25 AT&T was going after the competition's customer base in a market segment "that has not been our strongest." Analysts intepret that to mean AT&T is seeking to compete with Rolm Corp.'s recently introduced Redwood and to entice Rolm VSCBX and Mitel Corp. SX 200 users to System 25.

XEROX

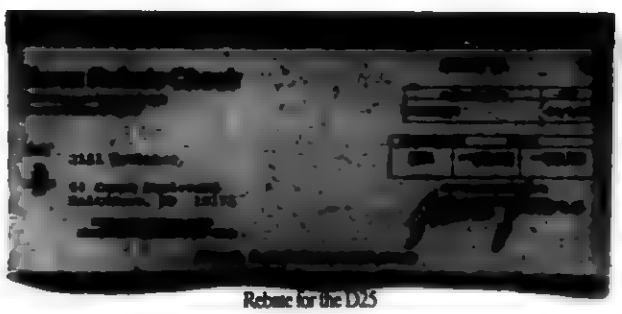
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VIEWPOINT

EDITORIAL

The privacy challenge

Privacy is one of those issues that most of us thought was settled back in 1776.

Guess again. Privacy, or the right to freedom from unauthorized intrusion, may be well on its way to becoming a seriously endangered species in 1986. Today, new developments in computer technology are providing tools for new, more sophisticated levels of privacy abuse.

This week, a research arm of the U.S. Congress, the Office of Technology Assessment, will release a report dramatizing the fact that there are precious few safeguards currently in place to guarantee the security of the federal government's three billion personal data files. "Few staff are assigned to Privacy Act implementation, few agencies have developed guidelines in response to technological changes, and few have conducted record quality audits," the report says.

Things are not much better in the private sector. In this week's Executive Report, "Safeguarding privacy," we learn that probably no more than 50 of even the largest and most sophisticated U.S. corporations are doing any more than Uncle Sam in protecting sensitive information, and some are doing far less.

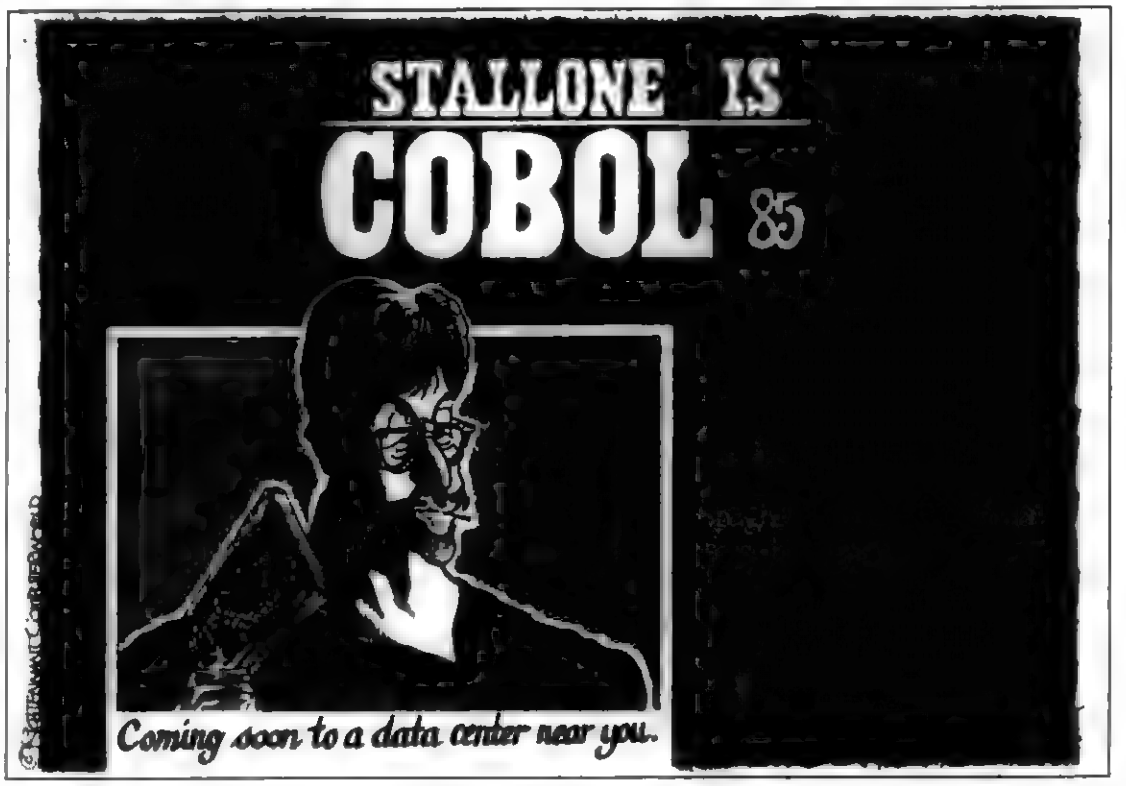
The reality of the situation presents information systems managers in business and government with one of their most significant management challenges in recent memory: the challenge of accepting responsibility for the integrity of the personal data within their technical domain. Action on this responsibility must begin with clear understanding of how the current danger came to be.

The microcomputer revolution pushed more and more information out to user populations, making more data available to more people — including those who may not be aware of the sensitivity of some data and who are certainly not trained, as data processing personnel are, to think about the correct ways of handling such data.

In fact, gathering and storing information carries with it a serious responsibility to simultaneously set up methods for safeguarding that information, whether it relates to employees, customers, competitors or citizens. Failure to attend to the problem will ultimately raise serious consequences.

Disclosures of confidential employee information can lead to employee unrest; disclosures of client information can result in lost business; disclosures of internal data can aid competitors or embarrass the corporation. In many cases, failure to protect data violates existing local, state or federal law. And widespread abuses would most certainly result in further legislation, even regulation, that is better handled by organizations policing themselves.

The opportunities to misuse data grow daily as more microcomputer, networking, electronic mail and other office automation products are put in place. MIS managers must take the lead in reshaping data management techniques traditional in mainframe shops to the end-user environment. Only they can provide the technical guidance and expertise needed to understand the problem, educate top management, establish guidelines and, finally, educate users.



LETTERS TO THE EDITOR

Unix users not ready for Release 3

The latest and greatest Unix, AT&T's System V Release 3.0, seems to be generating quite a bit of interest. People wonder why there is little user interest. This is probably not what AT&T had in mind.

There is actually a simple explanation for all this disinterest: Not too many people understand the new toys, and the vast majority of System V users do not need them — yet.

Although there are several added features, the biggies are demand paging and the new network environments, most notably Remote File System and Streams.

Demand paging used to be the one big feature that University of California at Berkeley versions of Unix had that AT&T's did not. In science-oriented areas, very large pieces of code are common; users need demand paging and are Berkeley version users. Most business users' code is small enough that the need just is not there, so they rightly will not see any compelling reason to convert (just recompile) to System V. Demand paging also does away with swapping, so it will also help performance, but it is hard to say how much.

The networking goodies are not notable so much for what they do overtly but for what they provide in an environment for sane, sensible networking of many machines in an efficient manner.

To me, that really means utter transparency. I can use any file, device or program on any other machine as long as I have the correct permissions; I do not have to log on to the remote machine and transfer files back to my machine just to do my work, although that remains an option.

Essentially, this makes it possible to have multiple servers for multiple machines. I hear that we will soon have a 3B2-based net server for personal computers from AT&T that will make the Unix tools for communication and data manipulation available to the system manager.

Now consider a distributed data base not only spread out among multiple disk partitions but even between machines. That is what the new networking tools make possible.

It is obvious that such a scheme, if it all goes well, should support not only very large data bases but also keep performance at acceptable levels. Both things were previously impossible under Unix, at least in normal scenarios (that is, in commercial products).

What is not obvious is that the higher level network environment is not dependent on any particular low-level transport protocol, meaning that the distributed environment could be implemented on Xerox Corp.'s Xerox Network Service or even IBM's Systems Network Architecture.

Also not obvious is that System V.3 is the first release of AT&T Unix that effectively subsumes the major architectural features (you could probably get some arguments about this) of the Berkeley version of Unix.

This level of feature competence is a necessary requirement for actually merging the Berkeley Unix versions into the Unix mainstream, that is, System V. The merger is a stated goal of AT&T, and at least one prominent Berkeley proponent, Sun Microsystems, Inc., is an active partner in this effort.

Bringing Berkeley back into the fold is desirable not only for purely commercial reasons, since the fragmentation hurts marketing, but it also could defuse the prevailing public opinion that Berkeley is technically superior to System V (*if* System V.3 lives up to its promise). That would make AT&T feel better and also help marketing.

Some large users, notably General Motors Corp., in making Unix availability a system requirement, have recognized that Unix is a key element in bridging the various software and network environments that they are trying (and succeeding with the Manufacturing Automation Protocol) to integrate. The new network tools will go a long way toward making the protocol really work, from the computer-aided design machines all the way down to the numerical control machines, with links to the office and the mainframes thrown in.

That is what is really new and neat about System V.3. It remains a question whether AT&T will be able to get a product that takes advantage of these features to market in a timely manner.

Ernest Wylie Harkins
DHR, Inc.
Boulder, Colo.

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VIEWPOINT

DP struggles against artificial intelligence invasion

There are certain topics sure to make people in data processing cringe: Budget cuts is one; customer support is another. And yet another is artificial intelligence.

Why AI? As a technology it has the power to make computers operate as never before, yet data processing is already circling the wagons against this strange invader. Women, children, personal computers — no one is safe.

Almost all of the misconceptions about AI occur simply because many have heard about it, but few have seen it. It remains something locked in darkened labs at major research and academic facilities throughout the country. But if seeing is believing, one should examine some of the existing products to get a sense of what is being done in AI to solve problems in the world of data processing.

Picture if you will a data base list containing more than 10 million names of people slated to receive direct mail catalogs or credit card solicitations. Every time promotional material is sent, it goes to a majority of the people on that list in what is usually a hit or miss proposition.

Yet, this approach is one that must be taken by companies such as American Express and Spencer Gifts, which fork over thousands and thousands of dollars to the U.S. Postal Service when they want to stage a massive direct mail campaign. In return, they end up reaching both qualified and unqualified people, but they still have to shell out the money to have every piece delivered.



By HARVEY P. NEWQUIST

The solution? Both companies are implementing a system called More from Persoft, Inc. of Woburn, Mass. More is an expert system that takes information about the names on the mailing list (such as their response rate, demographic valuation and so on) and pares the entire list down to the most appropriate names for a particular mailing. In addition to reducing the mailing costs, the expert system improves the percentage of response by identifying qualified recipients.

An isolated incident? Hardly. Expert systems are not the only aspect of AI finding their way into DP. Many companies use natural language interfaces to aid in information retrieval. General Electric Co., Westinghouse Electric Corp. and Eastman Kodak Co. employ voice recognition systems to minimize data entry time and transcription errors.

For an industry that prides itself on being on the cutting edge of high technology computing, DP is ignoring AI for all the wrong reasons. If it were called anything else (software enhancement software, perhaps?), there would be passionate pros and cons for its implementation from all corners of the computer industry. Users groups, conferences and seminars and a whole new wave of messiahs could be counted on to spread the word.

Looked at as a solution, AI presents some very real alternatives to struggling through problems that face all computer users, not just professional data processing personnel. AI technologies such as natural language interfaces and automatic code restructuring could save a lot of heartache in situations where traditional computing just gets too laborious and expensive.

Thirty years ago, chess-playing computers would have been considered AI, and 15 years ago, any mechanism that had the nerve to talk in a synthesized human voice would not have been called AI. In 1986, however, you do not buy chess-playing computers from Cray Research or IBM; you buy them from Toys R Us. And a brand new car, cash register or camera can easily talk your ear off.

AI already used in DP environment

Putting it in perspective, there are AI products that already have potential in data processing and in fact are used frequently in that environment. No matter what they are called, these products are very important pieces of a technology directed toward improving efficiency and interfaces in computing. Currently, they all come from vendors that usually fall into the rank and file of AI companies.

Some of these companies are trying to shed this image, since the presence of AI within DP is about as popular as contracting rare and infectious diseases. You still cannot buy AI products from Cullinet Software or McCormack & Dodge. But soon even these software companies will integrate AI techniques and products into their products — so much so that what was once considered AI will be totally transparent to the user.

Do not be put off by the intrigue, sensationalism and hype that goes along with the term artificial intelligence. Whatever a product is called, the most important criterion will always be whether it works. Because if it does not, no amount of magic, mystery, sleight of hand or AI is going to help it.

Newquist writes and consults on artificial intelligence and other advanced high-technology topics from his office in Scottsdale, Ariz.

Terrorism in the information age: A recipe for disaster?

READER'S PLATFORM

By MICHAEL BEADSMOORE

Take your ordinary, garden-variety terrorist. Add a tempting, unprotected corporate target that contains one of the organization's most vital strategic assets — a target that, if knocked out, could lead to major disruptions of service or even to corporate bankruptcy.

What you've got is a recipe for disaster — the soft underbelly of the information age — and it's time to shake off some of the dangerous complacency that now exists at corporate and governmental computer data centers across America. In fact, the shadow of Colonel Khadafy and memories of the Mexico City earthquake are, indeed, beginning to haunt corporate and DP managers everywhere, making the vital information in their charge suddenly seem very, very vulnerable.

A San Jose, Calif., TV station, for example, reported recently that companies throughout Silicon Valley were calling the police bomb squad for tips on how to protect their computer rooms. And there is a new spate of coverage in the industry press, such as the *Computerworld* article — "Report says most damaged DP firms go broke" [CW, June 7,1982] — on a study showing the severe effects on corporate survival of a catastrophic loss to a firm's data processing center.

Despite the new awareness of their vulnerability, U.S. enterprises still lag far behind their European counterparts in taking concrete measures for protection. Some years ago, Lloyds Bank Ltd. built a new head office building on the banks of the Thames River in London. The company's large computer was to be located in the basement, but, according to reports, the directors first commissioned an actuarial study to determine the likely risk of the computer room being flooded during high tides in the spring.

The results were surprising. The greatest risk to the bank came not from the threat of flooding, but rather from the possibility of terrorist bomb attack and the resulting loss of information. This despite Lloyd's highly regarded security measures. The bank afterward upgraded its disaster recovery capability, though it labeled the effort "contingency planning." As one Lloyd's official put it, "We don't have disasters; we plan for possible contingencies."

European firms have more experi-

See RECIPE page 18

Beadsmoore is senior vice-president at Maastor Systems Corp. and head of its disaster recovery group.

Changes in computer pros mirror changes in technology

READER'S PLATFORM

By LINDA C. FREEMAN

My introduction to computer programming came in the mid-1960s on a time-sharing terminal connected to the Dartmouth College computer. My initial fascination with computers carried me through my formal introduction from a professor who stood at the front of a lecture hall and intoned that programming would involve much pain — staying up late at night to meet unreasonable deadlines with inadequate means. Many students never returned after the first class. Today they might make good microcomputer programmers, where computing is much more personal, responsive and pleasurable.

But think of the people who stayed in that computer class. They expected computing to be one hardship after another. Then think of the different expectations of young people whose initial exposure to computing comes at home with the screen image displayed on the familiar TV. Clearly the so-called computer revolution requires a similar revolution in the kinds of people who work with the technology.

People who grew up with batch systems came to expect a computer culture with response time measured in hours or days. Often the effort (whether large or small) required much waiting and extreme patience.

In contrast, those coming of age with an on-line mainframe system come to expect relatively quick response times. They may be more willing to make mistakes — at least in entering the code — because they know the mistakes can be corrected easily, whereas a batch programmer has to be more meticulous about detail, because he or she might get just one run a night.

Today's microcomputer programmers expect even quicker response time plus independence from the processing needs of others. Response time can always be reliably gauged by the level of effort of one's own work. A short program will run faster than an equivalent long program because it is not stuck in a queue or waiting for an interrupt.

Batch programmers have to respond to a multitude of logical machine conditions, whereas programmers of interactive systems have to respond to the multitude of possible illogical human responses — such as

See CHANGES page 18

Freeman is a computer systems analyst at PERA SS, a government planning and engineering firm in Kittery, Maine.

Screen reflection: Its glaring effect on VDT operator performance

READER'S PLATFORM

By BILL GRENAWALT

In an earlier *Computerworld* article, Richard Koffler expressed doubts that glare could be a cause of VDT eyestrain and, consequently, that filters designed to screen for glare were actually helpful.

Mr. Koffler based his reasoning on a lack of scientific validation; however, anyone who has driven a car westward in the afternoon on a sunny day would feel strongly, I believe, that empirical validation, in this case, is more than sufficient.

In my work, I consistently hear complaints from computer operators about screen glare, which they associate with headaches, dry eyes, blurred vision, and so on.

Those complaints are identical to those expressed by respondents to a 1983 survey by Minolta Corp., a National Institute for Occupational Safety and Health study in 1981 and others. However, we do not have to depend only on personal experiences to accept that screen glare can, indeed, affect operator performance and well-being.

In a recent study, researchers in Physiological Optics and Computer Science at the University of California, Berkeley, demonstrated eye-blink rate as a measure of difficulty in reading a VDT screen.

The Berkeley group found that difficulty is inversely proportional to the number of eye blinks per minute. Adjusting for individual differences, the study established a blink rate of 15 per minute as normal for the viewing conditions of the study.

Blur or glare on the VDT screen reduced the rate to as low as nine. While blur must be corrected by internal adjustments to the computer, the use of an antireflective filter where glare was the problem enabled the researchers to bring blink rates up to within 95% of normal.

Two recent studies in which the Optical Coating Laboratory, Inc. participated also provide some very interesting statistics.

During the fall and winter of 1985, Strategic Information Research Corp. in New York conducted a comprehensive research project among VDT operators at the Optical Coating Laboratory's request.

The objectives of the project were threefold: first, to determine if a relationship existed between screen glare and the operator's office; next, to discover if a relationship existed between the incidence of a specific number of health conditions and use of a VDT; and finally, to examine the impact of panels specifically designed to reduce glare on a VDT screen.

The final report contained this observation: On a scale specifically constructed for the measurement of eye problems in this experiment, users of panels exhibited a greater decrease in average score than control group members.

This finding would seem to indicate that the participants in the test group experienced a genuine decrease in types and intensity of eye problems not attributable to the normal course of events.

The report stated: "Since the frequency of these problems among VDT users is directly correlated to interruptions in VDT use, productivity among VDT users will increase if the ... panel is introduced. This is the most significant conclusion drawn from the evidence of this study."

Grenawalt is ergonomics program director for Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Recipe for DP disaster

From page 17

ence at disaster recovery planning than U.S. companies, of course, because social and political conditions on the Continent demand it of them. Terrorism has unfortunately been a fact of European life for many years.

Another factor is that European governments have been more willing to intervene and regulate business in which they thought that the social good was at stake. Hence the emergence across Europe of various types of data privacy legislation, which in part obligates companies holding data on citizens to safeguard that information from loss as well as misuse.

A few years ago, the Swedish government surveyed top firms as to how they would fare in the event of a loss of their main information processing resources.

The results were nothing short of shocking: Barely 15% of the companies queried would be able to survive a disaster to their computer centers.

Since that survey, the government has promulgated a legal requirement that all Swedish companies must take concrete measures to protect the information resources in their charge.

Regardless of nationality, location (astride a major earthquake fault, for example) or the political climate in which they operate, all companies clearly face some risk for either a natural or man-made disaster.

Not surprisingly, companies that deal directly with the public have invested a significantly higher dollar amount in protecting their corporate information than have companies engaged, for example, in scientific research or manufacturing.

But, in either case, few companies can say (with any confidence) that the records, transactions, investment portfolios and other corporate information necessary for day-to-day operation would survive a major disaster. For years, corporate America has stuck its collective head in the sand rather than develop truly effective disaster-recovery planning and capability. Now it is catch-up time.

Changes in computer pros

From page 17

pressing the wrong PF-key. Programmers of expert systems need to comprehend human response plus human thought. They need the ability to analyze complex thought processes and describe them as a set of changeable rules.

A fourth-generation programmer needs to rely on memory less than a Cobol programmer because the work is more modular and usually prompted. Long-winded Cobol can be far more mnemonic than Fortran, Basic or assembler, since one does not have to express things in eight or fewer characters.

A fourth-generation programmer can get by knowing little hexadecimal or octal notation and almost no hexadecimal or octal calculation — mathematical abilities once required for all programmers but now mostly for systems work.

Likewise, memory addresses, once vital information to a programmer, are handled by operating systems and the physical design of a data base.

There may be less mathematics involved in fourth-generation programming, yet working in a network data base requires the ability to visualize to a far greater extent than when working with flat files or two-dimensional arrays.

Communications requires people who can function in the world of protocol — the give and take of formal two-party communication. They have to be able to respond to this technical handshaking as in a verbal call and response sequence.

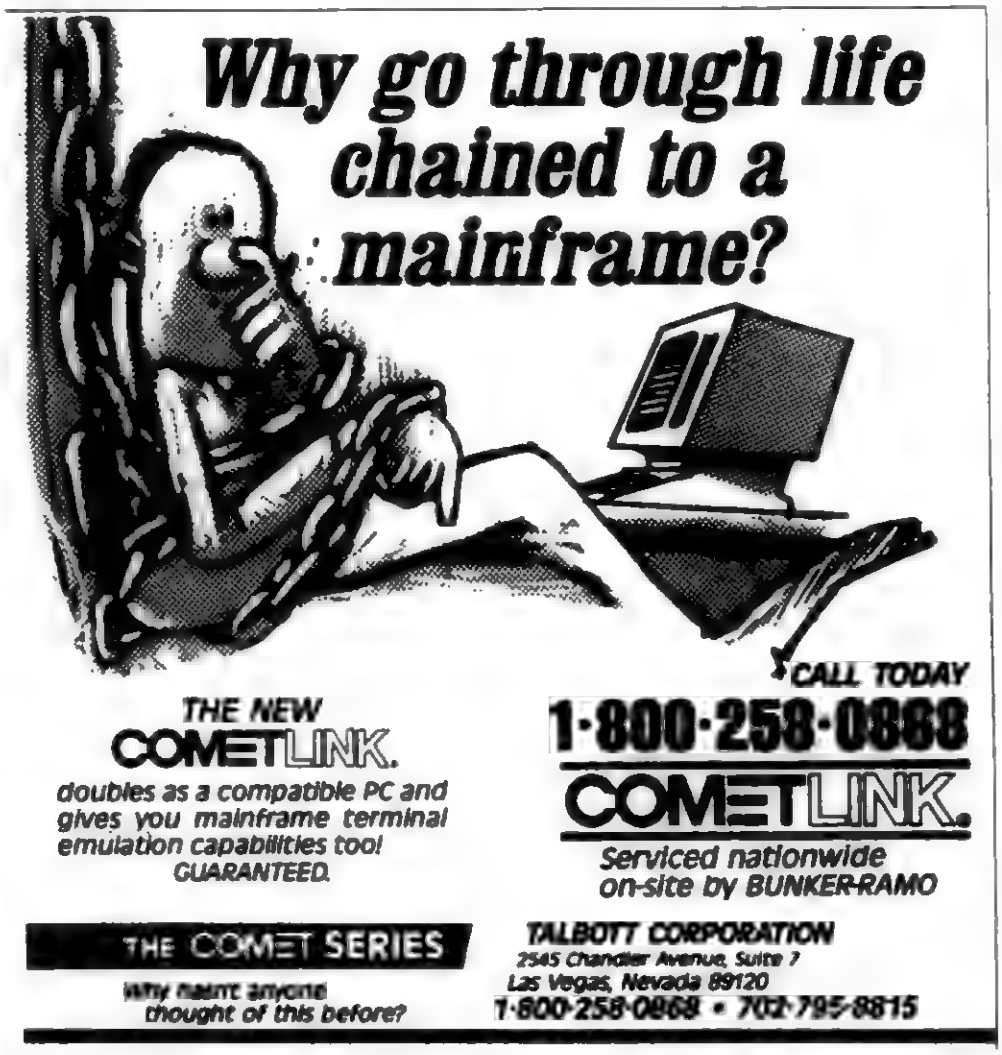
Networks require the same skills plus the ability to function in a hierarchy of organized interaction — passing information across peer levels as well as up and down the organization chart.

Sharing vs. security

Networks also require people who can be simultaneously concerned about the diametrically opposite worlds of sharing and security. They need to understand that neither sharing nor security is an absolute good or bad.

Programming languages have nearly eliminated required row and column entry, leaving only vestiges of the accounting school theory of computing. Most software houses know that it is just as easy (and usually easier) to program for flexible column entry as for fixed format.

As the computer culture evolves, it requires people with new outlooks on work, people who can get satisfaction from new types of work. It also requires the wisdom of seasoned professionals who can adapt to the changes in their work brought about by the changes in technology.



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C Microcomputers/Desktops
D Communications Systems
E [redacted] Systems

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SOFTWARE & SERVICES

SOFTALK
Charles Babcock

Imaginative price structures

In a recently released study, market research firm Input, Inc. highlights the reasons why price discounting in software is shortsighted. After eroding profit margins in the hard times, this practice makes it tougher to collect standard prices in the good times, the study says (see story at right).

The study doesn't say exactly which or how many of the software companies engage in discounting, but it seems clear from the results cited that discounting takes place during an industry downturn and is most prevalent wherever the competition is fiercest. In 1985, those areas included accounting software, manufacturing software geared to specific markets and data base management systems.

Discounting is really just one aspect of a business outlook that puts maximum emphasis on achieving quarterly results. A company discounts its products in part to maintain market share and also to show revenue on paper. Questions about the quality of that business — whether it represents a profitable deal — can be deferred beyond the scope of one quarter and therefore may not be raised.

The Input study concludes that software vendors should be more innovative in their pricing and consider short-term leases, which have lower initial costs. In doing so, they have to forego the cash-flow benefits of a lump sum payment when a permanent license is purchased.

This is not a new idea to Information

See IMAGINATIVE page 22

Babcock is Computerworld's senior editor, software & services.

Discounts hurt in long run

Study says performance more important to users

By Charles Babcock

Discounting as a response to temporary market pressures is bringing more drawbacks than advantages to software vendors, warns a study on trends in software product pricing.

The software companies' willingness to discount is eroding their profit margins, image and ability to survive future market downturns, according to the study from Input, Inc., a computer and communications market research firm based in Mountain View, Calif.

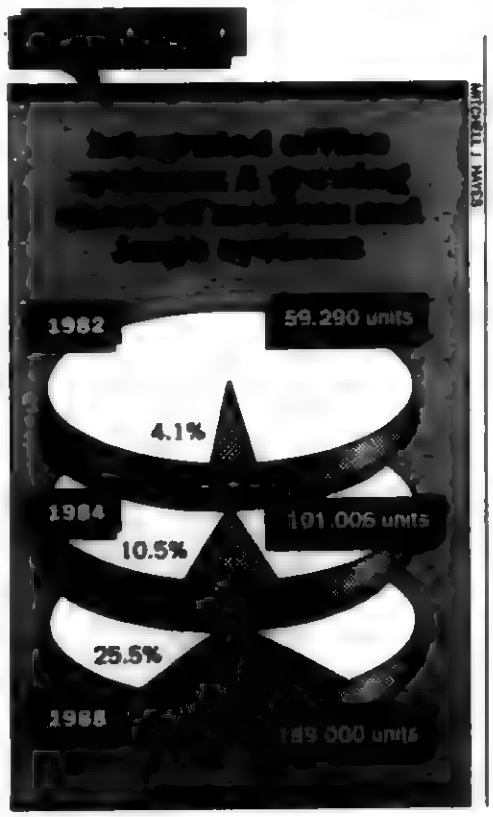
"Accounting software underwent some extremely aggressive discounting recently," notes Jack Keen, Input principal staff consultant, who compiled the data for the study in the second half of 1985. Prices declined less than might be expected because of added functionality in accounting products. In less volatile times, the enhancements "would have supported far greater levels of price increases" than they did in 1985, Keen explains in the report.

Manufacturing software aimed at vertical markets "showed the most softness during this period, mainly due to the aggressive actions of larger vendors who responded to greatly increased competition by implementing larger than usual discounts," the study says.

Increased competition to sell data base management systems is causing the basic DBMS packages "to evolve to more of a commodity image," the study declares.

An offshoot of a market that produces discounting is a slowdown in price increases. Software prices increased an av-

See DISCOUNTS page 24



MITCHELL J. HAYES

Tool uploads Micro CICS

By Jeffry Beeler

LOS ANGELES — Unicorn Systems Corp. has teamed up with a Connecticut OEM to put Micro CICS on a minicomputer with a VM/CMS-compatible operating system.

The agreement between Unicorn and Canaan Computer Corp. of Trumbull, Conn., will allow mainframe CICS applications development, testing and debugging to be offloaded to a 32-bit superminicomputer, Canaan's DCS 5800.

Both Canaan and Unicorn are training their sights on data centers that run CICS under MVS or DOS. A typical MVS or DOS shop divides its mainframe system into multiple CICS regions, some dedicated to program development or testing and others to production jobs.

However, because most businesses give preference to production, "development and testing are often interfered with or degraded," according to Forecross Corp.

See TOOL page 24

INSIDE

Cincom Systems announces its Ultra Interactive Database System for the DEC VAX line/22

NEW THIS WEEK

- Hewlett-Packard introduces HP Teamwork/Structured Analysis software for software engineers
- For more on this and other new products, see pp. 77-87.

INSTANT ANALYSIS

"On balance, I don't see Oracle or Ingres having any performance advantage. Each has certain areas where it does better than the other."

— Greg Pavlov, executive director, Frontier Science & Technology Research Foundation, an Ingres user, on the Oracle Corp. vs. Relational Technology, Inc. DBMS performance debate

ORACLE WINS THE 1985 DATABASE DERBY

The 1985 Database Derby pitted the world's leading DBMS companies against one another in Chicago.

The contest? Implement a complex, real-life application using state-of-the-art DBMS technology.

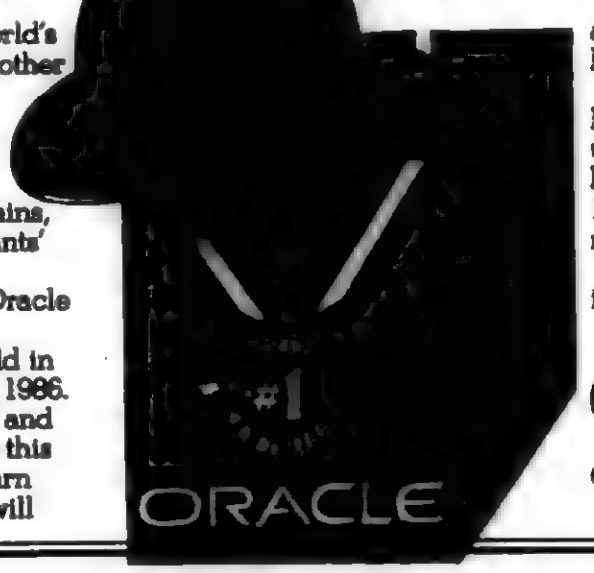
The objective? Measure productivity gains, ease of use and raw power of the contestants' DBMS products.

The winner for 1985? ORACLE,® from Oracle Corporation.

The second Database Derby will be held in San Francisco during the month of August, 1986. We look forward to seeing Cullinet, ADR and the rest of the database thoroughbreds in this year's run for the roses. But we should warn them that our gold medal team for 1986 will again include the cream of the ORACLE National Consulting Service organization.

If you'd like to know more about the Database Derby, and how ORACLE wound up in the winner's circle, join us for a free half-day seminar at a city near you. Call 1-800-345-DBMS, or write Oracle Corporation, 20 Davis Drive, Belmont, CA 94002.

And check our full-page ad earlier in this issue for further details about ORACLE.



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Cincom releases interactive DBMS for VAX

Includes upgraded query and reporting system

CINCINNATI — A relational data base management system for the Digital Equipment Corp. VAX line of computers has been given an enhanced, interactive query and reporting system in its latest release.

Release 1.4 of the Ultra Interactive Database System is available from Cincom Systems, Inc. of Cincinnati at prices ranging from $20,000 to $99,000, depending on environment.

The system is designed to utilize the multiple machine, multiple application environment of major VAX users, Cincom spokesmen said.

The query and reporting system, dubbed Spectra, allows users to retrieve and update information stored in an Ultra data base or in a personal file system that is maintained apart from the central data base, according to company spokesmen.

Tutorial facilities

The system also provides tutorial and Help facilities, with Edit and Browse commands to ease reporting tasks for end users.

The DBMS also includes a screen forms facility to aid in the design, test and storage of screen forms. Called Ultra-Scope, its run-time system automatically validates data, eliminating the need to do so through conventional methods, company officials said.

The physical data manager in Ultra-Scope now operates in a clustered VAX environment, allowing users on different VAXs to share data in one DBMS, spokesmen said.

Under the new release, users may mix physical files and indexed sequential files and access them through the DBMS' Relational Data Management Language.

In addition, company spokesmen said, Ultra includes a Basic language preprocessor as well as supporting Cobol, Fortran and Mantis, Cincom's fourth-generation language.

Chances are you don t currently audit your operating system—even though it's ultimately in control of information used to manage your organization. And for good reason.

For the most part, you don't audit the system because the software is just too complex. Then too, certain hard data on system controls is usually unavailable. And a manual review would take weeks to perform, require outside experts, and cost too much.

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AEX2-Examine/MVS software also helps your DP staff become more productive by improving their knowledge of the system, its controls, and its level of operating efficiency. In effect, it puts MVS under a cost-conscious microscope.

Tighter business controls, more accurate information and improved data center productivity are all key management objectives for the coming decade. AEX2-Examine/MVS software provides a tool to help you achieve these strategic objectives *today*. And positions you to meet your increasingly stringent demand for due care in the future.

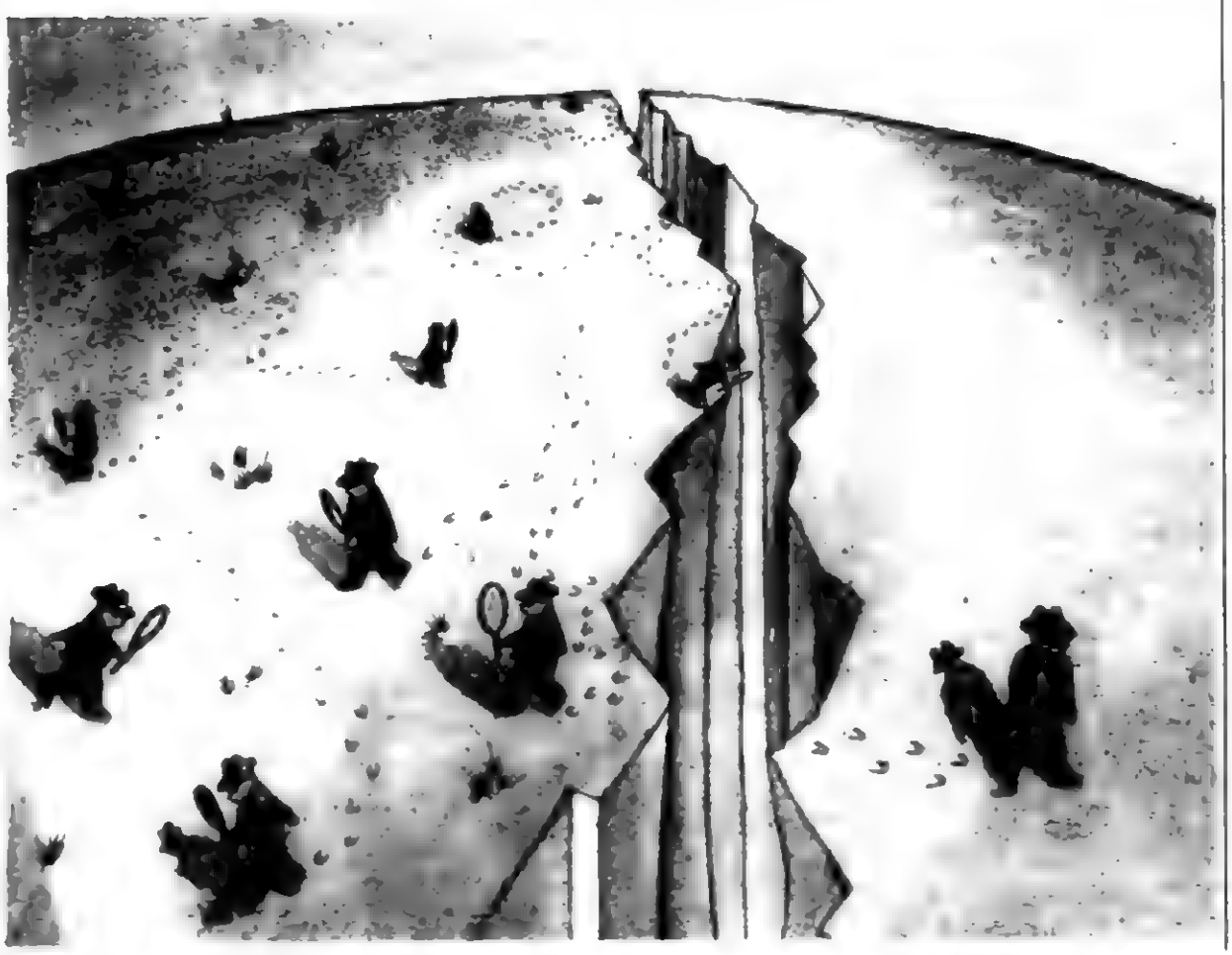
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Imaginative price structures

From page 19

Builders, Inc. of New York, whose sales have been 80% via leases over the 10-year life of Focus, its principal product. Verne Scheidler, Information Builders spokesman, is fond of saying some customers have paid for Focus several times over because they prefer lease arrangements.

Given the fact that Focus is an information center-oriented product, it is not surprising that many companies have decided to add the new service to their DP budget via the smaller initial cost of a lease.

Another company for which leasing is a hefty part of business is Cincom Systems, Inc., a systems and applications house. Its president, Dennis Yablonsky, says Cincom realizes about 23% of its revenue from software leases. When combined with maintenance revenue, the company receives about 40% of its revenue in recurring form, a fact that helps the company weather economic downturns, he says.

It's worth noting that both Information Builders and Cincom are privately held, which frees them from the pressure of quarterly results.

Escaped Wall Street scrutiny

Another company that more recently escaped the quarterly scrutiny of Wall Street is Applied Data Research, Inc. (ADR), now part of Ameritech.

President Martin Goetz says ADR has implemented a 20% reduction in short-term lease prices and now offers a month-by-month lease. The hazard of such brief leases, according to Goetz, is that a customer is free to discontinue his use of an ADR product on short notice and go with a competitor's. But many customers "like the comfort of not being locked into a product," which helps make the sale, Goetz says.

"Most companies underestimate how long they will use a product. Over the long haul, we think it will bring us more revenue," he says. ADR would like to see this side of its business grow from 15% to 25%.

There is little reason — other than, "We've never done it that way" — for software companies to avoid consideration of more flexible pricing schemes than the lump sum, permanent license, the Input study implies.

"Top management, preoccupied with many other business issues, often drags its feet when asked to approve additional resource time to review pricing structures more than once annually," the study says.

Pricing is complex and "often demands market information which is either nonexistent or sketchy at best." Faced with the possibility that it has set prices too high, management reverses itself in a competitive situation and begins discounting, which attracts unprofitable business.

Although discounting will always play a role in competitive situations, the company that can enforce its pricing policy is a more viable one than the company forced to constantly discount. Discounting should be approached "with extreme reverence and caution," the study concludes.

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VMBATCH even allows you to create pre-determined default job options for commonly run jobs (saving valuable time on routine jobs)...and gives you complete power to define all the who's, when's, and what's of your batch priorities.

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Discounts hurt in long run

From page 19

erage of 4% in 1983; by mid-1985 the rate had dropped to 2%, the study says.

The sensitivity of prices to market conditions in part is a self-imposed Achilles' heel of the industry, the study implies. Most buyers rank price at the bottom of their list of reasons why they make a particular purchase. Near the top are such reasons as "performance," "features" and "ease of use."

This mismatch of vendor vs. buyer perceptions is borne out in other areas. While vendors perceive their own financial stability to be a major selling point, buyers tend to view it as a secondary issue to performance, the study says.

The study notes that software pricing is too tradition-bound. It is viewed as "a once-a-year phenomenon, usually set to coincide with the budgeting cycle rather than market developments."

To make pricing a part of marketing strategy, software companies need to review prices at least once every four months and tie them to changes in the marketplace, the study says.

A major opportunity to win sales through pricing is the creation of "low entry" costs for buyers. The study states that low-entry offerings could include more attractive lease or rental plans or flexible usage pricing. For many software companies, however, current financial strategy rules over marketing, and that strategy seeks a lump sum payment upon purchase. The lump sum approach "results in immediate cash" and "generates impressive revenue and profit growth curves," benefits that in some instances "become highly addictive," the study continues.

In addition to low-entry offerings, vendors should consider regular price increases. "Price increases in the range of 3% to 6% may, in many cases, be made almost immediately since buyers generally expect this type of occurrence."

The study also recommends that annual support prices equal 12% of the lump sum price. The study was based on personal interviews with 26 information system managers and 678 telephone interviews with information system managers of mainframe and minicomputer systems.

Tool uploads Micro CICS

From page 22

President Kim Jones, whose San Francisco-based firm uses Micro CICS to produce commercial software.

With the Canaan-Unicorn combination, however, the CICS regions reserved for development can be migrated from a mainframe to the DCS 5800, which supports up to 36 users. Introduced early this year, the DCS 5800 executes 500,000 instructions per second and runs Canaan's VM/CMS-compatible operating system, Canaan officials said.

The ability to remove development tasks from a mainframe ensures increased control over in-house programming efforts for MIS departments, according to Irene Nesbit of Nesbit Systems, Inc., a Princeton, N.J., consulting firm. In addition, disk storage and machine cycles cost less for a minicomputer than for a mainframe, she said.

The offloading of CICS programming and testing domains to a dedicated processor also lowers response times and improves development productivity by an average of 50%, claimed Michael Scroggie, Unicorn's president.

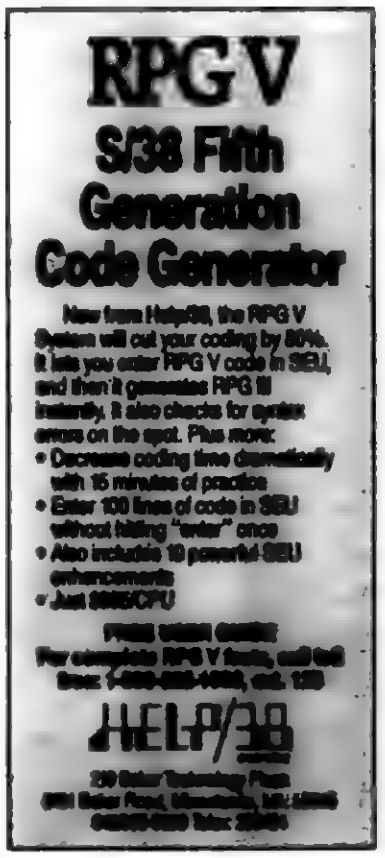
After a CICS application has been created, tested, debugged and compiled on a DCS 5800, the finished source code can be ported to a central IBM host for execution and production.

The uploading is made possible through Multigate, a family of system utilities that comes with the Canaan CPU, Canaan officials said.

The Unicorn development environment has also been available on IBM's Personal Computer/370 since Micro CICS was introduced last year.

Micro CICS, which supports VSAM and includes integrated testing and debugging aids, is available on the Canaan machine for a $16,500 license. A 2M-byte, 12-user DCS 5800 retails for $62,800.





SYSTEMS & PERIPHERALS

HARD TALK
Peter Cooperstein

Plan now for tax reform

Like it or not, data processing managers must accept the fact that the investment tax credit will almost certainly be taken away — retroactive to Jan. 1, 1986.

Although we do not yet know every detail the final tax reform legislation will include, lawmakers in both the U.S. House and Senate seem to agree that removing the investment tax credit will be necessary to help compensate for lost revenue from lowered individual and corporate tax rates.

If the DP manager has not already begun altering his course to accommodate the loss of the tax credit, it is time to do so.

Investment tax credit-lessor leases are ones in which the lessee passes the available tax credit to the leasing company to obtain lower rates than otherwise available. The great majority of such leases signed so far this year state that if the tax credit is retracted, the user's lease payments will be increased. While there's no use in crying over these deals now, managers can begin budgeting for these adjustments.

With the repeal of the investment tax credit, rates on tax credit-lessor leases will be increased anyway. And although this point will surprise many lessees, the rates will end up higher than if these transactions were originally tax credit-lessee leases — leases that allow the lessee to keep the tax credit, if available. The reason is that

See **PLAN** page 32

Cooperstein is vice-president of marketing for Western Marketing and Financial Corp., a San Rafael, Calif.-based leasing and brokerage firm.

Bringing 'down' a system

Raising too many tiles can cause crashes, readers warn

By Donna Raimondi

The ancient Chinese proverb that one picture is worth a thousand words proved all too true when *Computerworld* recently ran a CW Exclusive story about environmental problems encountered in computer rooms.

The story, "Head crashes: MIS seeks aid for sensitive disk drive problems" (CW, June 2), has resulted in a debate about proper methods of cleaning computer rooms. A number of callers, while generally having no problem with the article itself, were up in arms over the accompanying photograph (page 31).

The article related the experiences of several MIS managers who had improved the performance of their thin-film disk drives by cleaning their computer rooms. The photo in question shows a computer room floor with about 30 tiles raised off their supporting pedestals.

Some callers said that one should never lift more than two tiles at any one time. They maintained that the system could crash — as in physically crash through the weakened floor — or crash — as in fail because of dust pollution. But others said that there is no problem with lifting a row or two of the tiles.

The consensus of opinion seemed to be that managers who are planning to have work done in their computer rooms should pay attention to the fact that, at least under some conditions, it may be hazardous to the system to raise too many tiles.

"If you raise a lot of tiles, believe me, you are asking for problems of the first order. It's stupid to do that," said David Langley, president of Air Tech International, Inc. in Jacksonville, Fla., a firm that analyzes computer room air contamination. Tiles should be lifted in checkerboard fashion, Langley claimed, and not more than three or four at a time. When too many tiles are lifted, computer room

See **BRINGING** page 31

Start-up offers 40-bit AI processor

By James Connolly

ANAHEIM, Calif. — A 14-month-old start-up company plans to introduce its first product, a 40-bit symbolic processor pitted against artificial intelligence systems from Symbolics, Inc., Texas Instruments, Inc. and Lisp Machine, Inc.

Integrated Inference Machines, Inc. (IIM) reportedly plans to announce its SM45000 system at the Fifth National Conference on Artificial Intelligence in Philadelphia on Aug. 11.

IIM officials claimed a prototype SM45000 out-performed Symbolics' 3600 series systems by a 5 to 1 ratio in early benchmark tests. The SM45000 is priced from $39,000 to $44,500 and is scheduled to be available in October. "The speed will really show up when you enlarge the system," said IIM Vice-President for Engineering James Hino, who emphasized that one strength of the SM45000 is its flexibility and expandability. At present, it is intended for use by software developers and in large user companies that are developing their own AI systems, such as university researchers and government research and development laboratories.

The system is based on a proprietary custom 40-bit pipelined symbolic processor. It runs an extended superset of full Common LISP and supports peripherals and networking through an Intel Corp. 80286-based I/O processor that runs Microsoft Corp. MS-DOS and is also compatible with IBM Personal Computer software.

The SM45000 has the potential to address up to 20G bytes of storage, although the initial version will include up to 240M bytes of Winchester disk storage. Minimum memory is 10M bytes. Additional memory can be installed in 12 expansion slots in 10M- and 20M-byte increments to a maximum of 240M bytes. Hino also said that up to 1.2M bytes of no-wait-state ran-

See **START-UP** page 32

INSIDE

Intergraph announces a Fairchild Clipper-based workstation/**30**

Burroughs offers an uninterruptible power supply/**32**

Optical memory card technology shows market gains/**32**

NEW THIS WEEK

- Informer Computer Terminal offers a color portable workstation
- For more on this and other new products, see pp. 77-87.

INSTANT ANALYSIS

"Mainframe growth can and will return, but only when progress in software development and technology assimilation lowers the real cost of implementing effective end-user systems."

— **International Data Corp. report on the mainframe market**

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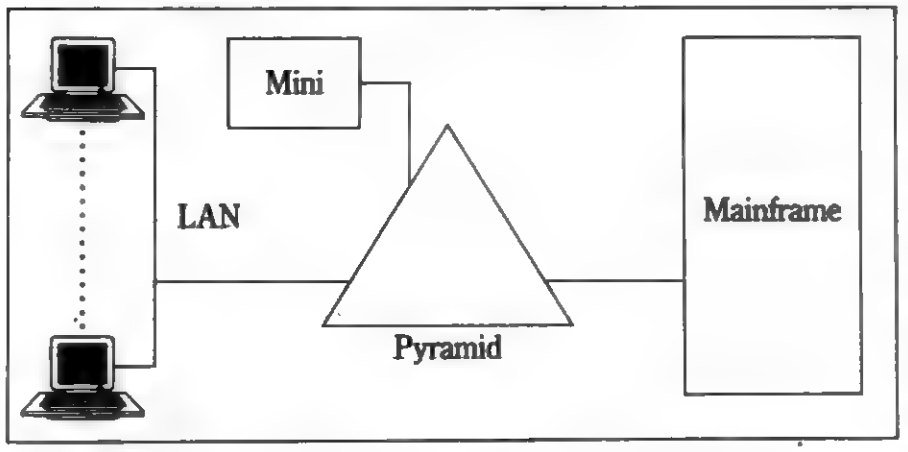
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This combination of features and openness makes our systems ideally suited for three important applications: As data base servers, pc/workstation servers, or software development environments. We'll talk about each one of these applications at length in a series of advertisements.

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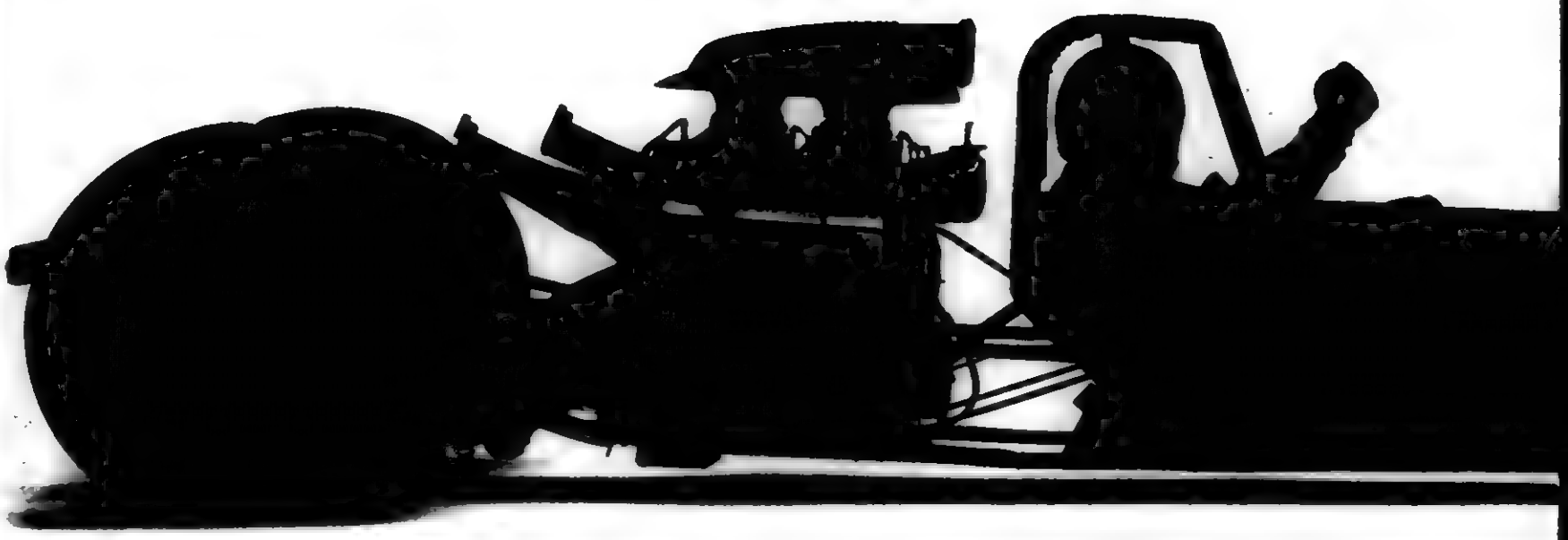
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The Shape of Performance.

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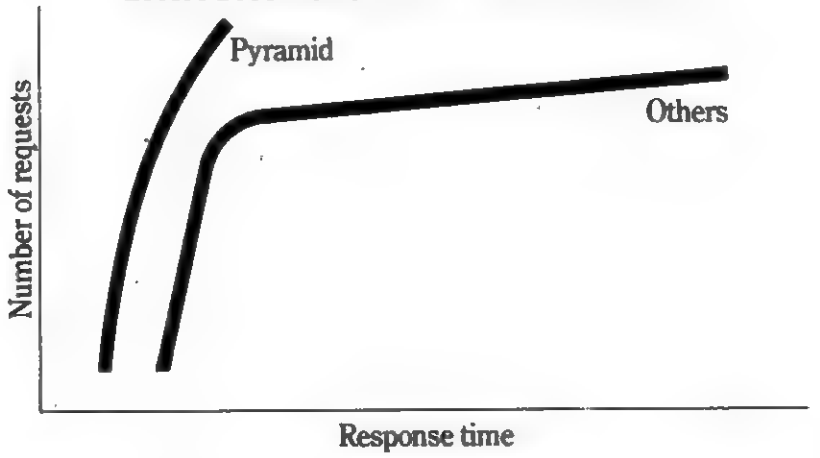
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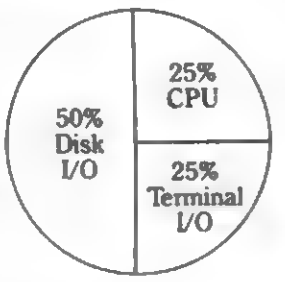
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Arete processor boosts Series 1000 capacity

By Donna Raimondi

SAN JOSE, Calif. — Arete Systems Corp. has released a modular I/O processor that almost trebles the number of users supported by its Series 1000 multiprocessor minicomputer.

The Modular Communications Processor (MCP) allows the Series 1000 transaction processing systems to support as many as 256 remote users, an increase from the previous maximum of 88 users.

The product also eliminates some of the wiring, cabling and termination problems of adding users or moving users around in a building, product manager Richard Hafner said. Instead of terminating each connection in the host cabinet, clusters of users can now be connected to an MCP, which is wired to the host with one cable. Multiple MCPs can be stationed throughout the building.

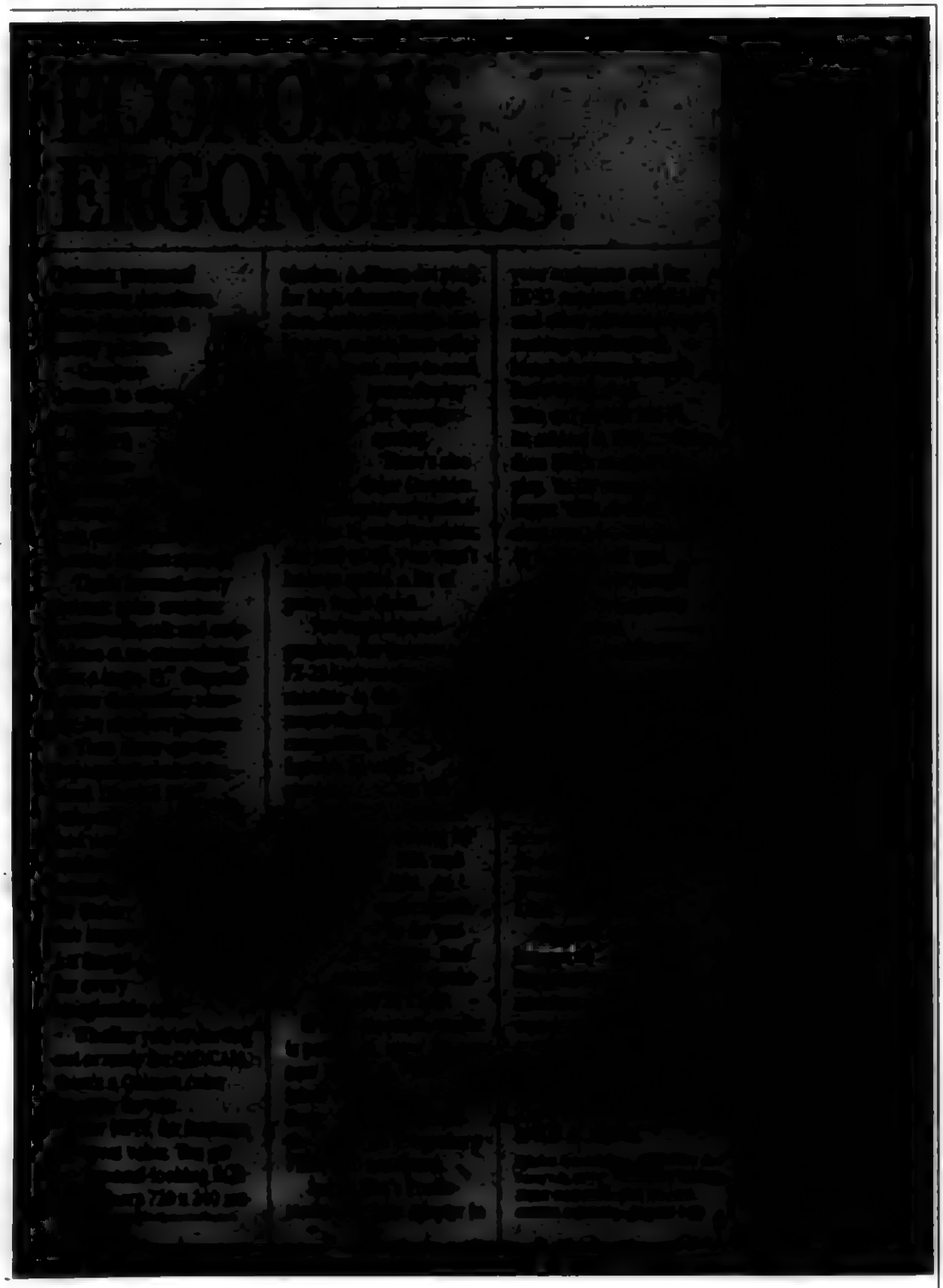
MCPs can connect to multiple Arete hosts or to other MCPs so that remote terminals, modems and printers can be attached.

The MCP is a free-standing unit that allows the linking of up to eight data communications processors located in the Series 1000 computers. A user needs a data communications processor for each 32 users on the system but only one MCP to link the maximum of 256 users.

Software included with the MCP allows customers to define user configurations and monitor communications for tracing and statistical reporting. The MCP transmits asynchronous data at up to 19.2K bit/sec. and synchronous data at up to 64K bit/sec.

The MCP is available as an upgrade to existing Arete Series 1000 systems for $38,000. Typical configurations, with tape and disk drives, that come with the MCP option support from 64 to 256 users and cost from $57,500 to $250,000.

A configuration with 64 users may or may not need an MCP, said James Bourgeois, director of marketing at Arete. If the system is growing rapidly and is expected to reach the limit of 88 users fairly soon, it would be worthwhile to buy the MCP, he said.



Intergraph unveils color workstations

By Rosemary Hamilton

LAS VEGAS — Intergraph Corp. last week unveiled two color workstations — the first systems to be introduced that use the Fairchild Camera and Instrument Corp. Clipper 32-bit microprocessor — at the Design Automation Conference.

The Interact 32C and the Interpro 32C, which reportedly operate at 5 million instructions per second (MIPS), are the second generation of workstations for Intergraph. The Huntsville, Ala.-based computer-aided design/manufacturing vendor reportedly is the No. 2 CAD/CAM vendor in terms of revenue and market share. It has marketed large systems based on Digital Equipment Corp. hardware since the early 1970s.

The Interpro 32C is a desktop unit designed for the technical professional, and it will sell for $25,000. The $40,000 Interact 32C is based on the same hardware, although it comes with a large, dual-screen display station and digitizing tablet because it is intended for design-intensive applications. Both systems are scheduled for shipment in October.

> ***'Intergraph Corp. had decided to change its Unix engine as soon as a more powerful processor was made available.'***
>
> — Thomas Miller
> Fairchild Camera and Instrument Corp.

The original Interpro 32, based on the National Semiconductor Corp. 32032 microprocessor, was quietly introduced in late 1984. It was Intergraph's first departure from the DEC platform, and it has not gained a significant share in the engineering workstation market, noted Charles Foundyller, president of Daratech, Inc., a CAD/CAM market research firm in Cambridge, Mass.

The Clipper-based systems will be shipped with the recently introduced AT&T Unix System V, Release 3.0 although they ran System V Release 2 when demonstrated last week.

Intergraph is the first vendor to announce a system based on the Clipper chip, which will be shipping in limited quantities this summer and is scheduled for volume shipment in the fourth quarter.

The Clipper offers five times the performance of a DEC VAX-11/780, which has a 1-MIPS rating, according to Fairchild. Clipper marks Fairchild's entry into the 32-bit CMOS microprocessor market, and it will compete against more firmly established 32-bit offerings from Motorola Corp. and National Semiconductor as well as the as-yet-undelivered 32-bit 80386 chip from Intel Corp.

Although built around a new chip,

See INTERGRAPH page 32

Bringing the system 'down'

From page 25

air flow is interrupted, spewing "junk" into the air and into the equipment. The stability of the floor is also jeopardized, he added.

"It is never recommended to remove more than two or three floor tiles at a time," said Tom Desantis, branch manager of Data Supply, Inc. in Hialeah, Fla., a company that distributes business forms and office supplies, including computer room floors.

"Computer room floors give good support downward but not from side to side," Desantis continued. "If you have five tons of equipment and you lift that many tiles off the floor, especially toward the center of the room, the pedestals can tip."

But Tom Bougie, regional sales manager for C-Tec, Inc., a Grand Rapids, Mich., manufacturer of raised computer floors, did not agree. "In order for the floor to fail, there would have to be a rolling load in the direction of the raised tiles," he said. A rolling load is equipment on wheels that is pushed around the room.

Computer room floors are made to hold a static, or nonmoving, load, Bougie said. And if the computer room has stringers — metal channels for stability that run from pedestal to pedestal and that the tiles sit in — even a rolling load would not be a problem. Stringers are commonly used in floors raised more than 18 in. and in many floors raised over 12 in., he said.

Al Faber, director of computer operations at the Dade County School Computer Center in Miami, has had rolling loads fall through his floor even when tiles were not raised. "We were hauling things on a skid, and the skid went through," he said. "If you set things at an angle on the tiles, they will fall through. We have taken as many as 12 tiles off at a time. It gets very dangerous, especially if you lift the stringers up too, like to lay cable."

> ***'The major problem is when you lift more than two tiles, you have broken the integration of the floor, and it could collapse or shift.'***
>
> — Mark Sher
> Compuclean International, Inc.

Mark Sher, president of Compuclean International, Inc. of Coral Gables and Tampa, Fla., said, "Raised floors were designed to hold the weight of the equipment." Sher, whose firm monitors and cleans computer rooms and ensures a proper environment for equipment, added, "The major problem is when you lift more than two tiles, you have broken the integration of the floor, and it could collapse or shift." Another problem, Sher said, is that the cooling system could be disabled because the tiles have holes or vents that help circulate the cooling air.

But Storm Larkins, president of Winton Laboratories, Inc. of Los Angeles, the company that was featured in the controversial *Computerworld* article, said his company routinely lifts numerous floor tiles and that he has never had a problem doing so. "We have never even had a complaint or a comment about this, and we use that picture in our sales brochure all the time," he added.

Desantis said he knows about shifting floors from experience. When he was DP manager of Traveler's Express Co., a New Jersey firm that has since been bought by Greyhound and moved, electricians pulled out a row of panels and the computer system fell through the floor. But, Desantis said, that was about 25 years ago, and the floor tiles were made of plywood. He said he does hear about plunging computer equipment from time to time, however, maybe twice in the past few years.

Desantis and Sher both pointed out that floor tiles go in only one place and must also be replaced in the right direction. "There is no such thing as a perfect panel," Desantis said. "You have to level new floors and adjust all the pedestals that the tiles sit on. So each panel has to go back where it came from and in the same position, or it will rock back and forth."

That rocking motion, according to Sher, can cause minute fragments of the aluminum floor structure to settle onto the subfloor. The particles can subsequently blow through the air-conditioning system and lodge in parts of the computer system, creating anything from a nuisance to equipment failure, depending upon where they land.



This photograph of lifted floor tiles during computer room maintenance work sparked safety debates.

And it was precisely the threat of equipment failure that led *Computerworld* in the first place to run the June 2 article and accompanying photo that some thought shows an environment ripe for a crash — as in equipment physically falling through the floor or becoming polluted by dust to the point of failure.

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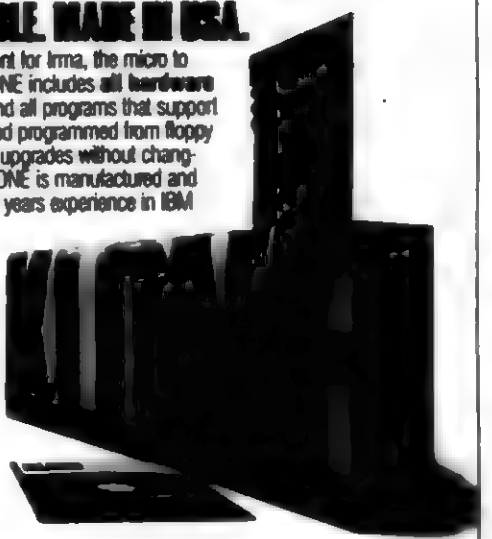
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Lasercard industry gets boost

Vendors show optical memory card products

By Donna Raimondi

Optical memory card technology, in which a laser records financial, security or other data on a card, has been boosted by four vendors who have licensed the technology.

The technology, pioneered by semiconductor component manufacturer Drexler Technology Corp. of Mountain View, Calif., was developed and patented by Jerome Drexler in 1981. It was licensed to four firms that have publicly demonstrated the read/write equipment they developed for the card.

Toshiba Corp., Nipponcoinco Co. and Matsushita Electric Industrial Co. all showed read/write products in Japan this year. Canon, Inc. demonstrated its read/write products at the Hannover Fair in West Germany.

The Drexler Lasercard optical memory cards use a laser light source by which data converted into digital signals is written into and read out of a special data storage stripe sealed inside the cards. Two million alphabetical characters (the equivalent of about 800 sheets of A4-size paper) can be stored on one card. This is in contrast to 72 characters commonly stored on magnetic strip cards and 8,000 characters that can be written to integrated circuit cards. Once the data has been written in, it cannot be erased.

With the optical cards, data is input via laser beams that punch microscopic holes in a silver layer inside the card.

Trials of an application for the optical card system will be carried out in a Japanese bank this summer. The experiment will allow about 100 employees in a Tokyo main office to do cashless shopping in the bank's dining room and snack shop as long as they do not exceed specified limits prestored in the cards. The cards will memorize deposits and withdrawals of funds, like an electronic checking account, Drexler spokeswoman Johanna Protsik said. Settlements will be processed once a month.

If all goes well after the six-month trial, the Tokyo bank will extend the experiment to consumers. New functions will be added, such as incorporating individual assets- and document-management functions and telephone card functions. The latter will be done in collaboration with Nippon Telegraph and Telephone Corp. The cards will also be used as identification cards since they can use image processing to store photographs and fingerprint data.

There are prototype systems working, Protsik added, but there is not yet enough equipment to set up a large operation. "We have talked to seven or eight thousand companies, and the interest is phenomenal."

Start-up offers 40-bit processor

From page 25

dom-access memory (RAM) can be configured for each 20M bytes of standard RAM.

The Common LISP extensions include graphics, random-access file structure and support for a mouse, pull-down menus and windows.

The standard graphics display is a 1,280- by 800-pixel bit-mapped graphics display. A 640- by 400-pixel color display is optional.

Company officials said symbolic processors can be used to support robotics and certain computer-aided design and manufacturing systems.

Burroughs uninterruptible power supply system fits in computer room

By James Connolly

DETROIT — Burroughs Corp. has introduced an uninterruptible power supply system designed to save space by being small enough to fit inside a computer room.

The UP 6000 was designed to protect large and medium-size computers, such as the Burroughs V series and A series systems, from erratic or interrupted utility power.

It has a minimum capacity of 60 kW and can be upgraded in the field to a 100-kW capacity.

"The power range, ease of upgrade, compact size and other state-of-the-art features make the UP 6000 unique among similar capacity uninterruptible power systems in the market," said Conrad Strelau, Burroughs vice-president of field engineering.

According to Strelau, the uninterruptible power supply system, including battery backup, is compact enough to be installed in the computer room, rather than requiring separate space.

Prices for the UP 6000 start at $60,000.

Integraph unveils workstations

From page 30

the new workstations have the same basic configuration as the National Semiconductor 32032-based Intergraph systems, which can be upgraded by means of a board swap.

The original Interpro 32 workstation, whose price Intergraph recently cut by $5,000 to $15,000, was constructed with separate I/O and display station processors. Those processors remain the same on the new systems.

The I/O processor is based on an Intel Corp. 80186 chip and has 512K bytes of local memory. In addition to controlling all the I/O and systems diagnostic functions, it also supports IBM PC-DOS-based operations, allowing users to run such popular micro programs as Lotus Development Corp.'s 1-2-3. This processor also controls the communications between the Interpro or Interact 32C and other devices on an Ethernet network.

The display station processor, proprietary hardware called the Raster Operations Processor, executes graphics commands and display operations such as windowing and vector and raster generation.

"Two years ago, National was the right choice," said Bruce Imsand, vice-president of systems development with Intergraph. "But we set it up as an independent processor in case we wanted to change."

Thomas Miller, a marketing manager with Fairchild, added, "Intergraph had decided to change its Unix engine as soon as a more powerful processor was made available."

Both the Interpro and Interact 32C come with 6M bytes of main memory, an 80M-byte disk drive and a 1.2M-byte floppy-disk drive. A 15-in. color monitor with 1,184- by 884-pixel resolution comes with the system although a 19-in. version with the same resolution is also offered.

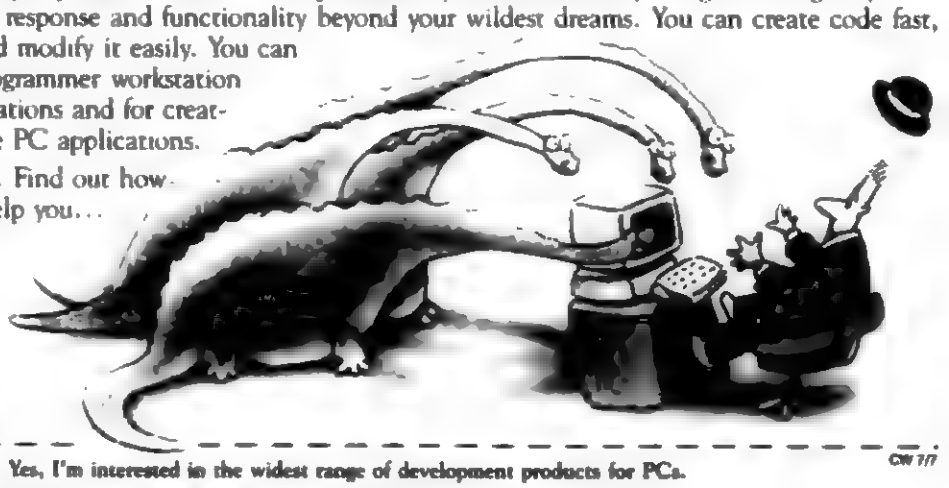
The entry-level systems include screen management software, as well as DEC VT110 and VT200 emulation and Interact terminal emulation software.

The Intergraph Network Core software, Graphical Kernel System routines and an Ethernet network connection are also standard.

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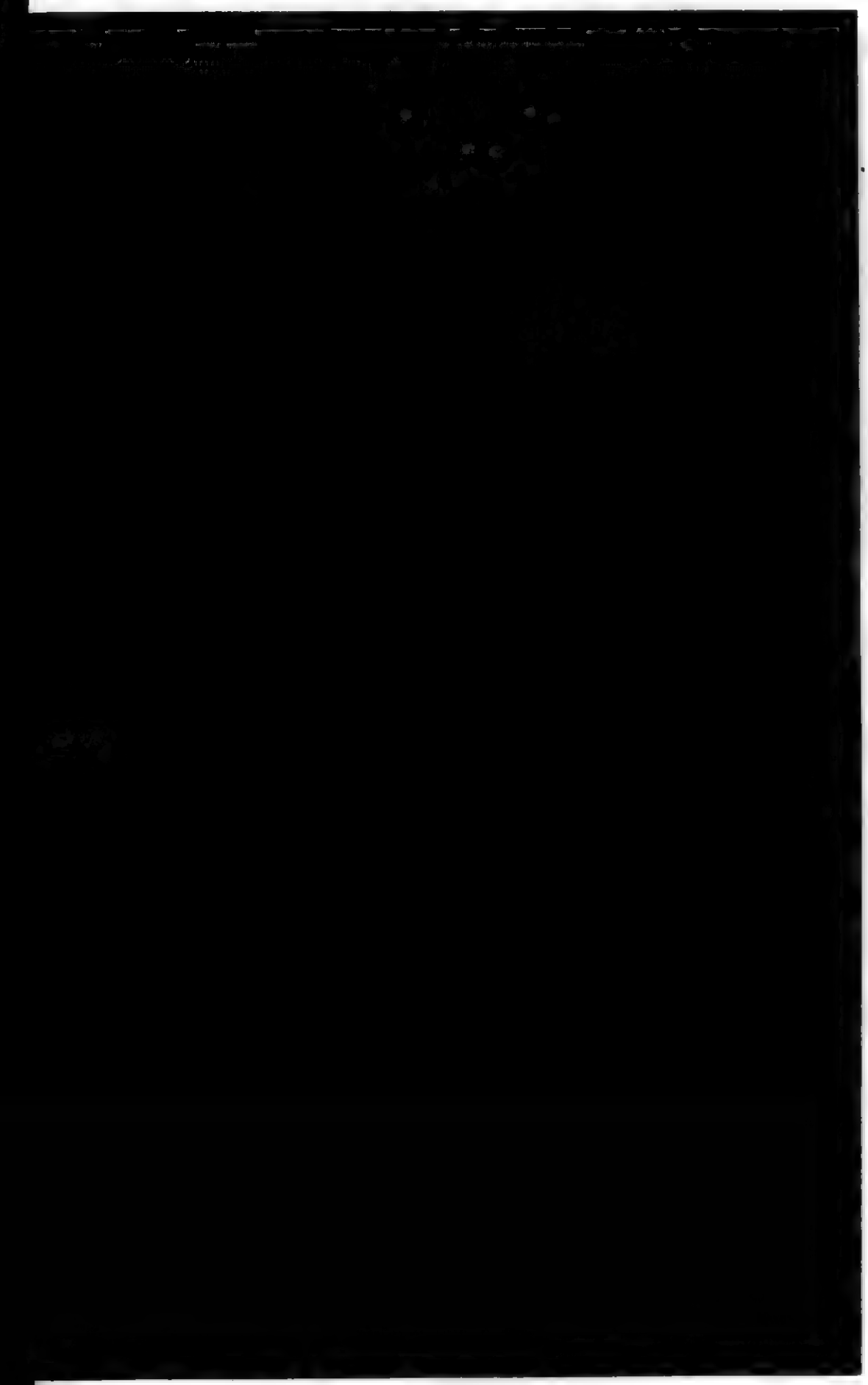
From page 25

investors in investment tax credit-lessor leases are primarily after the tax shelter benefits of the investment tax credit, and they do not value the depreciation benefits or the equipment's expected residual value as highly as tax credit-lessee investors do.

Incidentally, a leasing company that offers both tax credit-lessor and tax credit-lessee rates is often representing these two very different types of investors. One conclusion: recognize that times have changed and stay away from investment tax credit-lessor leases.

Investment tax credit-qualifying corporations either have had an appetite for the tax credit or have taken advantage of the tax credit by obtaining lower lease rates via tax credit-lessor leases. Now, users should rethink the new vs. used argument: The retraction of the investment tax credit means used equipment now becomes more valuable.

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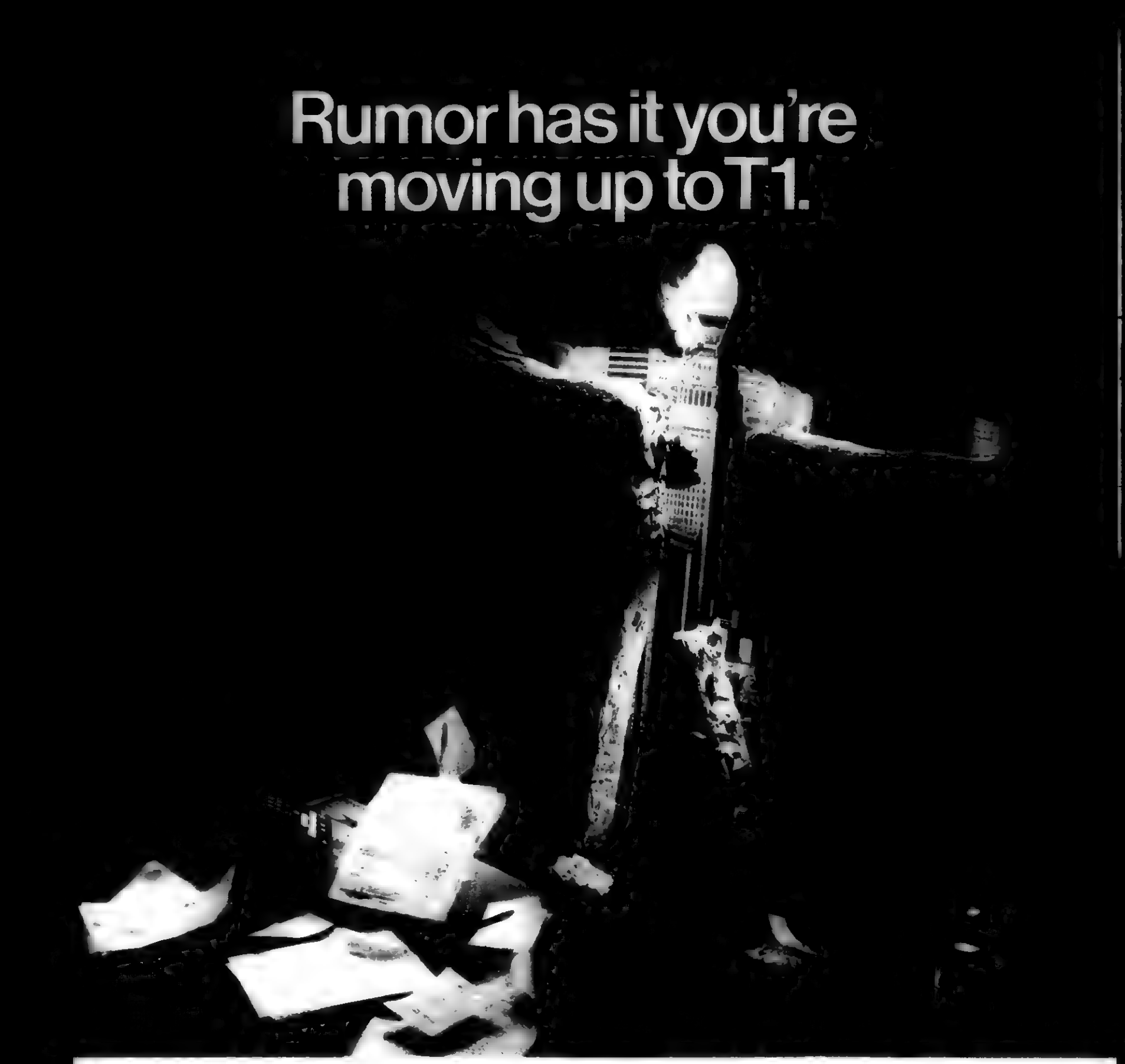
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DATA STREAM
Elisabeth Horwitt

Take T1 wheel from vendors

The article on T1 code mix-ups, "Code snafu threatens T1 private nets" [CW, June 30], is a strong argument for users to take control of their T1 networks rather than leave it to the regional holding company to make sure nothing goes wrong.

Briefly, that article discusses an equipment glitch that sometimes causes a private T1 line to get stuck in diagnostic loopback mode. When this happens, the line is out of commission until someone sends an engineer out to the site to fix the problem.

The most sinister aspect of the whole thing is the essential helplessness of the user. I'm not talking about Fortune 500 corporations with huge private telecommunications networks tended by expert technicians. They can take care of themselves. I mean the smaller firms that just recently started leasing a few T1 lines, primarily to save money on phone bills and to hook up a couple of remote sites to the corporate IBM mainframe.

These companies can't afford separate telecommunications departments; they settle for having an MIS manager oversee the installation in order to learn the basics of T1 networking and to keep track of operations on an ongoing basis.

Small blame to this guy if, when something goes wrong with his network, his first move is to send out a distress call to the local carrier. The carrier will undoubtedly fix the problem and take steps to ensure that it

See **TAKE** page 43

Horwitt is Computerworld's senior editor, communications.

Banyan enters low-end mart

Adds IBM net servers, inks OEM pact with Tallgrass

By Alan Alper

NEW YORK — Launching its first assault on the low-end networking market, Banyan Systems, Inc. recently added two new members to its family of IBM Personal Computer network servers and signed an OEM agreement with Tallgrass Technologies Corp. The agreement licenses Tallgrass to develop and sell systems that integrate its own disk and tape systems and Banyan's networking hardware and proprietary virtual networking software (Vines).

Banyan's two new server products, the Banyan/DTS and Vines/286, provide all of the functionality of earlier Banyan systems, company spokesmen said.

The Banyan/DTS was designed to support small organizations or departments with between five and 20 users, spokesman Paul Bergeron said. A Motorola, Inc. 68000-based proprietary server with a PC-size footprint, the product incorporates a PC-compatible bus that operates at twice the standard speed, according to Banyan.

Banyan/DTS supports up to 5M bytes of main memory, between 43M bytes and 118M bytes of hard disk storage and a 60M-byte tape drive, one serial and two parallel ports, up to eight asynchronous or synchronous connections and support for an external battery backup.

A base configuration including 1M byte of memory, a 43M-byte hard disk and the Vines networking software and support for one local-area network (LAN) is priced at $9,995. Shipments by Banyan and Tallgrass will start in August, both firms said.

Vines/286 is a version of Banyan's networking software package that runs on a standard IBM Personal Computer AT or compatible, converting it into a Banyan network server. Streettalk, Banyan's global data base for identifying, locating and

See **BANYAN** page 43

Standards bureau finalizes X.400

Specifications will link U.S., European E-mail

By James A. Martin

WASHINGTON, D.C. — The first complete version of the X.400 Message Handling Standard (MHS) protocol was recently finalized by a special interest group of the National Bureau of Standards.

Initially proposed as part of the Open Systems Interconnect model for vendor-independent communications, MHS defines a common interface that enables users to send documents between different types of computer systems and network services.

The specifications for MHS Version 1.0 are to be delivered on July 1 to the standards bureau and the Corporation for

See **BUREAU** page 37

New satellite to bypass local loop

By Stanley Gibson

Scheduled for launch in 1989, an experimental National Aeronautics and Space Administration communications satellite may provide a cost-competitive alternative to fiber-optic transmission.

Dubbed a "switchboard of the sky," the Advanced Communications Technology Satellite (ACTS) would use high-powered narrow scanning beams in the Ka-band (20 to 30 GHz) to achieve geographically targeted point-to-point communications.

Unlike conventional satellite systems that use a single fixed-antenna coverage pattern to transmit to a wide geographic region, such as a continent, ACTS would use a multibeam antenna that directs narrow beams at specific geographic regions — generally cities and other high-volume traffic areas.

See **SATELLITE** page 38

INSIDE

Artel Communications introduces a modular net system of multichannel optical-fiber rings/**38**

NEW THIS WEEK

- Luma Telecom introduces its Luma picture-transmission telephone
- For more on this and other new products, see pp. 77-87.

INSTANT ANALYSIS

"I'm glad you told me about the problem, but given the choice, I would not solve it by taking out the equipment I just put in. Instead I would just avoid using the code."

— George Goodman, vice-president, T. Rowe Price Associates, Inc., reacting to the news that his T1 equipment's diagnostic code could generate problems

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Bureau caps off X.400

From page 35

Open Systems (COS). If COS approves the protocols, as is expected, the standards bureau will incorporate them into the OSI model. COS will then make the protocols available to member companies such as IBM and Digital Equipment Corp. for testing, implementation and software design.

With Version 1.0 of the specifications, equipment vendors and long-distance carriers "now have enough to build their X.400 products around," said Peggy Garza, a member of the X.400 special interest group (SIG). "From here, we will work on a Version 2.0 of the specifications," she added.

The X.400 SIG implementation agreement specifies that all X.400 interfaces between message handling systems use the CCITT X.25 packet-switching protocol. This will provide a common denominator between U.S. and European systems, Garza said. "The United States has become very local-area network and Ethernet based, while Europeans are almost entirely using X.25-based network systems," Garza commented. "Electronic mail typically requires wide-area links, so long-distance carriers tend to use X.25 for those purposes."

'Historical event'

The finalization of MHS 1.0 is "a historical event, because never before have vendors and users gotten together to agree on a particular implementation," remarked Jean-Joseph Cinecoe, Open Systems Interconnection product manager for R&D at Wang Laboraties, Inc. in Lowell, Mass.

Version 1.0 of the X.400 SIG specifications was not designed to be all-inclusive, said Herb Klein, an X.400 SIG member and senior manager for MCI Mail's international systems development, a division of MCI Communications Corp., in Washington, D.C. "There are questions that are unanswered," he said. "We haven't decided how to interpret all the areas of ambiguity.

"When people begin to implement and build the applications software," Klein explained, "additional questions will arise, and when implementations from dissimilar software developers begin to interconnect, we will see there still is a requirement for further definition."

One feature that Version 1.0 lacks but which should appear in Version 2.0 is a standard set of directory protocols, which would allow users to send electronic mail messages without having to specify the network service to which the intended recipient subscribes. According to Garza, integration with the Manufacturing Automation Protocol (MAP) and Technical Office Protocol (TOP) is another important area that the committee will focus on with Version 2.0. MAP and TOP are networking protocols developed primarily by the manufacturing industry. Whereas MAP was designed for factory floor networks and TOP for the office environment, the two protocols will use many of the same upper level protocols — including, probably, X.400 MHS.

Implementing Version 2.0 MHS within MAP and TOP, Klein said, will enable MAP/TOP systems to communicate with X.400-compatible systems via public network systems. Specifications for MAP/TOP compatibility with X.400 are scheduled to be finalized later this year.

"I'm sure X.400 SIG has facilitated and hastened the implementation of X.400 products," said Jim White, a member of the Washington, D.C.-based Electronic Mail Association's standards committee. White is also chairman of Rapporteur, an international CCITT committee on X.400, as well as senior scientist with GTE Telenet Communications Corp. in Reston, Va. "They have produced a set of agreements and specifications that have held up nationally and internationally."

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Series/1

Fiber net supports multiple protocols

Users can interface fiber nodes without interrupting net

By Elizabeth Horwitt

A modular network system of interlocking, multichannel optical-fiber rings was recently introduced by Artel Communications Corp. of Worcester, Mass. The Fiberway family of local-area network products will support multiple networks using different protocols, including Ethernet and the IBM Token-Ring network, the company claimed.

"Fiberway is really an optical-fiber version of a broadband network; but unlike broadband, it can support multiple network protocols on different channels," said Richard Cerny, president of Salem, N.H.-based consulting firm Trellis Communications Corp. "With a digital fiber-based network, it's easy to add or expand channels incrementally as you need them."

Fiberway uses the same basic topology as IBM's network scheme, in which each device is linked to a local ring that is actually a series of loops radiating from a wiring closet. Wiring closets are then linked by an optical-fiber backbone ring. Fiberway's backbone supports up to eight 25M bit/sec. channels.

The EXL 50 Ring Interface Unit enables up to eight computers to transmit at 25M or 50M bit/sec. via a direct link to an optical-fiber local network, according to Artel Chief Executive Officer Tad Witkowicz.

Such speeds are made possible by the wider bandwidth supported by fiber and by a proprietary token-passing protocol that eliminates collisions, Witkowicz added. EXL 50 supports any devices equipped with boards that conform to the 802.3 Ethernet standard.

"The EXL 50 is ideal for superminis and engineering workstations that need to transmit at high speeds," he noted. Available now, it costs $8,750.

Fiberway network monitoring, diagnostics, reconfiguration and access control are performed by Netserver, IBM Personal Computer-based software. If a network segment goes out of service, the units reconfigure themselves so the problem is circumvented, Witkowicz said. The EXL 50 version of Netserver, available now, is priced at $9,450.

Planned releases for late this year and early 1987 include interfaces supporting the IBM Token-Ring, T1 Carrier and 3270 communications protocols; the Node Concentrator, a low-speed, low-price connection to the optical-fiber backbone via twisted-pair wiring; and a network bridge that attaches local rings to backbone rings.

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NATA vying to retain Computer Inquiry II

By Elizabeth Horwitt

The National American Telecommunications Association (NATA) is trying to discourage the Federal Communications Commission from abandoning the Second Computer Inquiry ruling that requires regional holding companies to maintain separate telecommunications services and customer premise equipment operations.

In a recent issue of the industry newsletter "Washington Update," the organization argued that currently implemented accounting safeguards are "wholly inadequate to prevent phone companies from using profits from monopoly exchange services to prop up unregulated offerings."

The companies are already using ratepayer funds to subsidize 1985 losses of $1 billion in the customer premise equipment arena, NATA claimed. It added that if regional holding companies are allowed to shift only three-hundredths of 1% of revenue, they will be able to win an extra 22% of the private branch exchange market and 14% of the key system market.

Satellite to bypass loops

From page 35

Unlike typical satellite network configurations that direct transmissions from a central earth station hub to remote sites, ACTS would perform the switching operations itself as it directed the narrow beams to earth stations in different metropolitan areas.

ACTS technology promises to compete with fiber-optic terrestrial lines because it enables customers to bypass the local-loop segment of long-distance networking, says John Evans, director of research at Communications Satellite Corp. (Comsat) Laboratories. Comsat is a contractor on the project.

Local-loop access charges make up much of the cost of long-distance transmissions, he notes, adding that although the growing use of optical fiber will bring down the cost of inter-local access and transport area networking, terrestrial network costs will remain high because users will still be forced to pay high local-loop charges.

In contrast, ACTS customers will be able to receive transmission directly from an ACTS earth station in their area. One of the first goals of the program is to have an ACTS earth station in each operating company's region, according to Evans.

While the satellite would have fixed beams operating continually to certain major metropolitan centers, it would use "hopping" beams that would target lower-use areas as demand required.

NASA's plan has one satellite above the U.S. and another above Europe. The two would be connected by laser transmissions sent by satellite-based devices, currently being developed by MIT's Lincoln Laboratories, that would convert radio frequency transmissions to laser beams.

Evans says an additional benefit of the ACTS program is that it would allow satellites to be placed closer together by utilizing narrow-beam transmissions. Current requirements dictate that satellites be placed no less than 3 degrees apart in geosynchronous orbit above the equator. But much of the space in key segments of the equatorial arc is getting used up, according to Evans. Narrow-beam satellites can be placed only 1 degree apart, he notes.

If funding goes through as planned, ACTS would go into experimental operation by 1989. But the project's future is in jeopardy because of pressure put on NASA as a result of the *Challenger* disaster and by the Reagan administration's budget cutting campaign. These factors may combine to shut off research on the ACTS program, leaving the field open to Italian and Japanese interests that are working on similar technology.

In the belief that private industry should put up the money necessary to research and build ACTS, the Reagan administration tried to delete the funds for the system from the budget last year and again this year.

However, Congress overrode the administration's wishes in the past, and a House committee has earmarked $95 million for the program this year. A final decision on funding is expected when the budget is enacted in the fall.

Brandel sys he knows of no private-sector companies willing to continue the program without government funding. RCA Corp., holder of the $280 million prime contract, and subcontractors Motorola, Inc., TRW, Inc. and Comsat, are waging a campaign to get the funds reinstated.

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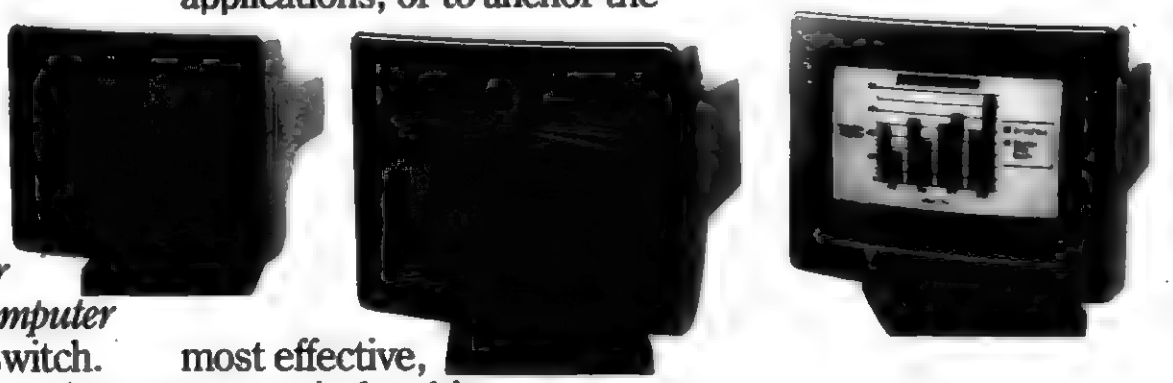
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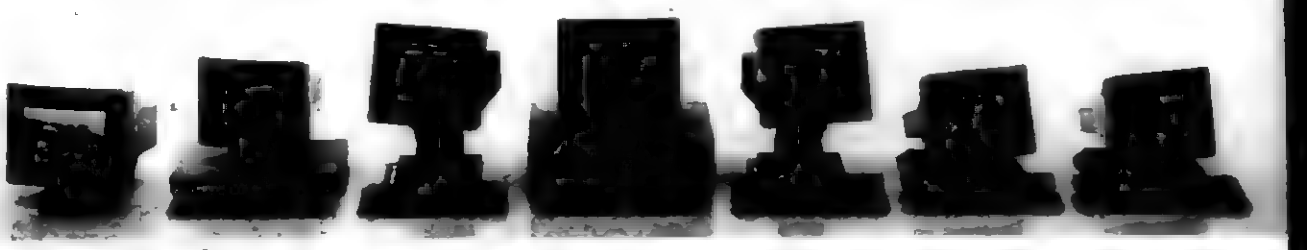


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From page 35

doesn't recur, which is all the telecom manager really cares about.

Unfortunately, some users' "ignorance-is-bliss" attitude allows T1 carriers to avoid dealing with a problem that will affect other customers' T1 installations. Granted, reported instances of the glitch are rare so far; but several industry representatives claim that the problem will get worse as private T1 lines proliferate.

It has also been suggested that the code mix-up has been responsible for network outages that were blamed on another problem. This is only too likely, considering that inexperienced net customers have no way to question carriers' diagnoses.

What grounds are there for accusing the T1 industry of a cover-up? Well, consider the fact that vendors and carriers have been sitting on a standards committee for about a year now, debating whether they should bother to fix the problem without bothering to tell customers anything about it. There is also the matter of cost. Repairing that elusive glitch would mean an expensive, extensive retrofit of existing equipment — and regional holding companies are more than likely to foot a hefty chunk of the bill.

Customer pays

This was the principal argument put forward by a Nynex Corp. spokesman who was against doing anything about the situation. He further pointed out that customers would wind up paying for the repair job in the form of rate hikes.

He insisted Nynex does not use the kind of equipment that causes the problem. (This is only technically true. Another Nynex source said the company has standardized around a manufacturer whose equipment generates a similar problem.) And if such a situation did arise, he concluded, it probably was caused by the customer misconfiguring the equipment.

I am always suspicious of a vendor that protests too much and of reasoning along the lines of, "There is no glitch, and in any case, it's much too expensive to fix."

For users, however, the issue goes far beyond the question of whether their T1 lines are likely to be hit by this particular headache. The broader question is whether a business is willing and able to acquire the tools and in-house expertise to manage its own network.

Increasingly, both the need and the opportunity are there. Companies are depending more and more on T1 lines to disseminate crucial strategic information. As their networks increase in complexity, they can no longer afford to place their network operations in the hands of a vendor.

The good news is that next year we will see T1 line diagnostics that bypass carrier premises. They will reportedly enable users to troubleshoot their networks on an ongoing basis without having to interrupt operations.

Best of all, users will be able to spot and fix problems before they become critical instead of depending on a carrier that tends to respond only to disasters.

Banyan enters low-end mart

From page 35

controlling access to network users, services and resources, is included. Vines/286 requires a minimum of 512K bytes of random-access memory. Both firms said they expect to begin shipping the product in October.

Standard features for both systems include file and peripheral sharing, access to mini and mainframe computers, links between two similar or dissimilar networks and gateways to X.25 packet-switching services and private wide-area networks. IBM PC networks from Corvus Systems, Inc., Proteon, Inc., IBM, 3Com Corp., Ungermann-Bass, Inc. and others can be linked through a Banyan server.

Banyan's Bergeron said the new file server products bring the firm into direct competition with 3Com and Novell, Inc., both of which have concentrated on networking clusters of PCs in small to medium-size organizations. The difference, he claimed, is that Banyan's "technology is at the beginning of its life cycle, while others' might be in a mid-life crisis."

Continental Grain Co. is currently evaluating the Banyan/DTS as a possible server for its smaller field offices. Larry Stouder, manager of the information center at the New York firm, said that he was "more than satisfied" with the desktop file server's performance.

The company had already installed an earlier version of the Banyan server on two floors of its headquarters. One server supports a 43-node Proteon Pronet token-ring network and a small Ethernet cluster. A second server supports a 20-node Ethernet network that will be replaced by a Pronet.

"We chose Banyan because it didn't lock us into a LAN architecture. We already had the Ethernet network, but it didn't matter if we went with Arcnet, Pronet or the IBM PC Network," said Eric Dickstein, senior business technology specialist. "I look at the Banyan server as the black box of black boxes."

According to the terms of the two-year, $8 million OEM contract, Banyan will supply Tallgrass, an Overland Park, Kan., mass storage subsystems vendor, with its 68000-based board and Vines software. Tallgrass will market a desktop file server, the TG-8000, and a software-only version — the TG8000-AT.



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		Nov 20
	Newport Beach	Oct 1
	Sacramento	Oct 28
	San Diego	Oct 8
	San Francisco	Aug 12
		Oct 15
		Dec 3
	Sunnyvale	Oct 1
		Nov 19
CO	Denver	Nov 11
CT	Stamford	Oct 23
DC	Washington	Aug 28
		Nov 19
FL	Jacksonville	Nov 19
	Miami	Oct 16
	Orlando	Dec 16
GA	Atlanta	Aug 26
IA	Des Moines	Nov 18
IL	Chicago	Aug 14
IN	Indianapolis	Dec 2
KY	Louisville	Sep 30
LA	New Orleans	Dec 16
	Shreveport	Dec 10
MA	Boston	Sep 24
	Burlington	Oct 2
	Newton	Dec 4
MI	Detroit	Sep 11
MN	Minneapolis	Oct 23
MO	Kansas City	Sep 18
MO	St. Louis	Aug 19
NC	Research Triangle Park	Oct 14
	Winston-Salem	Sep 23
NE	Omaha	Sep 24
NJ	Iselin	Sep 9
NM	Albuquerque	Aug 26
NY	Albany	Nov 5
	New York City	Sep 9
		Oct 21
		Dec 9
	Rochester	Aug 20
OH	Cincinnati	Nov 20
	Cleveland	Oct 15
	Columbus	Dec 10
	Toledo	Nov 18
OK	Oklahoma City	Dec 4
OR	Portland	Oct 29
PA	Philadelphia	Sep 16
	Pittsburgh	Nov 12
TN	Nashville	Nov 6
TX	Austin	Oct 21
	Dallas	Nov 5
	Houston	Nov 11
VA	Richmond	Dec 11
WA	Seattle	Oct 9
CANADIAN SEMINARS:		
	Calgary	Sep 17
	Montreal	Sep 25
	Ottawa	Oct 30
	Quebec	Sep 10
	Toronto	Nov 13
	Winnipeg	Oct 14

MICROCOMPUTERS

SMALL TALK
Douglas Barney

Favoritism and the small firms

There is growing fear among small and medium-size software developers that Microsoft Corp. and its hardware OEMs may be playing favorites by selectively leaking information about MS-DOS 5.0 to only large software vendors, giving them a leg up on the market for next-generation MS-DOS applications.

This scenario is quickly dissolving the hopes of small software developers that a new Microsoft operating system that unlocks protected mode and crumbles the 640K-byte barrier would give them a chance to break the iron grip held on the software applications market by Lotus Development Corp. and Ashton-Tate.

Microsoft, however, pleads innocent, blaming its hardware OEMs for any leaks that may have occurred.

Because smaller firms will probably take longer to develop sophisticated protected mode applications, they worry about a head start for their larger competitors, even if everyone gets information at the same time.

However, smaller developers do not even know when MS-DOS 5.0 will be available. All Microsoft Chairman Bill Gates will say on the matter is that a protected mode MS-DOS for the Intel Corp. 80286 chip will be out sometime in 1987.

The president of one small diversified software firm recently met a Microsoft representative and broached the subject of preferential treatment for the likes of Lotus and Ashton-Tate.

See **FAVORITISM** page 50

Barney is Computerworld's senior editor, microcomputers.

MIS executives waiting for promised productivity gains

By Alan Alper

NEW YORK — While seeking specific solutions to personal computing problems, management information systems executives are finding only generic remedies, a situation that is causing much frustration in the user community.

"Up until now, Lotus Development Corp.'s 1-2-3 has been the answer if you are doing a spreadsheet, graphics or data bases," noted Stephen Bosley, an analyst with the consulting firm International Data Corp. "People are sick of getting generic answers to specific business problems. Maybe that's why value-added resellers are getting as much attention as they are."

At a forum on personal computing directions sponsored by Computerland Corp. of New York recently, MIS executives voiced a litany of requirements, as yet unfilled by hardware and software vendors, that could enable users to attain long-promised productivity gains.

Needed, they said, are more powerful and faster systems, lower cost networking schemes and new and revised application software packages that are easier to use and better focused.

Many MIS executives said they were eagerly awaiting the next generation of Intel Corp. 80386-based microcomputers. The allure of 80386-based systems, promising true 32-bit processing, expanded memory capacity and multitasking functionality, they said, could provide the impetus to develop higher productivity application software.

Although 80386-based systems are not expected to be available in quantity until next year or early 1988, some firms are postponing PC buying decisions until they know more about the next-generation systems.

Lester Pierre, a technical manager at U.S. Trust Corp., said his firm is in a holding pattern with regard to the purchase of

See **WAITING** page 49

Software Publishing to join packed mart

Desktop publishing tool aimed at corporate users

By Douglas Barney

MOUNTAIN VIEW, Calif. — Software Publishing Corp. will launch an IBM Personal Computer-based desktop publishing software package this September into a market that will be teeming with competitors.

"The program is scheduled to be released formally at the Desktop Publishing Conference that we are sponsoring in San Francisco," said Jonathan Seybold, editor of "The Seybold Report on Publishing Systems," published in Malibu, Calif. "But at

See **FIRM** page 48

Autodesk tool draws praise

By Rosemary Hamilton

CHICAGO — Continuing to ride its wave of success, Autodesk, Inc. was met with rave reviews from users last month at its Autocad Exposition, a "show within a show" held at the annual Architectural/Engineering/Construction Systems conference.

Users repeatedly praised Autocad, the vendor's microcomputer-based computer-aided design and manufacturing (CAD/CAM) software. Autodesk also used the forum to introduce several products.

The only complaint concerned Autodesk support, which, apparently, has not kept up with a user base that has swelled to more than 50,000. But Autodesk officials

See **AUTODESK** page 46

INSIDE

Convergent Technologies announces a PC emulator board/**46**

Studio Software Corp. introduces its second desktop publishing package for the IBM Personal Computer/**48**

NEW THIS WEEK

- Hewlett-Packard offers graphics software for Vectra PC
- Ideassociates introduces add-in multifunction boards
- For more on these and other new products, see pp. 77-87

INSTANT ANALYSIS

"I can't remember any market in the microcomputer business that was not oversold."

— Brian Jeffery, director of research, International Technology Group, Palo Alto

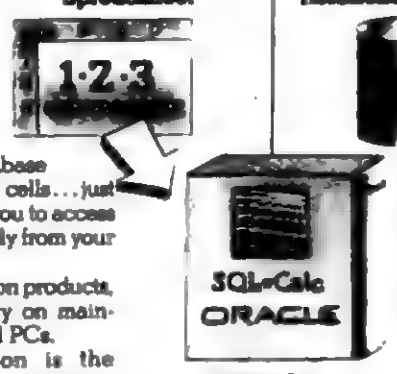
Oracle's SQL★Calc makes a relational DBMS as easy as 1-2-3.

Oracle Corporation has developed a Lotus 1-2-3 compatible spreadsheet and integrated it with its ORACLE® relational database management system (DBMS). The new product, SQL★Calc® is the first to combine a mainframe-class relational DBMS with an easy-to-learn and familiar PC spreadsheet user interface.

SQL★Calc is designed for 1-2-3 users who've run out of memory, flexibility and patience. SQL★Calc allows you to put SQL database commands into spreadsheet cells...just like formulas. This permits you to access large amounts of data directly from your spreadsheet.

Like all Oracle Corporation products, SQL★Calc runs identically on mainframes, minicomputers and PCs.

SQL★Calc's foundation is the ORACLE relational DBMS, which provides users with a complete set of SQL commands through which they can create, retrieve, modify and otherwise control their data. SQL is the industry standard database command language for large computers. The SQL commands available in ORACLE are identical to the SQL commands in IBM's premier mainframe relational DBMS products, SQL/DS and DB2.



Built on this powerful DBMS foundation is a Lotus 1-2-3 compatible spreadsheet that allows users to put SQL commands into spreadsheet cells in the same way as they enter formulas. When a SQL command for data retrieval is entered into a spreadsheet cell, information is automatically retrieved from the database and placed into the spreadsheet. SQL★Calc also permits users to modify the database–and even create new database tables–directly from the spreadsheet.

SQL★Calc is easy to learn because its menu and command structure are compatible with those of Lotus 1-2-3. And SQL★Calc's ORACLE DBMS requires no supplement: It is vastly more powerful than the database components of 1-2-3, Symphony, Framework, dBase II, dBase III, or any other PC DBMS.

SQL★Calc is available immediately for IBM PC/XTs and ATs for $995.* SQL★Calc will soon be available on a wide variety of systems, including IBM mainframes, DEC, DG, and other superminis, and most UNIX systems.

For further information, or to order your copy of SQL★Calc, call 1-800-345-DBMS. Or write Oracle Corporation, Dept. CS, 20 Davis Drive, Belmont, CA 94002.

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PC Emulator board runs MS-DOS, CTOS concurrently

Convergent VARs, OEMs get Ngen tool

By Peggy Watt

SAN JOSE, Calif. — Convergent Technologies, Inc. last week announced a PC Emulator board for OEMs and value-added resellers (VAR) marketing Convergent's Ngen line of workstations. The board enables users to run Microsoft Corp. MS-DOS applications concurrently with Convergent's proprietary CTOS operating system.

The PC-001 PC Emulator Module contains an Intel Corp. 80186 coprocessor with 768K bytes of internal memory and an IBM Personal Computer AT-compatible BIOS, designed by Phoenix Software Associates Ltd. of Norwood, Mass., according to Joanie Banks-Hunt, product manager.

The coprocessor enables the user to run several operating systems, including MS-DOS, CTOS and Distributed Unix. The board comes with MS-DOS 3.1 and Microsoft GW-Basic.

The board will also provide file sharing across local-area networks (LAN), including the Convergent cluster LAN, she said. Standard PCs cannot now be added to the Convergent cluster network, but that enhancement is in the works, she added. The PC Emulator attaches to the Ngen's X-bus expansion bus.

Suggested retail price for the board, which will be sold entirely by OEMs and VARs, is in the range of $1,500, Banks-Hunt said. It will be available immediately.

"It's one of those things the customers have been wanting, especially for low-cost networking capability," she said. "Our major OEMs have already signed to carry it, and it will cover almost our entire customer base."

The PC Emulator Module can run several of the MS-DOS programs that are considered a test of true IBM PC compatibility, including 1-2-3 from Lotus Development Co. and Flight Simulator from Microsoft, a Convergent spokeswoman said.

However, some copy-protected programs that look for the NEC Home Electronics, Inc. floppy disk controller chip used in the IBM PC as their copy-protection scheme may not run on an Ngen system equipped with the PC Emulator, Convergent said.

Convergent also claimed the board emulates an IBM Monochrome Display and printer adapter, IBM Color Graphics Adapter, Hercules Computer Technology, Inc. Monochrome Graphics Board and IBM Asynchronous Communications Adapter.

The board measures 8-in. high by 2½-in. wide by 12-in. long, weighs less than 10 lb and fits into the engine-option module of the Ngen.

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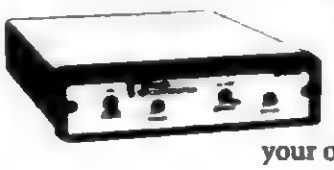
The TMS-one Asynchronous Communications Controller. The first controller that lets async terminals and PC's communicate as interactive (3270, 3290, and 5250) and batch (3767 and 3770) devices in SNA/SDLC or Bisynch protocols, all simultaneously.



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Autodesk tool draws praise

From page 45

assured users the problem was caused by its rapid growth and that the problem would soon be resolved.

"When I was asked to speak today, and to keep it brief, I thought, How can anyone do justice to a product like Autocad in 10 minutes? Well, I can't," said Rodger Marks, a planning staff engineer at Caterpillar Tractor Co. Marks was a participant in a panel discussion called "Autocad in the Corporate Environment," held last Thursday.

"The indications are very clear that everyone is going to Autocad," said Hillel Even-Ari, an Israeli architect who was on a U.S. visit representing the Society of CAD/CAM and Robotics in that country.

Many users, however, raised the issue of Autocad support. Some users said they had tried without success to get direction from Autodesk concerning which dealer to do business with.

One user said he did not want Autodesk to give its blessing to any one dealer; all he wanted was a listing of dealers in the Seattle area. But no one at Autodesk would provide that information.

"The company has grown so fast, maybe some things occurred that shouldn't have happened," said Tony Monaco, vice-president of marketing and sales. Monaco, who spent 24 years at IBM, was brought in to Autodesk two months ago, in part to address such problems.

At the show, Autodesk introduced the latest version of Autocad, Release 2.5, which is said to have 70 new features. These features reportedly include pan and zoom capabilities that are up to 10 times faster than previous versions and support of the Lotus/Intel/Microsoft Expanded Memory Specification.

The product sells for $2,750, and upgrades from the six previous versions are available. Users pay the difference between their early-version cost and the $2,750 price of Release 2.5.

The company also released Autocad 2.5 for both the IBM RT Personal Computer and the Sun Microsystems, Inc. Sun 2 and Sun 3 lines of 32-bit workstations. The software will also sell for $2,750.

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Icon-oriented desktop publishing package out for IBM PC

By David Bright

IRVINE, Calif. — Studio Software Corp. recently introduced Frontpage, its second desktop publishing package for the IBM Personal Computer.

With the icon-oriented $695 package, users without a graphics arts background can reportedly produce professional-quality documents on a laser printer in a short time. Studio Software is the vendor of Do-It, a more expensive publishing package.

The IBM PC and compatibles are lagging behind the Apple Computer, Inc. Macintosh in the desktop publishing market. Last year, 34,000 desktop publishing software packages were sold for the Macintosh and only 3,000 for the IBM PC, according to estimates from Dataquest, Inc., a San Jose, Calif.-based market research firm.

The June introduction of the productive, low-cost, easy-to-use program gives Studio Software a slight jump against competitors expected to have similar products available this fall, said Arlene Karsh, director of the computer publishing service at market researcher CAP International, Inc., of Marshfield, Mass. Among the expected competition are packages from Aldus Corp., Ashton-Tate and Software Publishing Corp., she said.

The key applications for Frontpage program will be newsletters, the production of data sheets and financial reports, said Peter Clarno, vice-president for product planning and development.

The program's features include preformatted document layouts, a library of type fonts, full hyphenation and justification and on-screen editing capabilities. Graphics files from Lotus Development Corp. 1-2-3 can be merged with text.

Firm joins packed mart

From page 45

the same time, Xerox Corp. will unveil its program that it acquired from Ventura Software, Inc., and Aldus Corp. will unveil the IBM version of Pagemaker.

"In fact, almost 30 new desktop publishing programs will be released at the conference," Seybold said.

And more competition is on the way. "You haven't seen yet how firms like Lotus Development Corp., Microsoft Corp. and people of that sort are moving. It is rapidly going to be a marketplace in which there are well-known players," Seybold predicted.

Although desktop publishing is now dominated by applications written for Apple Computer, Inc.'s Macintosh, many firms in the market are now writing for the IBM PC and compatibles.

"There is a gigantic installed base that is not addressed by the Macintosh," said John Monson, product manager for Software Publishing.

Software Publishing's package, currently codenamed Cheetah, was acquired from Bestinfo, Inc. of Springfield, Pa., a developer of PC-based typesetting, pagination and composition software.

Price less than $1,000

The package will sell for less than $1,000 and is said to target the corporate marketplace.

"It is mostly for internal corporate communications and things that need good quality, but not typeset quality, such as proposals, data sheets, newsletters, brochures and manuals," explained George Fanucci, engineering project manager for the Cheetah project.

Software Publishing is reworking the user interface of the Bestinfo product to make it more appealing to desktop publishing users.

"The goals are simplicity and ease of use. It will bear a strong resemblance to our other Harvard products, especially Harvard Presentation Graphics," Fanucci said.

The new Diconix 150. Try it on for size. At even in very thin briefcases. It's the one PC



Waiting for productivity

From page 45

microcomputers. "It's very tempting to go with 80286-based machines, but we feel we have to wait to see what the 80386 offers," Pierre noted.

IDC's Bosley contends that high prices are deterring corporate purchases of 80286-based machines, not anticipation of the next generation. "Why would users want to buy PCs for $2,000 now when they hear prices on PCs, other than IBM's, could fall to as low as $500 to $700 by Christmas?" he said.

Limitations of 80286-based microcomputers, such as the inability to address more than 640K bytes on the motherboard, are also restraining enthusiasm for the current generation of systems, noted John Koski, assistant vice-president at Johnson & Higgins, a Detroit-based insurance broker and benefits consultant.

Among other things, Koski hopes an operating environment is developed, similiar in concept to IBM's Topview, in which all applications software can be used regardless of the data format.

"Until we get to that point," Koski said, "projected productivity gains are nothing more than a con job."

Another area of concern is more effective networking solutions. With most of the networks currently available, users have to write their own software and tailor it to their specific needs.

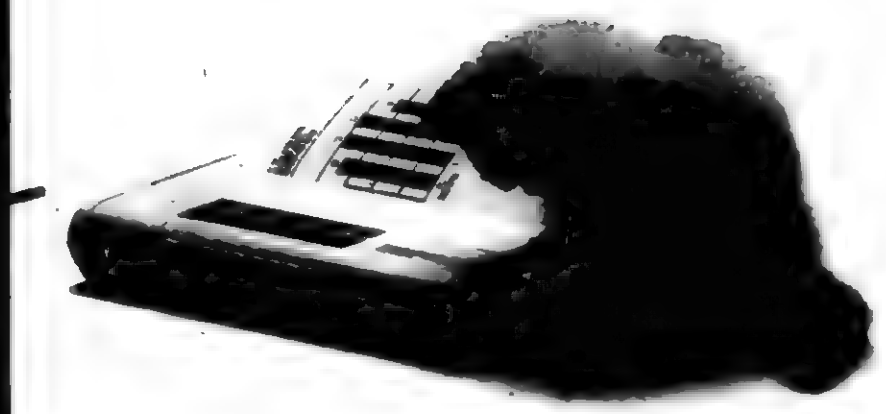
Networking is a major focus at Memorial Sloan-Kettering Cancer Center. The medical and research center will most likely install a token-ring network but says there are few options in linking up with a mainframe.

"Ultimately, we'd like to have a network of PCs," said Matthew J. Syracuse, a personal computer analyst in Sloan-Kettering's information center. "We'd like a network server so the PCs could talk to a mainframe. We haven't discovered a clear-cut solution yet."

As more sophisticated solutions are unveiled, many of which will solve specific personal computing problems, some MIS executives wonder whether it may complicate users' lives as opposed to facilitating productivity.

"I wonder, for example, once we get true multitasking with the 80386, whether the advantages obtained will somehow offset that mystical force of ease of use," Koski concluded.

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Voice-run workstation hits mart

AUBURN, Wash. — Hoping to give the still small voice recognition market a boost, Microphonics Technology Corp. last month introduced a Microsoft Corp. MS-DOS-based, voice-controlled communications workstation.

Targeted at office and factory workers as well as handicapped people, the $1,999 IBM Personal Computer-compatible system can also accept an optional voice synthesizer and a radio headset.

Called the VOX/COM PC, the machine incorporates the company's Pronounce voice recognition product, which is also available for the IBM PC. Microphonics marketing director Dave Williams claimed more than 2,000 of the $695 add-in boards and software packages have been sold, which he says makes Microphonics a leader in the voice recognition market for office automation.

Off-the-shelf applications

Said to provide voice control over all off-the-shelf IBM PC applications, the VOX/COM PC also features a 1,200 bit/sec. modem, a NEC Information Systems, Inc. V20 processor operating between 4.77 MHz and 14 MHz and a 20M-byte hard disk drive.

Other features include redial of busy numbers, Touch-Tone password security, call-progress tone detection and an electronic mailbox buffer. With a voice synthesizer, the system can read messages, stock prices and electronic mail to callers at remote locations.

Williams said a variety of voice synthesizers can be connected to the system, including an optional $199 unit from Microphonics.

— David Bright

Favoritism and the small firms

From page 45

According to the president, the Microsoft rep never denied that Lotus and Ashton-Tate received information on MS-DOS 5.0 that is still unavailable to smaller developers.

"It is nothing to worry about," the rep argued. But he was wrong, and that president is most surely worried.

The vice-president of a graphics software firm also expressed concern over the lack of information about MS-DOS 5.0 and was especially concerned that the large firms will move into his market when a new age of applications emerges. With Lotus' acquisition of Graphic Communications, Inc., maker of Graph-writer and Freelance graphics software, those fears are strengthened.

An up-and-coming software vendor reported his Microsoft representatives say they would be glad to tell all about the next version of the operating system, but the reps always seem to forget the nondisclosure forms.

Small developers are also well aware that Microsoft may have an advantage on all its competitors when it comes to protected mode applications. Microsoft, the major player in applications software for the Apple Computer, Inc. Macintosh, intends to expand its role in IBM applications. Microsoft Word for the IBM Personal Computer is a best-seller, and others, such as Chart, have done reasonably well.

Microsoft, which is breaking the barrier, must seem to have a head start over the rest of the industry in creating protected mode applications. A new version of Microsoft's Excel for the IBM Personal Computer and compatibles that runs through Windows could hamper even Lotus' effort to sell its own next-generation packages.

But larger software vendors who are considered by Microsoft to be strategically important have fewer beefs with Microsoft. Microrim, Inc. President Kent Johnson says his firm has access to the same information as the biggest vendors, but Microsoft markets Microrim's R:Base overseas, so a close relationship is to be expected. Johnson declined to say what type of information his firm has received.

Another thorn in the side of smaller developers is the Windows operating environment. Microsoft has made it clear to developers that if they want to be compatible with future versions of MS-DOS, they should write for Windows.

However, early converts who hoped writing for Windows would ensure that their applications would be poised to take advantage of protected mode may be disappointed. According to developers, a protected mode version of Windows will be released shortly after MS-DOS 5.0, and applications may have to be written for the new version of Windows in order to achieve total compatibility with the new operating system.

Therefore, software authors say, the larger firms tardy in endorsing Windows are now on par with the earliest converts. In this case, Lotus and Ashton-Tate, both of which, particularly Ashton-Tate, were late and rather lukewarm in endorsing Windows, could keep pace with the market just by standing still.

Microsoft claims there will be a large degree of compatibility between current Windows-based applications and the next release of the operating system. But the supplier cannot guarantee complete compatibility because MS-DOS 5.0 is not finished yet.

> ***'If you can only work with a set number of people, it makes good business sense to work with the top five.'***
>
> — Michael Swavely
> Compaq Computer Corp.

"It is not in Microsoft's interest to shut anybody out," remarked a noted securities analyst. "Clearly, as an operating system developer, they need the endorsement and the support of developers to write to their packages. But in a question of who gets the first peek, the sheer market clout of Ashton-Tate and Lotus and others might dictate that they would get the first look or maybe the greatest attention."

Others agreed that Microsoft and the hardware OEMs have valid reasons for not telling all they know to smaller software developers.

"You have to put yourself in Microsoft's shoes or in Compaq's shoes," said Michael Swavely, vice-president of marketing for Compaq Computer Corp. "When you look at the market today for PC software, the top five software companies have over 80% of the current market. If you can only work with a set number of people, it makes good business sense to work with the top five, as opposed to trying to spread yourself out to five hundred.

"We don't want to discriminate, and we don't intend to, but we have to prioritize our resources, and you tend to prioritize where the majority of the business is. It is an unfortunate part of business life," Swavely noted.

There may be other losers besides small software vendors in this scenario: The users who look for innovative next-generation software may find few choices among suppliers.

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Executive Report

Edited by Janet Fiderio and Becky Batcha



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Safeguarding privacy

MIS confronts a sensitive challenge

By MITCH BETTS

At one high-tech corporation, a resourceful manager rigged the office electronic mail system so that it would reproduce at his terminal all messages designated for other executives. He was able to do it because his company enforced no rules regarding mail routing or confidentiality.

In a large law firm, the office manager was concerned about the confidentiality of client files, because they contained proprietary client information as well as sensitive legal material. To test the security of the system, she created a blank file labeled "confidential." Employees accessed it eight times in one day.

In another corporation, a union official obtained a computer-based list of managers' bonuses. Recognizing the information's potential for damage, he leaked it to the press.

These abuses of data security and privacy, documented in a little-known study commissioned by the U.S. Congress last year, illustrate the kinds of problems that automated offices may face if their data security regimens neglect basic principles of privacy and their confidential information gets disclosed.

Such instances not only embarrass both employees and the organization but also may violate federal or state privacy laws. The MIS manager, like other corporate managers, holds legal responsibility to protect salary data, medical records and other employee information. If his organization's security practices fail to protect individuals' privacy, he will get hauled into court to explain why.

Widespread use of PCs leaves confidential information virtually unguarded. In companies that don't act to protect data security, MIS will be held responsible.

"The MIS director is the one who has the legal responsibility for making promises of confidentiality work in the systems or operational context," according to Columbia University's Alan Westin, one of the government study's two leaders. Westin and Lance Hoffman of George Washington University conducted the study under contract to Congress' Office of Technology Assessment (OTA).

Westin and Hoffman note in their report on the study that the legal duty to safeguard confidential information does not increase if information is stored on a computer rather than manually. However, courts will examine what security measures the data holder could have taken to protect

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Betts is Computerworld's Washington, D.C., correspondent. He frequently reports on security and privacy issues.

MIS confronts a sensitive challenge

Continued from previous page

personal information in any case that involves a breach of privacy.

"Courts will look to the prevailing customs and practices of security in a given type of data system and use a 'state-of-the-art' inquiry to determine if reasonable care had been exercised," the report says.

Despite the possible consequences, many organizations have only just begun to institute privacy policies for automated offices, according to Westin and Hoffman. Their report includes the results of a survey of 301 computer security professionals from medium-size and large businesses and federal agencies and notes a variety of breaches of computer-based, confidential information. The incidents include such abuses as secretaries disclosing personal and salary information to executive headhunters; employees selling customer mailing lists to competitors; and, in one case, a worker disclosing the salary of every employee in a corporate department.

In all, 14% of the respondents reported that someone inside their organization had leaked computer-based personal data about employees to an outsider, and 12% reported leaks of client or customer data to outsiders.

The problem has gotten worse recently, because confidential information — which has always been relatively well protected on mainframe computers — is now left virtually unguarded, as files are downloaded to microcomputers or spread throughout the office via electronic mail.

"What used to be the hub of security on the mainframe is now being lost because the information is disseminated to personal computers," according to Dave James, data administration and security officer for Riggs National Bank in Washington, D.C.

Robert E. Johnston, director of data processing for Phoenix Mutual Life Insurance Co. in Hartford, Conn., agrees. "The biggest problem is what I call the unauthorized transfers of information from the mainframe to the micros, which is currently technologically impossible to preclude," he says.

A trend toward end-user computing means that access to confidential information is spread to people who lack the data processing professional's instincts for data privacy and security, according to the OTA's final report, "Automation of America's Offices."

"The computer professional's sociocultural system had within it values, beliefs and concerns about privacy and security of information," the report says. "Today, people who have never participated in the sociocultural system of data processing environments, who have not been informed about the fine points of the law and ethics of protecting confidentiality or assuring data security, have easy access to an organizaton's data bases."

The report adds that end users who create ad hoc dossiers about clients on their micros may be violating laws, regulations or company rules. "If there is no auditing or physical inspection of end-user files, then management may be unaware of such conduct and suffer legal sanctions or have the company's reputation compromised."

In fact, almost half of the security officers surveyed for the Westin-Hoffman report said the proliferation of micros is leading to less compliance with government privacy rules such as the Fair Credit Reporting Act.

Experts say the solution is for MIS directors to take a lead role in ensuring that the confidentiality rules prevalent in the central data processing shop are applied to the end-user computing environment. In the last 12 to 18 months, some enlightened firms have begun to establish policies for end-user computing that cover security and the confidentiality of information. However, they are in the minority.

"Right now, I guess we have not more than 50 companies that have gone through that exercise with the degree of sophistication that is needed," according to Westin, a long-time privacy researcher and president of the Educational Fund for Individual Rights in New York.

Many of the firms that were shrewd enough to write privacy policies for mainframe data bases — such as IBM, Control Data Corp. and Bank of America — have taken the lead in applying those same principles to end-user computing, he says.

"What we need to have in the next few years is to parallel what happened [for mainframe data] in the late '70s and early '80s. You have to go from the few dozen who have been very shrewd and done the right thing and move to the next 100 companies, and then it makes its way to the next 1,000 companies. It's an imitative process. There are the leaders and then the second-stage followers, and then there's the bandwagon phenomenon, and finally there are those who only the law will reach," Westin says.

Confidentiality policies for end-user computing should contain the same privacy principles that are accepted for mainframe data bases, he says, namely the following:

- Giving notice to an individual that a file on him is being created.
- Ensuring that only relevant and necessary information is recorded.
- Giving the employee the right to see and challenge the record if it is used to make employment decisions about him.

"What we'll have to say for end-user computing is that there is now a new form of recording information about an employee that is the end-user floppy disk," Westin says. He stresses that corporate privacy codes should extend to cover files that end users create on their micros.

Westin concludes that the job of the MIS director is to understand the problem, educate top management about what needs to be done and provide technical guidance and expertise on how to carry out the policies. Only top management has the clout needed to enforce a privacy policy, he says.

> ***A trend toward end-user computing means that access to confidential information is spread to people who lack the data processing professional's instincts for data privacy and security.***
>
> — Office of Technology Assessment report

The Westin-Hoffman study found that some firms create a corporatewide privacy review committee or task force to establish fair information standards and educate employees. Others see that the company security officer handles the tasks.

A securities brokerage house that was cited in the study distributes to all its employees a privacy code of conduct for handling sensitive information about employees and clients.

The code requires employees, for example, to inform any customer, upon request, about the uses and types of personal information collected about him.

A cover letter from the firm's chief executive officer accompanies the code. In the letter, the CEO states that it is imperative for employees to guard sensitive client information "to maintain the client trust and loyalty we currently enjoy, as well as to meet any challenges that might be imposed by legislators, competitors or consumer advocates concerning the privacy issue."

The firm's security officer is now trying to expand the code to cover microcomputers. He also wants to start an education program and purchase an encryption package that supports access controls for downloading information from the corporate mainframe to micros.

Before organizations can address privacy and security, they must first decide what they consider confidential information, according to George Trubow, director of the Center for Information Technology and Privacy Law at the John Marshall Law School in Chicago.

"For instance, consider the detailed personal information that an employee may submit on his personnel application," he says. "The company ought to recognize that this information should not be disclosed outside of the people in the company who have a need to know and have been authorized to access it.

"Companies need to clearly establish policy,

Continued on page 58

THE FIVE FAIR INFORMATION PRINCIPLES

JEFF DARWEAU

There must be no personal-data record-keeping systems whose very existence is secret.

There must be a way for an individual to find out what information about him is in a record and how it is used.

There must be a way for an individual to prevent information about him obtained for one purpose from being used or made available for other purposes without his consent.

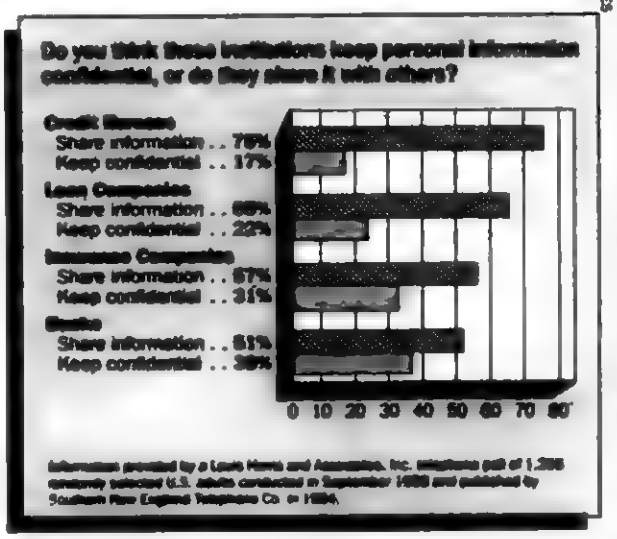
There must be a way for an individual to correct or amend a record of identifiable information about him.

Any organization creating, maintaining, using or disseminating records of identifiable personal data must assure the reliability of the data for its intended use and must take reasonable precautions to prevent misuse of the data.

Information provided by "Records, Computers, and the Rights of Citizens," published by the U.S. Department of Health, Education and Welfare, Secretary's Advisory Committee on Automated Personal Data Systems, 1973.

PUBLIC PERCEPTIONS OF CORPORATE PRIVACY PRACTICES

MITCHELL MARKS



Information provided by a Louis Harris and Associates, Inc. telephone poll of 1,255 randomly selected U.S. adults conducted in September 1985 and published by Southern New England Telephone Co. in 1986.

Expert's Opinion

Work monitoring: Productivity gains at what cost to privacy?

By SANFORD SHERIZEN

The next time you log on, imagine that every one of your keystrokes, pauses, work breaks, meeting times and data entry mistakes is being recorded for review.

Later, the records of these events get sorted, read and evaluated. They then become part of your permanent record. The people reviewing the data remain anonymous, and the information they collect never becomes available to you.



Sherizen

This is not Orwell's 1984, with government as Big Brother, but electronic work monitoring, which has moved from the assembly line to the white-collar office and is beginning to keep tabs on middle managers.

Sherizen is a Natick, Mass.-based information security consultant. He coauthored a report on work monitoring for the U.S. Congress' Office of Technology Assessment.

Work monitoring entails the capture and analysis of data to indicate the quantity of work being done. Corporations can purchase tools and enlist methodologies that record and analyze input, usage and output.

Monitoring has become an easy way to use technology as a tool to regulate technology and users. It is a large step in the automation of control. Because work monitoring carries major implications for both productivity and privacy, MIS and data processing managers require some statements of when and how it is appropriate. Unfortunately, few such standards exist.

The nation's courts tend to accept the idea that workers who use company equipment on company time give up certain rights. But they have yet to say exactly how many rights workers need to give up, even for important managerial reasons, before too much of their privacy is violated. The Privacy Act of 1974 and similar laws either do not apply or are too limited to provide guidance. The fair and just balancing of needs is hard to determine legally.

For the time being, then, managers must make their own judgments as to whether a specific instance of monitoring weighs most heavily on the productivity side — helping a firm get the most from its employees — or on the side of intrusion — invading individuals' privacy.

Work monitoring is clearly a productivity issue, with three major corporate pressures in its favor.

The first pressure is to use technology as efficiently as possible. As computers become more complex, their proper use becomes more difficult. Companies need to track an enormous amount of detail and make system-wide evaluations to regulate the use of their equipment.

The second pressure comes from cost-accounting requirements, which have become more complex as interactions between system users have increased and overlapped, necessitating monitoring for resource management and chargeback details.

The third pressure, less directly related to productivity, concerns information security. As corporations feel a need to protect proprietary information and other sensitive data, they turn to data flow surveillance and audit trail reviews.

At the same time, monitoring is a privacy issue. Companies need to remember that their records and measurements represent some of the most intrusive searches used outside of law enforcement, a fact that leads some observers to suggest that workers are losing their constitutional protections of privacy.

Corporations gather details of their employees' work and leisure activities — even the extent of a given worker's attention span. Compilations of data covering long periods of time become part of a worker's dossier, indicating how productive, cooperative and cost-effective he is.

Work monitoring also stirs up issues of fairness. The information that monitors collect is not as scientific as some people assume. Too often, work monitoring takes the place of appropriate managerial supervision. It replaces human evaluations with nominally objective facts. Quantity (number of keystrokes) gets misused as a measure of quality (how well someone works), and managers tend to use data against some workers rather than all, creating an opportunity for discrimination. Employees may never get a chance to see important data about themselves or to evaluate the information's accuracy.

Furthermore, today's worker

See SHERIZEN page 57

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print it up, share it and educate employees on it," Trubow says.

Perhaps even more important than writing the policy is communicating it to users, according to other experts. Nancy Finn, an office automation consultant with Communication Resources, Inc. in Needham, Mass., says, "I see the biggest problem in the end-user community as being one of education. People don't understand that certain information should not go across an electronic mail or messaging system.

She says education means holding meetings and workshops with employees about their responsibilities and recommends developing and communicating the privacy policy through an active, broad-based users group inside the organization.

At Riggs National Bank, James says, privacy is getting high priority because of an increase in the use of micros — which now number 300, compared with 50 a year ago — and the ease with which mainframe files can be downloaded to the micros.

James felt action was especially necessary because users were creating their own micro-based files, sometimes containing budget, payroll and personnel information. "You don't want any of your employees to be able to just come up to a PC, turn it on, see a file called 'personnel' and go and get it."

The bank has installed on its micros a software product called Privacy Plus from United Software Security, Inc. of Vienna, Va., which allows users to encrypt their files. The product is scheduled to be enhanced so that any data written to a floppy disk will be encrypted automatically and can be used only on that micro unless special permission is obtained to move it to another.

Although use of the encryption program is not mandatory now, employees are beginning to use it on their own. "It doesn't take long before some users lose a file or have a file read by somebody else, or they've left it up on the screen and come back to find somebody looking at the screen," James says. "Incidents occur, and then users recognize they should have used this product. It's beginning to catch on."

The next step, he says, is to send auditors to inspect the data stored on micros and check whether confiden-

Interview

ACLU technical leader addresses privacy law, civil liberties

Jerry J. Berman, director of the American Civil Liberties Union's (ACLU) Project on Technology and Privacy, is a leading privacy advocate who often testifies before the U.S. Congress. Working behind the scenes, Berman has helped to drive the Electronic Communications Privacy Act of 1986 — a bill that would outlaw the interception of data communications — through the Congress toward enactment this year. He was recently interviewed by Mitch Betts, Computerworld's Washington, D.C., correspondent.

Many privacy experts say that office automation increases the threat to individual privacy. What can be done about that?

Office automation technology can have applications that threaten privacy, but that's not inherent in the technology. It can be an enhancement of our capabilities to do work. We do have concerns about the growing use of computers to monitor the work of personnel. If it's done to improve productivity and help people do their jobs better, there's no adverse consequence. On the other hand, if computer monitoring is used to speed up work into an unreasonable assembly line operation or to keep workers in fear of retribution, and, therefore, create new stresses in the workplace, then the computer technology is being used in an adverse way.

The proper approach is to try to draw rules internally — or, if necessary, legislative guidelines — that strike a proper balance between the employer's right to use new technology and increase productivity and the employees' right to privacy and due process rights in the workplace.

The ACLU has been a driving force behind the proposed Electronic Communications Privacy Act. How did that begin?

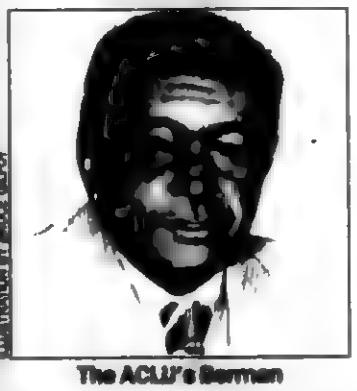
Our interest began when it was discovered that the 1968 wiretap statute had a gap in it. It covered voice communications and was silent on data and machine-based communications. The new communications technologies that have come along since then — including electronic mail, cellular radio and teleconferencing — were outside the privacy protections of the law.

We thought the appropriate approach was to deal with it through comprehensive legislation rather than a case-by-case approach through courts, because that might lead to a jumble of interpretations. The courts deal with technology very slowly, very reluctantly.

Then we tested the politics of it by bringing together a variety of business and privacy organizations and legislative staff to discuss the problem in a public policy conference in June of 1984. The conference led to an informal political coalition to press for legislative change.

Without a broad-based coalition, including business and technology firms, there was no way that the legislation would pass in this Congress or this administration.

What should be done about the so-called pirate bulletin boards, which often trade stolen passwords?



The ACLU's Berman

If monitoring is used to speed up work unreasonably or to keep workers in fear of retribution, then the computer technology is being used in an adverse way.

Legislation is now wending its way through the Congress that would make it a federal crime to do that. We think that a bulletin board operator who is intentionally and knowingly posting stolen passwords is participating in a crime and an invasion of someone's privacy. In that narrow sense, we think that making such activity a crime is in the public interest.

At the same time, we are very concerned that legislation not be drawn in an overbroad manner that inhibits a whole new public forum, which is bulletin boards.

These statutes must be narrowly drawn, because if they make the operator liable for any illegal notices that may appear on the board, that could put the operator out of business because it would require the operator to monitor all of the traffic on the board. That may be too burdensome.

What we hope to address in the future is protection for the First Amendment rights of bulletin board operators.

Let's turn to computer matching, where federal and state agencies compare files to find welfare cheaters and debtors. Do you oppose all matching or just the cases with the greatest potential for abuse?

We think that computer matching should only be conducted if citizens are informed that the information that they supplied to the government is going to be used for that purpose. When a computer match is conducted, no adverse action should be taken on a discrepancy in information without giving a citizen the opportunity to explain. The third requirement is that it shouldn't be conducted with any file unless there is congressional authorization for it.

We'd like to see computer matching done in accordance with the principle that personal information that is collected for one purpose should not be used for another purpose without notifying the person and providing due process.

The larger concern today is not computer matching, but the move toward front-end verification, where instead of trying to take ineligible people off the roles, the government tries to keep people off in the first place. When you go to apply for financial aid, the government wants to check your information against a data base about you to see if you qualify — or to be blunt, to see if you're telling the truth.

In order to do that, the government is starting to link different data bases together using the Social Security number as a common identifier. These links provide access to different files containing employment, income, wage, pension, automobile registration, bank and tax information. In a sense, a front-end verification system is a de facto national data base — an electronic file on every citizen in the U.S.

This is happening in a piecemeal fashion; if the government announced it was trying to do this all at once, I think there would be a hue and cry from the public and it would go nowhere. We want to bring some attention to this and get Congress to write some legislative standards. For starters, we think that political, tax, census and race information should not be included in these merged files.

Given all of the debatable privacy issues, do we need a new privacy commission or think tank in congressional committee?

For many years the thinking of the privacy community has been that the ultimate solution is the creation of a government data protection board like the ones in Europe.

Speaking for my project and the ACLU, we do not think that is the appropriate approach. Even if it was, a new federal regulatory board is just not in the political cards in an age of deregulation. And if the Reagan administration or any administration thought the privacy board was creating too many restrictions, the obvious strategy would be to change the board's membership.

Certainly the Reagan administration has demonstrated that you can take a civil rights commission and turn it right around. Furthermore, there are First Amendment concerns, since data protection boards tend to push toward licensing schemes concerning when you can use certain information.

But I don't mean to suggest that we don't need oversight mechanisms. We have recommended the formation of a select congressional committee or commission that would analyze and give guidance on a range of information policy issues, including computer and communications security and privacy. ■

tial data is encrypted or not. In the meantime, James has given security presentations to the bank's users group and is making presentations to various offices on data security and integrity issues. "In order to get security into the mind-set of all individuals, you have to sell it," he says.

Getting the privacy message across to employees should at least help reduce the abuses caused by ignorance, negligence and curious browsing through files, according to many observers.

"Browsing has always been present, long before there were computers," according to John Marshall's Trubow. "With manual systems, it was very cumbersome, but when you can sit at a keyboard and get access to virtually every corner of the corporation, curiosity has become a real problem. It's not something to be brushed aside."

Richard Cashion, assistant director of data processing at Tennessee Technological University in Cookeville, Tenn., reports a case in point. "I had an instance here several years ago where one of the data entry operators told someone else about the payroll deductions that several people were taking," he says.

Although it was just an offhand remark, Cashion considered it a serious infraction and treated it as such. "That person had access to the information but not permission to release it. The disclosure is serious and requires educating that person that it's wrong," he says.

The consequences of disclosing personal data can run from the merely annoying to the very serious. Robert P. Campbell, a security and privacy expert and president of Advanced Information Management, Inc. in Woodbridge, Va., recounts one incident that came down heavily on the latter side. "We had a case in the Washington, D.C., area a few years ago, where a couple of convicts got access to a credit data base and used the information to target victims for burglary," he says.

If a company fails to respect and guard employees' personal data, serious legal consequences can arise. Several federal and state privacy laws require those who keep files of personal information to inform the subjects that the files have been created and may be used to make decisions about them.

Some state privacy laws are general in nature. Virginia's, for example, prohibits the intentional and unauthorized examination of "any employment, salary, credit or any other financial or personal information relating to any other person." Other state laws specifically protect credit, insurance, medical and banking records. In Michigan, for example, statutes protect the confidentiality of accounting, banking, insurance and medical research data and make it a crime to sell medical patient information.

Various other states protect records kept by psychiatric hospitals, pharmacies, drug abuse clinics, personnel departments, utilities, cable television stations, employment agencies, schools and newspapers as well as records about child abuse, human artificial insemination and abortions.

Congress might also step into the privacy arena, as it has from time to

Continued on page 58

FEDERAL PRIVACY LAWS

The Crime Control Act of 1973
requires that state criminal record systems, developed with federal funds, ensure the privacy and security of the data.

The Privacy Act of 1974
restricts the collection, use and disclosure of individually identifiable information by the federal government. It gives the individual rights to access the information and to correct it.

The Tax Reform Act of 1976
protects the confidentiality of personal tax information.

The Right to Financial Privacy Act of 1978
limits the access of U.S. agencies to information about customers of financial institutions by providing assurances about the privacy of bank records.

The Privacy Protection Act of 1980
prohibits government agents from conducting unwarranted searches of press offices and files.

The Electronic Funds Transfer Act of 1980
states that EFT providers must notify customers about third-party access to customer accounts.

The Debt Collection Act of 1982
establishes due process procedures that federal agencies must use to release any information about bad debts to credit bureaus.

The Cable Communications Policy Act of 1984
requires cable TV services to inform subscribers if any personal information is collected, used or disclosed.

Information provided by the U.S. Congress' Office of Technology Assessment's "Automation of America's Office" report, December 1985.

SHERIZEN from page 56

monitoring device can very easily become tomorrow's citizen monitoring device, particularly given the availability of large-scale data bases containing personal information.

Because of this, the U.S. Congress, which has not been active in privacy matters since it worked on the Privacy Act 12 years ago, has started to raise questions once again. In the intervening time, advances in technology have opened opportunities for greater and greater invasions of privacy.

The Office of Technology Assessment (OTA), Congress' technical think tank, is preparing a report on the security and privacy implications of work monitoring for release to Congress this fall. The report will be available to the public shortly afterward from the OTA, Washington, D.C. 20610. ■

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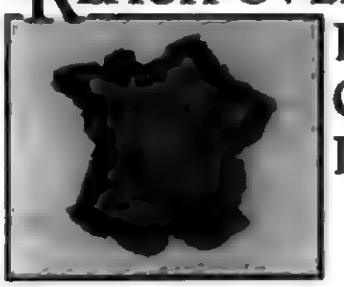
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Business concerns force insurers to lead the way in data security

By EVAN HENDRICKS

For the insurance industry, the collection and protection of customers' sensitive personal data is an integral concern. "We probably handle more kinds of sensitive information than any other business," says R. Otto Meletzke, director of regulatory services and corporate legal affairs for the American Council of Life Insurance.

Life and health insurance companies collect, maintain and sometimes share details on individual medical conditions and treatments. The data, along with the statistics that are drawn from them, serve as the lifeblood of an industry that perhaps better than any other exemplifies the information economy.

It comes as no surprise, then, that insurance companies remain on the cutting edge of any technology that is designed to safeguard sensitive information from unauthorized access and other abuse. Insurers understand that to maintain the free flow of customer health information, which is so important to their survival, they must guarantee confidentiality.

An unpleasant memory from the 1960s, the Factual Services Bureau case in Colorado (*Colorado* v. *Home Insurance Co. et al*) underlies insurers' concern for the privacy of data. In the case, an insurance support organization was prosecuted for alleged theft, bribery and misrepresentation in obtaining confidential medical information from hospitals and doctors and selling it to insurers.

Ultimately, the Colorado Supreme Court dismissed the case, finding that the perpetrators could not be prosecuted under theft laws because "information was not a thing of value." Insurers know better, and they quickly moved to clean up their act.

Considering the massive volume of data they handle, they have been remarkably successful; no similar horror stories have surfaced. Insurance executives will sigh with relief that the industry has thus far avoided an electronic Love Canal; at the same time, they will deftly slip their hands under the table to knock on wood.

The main responsibility for protecting personal medical information maintained by life and health companies lies with data processing. And, as the following examples show, MIS departments in the industry try to leave no stone unturned.

Prudential: Layers of security. William Burgess, a Prudential Insurance Co. vice-president for information systems, says his company has added succeeding layers of security over the years because, "As the files grow, the risk grows."

Prudential's internally designed data security system features a great number of built-in controls. Access to computerized records, for example, is separated along the lines of the military's need-to-know principles.

> ***"Companies can protect sensitive information more easily on a computer than they can in a manual system."***
>
> — Bill Roberts
> Pacific Mutual Insurance Co.

An elaborate system of internal passwords — both general and transaction specific — is designed to ensure that a minimum number of people can get access to sensitive claims data. People working on policies, for example, do not get access to claims. Burgess says the firm does not experience problems with computer hackers, in part because Prudential's most sensitive systems are separated from its dial-up systems.

Pacific Mutual: Passwords and more. Bill Roberts, a Pacific Mutual Insurance Co. vice-president for information systems, expresses a belief common among data protection managers: Companies can protect sensitive information more easily on a computer than they can in a manual system,

See HENDRICKS page 62

Hendricks is editor and publisher of "Privacy Times," a biweekly legal newsletter based in Washington, D.C.

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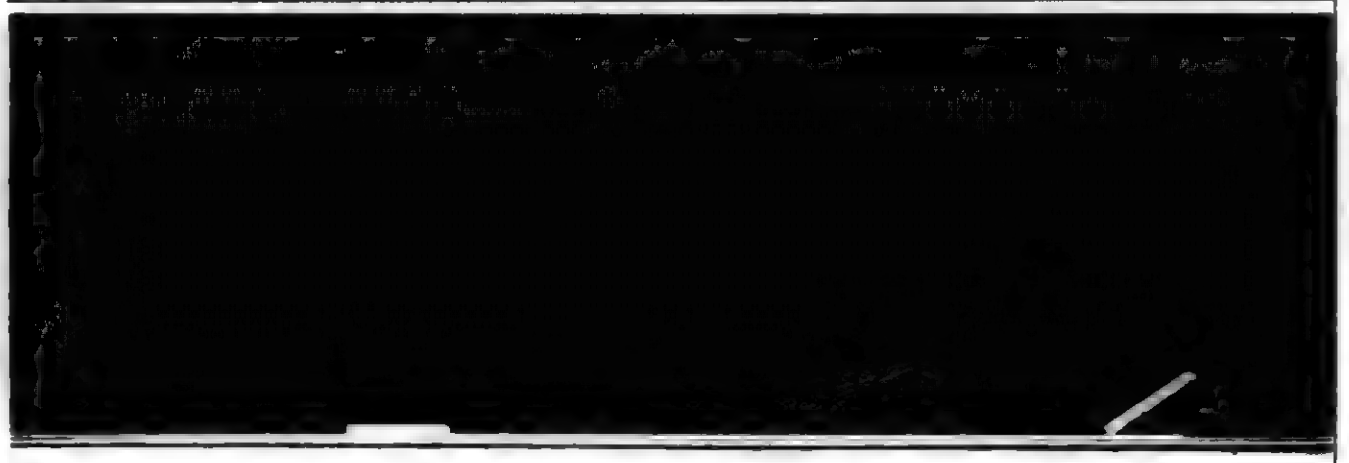
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Continued from page 57

time (see chart page 57).

The OTA, a congressional advisory body, concludes in its report that if organizations are not willing or able to apply privacy safeguards to end-user computing to protect their clients and employees, "Congress may wish to clarify and strengthen through legislation the liabilities that such organizations incur by their failure."

Congress is already on the verge of passing one new privacy law. The Electronic Communications Privacy Act of 1986, a bill that would prohibit the interception of data communications such as electronic mail, is headed for enactment this year, perhaps as soon as August.

Under the existing body of state and federal law, it appears that corporations have little legal recourse if confidential information about them is disclosed.

The concept of corporate privacy — or the protection of corporate information that does not fall into the categories of trade secrets, copyrights or patents — is a fuzzy area.

For example, a firm might use some form of industrial espionage to find out how many employees a competitor assigns to a particular research project — as well as their job descriptions, titles and other details — in order to discover what market the competitor is seeking.

"In this country, corporations have not been recognized as having a privacy interest," Trubow says. "Since we don't have a clearly recognized right to corporate privacy, that information is unprotected," he adds.

Consequently, Trubow says, a company may be able to take legal action against an employee who discloses sensitive information after signing a nondisclosure agreement, but it cannot take action against the recipient of the sensitive information.

"Now that's a very troublesome area," he says. "I'm not one who wants to give corporations any more shield behind which to hide their conduct.

"But, on the other hand, I do recognize that corporate entities have an interest in this gray area of information that is extremely important to them in a competitive environment," Trubow says.

Likewise, data processing managers argue that once their organizations take raw data and turn it into a sophisticated information system, that information has value and should therefore warrant legal protection.

However, the courts are not comfortable with the abstract concept that information can be owned and protected, Trubow and Cashion say.

What privacy threats will companies face in the future? Experts warn that there will be an increasingly strong appetite by credit and marketing firms for personal information about employees and clients.

"I think there is a tremendous market developing for personal information on individuals," according to Advanced Information Management's Campbell.

He argues that, with the consumer economy growing more dependent on credit, financial institutions will be driven to hiring private investigators to obtain information on individuals for credit checks.

"There is going to be a greatly increasing demand for accurate, reliable and critical pieces of information on the individual: his character, credit and health. Consequently, market forces are probably going to cause a third-party industry to evolve that will deal in the collection and dissemination of this type of information," Campbell says.

Investigators will develop an underground network of sources within major corporations to obtain the information for credit checks.

"People who are granting credit will be less and less able to tolerate bad decisions," Campbell says, "because deregulation will force profit margins down and make it so much more competitive."

Market researchers will also seek personal data to identify sales targets, Campbell says.

"I had an incident about two years ago when a local agent for an insurance company, which my wife has a policy with, called up and started inquiring about our insur-

Continued on page 62

THE THREE ISSUES OF OFFICE PRIVACY

JEFF DARNEAU

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2. Protection. Decide who should have access to personal data, and under what circumstances it can be released outside the organization.

3. Notice and Access. The subject of data collection should know when a record has been created about him, have the right to examine the record and be able to challenge the accuracy, completeness or use of the record.

Information provided by the U.S. Congress' Office of Technology Assessment's "Automation of America's Office" report, December 1985.

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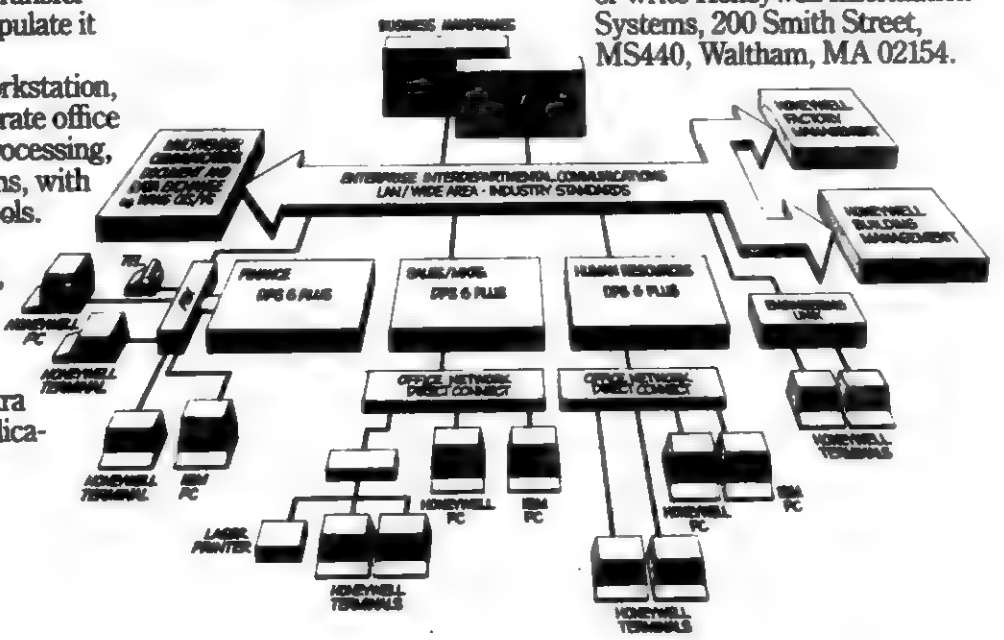
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Continued from page 59

ance portfolio. He went into his local data base and started reading stuff about us that I didn't think he should really have access to. He was using his micro and some downloaded data from the insurance company's main computer to prepare a sales pitch to us. I found it offensive."

Tennessee Tech's Cashion adds that insurance agents have called him at the university and said they would pay him for a computerized list of students and their grades or a list of all employees with their salaries and addresses.

Attempts to buy confidential information are nothing new, Westin observes. In the last 10 to 15 years, there have been numerous episodes of police selling computerized criminal history files to businesses and people buying data from credit bureaus, he says.

"In addition, the sale of customer lists to competitors is as old as business itself," Westin says.

There are numerous cases where New Jersey casino employees steal computerized lists of heavy rollers and sell the lists to a competing casino, which then offers inducements to the big bettors to switch their heavy play over to them.

"Those are the kinds of penetrations of privacy and confidentiality that have gone on in the manual era, in the early computing era and are absolutely predictable in the future," he adds.

"Now you can get larger quantities of data, and with end-user computing, it's within the general reach of many, many more people inside the organization," Westin says. ■

HENDRICKS from page 58

he says. His firm's password system is a good example of why the maxim holds true.

Roberts depicts the system as a multilayered one much like Prudential's: "First, you need lots of numbers in the right sequence just to get in. Then you still need special logon codes to get access to the files you want," he says. "The number of passwords is doubled if you are calling from the outside."

Pacific Mutual maintains off-site storage to back up the system in case of a disaster or accident.

The MIB: Access rights and disclosure rules. The insurance industry's relationship with the Boston-based Medical Information Bureau (MIB) has created the world's largest electronic network of health data.

More than 750 life insurance companies participate in an on-line exchange of medical data with the MIB, which is a sort of credit bureau for health data. The bureau's system was designed to prevent life and health insurance applicants from giving incomplete or inaccurate medical histories.

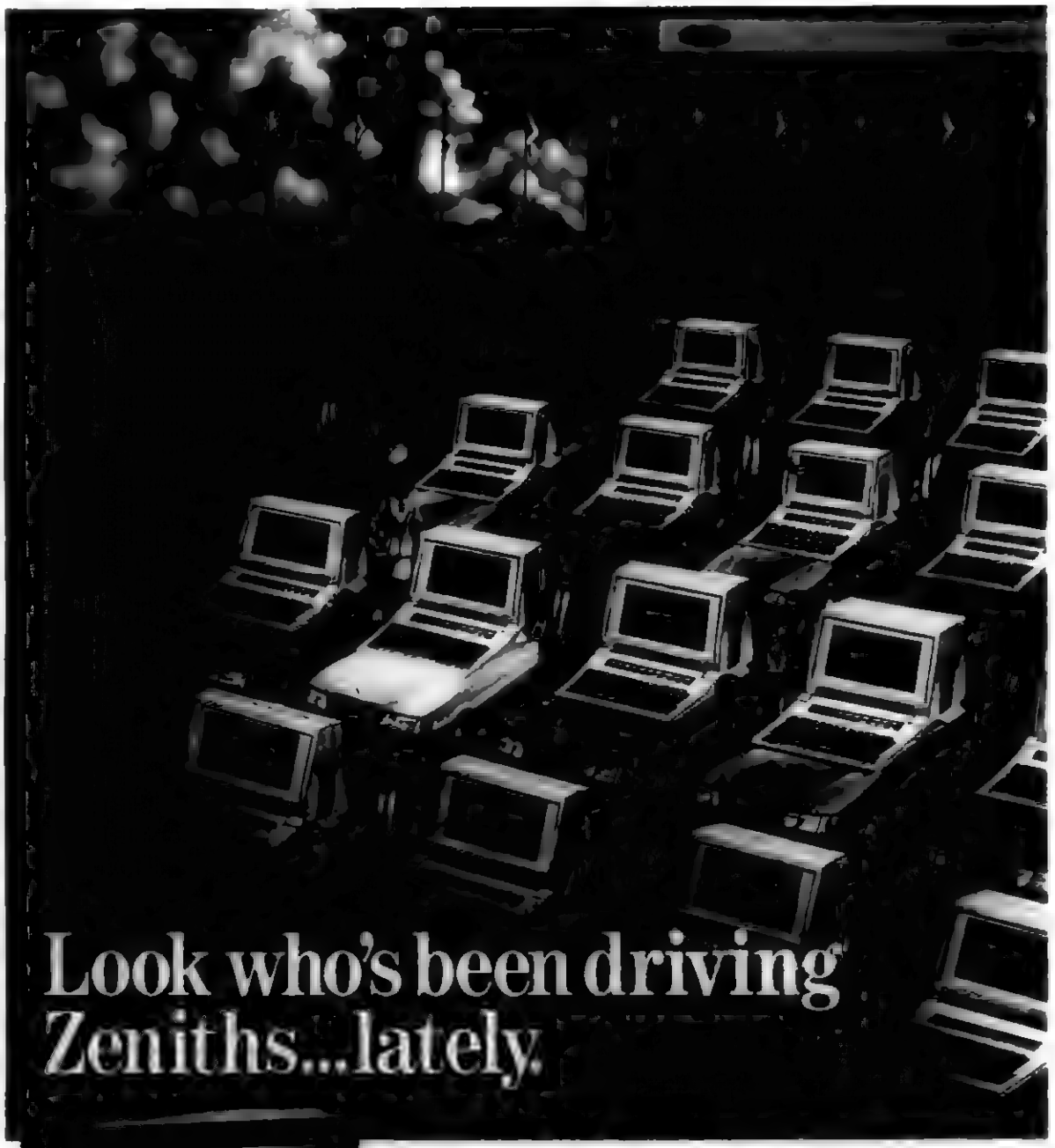
Insurance companies report customers' medical conditions — blood pressure, weight, height, X-ray results and the like — with one or more of about 210 codes. Five additional codes cover nonmedical information such as a history of reckless driving and/or participation in hazardous sports.

In 1971, the MIB adopted many of the privacy protections and fair information practices that the U.S. Privacy Protection Study Commission would recommend for all industries five years later. These include the right of customers to obtain copies of their own records and to correct inaccurate data.

MIB rules require that insurers provide applicants with a written notice of data exchange practices and consumer access rights. Each year, about 7,000 people request access to their MIB files. Of those, about 200 seek corrections.

Disclosure is restricted as well. Member companies can only obtain a person's file after the individual signs a written authorization. The MIB refuses to release reports to nonmember companies, to credit or consumer reporting agencies or to government agencies that do not have a court order.

Moreover, insurers cannot make underwriting decisions on the basis of data provided by the MIB. "It is meant to be nothing more than an alert system," according to Nick Latrenta, an assistant vice-president for Metropolitan Life Insurance Co. "We have to independently corroborate any data we get." ■



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In Depth

In charge of change

How to provide a happy ending for your systems project

Rescuing new systems that are technically correct but are doomed to fail • Heading off executives who rely on intuitive solutions alone • Crystal ball: a model to predict your organization's response to change

By ROBERT MAHER and CONSTANCE ALEXANDER

A major challenge for information technology planners is to design solutions that work on two levels: technical and organizational. Understanding this challenge, AT&T's Organization Effectiveness Group (OEG) uses a "map" of organizational performance to guide clients through uncertain terrain when implementing new systems. This article presents that map and, using a hypothetical customer service center, shows how a technically correct system should also fit the organization's strategy, structure and people if the system is to achieve desired results.

□

Gleaming and efficient, the new Regional Customer Service Center is designed to hum with high-tech goodwill. Routine tasks are mechanized. State-of-the-art hardware promises ease of use. Software is tailored for the collection of crucial information, and the system is networked so that data can be transmitted in an instant to the right people.

Technically, the system is fast and efficient. To find out how things are going organizationally, listen to some of the people directly involved with the new customer service center:

● "Millions," the service center manager complains. "This data entry and retrieval system was supposed to save millions of dollars. And it would have, if service representative turnover hadn't skyrocketed. After six full months, the center is up and running, but we're spending too much time and money trying to keep it staffed. Turnover is up 120%. Sometimes I think we'd have been better off with the old tub files and the Hold button."

● "Oh sure. The Regional Customer Service Center is in a brand new building, much nicer than the old local center I worked in. But the new place reminds me of a glass-and-chrome filing cabinet," one of the service representatives confides.

"I feel like some kind of robot sitting at my workstation," the representative continues. "Stare at the screen, take one call after another. It used to be you could give some personal attention to customers when they had service problems. Now we follow a set format. What ever happened to the personal touch?"

When customers experience service problems, they call the Regional Customer Service Center and are efficiently routed to the first available service representative. The representative punches in a code, and customer records appear on the VDT.

As the customer describes the problem, the representative summarizes the information and enters it into the system. The representative also asks a few relevant questions and logs in the answers. In seconds, the updated file is transmitted to the appropriate local repair office so a technician can be dispatched to the customer location.

● "If you ask me," a supervisor chimes in, "it'll just take a firm hand to manage the new service center. Stricter rules — that's what we need. We have some

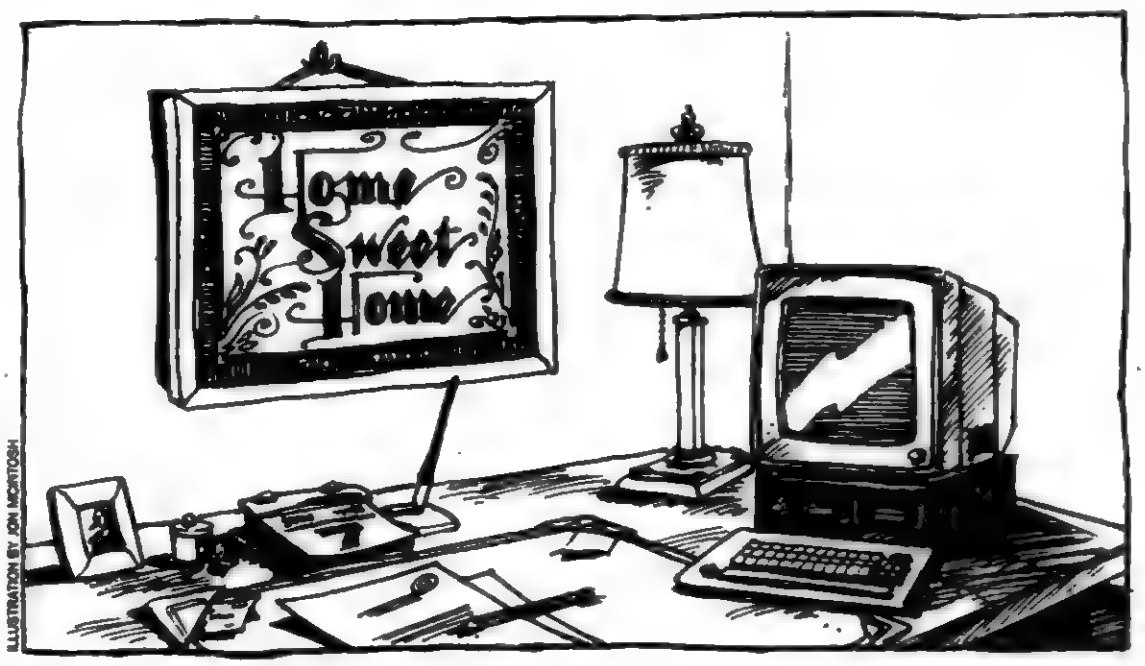


ILLUSTRATION BY JON MCINTOSH

About the authors

Maher is division manager of AT&T's Organization Effectiveness Group, a consulting and training group in Morristown, N.J. Alexander is president of Intex Communications, Piscataway, N.J.

representatives who transferred in from the local centers. And then there are the new hires — kids right out of college who have technical know-how but don't know much about our customers or our products. Of course, I don't need to pay much attention to the transfers. It's the new hires that bear watching."

• "We were told there'd be a change with the move to a regional customer service center," a customer explains. " 'Faster service,' they promised in the letters they sent out before the new system cutover. And they did what they promised. Calls go through immediately. Service representatives ask so many questions you can't get a word in edgewise before they say 'Thank you' and hang up.

"They send repair technicians out fast enough, but often they appear without the right tools for the job. Yesterday one of the technicians gave me his card. Told me customer complaints were at an all-time high. Said if I call him directly and bypass the Regional Customer Service Center I'll be better off."

Pitfalls

Apparently, the new system at the Regional Customer Service Center is frustrating everyone. A manager, a service representative, a supervisor and a customer criticize the operation.

No one is complaining about the technical aspects of system performance, but they are finding fault with the organization.

And when technical and organizational performance do not mesh, new systems like the Regional Customer Service Center's cannot achieve desired results.

The Regional Customer Service Center was designed by a talented team of individuals. How could such problems occur in spite of all that brain power? Was it just bad luck, or could any of the pitfalls of the regional service center have been avoided?

Such problems are not unusual. An informal study by Cyrus Gibson and Thomas Davenport for "Information Strategy: The Executive's Journal" evaluated 20 systems that were successful from a technical standpoint. Of the 20, 16 did not fully achieve expected organizational results, thus underlining the uncomfortable fact that technically correct systems do not guarantee that the desired organizational change will occur.

Skeptics might answer that a crystal ball is the only reliable way of seeing into the unknown, and most organizations just do not have access to such an infallible tool. But those who understand the dynamics of change know that a map is crucial when an organization is headed for new territory.

One such map is the Organization Performance Model (OPM), a tool AT&T's OEG uses with its clients in planning organizational changes like the move to the new Regional Customer Service Center just described.

The OPM is based on the work of David Nadler and Michael Tushman in their book, *Congruence Model For Organizational Problem Solving* (Columbia University, Graduate School of Business, New York, 1980).

The OPM is a framework that includes technical and human aspects of organizational performance — the two basic factors that need to be reconciled in the successful implementation of every system.

A systems view

The model is made up of four main elements: strategy, results, organization and leadership. The theories underlying its structure are simple:

• Strategy provides direction for the organization.

• Results are achieved by following the strategy.

• The organization translates strategy into results. In the OPM, the organization is composed of the work, the people, the formal structures and systems, the informal networks and power structures and communication — both feedback and "feedforward."

• When the individual components of the organization are aligned with the strategy, desired results can be achieved, because all the pieces fit.

• When a change is made in any individual component of the organization — the work, for instance — the other components need to be adjusted accordingly.

• A fine-tuned organization is important, but leadership at every level of the organization is a must if changes are to be implemented successfully.

Guided by the OPM, information technology planners can make sure that all the parts of the organization support the goals and objectives of the new system.

In context of goals

Of course, the strategy itself must make sense in terms of the organization's environment, history and resources.

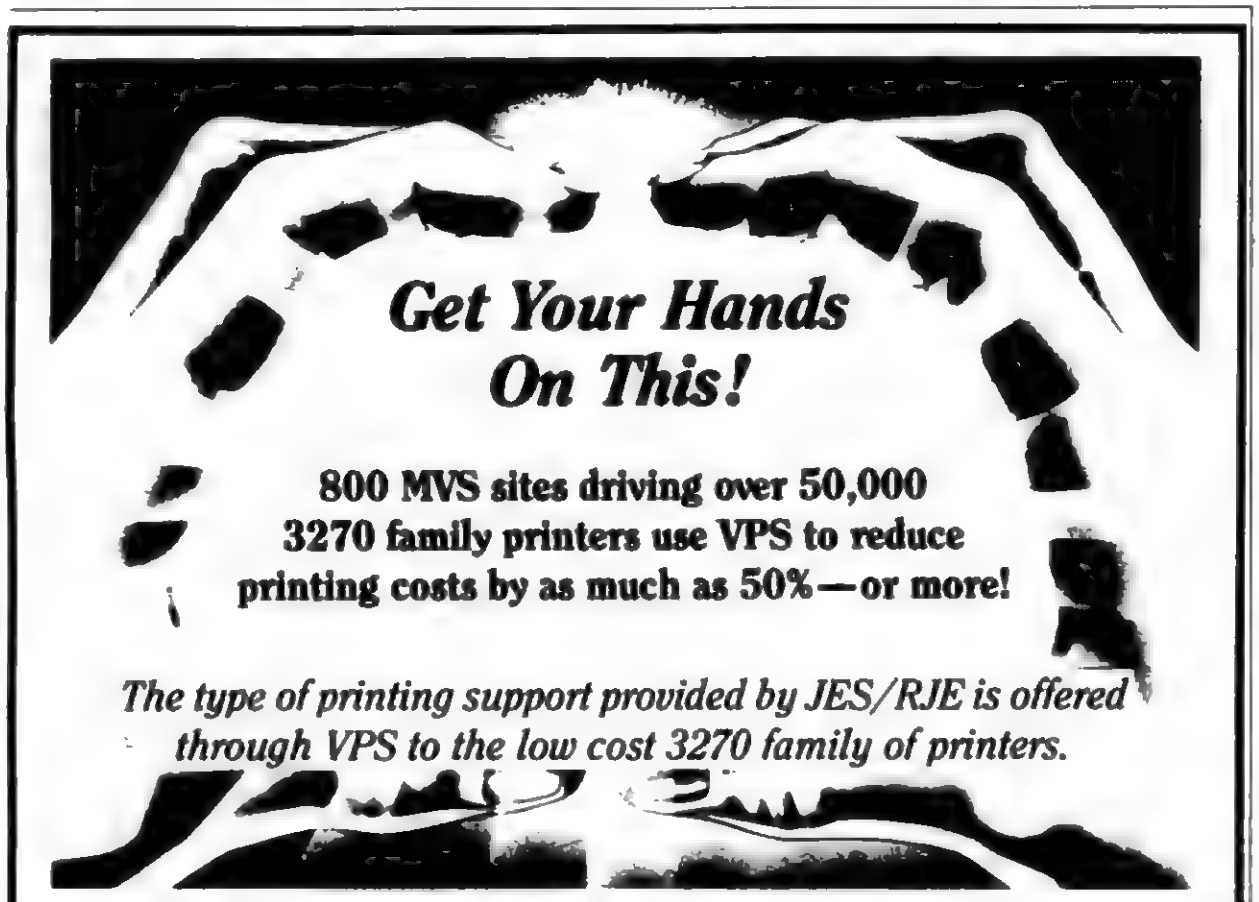
In the case of the Regional Customer Service Center, the strategy to regionalize and mechanize the customer service function was logical. Service can be the factor that differentiates competing products, and information technology, when implemented successfully, can sharpen an organization's competitive advantage.

If the strategy fits, then planners need to ask some basic questions before redesigning the organization and its components in support of that strategy:

— What is the organization doing now under the existing system? How will the work be different once the new system is implemented?

— What skills and knowledge do workers currently possess? What additional or different skills and knowledge will be required?

— What worker needs and



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preferences does the job currently fill? What needs and preferences will be met under the new system?

— What systems support the current way of doing things? What supports will be needed for the new system?

— How does the informal power structure support the current work? How will the new system affect the power structure?

— What steps do we need to take to ensure that the organization makes the move successfully from the present to the future?

Changes

In the Regional Customer Service Center's case, the work was going to change considerably — making the move from a manual system that required high interpersonal involvement and decision making by the service representative to an on-line data entry and retrieval system that routinized much of the process.

Under the nonmechanized local system, the work was performed by individuals who knew specific customers' needs.

Local service representatives, under the old system, took pride in their close relationships with customers and felt a sense of accomplishment in on-the-job decisions such as making suggestions to the repair technicians' supervisor as to which technician would be best assigned to a particular customer problem.

Local representatives brought years of experience in customer service to their jobs. Many of them had worked their way up through the ranks of nonmanagement jobs and enjoyed a sense of achievement about the help and guidance they were able to give customers with service problems. Under the new system, much of what satisfied the service representatives was to change.

Job design in the old system provided intangible benefits. Representatives were allowed autonomy and freedom to act. They were accustomed to calling the shots — telling the repair technician supervisor how a particular customer problem should be addressed. This aspect of the representatives' job would change considerably with the new system.

Formal structures and systems in the local service centers were linked directly with technicians, who in the past were usually housed in the same building. If technicians had questions about a particular customer problem, they could pull the file or ask the service representative questions before going out to fix it.

Furthermore, the informal organization in the local centers was built on long-standing relationships between customers, technicians and representatives. Irate callers were seldom a problem, because customers and representatives knew each other in outside settings. They might worship together or belong to the same social clubs; their children might play on the same soccer team.

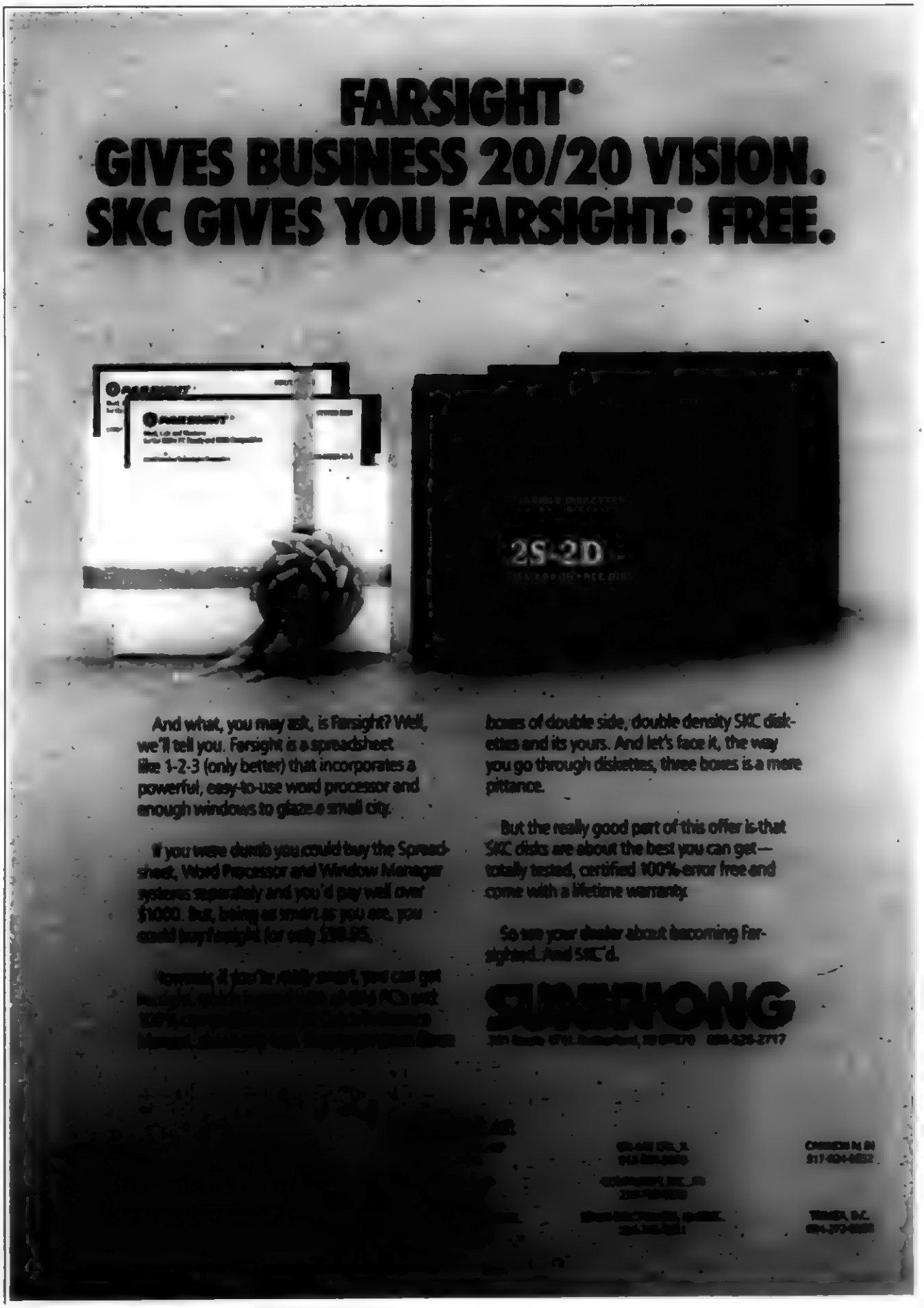
Because of the close working relationships between service representatives and repair technicians, neither group was constrained by strict policies and procedures. They practiced flexibility, finding it easy to bend rules as needed to make sure customers' needs were well served.

With the move to Regional Customer Service Centers, this close alliance would be broken, because the informal network would be disrupted.

Action plans for reconciliation

If service was indeed to be a competitive advantage, the

> ***Strategy provides direction for the organization. When the individual components of the organization are aligned with the strategy, desired results can be achieved, because all the pieces fit.***



differences between the old and new systems needed to be reconciled.

By using the OPM to identify the extent and nature of the changes, systems planners can predict areas in which "fit" between the old and the new might be a potential problem.

Once the pitfalls are identified, action plans are constructed to address critical issues. For example, the following action plans were established for the new Regional Customer Service Center:

Work in the center was routinized, with less decision making required by service representatives. Existing representatives are informed of changes. The options of either moving to another local job or transferring to the regional center are offered. Training is provided to transfers. A recruiting program is developed to attract new employees to service representative positions. Career paths are aligned with recognition and reward programs.

Formal structures and systems for service representatives and local repair technicians had to focus on responsiveness to customer needs. Methods and practices of these two geographically separate groups are aligned, with emphasis on speed and thoroughness of service. Representatives supply complete information, so repair technicians had to make only one trip to a customer site to fix the problem. Measurement systems for representatives and technicians should complement each other.

Local technicians and regional service representatives needed ongoing communication to ensure success of the system. Interfaces between the technicians and representatives need to be managed. A feedback mechanism — a standing committee, perhaps — could meet regularly to review results, problems and achievements. The people responsible for the success of the change need to be involved in its assessment and adjustment.

History holds a key

As action plans are devised to help an organization meet the challenge of change, it is important to take a look at the organization's past to see if it holds any clue to the future.

History, quite simply, is a key indicator of an organization's ability to respond to change and its willingness to be both flexible and forceful as needed.

Some significant questions to consider include the following:

— How has the organization adapted to changes in the past?

— What changes have occurred in the organization in the past two years? Were the changes the result of outside pressure, environmental factors, organizational or structural changes or other factors?

— How have key decisions been made in the past? At highest levels only? At headquarters? By committee? By consensus? Seat of the pants? Firefighting mentality?

— How have key leaders, both formal and informal, acted in past times of change? Are these leaders still part of the organization?

— What stories or organizational legends are told about other changes that have occurred?

— What organizational strengths and weaknesses are indicated by the change history? What implications do these strengths and weaknesses have for the successful implementation of the impending change?

Leadership makes the difference

Without effective leadership, the most rigorous analysis and action planning can fall short of desired results. With the Regional Customer Service Center, for example, tools such as the OPM are bolstered by dedicated and empowering leadership.

According to Warren Bennis and Bert Nanus, coauthors of *Leaders: The Strategies for Taking Charge* (Harper & Row Publishers, Inc., New York, 1985), American organizations have been overmanaged and underled.

Further, the Bennis and Nanus studies find that leaders understand the difference between efficiency and effectiveness and spend their time doing the right things instead of doing things right.

Effective leaders, the kind whose organizations consistently perform up to standards of excellence, have a clear vision — a strategy — that creates a focus for the organization. They communicate this vision frequently and creatively and position the organization for change. They also empower those who follow them by emphasizing accountability and reliability.

Leaders, in short, understand the complex interrelationships of all the organization's components illustrated by the OPM. Armed with an understanding of the model, leaders can ensure the successful implementation of systems by taking the following steps:

- Communicating the goals of the new system.
- Securing commitment to those goals.
- Exerting influence to encourage high performance standards.
- Encouraging in employees a sense of personal responsibility for their work.
- Recognizing and rewarding desired performance.
- Instilling a spirit of teamwork.
- Understanding the impact of change on every level, especially middle and first-line managers who may perceive a loss of power and formal authority due to the change.
- Encouraging groups to collaborate.
- Creating an environment of trust, cooperation and open communication.

Leaders are needed at all levels, and it is essential that leadership

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style fit with the other elements of the organization.

Real-life application

The OPM comes to life when its concepts are applied to actual situations. If, in the case of the Regional Customer Service Center, the OPM had been used as a map in the planning phases, the results of the system might have gone something like this:

● "System's up and running, and it looks like we'll meet the projected savings," the customer service center manager reports. "It's a good thing we anticipated the high turnover rate.

"In this company, many of the nonmanagement peole would rather move to a different location, especially if a long commute is involved. The few representatives who did elect to transfer to the new Regional Customer Service Center were interested in making a change. Some of them were a little shaky with computers at first, but with a little reinforcement and some training, there are no problems."

> ***Effective leaders, the kind whose organizations consistently perform up to standards of excellence, possess a clear vision — a strategy — that creates a focus for the organization. These leaders communicate this vision frequently and creatively and position the organization for change. They also empower those who follow them by emphasizing accountability and reliability.***

● "I have a two-year degree in computer science, and I wanted a high-tech job with a big company," one of the newly hired representatives explains. "This service representative position gives me a foot in the door. It's a good starting place for me. The initial training helped me get acquainted with the product line and gave me an overall understanding of the company. The system was a cinch to learn.

"The representatives who transferred from local offices have been great. We help each other out, in fact. They know the ins and outs of the company and the products, and I know the technical stuff. I like working in a new building right in the center of the city. Even the shift work isn't bad. I can go to the beach in the morning when I'm working 3 p.m. to 11 p.m."

● "Developing the right measurement system was one of the biggest planning challenges for the Regional Customer Service Center. At first," a supervisor confesses, "we toyed with the idea of strict time limits within which representatives had to get customer repair information and transmit it to the appropriate local repair office.

"Then we realized that fast service is no good if it's not the right service. We had to develop measures that emphasize quality, thoroughness and speed. And we had to work closely with technicians to find out the kinds of questions the service reps should ask. The technical people were involved in developing representative training, too.

"Finally, we had to make sure that service representatives and repair technicians were evaluated in ways that made overall sense to the strategy of service as a competitive advantage."

● "The new Regional Customer Service Center is meeting my needs just fine," a satisfied customer beams. "There are no more busy signals when you're calling for important repairs. And the technician arrives fast. It's amazing to think that the customer service center is hundreds of miles from here, but the details of my problems are available to local technicians immediately, just as they were when service representatives and technicians were together in local offices.

"If you ask me, I think the change is great. I'll stick with this company, maybe even pay higher prices, because service makes the difference."

A guide in times of change

The OPM is a conceptual representation of an effective organization. It includes all components of the business — strategy, work, formal structure and systems, the informal organization, the people, communications and leadership.

Because the OPM is a way of looking at the interacting factors that contribute to effective organizational performance, it can be used as a framework for predicting problem areas in times of change.

Applied to planning for the Regional Customer Service Center, for example, the OPM can be a powerful tool to ease the implementation of an information technology system that falters not because of technical flaws but because of gaps in the organization that made the new system cumbersome and unappealing to employees.

With the OPM, the organization is given a blueprint to follow and a common language and framework for planning so that managers can understand the scope of a new system's impact, predict problem areas and direct action plans that ensure system success. ■

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MANAGEMENT

TAKING CHARGE
David A. Ludlum

How info execs can get respect

Taking their cue from a popular comedian, a pair of information systems consultants recently invited me to explore their clients' lament that they "get no respect" from their bosses or from peers in other corporate departments.

The implication was that a culture gap as wide as the Grand Canyon, rooted in personality and language, separates information systems managers from other high-level executives. In the view of top executives, MIS professionals speak in incomprehensible jargon and marvel at technology for its own sake.

This issue of getting no respect seemed like an appropriate one to take to Las Vegas, where thousands of MIS managers were soon to gather for the 1986 National Computer Conference.

Despite the festive atmosphere of that overlit oasis, there was little humor in the responses of MIS managers queried on the issue of respect. They agreed that, as a group, they face an uphill battle in getting it from others in their organization (although several of them noted that the problem does not affect them personally).

But surprisingly, the managers tended to ignore the question of a culture gap, attributing the lack of respect instead to a larger issue — MIS managers' performance in meeting the needs of their users, which, in theory, is meeting the needs of their employers. To get respect, said one MIS manager after another, managers must aggressively

See HOW page 76

Ludlum is Computerworld's senior editor, management.

Scout pledge: Go on-line

Will give headquarters local membership data

By James A. Martin

IRVING, Texas — The "Be Prepared" motto of the Boy Scouts of America (BSA) is associated more with camping than computing. But with data processing costs rising and budgets shrinking, the BSA is giving its motto a new twist by putting its regional councils on-line.


Spalter

Although the BSA headquarters has been automated since the early 1960s, starting with an IBM 360, many of the smaller council offices across the country continue to process records manually.

Now, with the number of scouts to keep track of rising, record-keeping costs escalating and resources limited, there are strong incentives to lower costs through automation. The BSA's $3.6 million data processing budget for this year is down 7% from 1985.

"The cost of processing the paperwork goes up regularly, and without data processing, we would have to end up raising membership fees and subsequently lose membership," says Susan Spalter, director of the BSA's information systems division at the Irving headquarters.

"Most people are surprised that we have data processing support for Boy Scouts," Spalter says. "But we're no different from a profit-making company. We have to have funds to survive, although we can't compete for a profit."

The automation program also might help generate revenue by providing councils and headquarters with more complete data on members, personnel and supporters, which is especially valuable in fund-raising efforts.

The BSA's master plan calls for every local council to go on-line with membership data and possibly other information by 1988, according to Joseph L. Anglim, chief financial officer at BSA headquarters.

However, each council is responsible for funding its own operations, and the BSA will not force councils to computerize, Anglim said. "But somewhere off in the distance, it will be the only way for councils to do business with headquarters."

The BSA's information systems department functions as MIS to the councils,

See SCOUTS page 75

Management ability brings perks

By David A. Ludlum

Businesses are hiring information systems managers who are sensitive to their company's needs and then rewarding them with the sort of perks traditionally given to high-level executives, according to recent surveys.

Studies by consulting firms have also found that employers continue to pay premiums for data processing professionals with expertise in data communications, including on-line systems and micro-to-mainframe links.

Most information systems management jobs are being offered to people sensitive to the needs of the company and its computer users, according to a survey of MIS salaries in the Chicago area conducted by Consultants to Executive Management Co. of Oak Brook, Ill.

"The older 'data processing department manager' image is giving way to an image of 'data processing executive,' who uses information as an asset to the corporation, assisting other operating units in solving their business needs," said John D. McMahon, a senior consultant with the firm.

The survey also found that management salaries continue to increase, as do those for data processing professionals skilled in on-line applications, particularly IBM's CICS, in personal computers and in data communications — including mainframe-to-micro links.

According to McMahon, professionals

See MANAGEMENT page 74

David's Cookies, in the chips, selecting PC network vendor

Expanding firm moves on from service bureau

By Alan Alper

NEW YORK — Would David's Cookies crumble without a computer to handle its accounting tasks? Probably not, but the king of the franchise cookie business is not taking any chances.

The 7-year-old, privately held company is in the final throes of selecting a vendor to install a network of microcomputers to handle tasks such as order entry, inventory control, purchasing, accounts payable and receivable and financial reporting.

Office automation is coming to David's Cookies as it diversifies its product offerings and expands its international presence with outlets in Japan and Europe. The firm's 140 franchises do about $50 million in business annually, approximately $20 million of which drops to the bottom line, observers estimate.

David's Cookies' growth has reached a point at which annual financial reports and use of a service bureau for accounting modes do not meet its expanding needs, said Tim Downing, chief financial officer.

'Have to have a computer'

"We have to be flexible and able to turn on a dime," an emphatic Downing says. "To do that, we have to have a computer system. We're too large now not to have one."

Young, growing companies use service bureaus to keep their costs down and still receive some of the benefits of computerized accounting methods, consultants say. But, as firms grow, it becomes less cost-effective for them to use service bureaus since most bureaus charge their customers by the amount of work done. The more work done, the higher a firm's computing costs.

"The decision to go to an in-house computer, in part, is based on replacing variable costs with those that are fixed," notes Eric Knutsen, vice-president of consulting at Gartner Group, Inc. "Companies switch to their own system when the economic analysis says the fixed costs are less."

Downing adds, "It's an issue of control. You have more effective control over the end product with your own system.

"It's also a question of timeliness," he continues. "There are times when you are waiting for a financial report and the bureau's computer breaks down. Sometimes, they call the next day and say they have to re-enter your data."

Control of information

The firm has spent the last year working with a computer consultant to evaluate various technological approaches. "We went with the personal computer network because it offered the best method of control of information. It also was much cheaper than putting in a larger system," Downing explains.

Final vendor selection is expected to occur this month or August. David's Cookies is considering only vendors that supply hardware with com-

See DAVID'S page 76

INSIDE

Book reviews: Software development, CD-ROM, data communications/72

Calendar: Shows, conferences, seminars/74

INSTANT ANALYSIS

"The half-life of information systems executives that I have found in the Southwest is about 26 months before they're fired. And one of the reasons is they're not part of the management team."

— M. Victor Januleitis of the Los Angeles executive search firm Positive Support Review.

Buyers sharpen focus before departing on trade show circuit

Cost consciousness reshapes agendas

By Jeffry Beeler

Among sophisticated buyers, the reasons for attending major trade shows, such as the recently concluded 1986 National Computer Conference, have changed dramatically during just the last few years.

Until fairly recently, "attendees went to NCC and other large trade shows primarily to get the big picture of what's going on inside the industry," observed industrial psychologist and behavioral scientist Allen Konopacki.

"That was a few years ago. Today, many of these same people are coming to the shows instead with some very specific agendas. They want to find out what is new in selected markets," he continued.

Konopacki, who works with Chicago-based Incomm International, Inc. and specializes in the psychology of trade-show buying behavior, bases his conclusion on the results of a telephone survey of approximately 2,000 users.

The study, which Konopacki conducted in the early 1980s with some university collaborators, asked "power buyers," or corporate executives whose annual systems budgets total at least $250,000, what they wanted trade shows to do for them.

Part of the reason why MIS executives are more focused today in their motives for attending NCC apparently stems from increased vigilance and control by senior management.

"Up until a few years ago, many attendees had some pretty fuzzy ideas about why they went to trade shows," commented Kenneth Facemyer, information systems manager at Supelco, Inc., a chemical supplier based in Bellefont, Pa. "But today, if you tell company presidents that you plan to spend $2,000 to attend NCC, they're going to expect you to explain exactly why you're going."

But the mounting pressure on systems managers to have clear-cut missions when they attend industry gatherings is by no means coming entirely from above. Many such individuals are finding their trade show agendas increasingly shaped from below by their end users.

Disseminating information

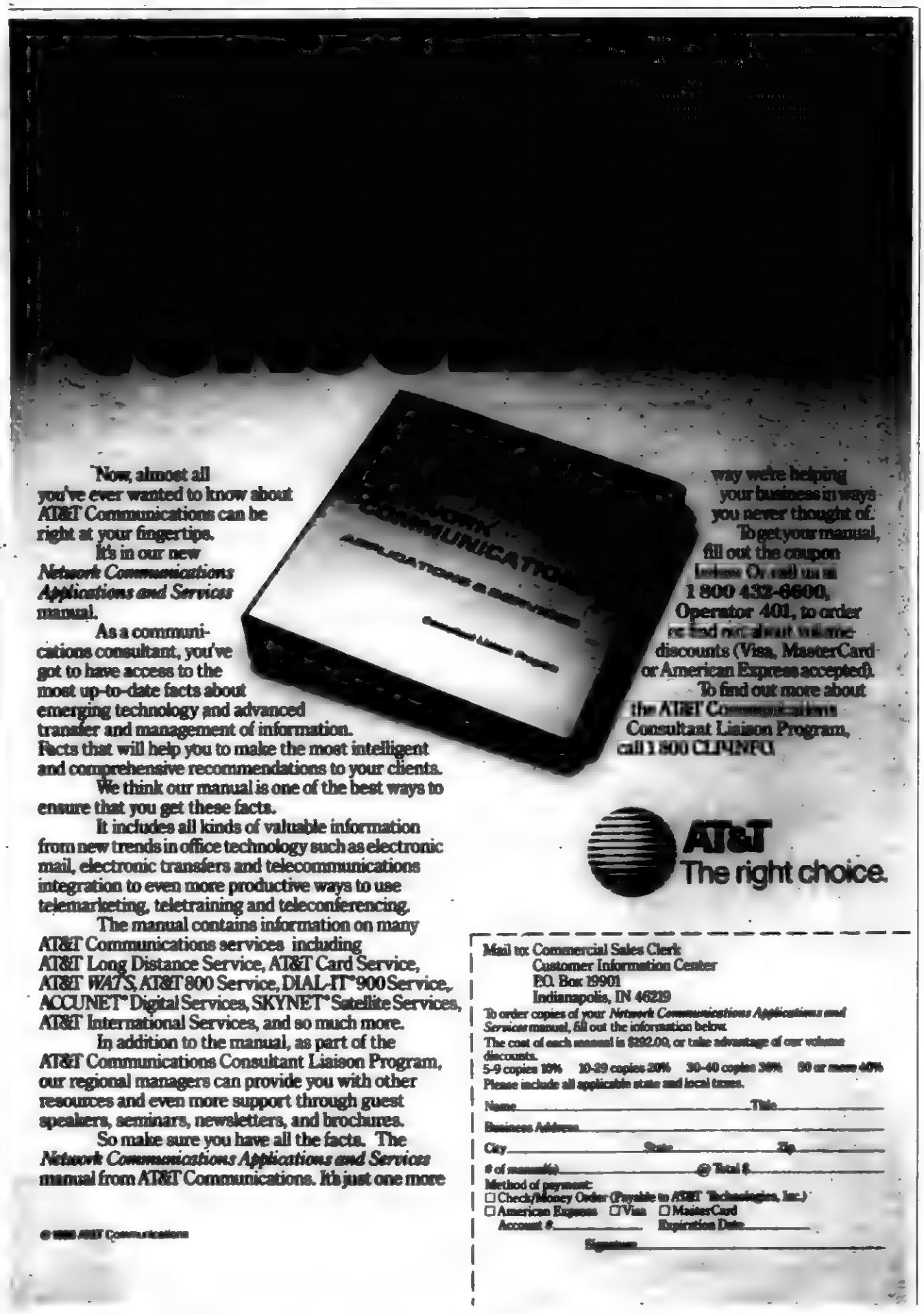
A case in point is Daniel Kennedy III, MIS director and vice-president of operations for Belwith International Ltd., which distributes cabinet knobs and pulls from its City of Industry, Calif., headquarters. In part, Kennedy's trips to NCC are dictated by the growing need among his users for information about microcomputers.

"In our company, we're seeing a migration of applications to personal computers, but we're also still concerned about controlling our data base," Kennedy said during a conversation at NCC. "DP has the responsibility for tutoring our users in how to use their PCs."

Thus, one of Kennedy's aims in visiting the NCC Las Vegas show this year was to bring himself up to date with the latest microcomputer developments and then to pass along this information to his nontechnical users, he said.

Other MIS directors, however, attend industry conferences with quite different — although no less narrow — goals in mind. Charles Williams, automated data processing service center manager at Oak Ridge National Laboratory in Tennessee, traveled to the latest NCC to search for networking products capable of improving the telecommunications speed and capacity among his three computing installations.

"I used to go to NCC to find out what the big vendors were doing," Williams said at the show. "But now, I have to come with some very specific objectives. The conference is just too big these days for me to be able to see it all."





MANAGEMENT

OFF THE PRESS
Michael L. Sullivan-Trainor

BOOK REVIEWS

CONTROLLING SOFTWARE DEVELOPMENT
By Norman Statland

Calling upon a collection of his client's information management philosophies, Norman Statland, national director for Price Waterhouse & Co.'s Information Resource Management Service, presents a methodical review of management techniques for controlling software development. The subtitle targets the audience: "A Guide for Information Resource Managers."

Aimed at corporate information resource managers, the book has a broader focus than the title suggests. Statland discusses the place of the information resource and the information manager within the corporation and provides a step-by-step approach to software development.

He discusses common errors in information resource management, such as relying on technical specialists or vendor promises to ensure a company's computers are being used to their best advantage. Statland responds to these issues by emphasizing the need for control through appropriate procedures and an understanding of how information resources contribute to corporate objectives.

Citing examples from his wide experience, he presents an overview of system development activities, including a basic system development life cycle for the construction of information processing software. He follows with advice on how to develop reliable computer programs and a review of the role of the project manager. Also covered are methods for determining costs and forecasting the future of systems development.

Hardcover, 182 pages, $32.95, ISBN 0-471-87505-8, by John Wiley & Sons, Inc., 605 Third Ave., New York, N.Y. 10158.

CD-ROM — THE NEW PAPYRUS
Edited by Steve Lambert and Suzanne Ropiequet

How do you produce a comprehensive book about a controversial new storage technology, like compact-disk/read-only memory (CD-ROM), that has prompted as many advocates as doubters?

Consult the experts, of course. Starting with Microsoft Corp. Chairman William H. Gates, the editors do just that, compiling 44 eloquent essays by a wide variety of authors, all of whom recognize the potential of CD-ROM and have become involved with it in some fashion.

Each section focuses on a specific aspect of the new technology, beginning with a look at the past contributed by Vannevar Bush, a pioneer in computer design and director of the U.S. Office of Scientific Research and Development during World War II. In an article reprinted from the July 1945 *Atlantic Monthly*, Bush describes the need for easily accessible new storage technologies.

The introductory section also includes a lively discussion of the marketability of CD-ROM titled, "Finally it works: Now it must play in Peoria," by David Miller, managing partner for DCM Associates, a San Francisco information resource management consulting and professional services firm.

From there, the editors get down to the business of what CD-ROM is, what it can do and who is implementing it where. They rely on a host of contributors, including Leonard Laub, a researcher, author and founder of Vision Three, Inc., a systems consulting firm; Bill Zoellick, manager of software research at TMS, Inc., a Stillwater, Okla., firm specializing in digital laser technology; and Jock Gill, president of Computer Access Corp., a Belmont, Mass., text-retrieval software and hardware company.

The elements of design using CD-ROM and the technology's potential impact on publishing are covered by Gabriel Ofiesh, Professor Emeritus of Educational Technology at Howard University in Washington, D.C., and Brian Martin, a consultant in systems and product development, among many others.

Turning to applications, the editors offer essays on the implementation of CD-ROM in the Library of Congress, medical and legal uses, geographic studies and archival and research activities.

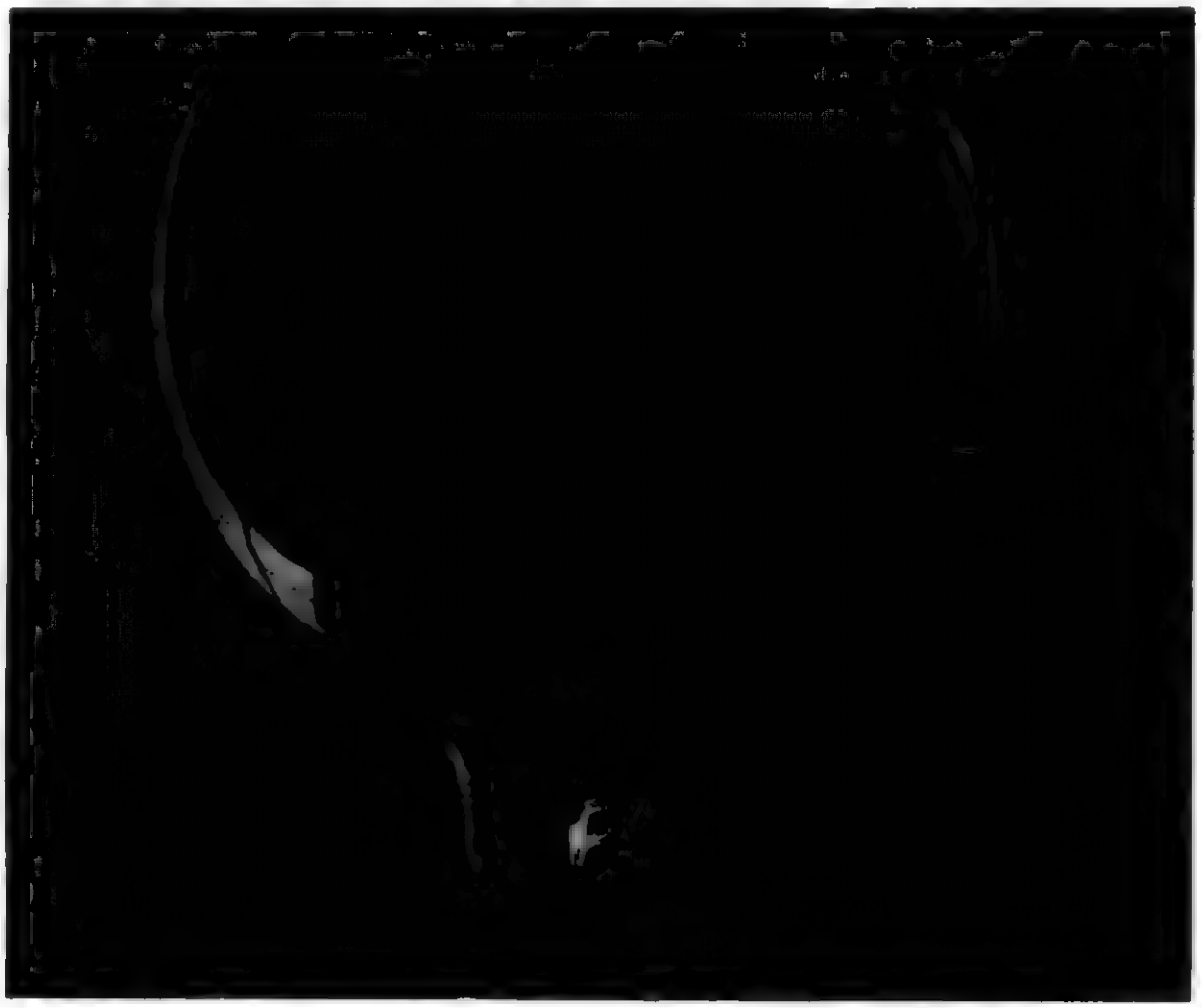
Softcover, 618 pages, ISBN 0-914845-74-8, $21.95, Microsoft Press, Box 97017, 16011 N.E. 36th, Redmond, Wash. 98073.

DICTIONARY OF DATA COMMUNICATIONS, SECOND EDITION
By Charles Sippl

The marriage of telecommunications and computing has brought forth an offspring — data communications, complete with its own terminology. This dictionary provides a quick reference guide to data communications in a range of areas including personal and business telecommunications; office, value-added and local-area networks; cellular radio and paging systems; electronic mail and message systems; satellite services; voice technology; and fiber optics and laser communications.

Sippl has been editor and publisher of computer industry newsletters and the author of several computer and communications dictionaries.

Softcover, 532 pages, ISBN 0-470-20256-4, $21.95, Halsted Press, a Division of John Wiley & Sons, Inc., 605 Third Ave., New York, N.Y. 10158.



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Management gets the perks

From page 69

with on-line and data communications skills command about a 10% to 12% compensation premium over those with comparable experience in similar operating environments.

"More and more packages are giving on-line capabilities. More and more shops are gaining access to information instantaneously," he said. Professionals who "can allow one machine to talk to another have the hardest time leaving" an employer, McMahon added.

Those findings are echoed in a survey of compensation for data processing professionals in Southern California, conducted by Positive Support Review, Inc., a Los Angeles consulting firm.

That study found higher salaries and perks being provided to specialists in operating systems and data base administration as well as in data communications and, to a lesser extent, in on-line systems.

The perks include profit sharing, club memberships, company cars, trips, seminars and personal computers for home use. "We are seeing more and more firms paying high premiums to attract and retain the data processing talent they need," said John Clarke, a senior partner with Positive Support Review.

According to the survey, the perks also go to all senior data processing executives and, increasingly, to department and project managers. Clarke attributed the increasing popularity of perks to many companies' belief that they need information technology to maintain a competitive edge.

In a related development, McMahon of Consultants to Executive Management noted that with the supply of data processing professionals moving closer to the number in demand, it is increasingly important for job applicants to view data processing as a tool and to avoid jargon when communicating with users.

A well-rounded manager

He suggested that anyone interested in entering the information systems field aim to become a well-rounded manager, rather than "a pure technician who wants to code all day."

A third survey by the American Management Association has found that, on the average, companies hiring a $28,000-per-year computer programmer can expect to spend $8,900 just to relocate him.

The association's report, "Hiring Costs and Strategies," examines companies' expenses for employment agencies' fees, executive search firms' fees, referral awards, advertising, travel, lodging and entertainment.

Many companies expect to pay 25% of an employee's salary to an employment agency that places him and 30% to an executive search firm that does so, according to the report.

Such expenditures may be yielding more for employers. The study by Consultants to Executive Management found that the average stay of information systems personnel at companies seems to be lengthening from 18 months to about 24 months.



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Sync-Up is versatile. It's available with the following UDS software options: DIAL for use with your existing emulator package; BSC for 2780/3780 or 3270 emulation; or SNA for 3270 or 3770 emulators. It supports most other synchronous communications packages.

Sync-Up is economical. Prices start at $625, quantity one, for a 201C without software.

Sync-Up is NOW. 201s and 208A/Bs are available for immediate shipment.

For technical details and complete pricing information, contact Universal Data Systems, 5000 Bradford Drive, Huntsville, AL 35805. Telephone 205/721-8000; Telex 752602 UDS HTV.

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CALENDAR

JULY 13-19

JULY 13-18, CHICAGO — **Guide 65.** Contact: Guide International Corp., 111 E. Wacker Drive, Chicago, Ill. 60601.

JULY 14-17, BOSTON — **Software Trends for Executive Planning and Strategy.** Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

JULY 16-18, WASHINGTON, D.C. — **SNA Architecture and Implementation Seminar.** Contact: Communications Solutions, Inc., 92 S. Saratoga-Sunnyvale Road, San Jose, Calif. 95129.

JULY 17-18, PALO ALTO, CALIF. — **CD-ROM Product Development: What Does It Take?** Contact: Claudia Isaacoff, Information Industry Association, Suite 800, 555 New Jersey Ave. N.W., Washington, D.C. 20001.

JULY 20-26

JULY 20-23, TORONTO — **Directions at Toronto.** Contact: Cincom Systems, Inc., 2300 Montana Ave., Cincinnati, Ohio 45211.

JULY 21-22, SAN JOSE, CALIF. — **Computer-Aided Logistics Support.** Contact: Education Foundation of the Data Processing Management Association Seminars, Dept. CALS, P.O. Box 3608, 3420 Kashiwa St., Torrance, Calif. 90510. Also being held July 24-25 in Los Angeles.

JULY 23-25, BOSTON — **Microtrends '86, Education: Redirecting the Revolution.** Contact: Bobbi Hunt, International Communications Industries Association, 3150 Spring St., Fairfax, Va. 22031.

JULY 23-25, MORRISTOWN, N.J. — **Data Communications: Fundamentals and Beyond.** Contact: The American Institute, Carnegie Building, 55 Main St., Madison, N.J. 07940. Also being held July 30 to August 1 in Los Angeles; August 6-8 in Anchorage, Alaska; August 13-15 in Boston; and August 20-22 in Indianapolis.

JULY 24-25, ATLANTIC CITY — **Integrated Logistics Support.** Contact: TTS Seminars, c/o Technology Training Corp., Dept. ILS/LSA, P.O.

See CALENDAR page 75

Scouts pledge to go on-line

From page 69

supplying technical support, programming, customer service and assistance in determining hardware and software requirements.

Last March, a users group composed of 12 council representatives met for the first time. The group is expected to meet every six months to discuss systems needs and the problems of automating the councils. The members — two from each of six regions — are picked by regional directors.

The automation program began early last year. So far, about 100 of the 412 councils have acquired their own computer systems. Another 20 to 30 are expected to do so by year's end. The computer systems vary in power depending on the size of the council, which ranges from 1,000 to 75,000 members.

At present, all but one council with stand-alone systems use Texas Instruments, Inc. Business System 300A or 600A series minicomputers, according to Page Carwile, director of council information services.

The primary application for these systems is the organization's Membership Support System (MSS), a software program that was written in-house to compile scout membership data.

The New York City council has installed an IBM System/36 Model 5360, for which the headquarters recently developed MSS. Other councils are expected to follow suit. This summer, four to six small councils will act as beta-test sites for MSS running on generic IBM Personal Computer AT clones.

In the past, up to 130 councils used TI's Silent 700 terminals to dial into the headquarters' host computer, an IBM 4381, and access general ledger and fund-raising software. Those are being phased out in favor of the stand-alone systems, although about 80 of the Silent 700s remain in use.

Along with MSS, Boy Scout headquarters has developed or acquired applications in accounts payable, payroll, general ledger and fund-raising for councils using the TI systems. To date, only MSS is available for councils using the System/36 or PC AT clones. Additional applications are being developed for those systems, Carwile says.

To transmit membership data — the only data sent to headquarters — councils use the General Electric Information Services Co. (GEISCO) network. GEISCO collects a subset of all data transmitted during a day's time, then batch processes it for the IBM 4381 to add to its data base the next morning.

Larger quarters

Despite the need to keep expenses down, the information systems division will soon move the mainframe and peripherals from its headquarters' 15,000-sq-ft space to a 25,000-sq-ft facility across the street, according to James H. Rowe, director of data processing.

"We need a bigger machine room, as there is not enough space now to add anything, and other departments in the building can certainly use the space that the move will free up," Rowe says.

The IBM 4381 is "running at very high capacity" now, he adds, and a larger processor, most likely an IBM 3090, is being considered for installation in 1987. In the meantime, additional software applications, including camp management and inventory control, are being developed for the councils.

"Data processing people are bells-and-whistles people by nature," says Information Systems Director Spalter.

"We have a tendency to look at the newest and the brightest. But at Boy Scouts, we have to be careful to look at the underlying needs and at all the alternatives closely. Anything we spend in the national office, if we can't recover those costs, we wind up with fee increases. And that means less scouts."

CALENDAR from page 74

Box 3608, 3420 Kashiwa St., Torrance, Calif. 90510. Also being held July 28-29 in Orlando, Fla., and July 31 to August 1 in Washington, D.C.

JULY 24-25, SAN FRANCISCO — **Advanced Communications Architectures Seminar.** Contact: Communications Solutions, Inc., 992 S. Saratoga-Sunnyvale Road, San Jose, Calif. 95129. Also being held August 19-20 in Washington, D.C.

JULY 24-25, WASHINGTON, D.C. — **EDI Training Session.** Contact: TDCC, 1101 17th St. N.W., Washington, D.C. 20036. Also being held August 21-22 and September 25-26 in Arlington, Va.

JULY 27 TO AUG. 2

JULY 27-30, BOSTON — **Recognition Technologies Users Association Forum '86 Summer Session.** Contact: Recognition Technologies Users Association, P.O. Box 2016, Manchester Center, Vt. 05255.

JULY 27-31, ANAHEIM, CALIF. — **Third Annual Information Center Conference & Exposition.** Contact: Information Center Conference & Exposition, Weingarten Publications, Inc., 38 Chauncy St., Boston, Mass. 02111.

JULY 28-29, AVON, COLO. — **How to Manage Data and Information as a Resource.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

JULY 28-30, RENO, NEV. — **1986 Summer Computer Simulation Conference.** Contact: The Society for Computer Simulation, P.O. Box 17900, San Diego, Calif. 92117.

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How info execs can get respect

From page 69

lead their organization into the age of end-user computing.

One consultant from a Big Eight accounting firm acknowledged the importance of avoiding jargon and understanding bottom-line needs. He said there are a lot of competent MIS managers around, "but they're so tied up in their jargon they scare off everbody."

But others who were questioned dwelt on the need to help users, a function that has rapidly grown in importance with the spread of personal computing.

The president of an MIS research center said he thinks it's time MIS managers listened to end users. For a long time, MIS managers felt they knew what turned on their users, he said. They expected users to shape their work to conform to MIS department systems, but users won't stand for that any longer, he explained.

MIS managers have acted as controllers rather than facilitators, interfering with users' work, said an MIS manager from a major Midwestern university.

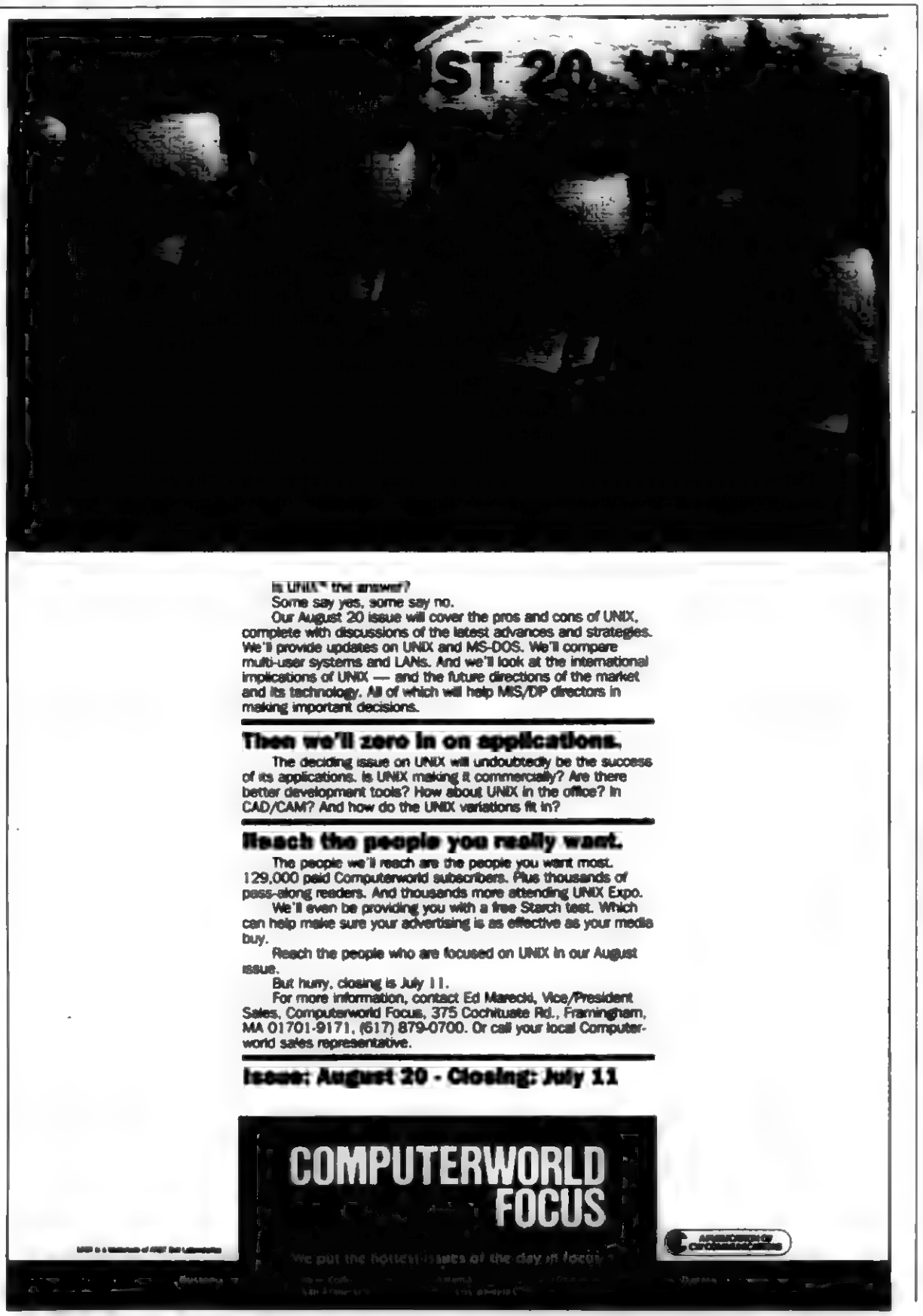
"It would be like saying, 'I'm from the government, and I'm here to help you,'" he said.

Helping users boils down to making a contribution to the company's bottom line, according to an MIS support services manager for a utility.

In the process, it's important for MIS executives to avoid turf battles over computer operations, a software development manager cautioned, saying that these managers have to put corporate goals ahead of their department's goals.

Information systems managers might find some help for their efforts to address corporate needs from a suprising source — the demands of tightened purse strings, one manager noted. He said slimmer budgets have forced him to be more circumspect in justifying projects.

But the most important thing MIS executives must do to become more attuned to corporate needs is to examine their own weaknesses, the Big Eight consultant said. That might mean getting trained in hot business areas that they are not strong in, such as finance. But whatever it takes, "it's going to depend a lot on him and not on his company," the consultant said.



Planning for fast growth

While David's Cookies is installing a personal computer network, managers of many other fast-growing small companies are usually so preoccupied with day-to-day problems that they rarely have time for the planning required to start and maintain computer operations, according to management consultants.

Many firms, small and large, usually do things backwards, says Eric Knutsen, vice-president for consulting services at Gartner Group, Inc. "They buy the hardware and then find a programming analyst or technical guy. They then call in a consultant who says, 'Let's make a plan!'"

What does proper planning entail? Knutsen says it means projecting systems requirements at least two years into the future.

Joe Scordato, president of Management Services Group, Inc. of West Nyack, N.Y., and president elect of the Independent Computer Consultants Association, suggests two sets of plans: a strategic one for computing needs over a five-year period and a tactical one covering a one- to two-year period.

Planning should also distinguish between functions performed by the information systems (IS) department and duties handled by end users. "That will determine how the IS department should be staffed," Knutsen says.

Picking appropriate software should precede hardware selection, since the software is key to estimating productivity gains, Knutsen says.

With the price of hardware descending rapidly, he adds that small companies should plan to purchase processing capacity in excess of their projected needs. "Hardware is the only bargain companies are going to get, so they should buy a computer as large as they can afford because they'll run out of capacity sooner or later," Knutsen explains.

Companies just beginning their computer operations should focus on automating functions critical to the company's mission rather than computerizing everything at once, he said. Small firms also should consider using plain-vanilla equipment.

— Alice Rigdon

David's Cookies selects net vendor

From page 69

patible application software. "They also have to be available for training and troubleshooting and offer a maintenance contract," he adds.

The firm is not adding an MIS manager right away, but Downing acknowledges one will be needed in the long term. "We can't justify an MIS person right now, but somewhere down the road, we'll need one."

NEW PRODUCTS

MS-DOS shell eases micro use

Peter Norton Computing, Inc. of Los Angeles has announced the Norton Commander, a $75 control and file management package aimed at hard disk-based IBM Personal Computers and compatibles.

The software was reportedly designed to assist users in executing some of the most common Microsoft Corp. MS-DOS commands, such as copying, deleting and renaming files.

According to the vendor, the utility package also contains many commands not found in MS-DOS. It can simultaneously display two disk directories, perform commands on selected groups of files, allow for instantaneous editing and viewing of files and simplify movements of files from one directory to another.

The Norton Commander places two working panels on the top left and right corners of the screen and a menu bar on the bottom of the screen, leaving the rest of the screen as usual.

Files listed in summary form

The directory panels include the name, extension and time or size of files. Files can also be listed in summary form. Additionally, files can be displayed according to time created, size or extension or sorted alphabetically.

The Norton Commander offers both one- and two-panel modes. One-panel mode is aimed at data and program access and leaves most of the screen clear. The two-panel mode is suited for disk maintenance operations such as file transfer.

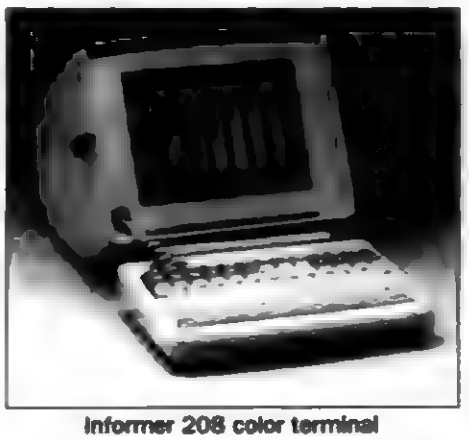
A key feature of the Commander, a company spokesman said, is point and shoot, which allows users to point to something, either with a cursor key or a mouse, and "whatever is pointed at gets done." Another feature of point and shoot is that it enables users to tell the Norton Commander in advance that any time they work with a particular data file, they also want to work with a particular software application. Then that application will automatically boot along with the data file, according to the vendor.

Available now, the Norton Commander takes up 10K bytes of random-access memory.

Informer terminal debuts

Color portable workstation offers IBM 3274 emulation

Informer Computer Terminals of Laguna Hills, Calif., has introduced the Informer 208 color portable workstation that connects to an IBM 3270 communications network and is said to be functionally equivalent to IBM's 3274-51C controller and 3179 color terminal.



Informer 208 color terminal

According to a company spokesman, the Informer 208 workstation offers full IBM 3274 and 3179 emulation using either IBM 3276 system network architecture/synchronous data link control or binary synchronous communications protocol.

Each emulation utilizes direct RS-232C or dial-up connection to the mainframe through any one of six integral modem options. These built-in modem options include V.22 bis, 208B/V.27 and 201C/V.26. As an additional feature, each Informer 208 is said to include an external asynchronous ASCII printer port for use with Informer's Model 287 or other compatible asynchronous printers.

The Informer 208 color portable workstation features a high-resolution nine-in. color monitor and flip-down keyboard. The high resolution is achieved by the use of liquid crystal shutter technology that results in crisp characters with a flicker-free image and greater contrast, convergence and durability, the vendor stated.

The standard Informer 208 is priced at $2,995. Equipped with an optional V.22 bis integral modem, it costs $3,595.

The Informer 208 model is the newest addition to the Informer family that includes the Informer 211 Personal Computer adapter, a module that gives IBM Personal Computer, Personal Computer XT and AT users connection to IBM mainframes; the Informer 207, a 14-pound portable monochrome terminal; the 205, a compact data entry workstation with a 12-in. screen and the Informer 203, a nine-in. screen with the features of a full-size model.

Options such as integral modems, a built-in security feature and dual and triple emulation are available for the Informer 208 in any of five standard packages.

Novell software bridges LANs

Novell, Inc. of Orem, Utah, has announced the release of Netware Bridge Software, a product that allows communication between local-area networks (LANs).

Netware Bridge Software is said to allow a dedicated or nondedicated workstation on any LAN running Version 2.0 or higher of Novell's Advanced Netware operating software to support up to four like or unlike network interface cards. In addition, LANs will be able to support multiple bridges. With this product, the vendor stated, users on different LANs can communicate with each other and access each other's file servers.

The external bridging capability is an addition to the internal bridging inherent in Advanced Netware 2.0. However, Netware Bridge Software resides in a workstation rather than in the file server. According to a company spokesman, the internal and external bridge are similar but have different applications.

According to the vendor, Netware Bridge Software can act as a repeater to extend the recommended distance between the workstation and file server.

Netware Bridge Software is priced at $395, including software and user manual.

Smaller chips increase space, savings on Ideassociates multifunction boards

Claiming increased space and cost economies, Ideassociates, Inc., of Billerica, Mass., has announced two add-in multifunction boards that use surface mount technology, which is said to save space by placing smaller chips closer together on both sides of the board instead of just on one side.

The company's All Aboard product is said to provide all the essential add-on functions for an IBM Personal Computer XT. The second product, Overboard, is a half-length graphics adapter that fits into the short slot of an IBM PC XT or AT.

All Aboard reportedly combines IBM's Enhanced Graphics Adapter (EGA) or IBM monochrome/color graphics with up to 2M bytes of expanded memory, a hard-disk controller, a serial port, a parallel port and a clock. Prices start at $545 and $795 for boards with monochrome/color graphics and EGA support, respectively. With expanded memory conforming to the Lotus/Intel/Microsoft Enhanced Memory Specification, the prices run $200 higher.

With monochrome/color graphics support, Overboard's price is $396. With EGA support, it costs $596. Deliveries are scheduled for July.

Luma picture phone bows

Transmits, receives stills over regular phone lines

Luma Telecom, Inc. of Santa Clara, Calif., has introduced Luma, a picture-transmission desktop telephone.

According to the vendor, Luma is said to send and receive black-and-white, freeze-frame, still-picture snapshots in one to five seconds over regular phone lines.

Luma, which is about the same size as an ordinary business phone, is said to weigh 8 lbs. Its electronic components, including the screen, camera and phone, are contained in one unit, priced at $1,450.

According to the vendor, to use Luma a caller selects a live, full-motion image then presses a button to freeze and transmit the picture.

In addition to its picture-transmission capabilities, Luma is said to include a number of operating features including hands-free calling and a screen-display directory that can hold up to 100 names and numbers.

Some options available for Luma include a video printer said to instantly reproduce screen images on paper and a variety of lenses, such as close-up and wide-angle lenses, for enhancing pictures of objects and graphics.

INSIDE

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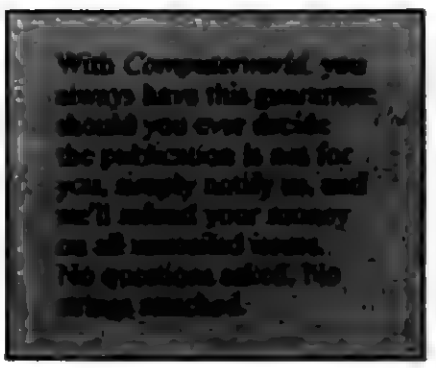


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The Appgen Applications Generator costs $6,000, and most applications cost $600.

Software Express, 7th Floor, 2925 Briarpark Drive, Houston, Texas 77042.

■

Datametrics Systems Corp. has released **Version 2.0** of its **Torch/Performance Management System** (PMS), a software package for use with Sperry Corp.'s Sperry 1100 computer systems.

Torch/PMS is said to produce a series of management and technical reports that describe the performance of the system, pinpoint problem areas and highlight system utilization trends for long-term planning purposes. Torch/PMS also provides scatter plots and performance reports, according to the vendor.

The price of the Torch/PMS ranges from $29,700.

Datametrics Systems, 9840 Main St., Fairfax, Va. 22031.

■

Hewlett-Packard Co. has introduced its **HP Teamwork/Structured Analysis**, a software program to help software engineers develop and manage software specifications.

The program is said to include a project library that serves as a central data base, a user interface that provides windows into the project library and an intelligent editor that can build data-flow programs.

The software is a companion product for the HP 6400 logic-development system.

The HP Teamwork/Structured Analysis costs $8,900.

HP, Inquiries Manager, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

Applications packages

GSI Transcomm Data Systems, Inc. has announced its **Tolas Version 6.2** application software package.

Some of the features of Tolas 6.2 include a window of information that defines or lists processing options and on-line documentation capabilities. The natural language independence feature enables programmers to change the contents of the screen without altering the application program.

Tolas Version 6.2 is compatible with Digital Equipment Corp.'s line of VAX minicomputers.

Tolas Version 6.2 costs from $5,000 to $36,000 per module.

GSI Transcomm, 1380 Old Freeport Road, Pittsburgh, Pa. 15238.

FMT Associates, Inc. has introduced **Labels/3000**, a mail list and label system for the Hewlett-Packard Co. HP 3000.

The product consists of more than 24 programs for imprinting postcards, folder labels, shipping labels and Rolodex cards. Function keys support display record, add record, delete record, on-line Help, print screen and change function.

Labels/3000 also comes with a file maintenance program that removes duplicates and provides a list of possible duplicates. Linkage to other systems is provided through an intermediate ASCII file.

Labels/3000 costs $1,800.

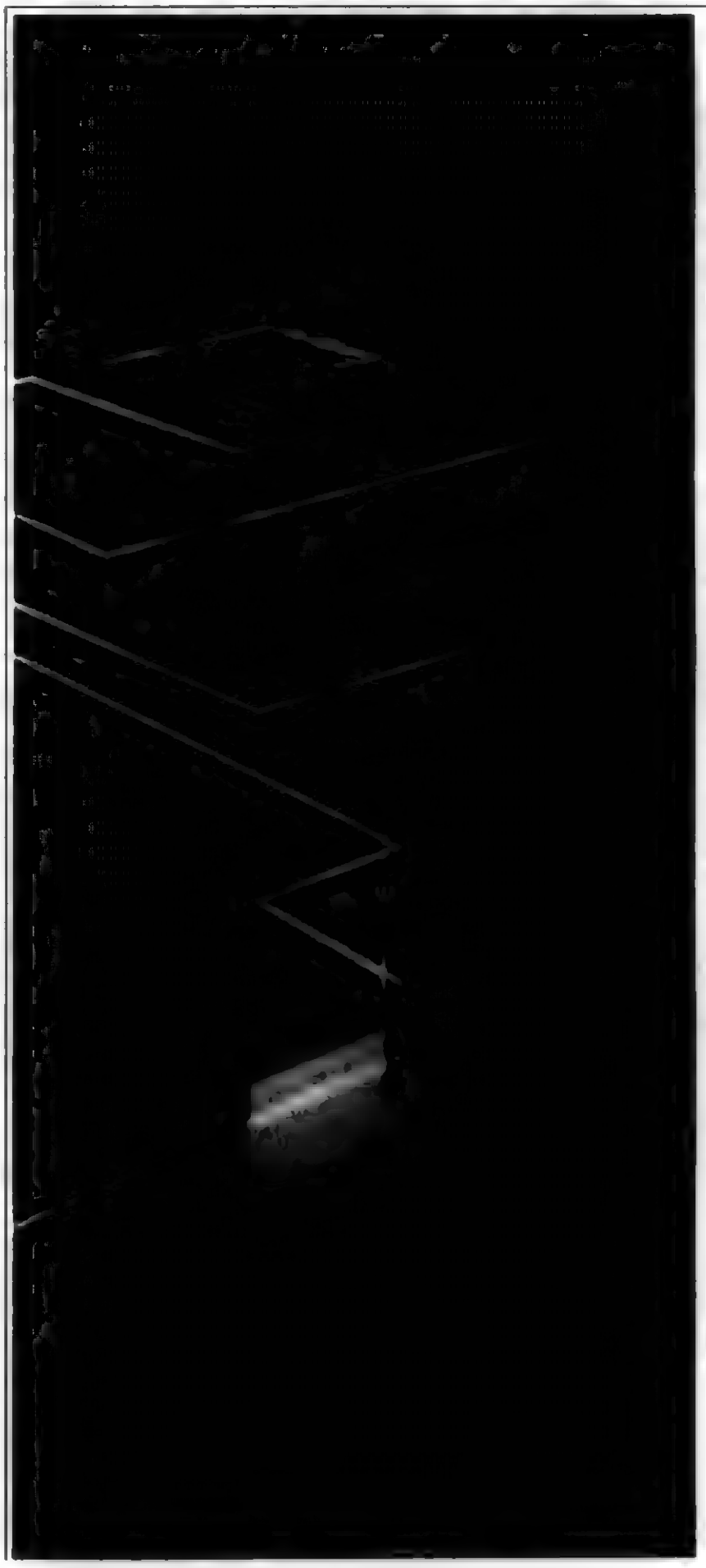
FMT Associates, 6475 Fox Run Circle, Jupiter, Fla. 33458.

■

Sherpa Corp. has announced **Sherpa Data Management System** (DMS) for tracking and controlling a design project through its life cycle.

Sherpa DMS is a Digital Equipment Corp. VAX-based system said to be capable of both data management and process management functions. It can manage schematic diagrams, parts lists, design drawings and other design files. Other features are said to include record management, enforcing design methodologies and re-

Continued on page 80



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Continued from page 79

lease procedure control.

Sherpa DMS costs from $59,000 to $80,000.

Sherpa, 2355 Old Oakland Road, San Jose, Calif. 95131.

■

Hewlett-Packard Co. has introduced its **HP Printed Circuit Design System**, a computer-aided design package.

The HP Printed Circuit Design System couples printed-circuit board layout with electrical engineering design, manufacturing and testing. According to the vendor, it features automatic packing and placing, a component library, automatic routing and manufacturing and test links.

HP Printed Circuit Design System costs from $60,000 to $82,000.

HP, Inquiries Manager, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

Utilities

Decision Technology, Inc. has announced its **Decision Analyzer** for use under CICS/VS, TSO or CMS.

The Decision Analyzer retrieves data directly from data bases, standard IBM file types or user-customized file types. It includes an ISPF-like editor for preparation of requests and review of the output.

The Decision Analyzer runs in fewer than 256K bytes of storage and the on-line query feature is designed so that only two or three I/O's are required to access and display any record in a several-million-record file.

The Decision Analyzer costs $48,000.

Decision Technology, 1020 U.S. Rt. 1, Princeton Corporate Center, Princeton, N.J. 08540.

■

Goal Systems International, Inc. has introduced **FAQS/VM** for spool and console file management.

FAQS/VM is said to be divided into two components: Viewsp, which provides enhanced capabilities for VM spool files, and Viewcon, which offers enhanced console file management including real-time scrolling and hardcopy file archiving to tape.

FAQS/VM provides extended color support for IBM 3179 and 3729 terminals. FAQS/VM operates under VM/SP or VM/HPO Release 3 and above on IBM and compatible 370, 4300 and 3000 computers.

FAQS/VM costs $4,760.

Goal Systems International, 5455 N. High St., Columbus, Ohio 43214.

■

Infodex, Inc. has introduced **Macrolock**, a utility for protecting proprietary programs under Data General Corp.'s AOS and AOS/VS operating systems.

Said to protect the software programs from unauthorized copying and tampering, Macrolock locks the software vendor's 32- or 16-bit product by permanently modifying the proprietary program file. A locked program will not work until unlocked by entering the correct password.

Macrolock costs $7,500. Macrolock II, an enhanced version for vendors who charge term license or software service fees, costs $12,000.

Infodex, 7000 Boulevard E., Guttenberg, N.J. 07093.

Process Software Corp. has introduced **VIOSA**, a software package for high-resolution RS-170 video image processing on Digital Equipment Corp. systems.

VIOSA is said to operate with the Datacube, Inc. QVG/AFA video imaging hardware. With a RS-170 resolution of 512 pixels vertically by 768 pixels horizontally, Datacube's QVG/AFA and VIOSA are said to combine to give any DEC VAX or PDP computer high-resolution video imaging capability.

According to Process Software, VIOSA can be used in computerized applications that make use of real-time video signals.

The cost of VIOSA ranges from $695 to $895, and it is available for immediate delivery.

Process Software, P.O. Box 746, Amherst, Mass. 01004.

Levi, Ray & Shoup, Inc. has announced its **VPS Monitor and Control Facility** (VMCF) command interface for its VTAM Printer Support System (VPS).

VMCF is said to add full-screen, menu-driven command entry facilities for controlling both local and remote printing on the IBM 3270 family of printers in an IBM MVS environment.

According to the vendor, VMCF gives VPS users full-screen JES2 queue manipulation capabilities, including the ability to change the characteristics of any given output group.

The VPS software, which includes the VMCF facility, is priced at $11,000. The CICS-based VMCF facility is priced at $2,500.

Levi, Ray & Shoup, 2387 W. Monroe, Springfield, Ill. 62704.

• **Chi/Cor Information Management, Inc.** has announced its **Report Routing System** for expediting the report routing capabilities of systems in multiorganizational and decentralized operating environments.

The system provides for the distribution of one or more copies of all or a part of a report to different people in a single location or in remote locations. The Report Routing System allows entire reports or specific pages to be selectively routed to one of several output queues. Input to the Report Routing System is a standard print image file.

The Report Routing System runs on IBM mainframes under OS/MVS, DOS/VSE and VM/SP.

It costs $8,000.

Chi/Cor Information Management, 10 Riverside Plaza, Chicago, Ill. 60606.

What's missing from this picture?



MICROCOMPUTERS

Software applications packages

Hewlett-Packard Co. has introduced **Graphics Gallery**, graphics software for its Vectra personal computer as well as IBM Personal Computers and compatibles.

Graphics Gallery consists of two programs. The Drawing Gallery includes 15 text fonts and allows users to create, draw and edit business graphics, including text charts, organization charts and flow diagrams.

The Charting Gallery permits users to originate pie, bar and line charts from original data or data from other software programs.

Charts developed in Lotus Development Corp.'s 1-2-3 and Symphony programs can be integrated into the Charting Gallery.

The Drawing Gallery costs $395, and the Charting Gallery costs $295.

HP, 1000 N.E. Circle Blvd. Corvallis, Ore. 97330.

■

Samna Corp. has announced a version of its **Samna+** office automation software program for the AT&T Unix Personal Computer 7300.

Samna+ is a document processing package that combines word processing and spreadsheet applications.

New features that take advantage of the AT&T Unix System V operating system include support for six different AT&T terminals and terminal emulations, windowing applications as well as toggling between Samna+ and the PC 7300 User Agent program, according to the vendor.

Samna+ is priced at $745.

Samna, 2700 N. E. Expressway, Atlanta, Ga. 30345.

Software utilities

The Software Bottling Co. has announced **Flash-Up Windows**, a memory-resident utility that allows users to automatically create menu and Help windows.

According to the vendor, windows created using Flash-Up Windows' window editor can be incorporated into most software programming languages.

Flash-Up Windows is said to provide an interface that can be used for almost all of a programmer's applications.

The Flash-Up Windows is priced at $75.

Software Bottling, 6600 Long Island Expwy., Maspeth, N.Y. 11378.

■

American Computer & Peripheral, Inc. has announced the **386 Translator**, a software development tool.

The 386 Translator is said to plug into the Intel Corp. 80286 CPU pin grid array socket of an IBM, American AT or compatible to transform the system into an Intel 80386 programming environment.

The 386 Translator is priced at $395 without the Intel 80386 chip and $895 with the 80386 chip.

American Computer & Peripheral, 2720 S. Croddy Way, Santa Ana, Calif. 92704.

■

M/H Group has announced its **Archive-Link** software, which provides disk-to-disk document conversion for IBM Personal Computers and compatibles.

According to the vendor, Archive-Link converts documents stored on Wang Laboratories, Inc. Office Information System or VS 5¼-in. archive disks to IBM document formats, including Ashton-Tate's Multimate, IBM's Displaywrite, Wordperfect Corp.'s Wordperfect, Wordpro International's Wordstar and Office Solutions, Inc.'s Officewriter document formats.

The Archive-Link technique is said to provide clean, editable documents after conversion. Format lines, word wrap, underscoring, superscript and subscripts are preserved in the conversion.

Archive-Link is priced at $395.

M/H Group, 222 W. Adams, Chicago, Ill. 60606.

Software data base management systems

Unify Corp. has announced that its **Microsoft C Interface** will be included with every development license of its Unify data base management system for Microsoft Corp.'s MS-DOS.

The Microsoft C Interface has more than 100 routines that will allow programmers to reach all parts of the DBMS, from high-level screen and menu handlers to the lowest level data management access.

The DBMS development license, including Microsoft C for MS-DOS, is priced at $995.

Unify, 4000 Kruse Way Place, Lake Oswego, Ore. 97034.

■

Digital Matrix Services, Inc. has announced its computer-aided design product **Digicad** and a graphics relational data base manager **Digibase**.

Digicad supports 12 different line styles and a variety of shading and traces. It allows one monitor to act like six independent monitors. It also allows the user to size drawings by positioning them on the paper.

Digibase works with both text and numeric data. It allows graphic images such as pie charts and entire floor plans to be stored and retrieved.

Both products run on IBM Personal Computers, Personal Computer XTs or ATs. Together, they cost $2,500. Digibase alone costs $1,000.

Digital Matrix Services, 1275 Sweeten Creek Road, Asheville, N.C. 28803.

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IBM does offer a way to connect their desktop computer to a monitor, printer or external modem—but only if you pay extra. COMPAQ *builds in* these extras. Just as we build in shock isolation systems to protect data. We also build in high-resolution text *and* graphics so you need only one monitor, not two. What's more, true compatibility makes COMPAQ Computers ideal for connecting to mainframes, minicomputers or to networks.

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NEW PRODUCTS/MICROCOMPUTERS

Lotus Development Corp. has announced the **Personal Engineering Resource Directory**, a list of third-party products that work with 1-2-3 or Symphony.

The directory includes descriptions of software and hardware targeted at scientists and engineers, along with data acquisition hardware and software. Listings include product pricing, vendor names and addresses, and hardware and software requirements.

The directory is free. The next version will be out this fall.

Lotus Development Corp., 161 First St., Cambridge, Mass. 02142.

Auxiliary equipment

Network Technologies, Inc. has introduced the **Montest-25K**, a portable video generator for testing the AT&T Personal Computer 6300 color or monochrome monitors.

The Montest-25K is battery powered. It features four patterns and generates red-green-blue, horizontal and vertical sync, transistor-to-tranistor logic compatible signals. Features include a horizontal scanning rate of 25.8 kHz, a vertical rate of 59.8Hz and 400 displayed lines.

The Montest-25K is priced at $199.95.

Network Technologies, 19145 Elizabeth St., Aurora, Ohio 44202.

EKD Computer Sales & Supplies Corp. has announced **Teleswitch**, a remote-, phone- or modem-activated power-control device for microcomputers.

Teleswitch is said to enable a remote, password-authorized caller to turn on a powered-down personal computer or microcomputer and peripherals at any time from anywhere. A time-delay circuit will turn the power off five minutes after the caller gets off the line.

Teleswitch is priced at $229.

EKD Computer Sales & Supplies, 764 Middle Country Road, Selden, N.Y. 11784.

COMMUNICATIONS

Controllers

Digital Controls Corp. has introduced **Octagon**, a peripheral matrix switch for data channel reconfiguration.

Octagon is said to be field expandable from 4- by 4- to 8- by 8-matrix capacity. An optional secondary microprocessor is said to provide on-board intelligence to the switch, freeing the switch console to work with other applications.

According to the vendor, some of the features that come with the microprocessor options include a channel activity log and an electronic mailbox that reportedly stores user-generated messages either on a personal or global basis.

The cost of the Octagon matrix switch is $19,500. Lease options are also available.

Digital Controls, 3495 Newmark Drive, Miamisburg, Ohio 45342.

Protocol converters

Dynapac Systems has announced the **Hostpad** packet assembler/disassembler software option said to enable non-CCITT X.25 hosts to connect directly into a packet switching exchange (PSX) packet switch.

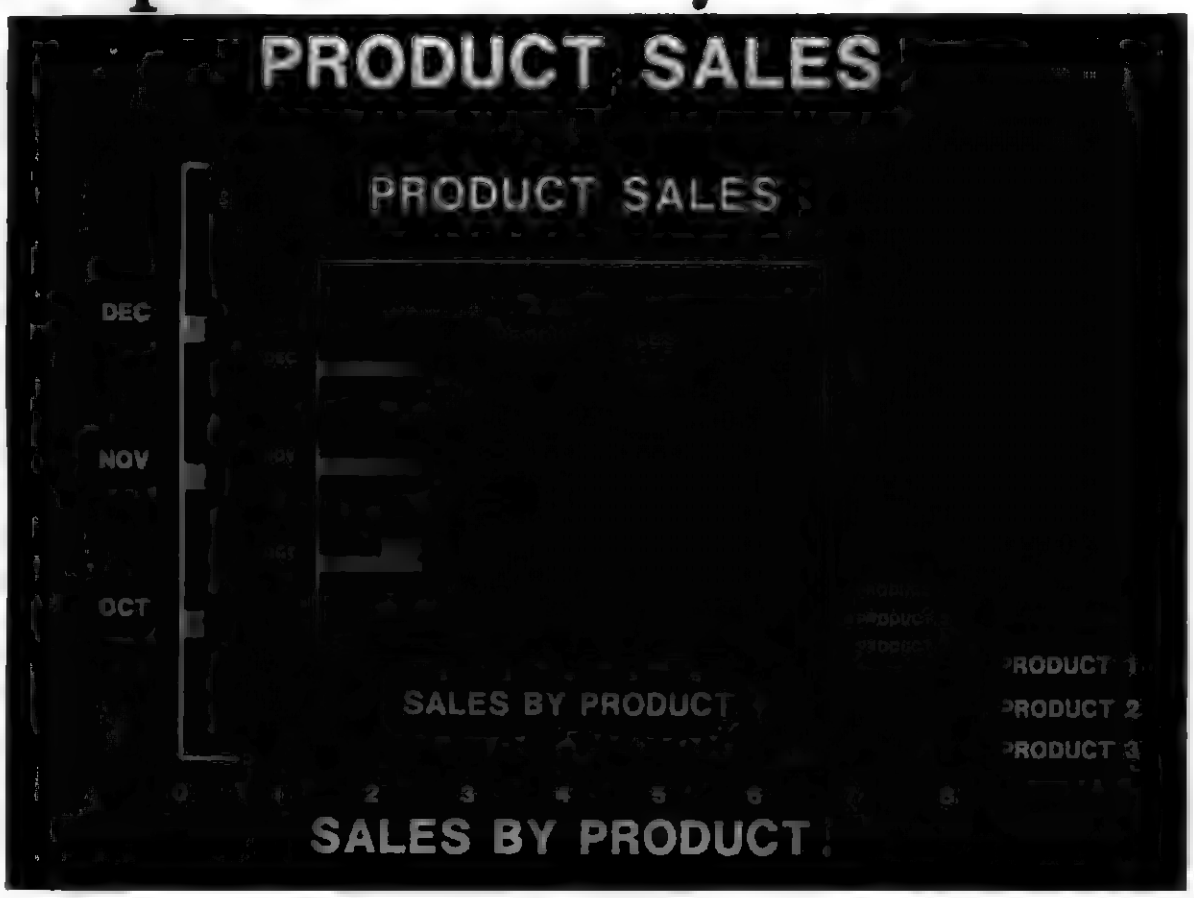
Hostpad works with the PSX for asynchronous hosts accessing X.25 networks and operates with an 8-port RS-232-C card to upgrade the PSX node for the packet assembler/disassembler.

With the Hostpad option, the PSX performs such functions as packet switching, network control and non-X.25 host interface.

The modular Hostpad option costs $1,000. Each 8-port RS-232-C card costs an additional $1,850.

Dynapac Systems, 5350 Shawnee Road, Alexandria, Va. 22312.

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NEW PRODUCTS/COMMUNICATIONS

Software

Bramalea Software Systems has announced **Netmail**, a combination electronic mail and information transporter for Prime Computer, Inc.'s Prime computer network.

Netmail is used to send messages and files from one Prime user to another. As an electronic mail system, Netmail's capabilities include distribution lists, registered and/or confidential mail, automatic reply addressing, filing and text editing.

Netmail costs $7,000 for the full network version, and a single-node version costs $2,000.

Bramalea Software Systems, 1867 Yonge St., Toronto, Ont., Canada M4S1Y5.

■

Telenex Corp. has announced **Autoscope**, a CCITT X.25 emulation package said to eliminate the need for user programming and to automatically interact with an X.25 network.

The X.25 emulator interacts with the user through the keyboard and formatted screens. The screens provide selection of all parameters and run-time options. According to the vendor, each state within the protocol is reportedly verified while the user directs the flow of events. A user can select an address, place a call and once the call is established, the emulator sends data packets to the selected address.

The Autoscope X.25 emulation package costs $1,500.

Telenex, 502 Pleasant Valley Ave., Moorestown, N.J. 08057.

■

Arkansas Systems, Inc. has announced its **Path-Thru** software and hardware for protocol conversion and communications control.

Path-Thru is said to enable IBM 3270 bisynchronous terminals to operate attached to IBM System/36 and 38 computers and optionally pass through the System 30 machines to access resources on IBM mainframes.

Path-Thru includes Arkansas System's Path II IBM Personal Computer-based protocol converter and communications controller and IBM 3270 emulation software running on the System/36 and 38.

Path-Thru costs $8,950.

Arkansas Systems, 8901 Kanis Road, Little Rock, Ark. 72205.

Multiplexers/Modems

The Remington Rand Corp. has announced its **Model 1200** intelligent modem.

The direct connect, stand-alone Model 1200 allows personal computers to communicate in full- or half-duplex mode over ordinary telephone lines. It features Hayes Microcomputer Products, Inc. compatibility and a data transfer rate of 1,200 or 300 bit/sec.

Other features include autodial and answer, automatic redial, real-time clock, busy signal detection, front panel diagnostic indicators and an internal power supply. It is Bell 212A and 103 compatible and works with computers equipped with RS-232 interfaces.

The Model 1200 modem is priced at $399.

Remington Rand, 6395 McDonough Drive, Norcross, Ga. 30093.

Promodem 2400, a modem said to operate at 2,400, 1,200 and 300 bit/sec. is being offered by **Prometheus Products, Inc.**

Promodem 2400 has a plug-in communications buffer card option that allows it to send and receive messages even if the computer is busy or turned off. A second option is a 12-char., front-panel alphanumeric display that functions as a clock when the modem is idle and indicates dialing status when the modem is in use.

Standard features include autoanswer and dial, Hayes Microcomputer Products, Inc. compatibility, tone or pulse dialing and call progress monitoring.

Promodem 2400 costs $595. The communications buffer costs $149, and the alphanumeric display is $99.

Prometheus Products, 4545 Cushing Pkwy., Fremont, Calif. 94538.

Local-area networks

The **Destek Group** has released **Desnet BIOS**, an IBM Netbios-compatible local-area network for Microsoft Corp. MS-DOS and IBM PC-DOS.

Desnet BIOS features language interfaces, network clocks and remote loaders. Desnet BIOS includes 2M bit/sec. carrier sense multiple-access collision detection protocols for S-100, IBM Personal Computer, Personal Computer XT and Intel Corp.'s Multibus products. It includes a Personal Computer AT bus network board that utilizes the full 16-bit transfer capabilities of the IBM PC AT and the IBM RT Personal Computer.

The Desnet BIOS costs from $600 to $800 per node for hardware and from $100 for software.

Destek Group, 830 E. Evelyn Ave., Sunnyvale, Calif. 94086.

Test equipment

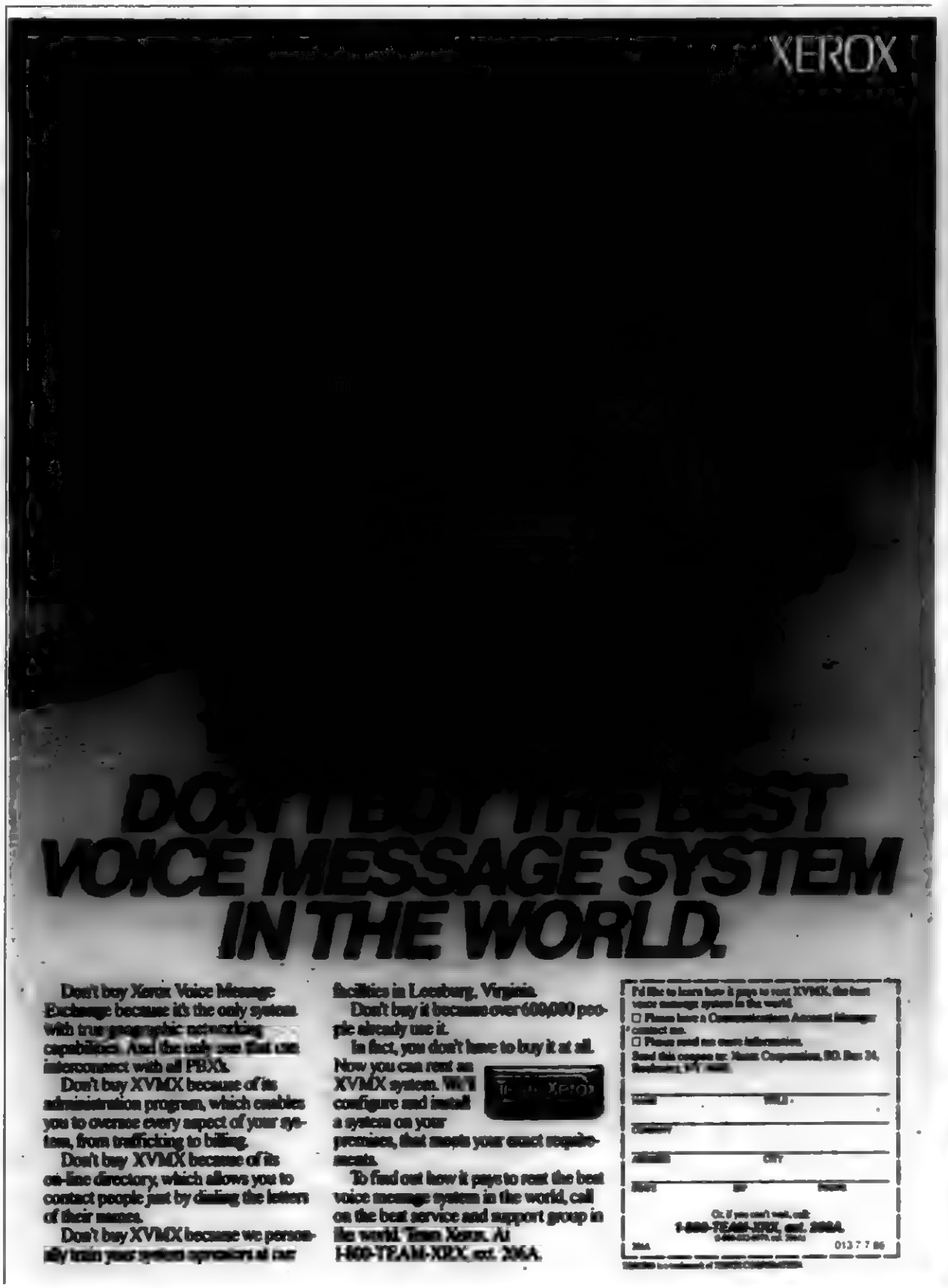
Northern Telecom, Inc. has added the **Datascope 2000** portable data line monitor and protocol analyzer to its Datascope product line.

Datascope 2000 is said to operate at speeds up to 19.2K bit/sec. in full-duplex mode, allowing the operator to look simultaneously at send and receive data. The unit has 800K bytes of storage on a 3½-in. floppy disk and a 192K-byte input buffer.

The Datascope 2000 unit has a RS-232 serial communication port and a parallel printer port. It automatically decodes most protocols, including asynchronous, bisynchronous, CCITT X.25 and IBM Systems Network Architecture.

The Datascope 2000 costs $3,650.

Northern Telecom, 8000 Lincoln Drive E., Marlton, N.J. 08053.



"The #1 place to recruit qualified computer professionals nationally is Computerworld."



Robin Schwartz
Employment and
Employee Relations Manager
McCormack & Dodge
Natick, MA

Robin Schwartz is Employment and Employee Relations Manager for McCormack & Dodge, a software company based in Natick, Massachusetts. She is responsible for recruiting people for the company's home office as well as its seven regional offices across the country. And earlier this year when Robin was looking for software applications sales and support people, she chose to run an ad in Computerworld.

"*I had numerous openings for positions across the country. From a cost-efficiency standpoint, Computerworld seemed like the logical choice,*" says Robin. "*But before finalizing my decision, I did a little investigating. I talked to our sales managers here at McCormack & Dodge — and they all agreed. The #1 place to recruit qualified computer professionals nationally is Computerworld. To keep in touch with what's going on in the industry, people have to read Computerworld,*" she explains.

McCormack & Dodge is enjoying national visibility as a result of the ad, but, more importantly, Robin is quite pleased with the responses. "*My people were right. We placed the ad in the beginning of the year and received tremendous response via our two-day hot line (800 number). And since we are still getting resumes, Computerworld obviously has a long life cycle through its pass-along circulation,*" she adds.

"*The quality of the responses has made our ad placement more than worthwhile,*" concludes Robin. "*The professionals responding to our ad are experienced, not just job changers. We are getting in touch with just the people we need to reach.*" In fact, according to Robin, "*Quite a few of the positions are already filled. Thanks to Computerworld!*"

Computerworld. We're helping employers and top professionals get together in the computer community. Every week. Just ask Robin.

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Framingham, MA 01701-9171/(617) 879-0700

A PUBLICATION OF CW COMMUNICATIONS

Auxiliary equipment

L-COM Data Products has announced its **Baluns** coaxial eliminator for computer system expansion.

According to the vendor, up to four terminals can be added to the IBM 3270 using Baluns twisted pairs instead of cables. Baluns is said to allow transmission of data up to 1,000 ft without performance degradation. Baluns is installed by use of screw terminals or RJ-11 connectors.

The CF-11 Balun is priced at $44.50.

L-COM Data Products, 1755 Osgood St., North Andover, Mass. 01845.

SYSTEMS & PERIPHERALS

Turnkey systems

Identix, Inc. has introduced its **IDX-10** identity verification system.

IDX-10 is a compact terminal that contains a patented fingerprint reader and intelligent hardware for fingerprint analysis. The IDX-10 allows access when a user's fingerprint matches a reading of the fingerprint stored in the host computer's memory. The system also maintains an audit trail of all access attempts and the results.

The host for the IDX-10 terminal is an IBM Personal Computer XT enhanced with printed-circuit boards and proprietary software. The IDX-10 terminal costs $7,500, and the host system also costs $7,500.

Identix, 2452 Watson Court, Palo Alto, Calif. 94303.

■

Recognition Equipment, Inc. has announced **Tartran Automated Lockbox Systems** (TALKS).

According to the vendor, TALKS allows a financial institution to offer customized processing and quick response to customer requests, changing market demands and geographic needs without making major changes to established work flows. TALKS provides enhanced error detection and centralized account management.

The TALKS system includes the Tartran data capture system, six workstations, a printer, TALKS data capture software and IBM 3780 communications.

The TALKS system is priced at $100,000.

Recognition Equipment, P.O. Box 660204, Dallas, Texas 75266.

Processors

Data Translation, Inc. has introduced the **DT1407** analog I/O board and the **DT1403** digital-to-analog board for VMEbus.

The DT1407 has a 16-bit, 100-kHz analog-to-digital subsystem with 4 differential inputs. The DT1407 also includes two 12-bit, 125-kHz digital-to-analog converters, an on-board programmable clock and 16 lines of digital I/O organized as two 8-line ports. The DT1407 costs $2,765.

The DT1403 is a digital-to-analog board with two or four 16-bit digital-to-analog converters. With two 16-bit digital-to-analog converters, it costs $1,400, and with four converters, it costs $2,095.

Data Translation, 100 Locke Drive, Marlboro, Mass. 01752.

Graphics systems

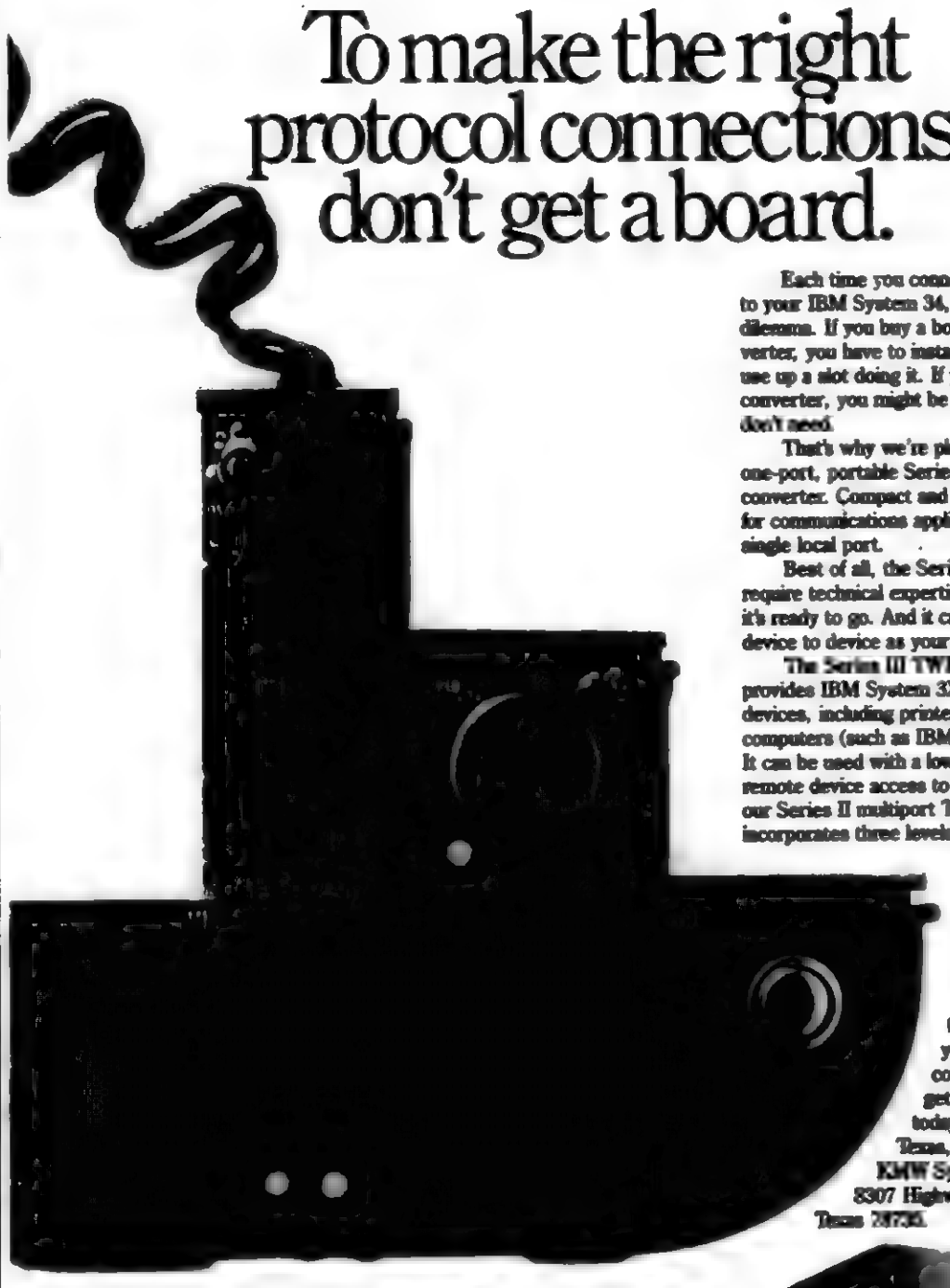
Adage, Inc. has announced **Ruggedized LEX 90**, a version of its **LEX 90** graphics display system.

Ruggedized LEX 90 is said to provide high-resolution color graphics, alphanumerics and imagery data capabilities. Features include a 1,280- by 1,024-pixel resolution and a 30Hz or 60Hz display. Also featured are true color functionality, virtual windows technology, dual resolution and two-dimensional transformations.

The system consists of a rack-mounted graphics display processor and a color monitor.

The display processor is priced from $19,495 and the ruggedized color monitor from $4,995.

Adage, One Fortune Drive, Billerica, Mass. 01821.



To make the right protocol connections, don't get a board.

Each time you connect a PC or peripheral to your IBM System 34, 36 or 38, you face a dilemma. If you buy a board level protocol converter, you have to install it yourself — and use up a slot doing it. If you buy a multiport converter, you might be paying for ports you don't need.

That's why we're pleased to announce our one-port, portable Series III TWINAX protocol converter. Compact and affordable, it's perfect for communications applications that require a single local port.

Best of all, the Series III converter doesn't require technical expertise. Simply plug it in and it's ready to go. And it can be moved easily from device to device as your needs dictate.

The Series III TWINAX converter provides IBM System 3X connections for most devices, including printers, CRT's and microcomputers (such as IBM, Wang and Macintosh). It can be used with a low cost modem to give a remote device access to the 3X as well. And like our Series II multiport TWINAX converter, it incorporates three levels of internal diagnostics, menu-driven programmability, printer passthrough, file transfer and 256h status line capabilities.

So now, you can take care of virtually all your single port protocol connections without getting a board. Call us today at 1-800/531-5167 (in Texas, 512/836-9000) or write KMW Systems Corporation, 8307 Highway 71 West, Austin, Texas 78735.



KMW SYSTEMS CORPORATION

For the right connections

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Terminals

Lear Siegler, Inc. has announced the **ADM 1000** and the **ADM 2000** VDTs.

The ADM 1000 features a 14-in. tilt-and-swivel monitor, available in green or amber. It offers seven programmable keys, shiftable for 14 functions. Other features include basic editing capabilities, block graphics, line drawing characters and a program mode for displaying all data received from the host.

The ADM 2000 is said to provide windowing capability and 16-level function key memory. It features dual host ports, allowing users to run different applications and terminal emulations simultaneously in up to 16 overlapping windows.

The ADM 1000 costs $399, and the ADM 2000 costs $699.

Lear Siegler, 901 E. Ball Road, Anaheim, Calif. 92805.

■

Lear Siegler, Inc. has enhanced its **Model 7105** and **7107** color graphics terminals.

Both models now feature Tektronix, Inc. 4105 and 4107 terminal compatibility as well as 640- by 480-pixel resolution, simultaneous display of 16 colors from a palette of 4,096, 16K- by 16K-byte virtual address space, simultaneous displays of up to four separate windows and independent color and alphanumerics.

The Model 7105 provides pixel zoom and pan. The Model 7107 offers true zoom and pan and local two-dimensional transformation.

Model 7105 costs $2,995, and Model 7107 costs $3,995.

Lear Siegler, 901 E. Ball Road, Anaheim, Calif. 92805.

Printers/Plotters

QMS, Inc. has introduced the **QMS-Smartscript 800**, **QMS PS-2400**, **Lasergrafix 1500** and **Smartwriter 150** laser printers.

QMS Smartscript prints at 8 page/min. It functions as a QMS Smartwriter or as support for the vendor's Postscript page description language for desktop publishing. Available in September, it costs $8,995.

The QMS PS-2400 is said to print 24 page/min with 13 resident fonts, and it also supports Postscript. Available in August, it costs $29,995.

Lasergrafix 1500 is a desktop 15 page/min, full-page bit-map printer for printing graphics. Available in September, it costs $11,995.

The Smartwriter 150 features 15 page/min print speed with 19 resident fonts. Available in November, it costs $6,995.

QMS, P.O. Box 81250, Mobile, Ala. 36689.

■

Analog Technology Corp. has introduced **Model 20/20**, a nonimpact, thermal transfer line printer.

Model 20/20 is said to generate horizontal or vertical Code 39 at 9.4 char./in. and 47 in./min. The printer has a bidirectional dual sprocket feed for pin-feed continuous forms. The Model 20/20 includes such features as automatic number field incrementing, line box and form drawing, automatic horizontal and vertical spreading as well as fill-in-the-blanks file merging.

The Model 20/20 is priced from $6,030 to $6,700, depending on quantity.

Analog Technology, 1859 Business Center Drive, Duarte, Calif. 91010.

■

Analog Technology Corp. has released **Model 195BR**, a bar-code label printing controller for Texas Instrument, Inc.'s 810 RO printer.

Model 195BR, said to provide verification of bar codes as they are printed, sends a true-or-false verification or the decoded character string to the host computer, forces the printer off-line and voids out the bar code that was rejected.

A noncontact, infrared bar-code scanner that is mounted on the printhead carriage rides back and forth and scans the bar codes as the paper passes the scanner.

The Model 195BR costs from $2,250 to $2,495, according to the vendor.

Analog Technology, 1859 Business Center Drive, Duarte, Calif. 91010.

Power supplies

Alpha Technologies, Inc. has announced its **Alpha 500** uninterruptible power source.

Alpha 500 is said to provide a 500W backup source for microcomputers, telephone systems and other electronic equipment.

Alpha 500 reportedly has such standard features as front-panel lights for all functions, a warning alarm that sounds before batteries are fully discharged, standard 30 minutes of backup time and easy mounting.

According to the vendor, there is no on/off switch, so the unit cannot be accidentally shut off.

Alpha 500 is priced at $695.

Alpha Technologies, 3767 Alpha Way, Bellingham, Wash. 98225.

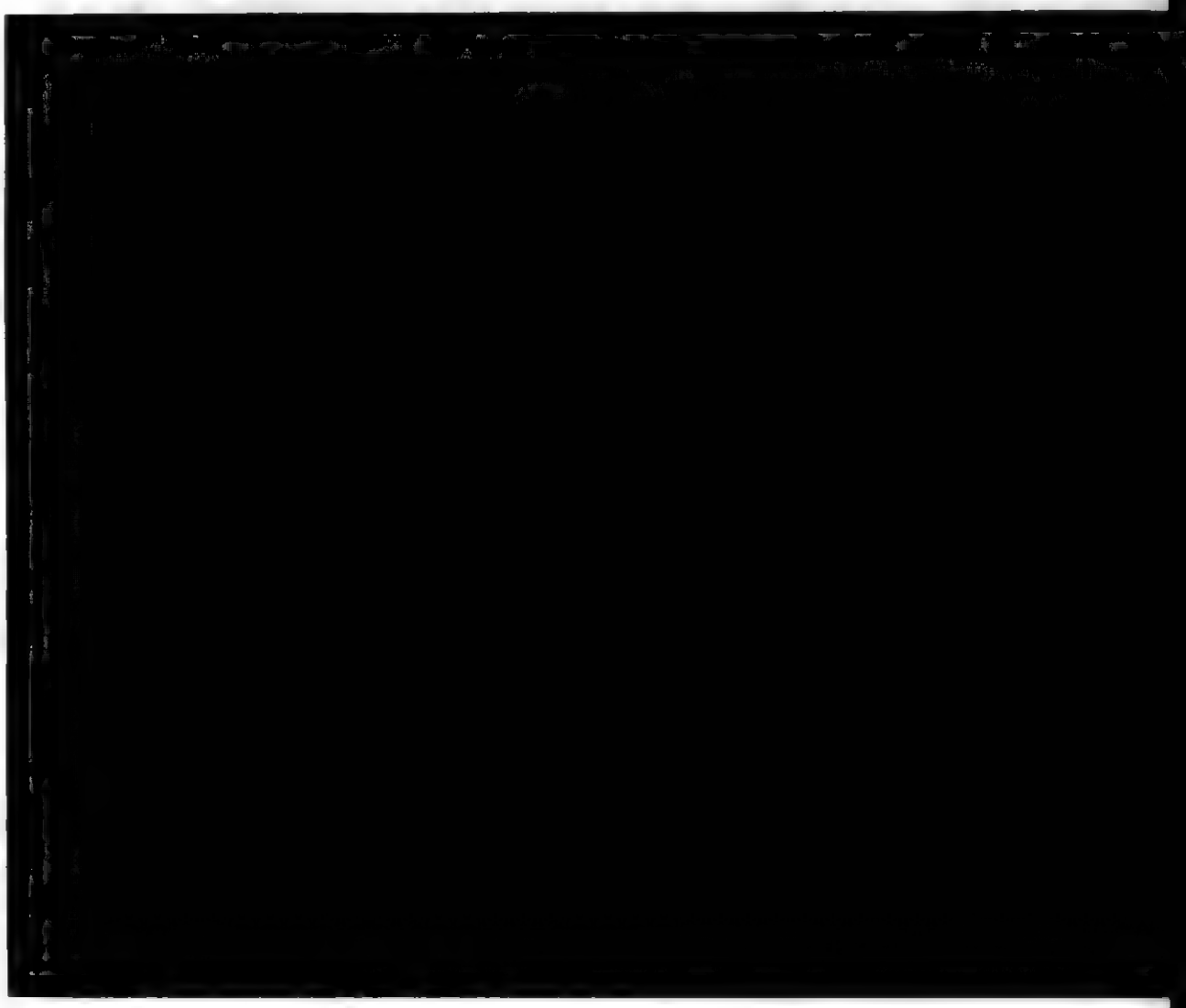
Components

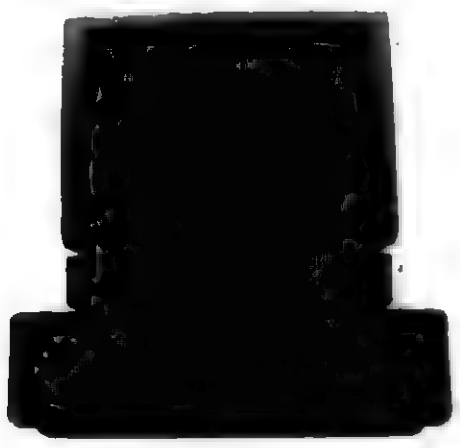
MDB Systems, Inc. has introduced its **RCS-P**, a rack-mountable ruggedized peripheral subsystem for users of Digital Equipment Corp. Q-bus and Mjcrovax II computers.

The chassis contains a combination of two fixed and/or removable peripheral devices. Peripherals supported include DEC's RD53 71M-byte disk, RX50 floppy disk and TK50 cartridge tape unit. Disk drives from companies such as Siemens AG, Fujitsu Ltd. and Control Data Corp. are also supported.

The peripheral device controllers

With Diskit 2 Plus, this is what intruders





available include DEC's RQDX or MDB's MLSI or MV-ESDI-RM.

List prices for the RCS-P with controllers start at $19,630.

MDB Systems, 1995 N. Batavia St., Orange, Calif. 92665.

Auxiliary equipment

Digital Equipment Corp. has introduced the **VT220 motorized stand** and the **Tilt/Swivel base** video monitor accessories.

The VT220 motorized stand is a full-size, automatic stand with a manually height-adjustable keyboard table and electronically controlled monitor height.

The monitor platform enables the user to move the terminal left or right.

The VT220 motorized stand is priced at $349.

The Tilt/Swivel base for personal computers and VT200 terminals allows the user to adjust the terminal up, down and sideways.

The Tilt/Swivel base is priced at $99.

DEC, Continental Blvd., Merrimack, N.H. 03054.

PRICE REDUCTIONS

Lear Siegler, Inc. has announced price cuts on its **ADM 220 and ADM 364** VDTs.

Both the ADM 220 and ADM 364 offer standard features such as a full tilt-and-swivel monitor, a detached, low-profile DIN standard keyboard, split screen, double-high and double-wide line attributes and vertical or horizontal scrolling.

The terminals' three-level function keys provide 45 functions, including 15 fixed and 15 programmable, plus an additional 15 programmable, nonvolatile functions.

Both the ADM 220 and the ADM 364 now cost $729.

Lear Siegler, 901 E. Ball Road, Anaheim, Calif. 92805.

■

Digilog, Inc. has reduced the price of its **Digilog 300 data analyzer**.

Digilog 300 plugs directly into data lines for automatic determination of line protocol, speed, code and parity.

Features of Digilog 300 include an interface lead graphics and a decoder that decodes each frame of the protocol and gives the English language interpretation.

Digilog 300 operates at 19.2K bit/sec. and features a full typewriter-style keyboard, printer interface, 400K bytes of on-line capture storage and a full 24-lead RS-232 breakout panel with 17 LEDs for interface monitoring, reconfiguration and 800K disk drive.

Digilog 300 now costs $3,995.

Digilog, 1370 Welsh Road, Montgomeryville, Pa. 18936.

■

TAT Graphics Group, Inc. has dropped the prices of its **Sextant 819, Sextant 1019, Sextant 815** and **Sextant 614A** display subsystems.

The Sextant 819 subsystem, which includes a 19-in. monitor and the Galaxy G800 graphics display controller board, now costs $4,495.

The Sextant 1019 display subsystem, which includes a 19-in. monitor and the Galaxy GX1024 graphics display controller board, now costs $4,695.

The Sextant 815, including a Galaxy G800 controller board and a 15-in. monitor, costs $3,995.

The Sextant 614A display subsystem consists of a 14-in. monitor and the G640 graphics card. It costs $2,195.

All four subsystems have 16 colors displayable out of a palette of 4,096.

TAT Graphics Group, Building E, 1270 Lawrence Station Road, Sunnyvale, Calif. 94089.

■

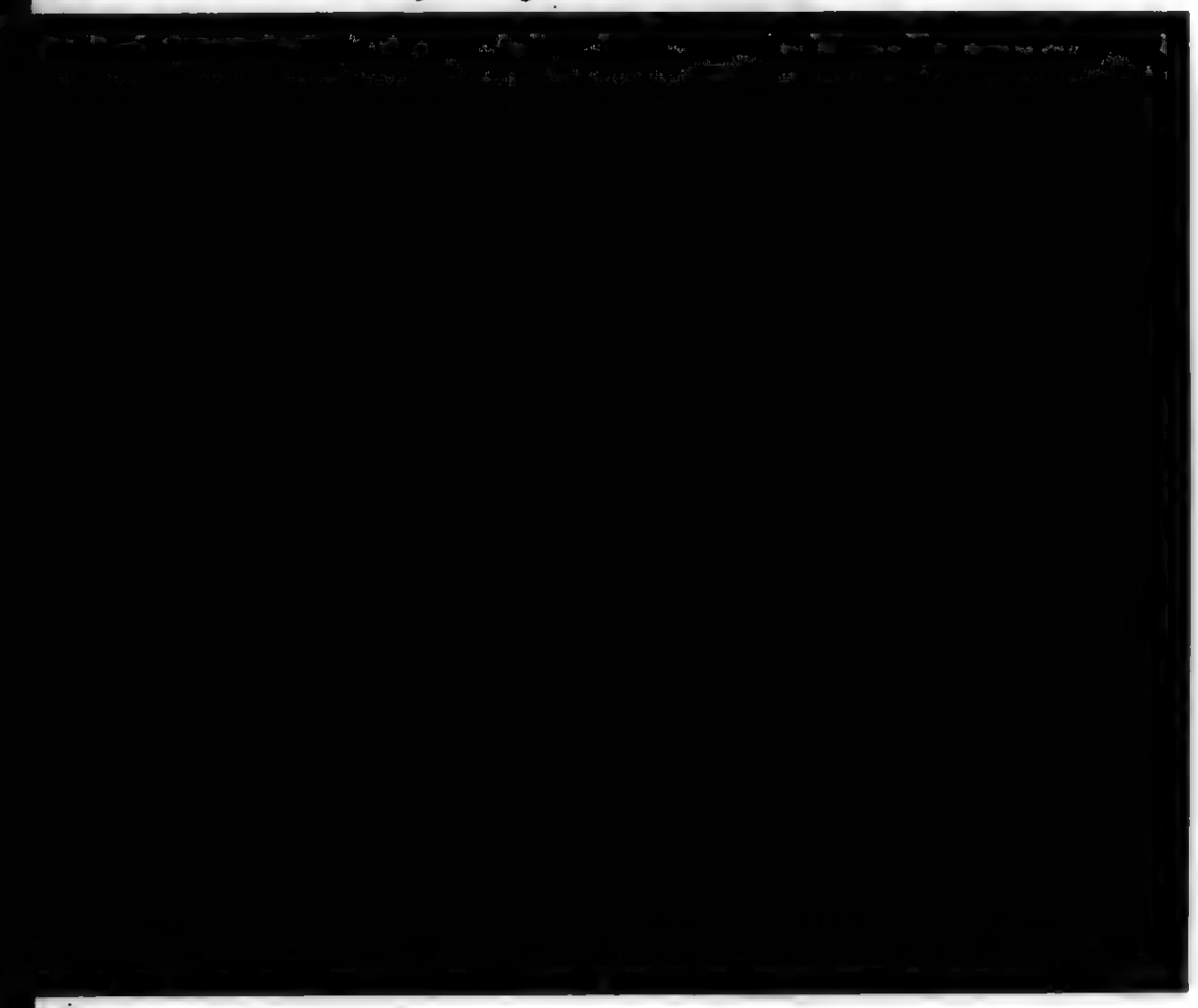
Software Recording Corp. of America has reduced the price of its Automentor software product.

Automentor allows users to create interactive tutorials, training sessions and user support aids as well as develop software and hardware demonstrations, presentations and applications prototypes. It features bit-mapped graphics capabilities that support IBM Color and Enhanced Graphics Adapters.

Automentor is now priced at $495.

Software Recording, Suite 130, 24 Professional Center Pkwy., San Rafael, Calif. 94903.

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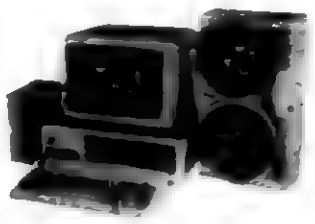


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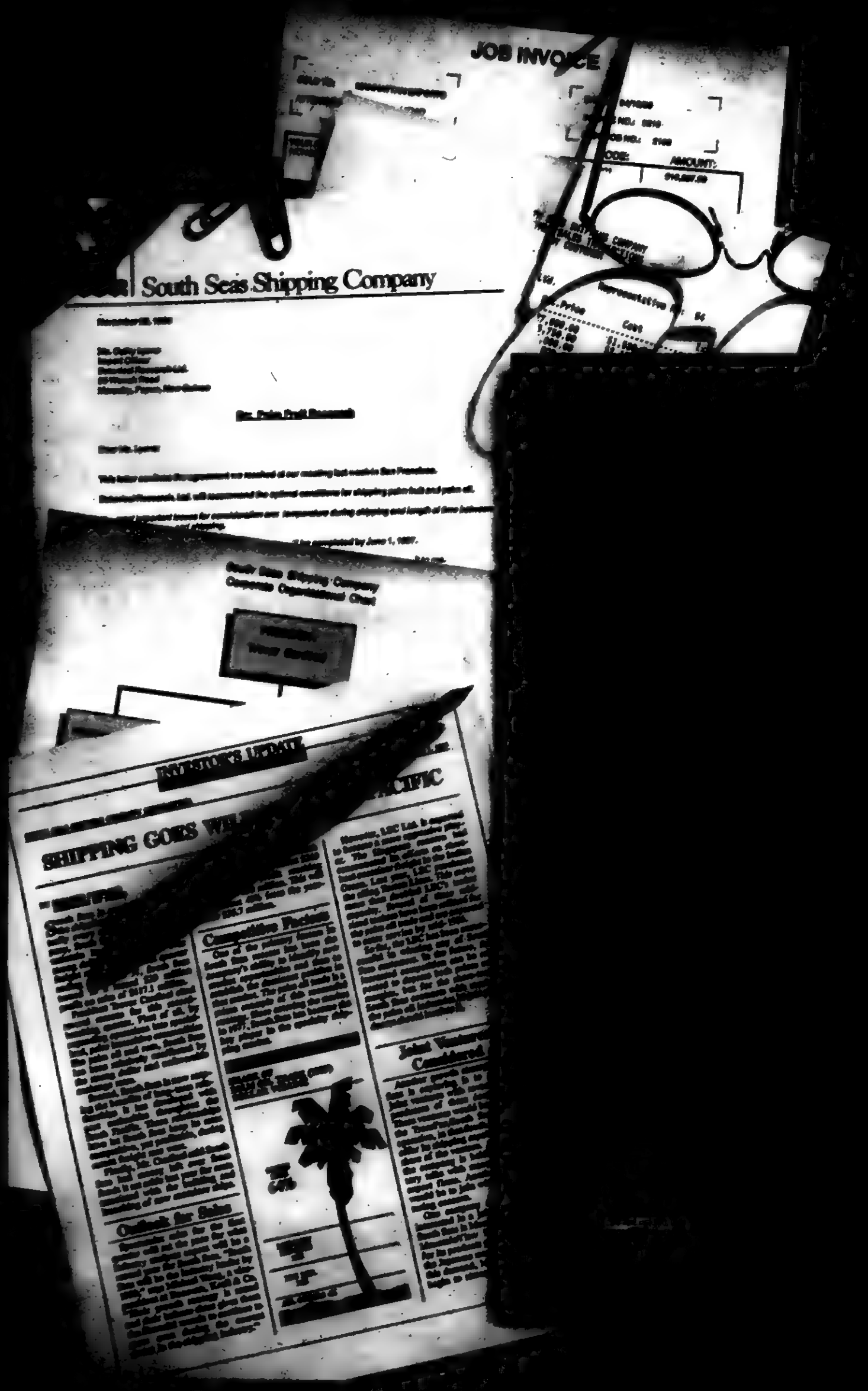


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COMPUTER INDUSTRY

Section begins on page 118

Anderson fights to import Nixdorf's European success to U.S.

President says service, support foundation laid

By James Connolly

LAS VEGAS — As well known as the name of Nixdorf Computer AG may be in Europe, the company that does business in the U.S. as Nixdorf Computer Corp. is still fighting to establish itself in the domestic market.

Now in his fourth year as president of the U.S. operation, Michael H. Anderson recently discussed reasons that European success has not migrated to the U.S.

"Because it isn't time," Anderson said at the 1986 National Computer Conference, where Nixdorf introduced new models and enhancements for the firm's minicomputer and small mainframe product lines. "We had to build a foundation first. And it is that kind of long-term thinking that says, 'Make sure the cart is behind the horse.' "

Protecting installed base

Anderson described the steps the company has taken to protect its installed base in market areas such as data entry, while building a nationwide service organization that can support growth in vertical markets, such as retail and banking.

"If we had tried to take on a large retail network here in the U.S. without the four years we have spent developing a service network, then we would likely have a dissatisfied customer, which would then say that we have difficulty doing business on a large scale," Anderson said. "All of those pieces would have fallen apart."

Anderson, a former marketing and sales executive for IBM, said IBM's announcement of new processors and connectivity tools for the IBM System/36 and System/38 on the same day Nixdorf made its most recent announcements was not a threat to Nixdorf.

In comparing Nixdorf's machines to the System/36, he emphasized his firm's offering of systems down to small, micro-based CPUs. "Our intention is that the software that is written for the lowest end, micro-based product will run all the way up to the largest system," he said. "So our strategy is not obsolescence. Our strategy is continuity. I don't really worry too much about what IBM does with its System/36, 38 line. They are still dead-ending their product set, and you don't have the safety valves to be able to move up."

Nixdorf's announcements included the 8810 Micro 35, a competitor for the IBM Personal Computer XT. But Anderson maintained that Nixdorf is not trying to be a major player in the microcomputer market.

"Our installed customers want PC functionality at a workstation, but they don't want to give up what they already have with Nixdorf, which is the interface with all of our software," Anderson said. "So it is not an announcement that Nixdorf is getting deeper and deeper into the PC game and that you can expect to see our products on the shelves of Sears Roebuck & Co."

Anderson said that Nixdorf offers personal computers to make its systems more attractive by adding function. He predicted that the company will add an IBM Personal Computer AT competitor soon.

But the Waltham, Mass.-based U.S. operation will wait until 1987 to bring to the U.S. a high-end system that Nixdorf is selling in Europe.

That system, the 8890D, was designed to be compatible with the IBM 4381. It will require more work on its operating system before being offered to the U.S. market, in which Nixdorf's existing Nixdorf Nidos-based 8890s compete with the DOS/VSE-based IBM 4361s.

One decision yet to be made is whether the 8890D should run IBM's MVS rather than just the DOS-based software that is the focus of the company now.

"Our system is not an MVS-class machine," Anderson said. "Amdahl Corp., IBM and others are operating in a mode that is not Nixdorf's niche in this overall marketplace.

"Ours is total systems from us, which means the hardware, software and the service and support," Anderson added. "We think there is a large number of users of 4300-class systems who are tired of having their investment in software, especially DOS/VSE, jeopardized."

Non-MVS users a rich market

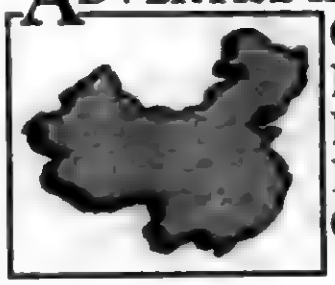
Anderson says he believes there is a base of users who do not want to migrate to MVS, and that group represents a rich market for Nixdorf.

Anderson said he expects Nixdorf's 10-year record of worldwide revenue growth to continue despite this year's sudden death of company founder Heinz Nixdorf.

"He was a charismatic leader who had built the company from nothing," he said. "But all customers, especially the North American customers, will now see an even stronger Nixdorf."

He noted that Nixdorf's founder's successor, Chairman Klaus Luft, and others on the board of directors, have extensive experience in dealing with the North American operations.

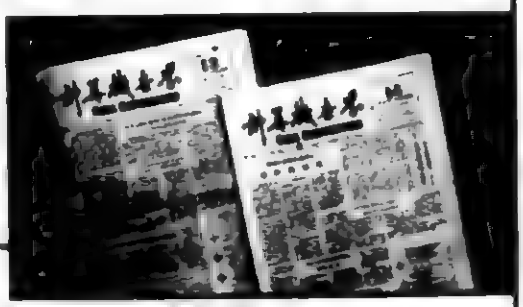
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Token-ring net developer strives to enforce patent protection

Lowers royalty fees, tracks down net vendors

By Stanley Gibson

NEW YORK — Nineteen years after he devised the first token-ring network in Sweden, Olof Soderblom finally appears to be making headway with network equipment vendors.

The developer of a token-ring networking technology has lowered his asking price for patent compensation and has signed royalty agreements with seven U.S companies and a total of 16 companies worldwide.

Willemijn Holding Co., the Rotterdam, Netherlands-based company in charge of asserting Soderblom's patent claims, recently announced at a New York press conference that it has liberalized terms, including those for the 4M bit/sec. boards that connect IBM Personal Computers and compatible machines to token-ring nets.


Soderblom

The new terms are the most recent of several downward adjustments that Soderblom has made in his royalty demands since first asserting his patent rights in 1981.

Despite the fact that Soderblom's patent was issued after lengthy proceedings and that included questions raised by many parties, including AT&T, Sperry Corp. and IBM, there still appears to be doubt as to its validity. A patent application by AT&T's Bell Laboratories was so similar to Soderblom's that proceedings were held by the U.S. Patent Office in the 1970s to determine which was the senior patent — the one that would entitle its owner to royalty payments.

Patents were eventually issued to both AT&T and Soderblom, but several references to Soderblom's application in the hearings records mention it as the junior and AT&T as the senior, according to those who have reviewed the records.

AT&T is currently sending letters to local-area network vendors asking for the same rights as Soderblom. Howard Charney, senior vice-president and legal counsel for 3Com Corp., said he has received letters from both Soderblom and AT&T asking for royalty payment on the same token-ring network boards. Having read both patents, Charney says of AT&T's document, "It's real close. It sounds like Soderblom's patent."

Attorneys for AT&T Bell Laboratories could not be reached for comment on the patent situation.

Pending an ultimate patent adjudication, network companies such as 3Com are faced with paying both AT&T and Soderblom in order to preclude the possibility of a patent infringement suit.

Soderblom came up with his token-ring idea at the age of 27 in 1967, when he was working in the data processing department of a Swedish bank. Although he has continued inventing and consulting since then, much of his time and effort has gone into asserting his patent claims on the token-ring scheme.

For the past year, he and his Washington, D.C.-based attorney, George Vande Sande, have been traveling the world in an effort to convince vendors to sign a licensing agreement or face a lawsuit on patent infringement.

Soderblom, who lives in the UK, was awarded a U.S. patent for the token-ring network scheme in 1981, after first applying for it in 1968. He was awarded patents in several countries in the late 1960s.

Soderblom revealed that Willemijn Holding received income from licensing revenue last year of $750,000, and revenue so far in 1986 has been $1 million. He says his legal fees thus far have been about $1 million.

Compliance kept secret

The only companies that have publicly revealed their agreement to pay Willemijn are IBM, Ungermann-Bass, Inc. and Bridge Communications, Inc. Other firms have insisted that their compliance with Soderblom's terms be kept secret.

IBM reportedly paid a lump sum of $5 million in 1980 for the right to use the system. In 1985, IBM announced it would make token passing a standard in its local-area networks.

3Com has yet to reach an agreement with Soderblom, although 3Com Chairman Robert Metcalfe has stated that discussions have been in progress (CW, June 2).

Wang Laboratories, Inc. admits that it is involved in discussions with Soderblom's attorney. Prime Computer, Inc., however, says that although Soderblom has contacted the company, no discussions or litigation with him are in progress.

The number of U.S. companies that may be liable for royalty payments could run as high as 1,000, according to Vande Sande.

Soderblom's U.S. patent was heavily contested after it was originally filed in November 1968. A patent was finally granted in 1981, which was reissued with broader meaning in March 1985. The U.S. patent is due to expire in November 1998.

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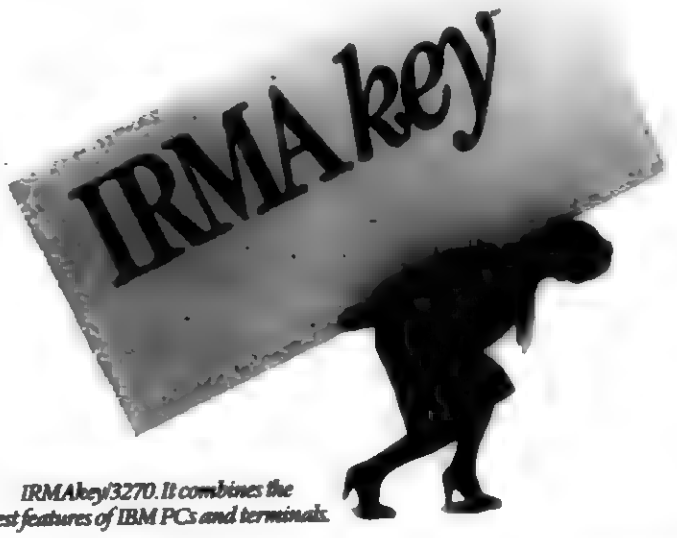
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Microsoft buy-out of Topview clone maker a mixed message

By Peggy Watt

REDMOND, Wash. — The microcomputer software industry has mixed reactions to Microsoft Corp.'s recent acquisition of a Berkeley, Calif., firm that developed a clone of IBM's Topview.

Microsoft acquired Dynamical Systems Research, Inc., developer of Mondrian, a character-based Topview-compatible operating environment. Observers believe Microsoft's first major corporate move since it went public sends mixed signals about the direction of its long-term co-development agreement with IBM [CW, Aug. 26].

"You could say Microsoft is giving up on IBM and going directly to the few end users who've written to Topview, so that Windows can do everything Topview can," says Bob Lefkowits, vice-president of software research at Infocorp., a Cupertino, Calif., market research firm.

But Lefkowits alternatively speculates that Microsoft has grabbed some hot, Topview-savvy programmers to help it design a "Super Topview" on contract for IBM, which wants to market a product that combines the best of both programs and fights clone products such as Mondrian.

Mondrian reportedly requires less memory and runs faster than Topview. The product is fully compatible with Topview function calls as well as its applications.

Microsoft will say only that it wants to "address the needs of those few" who invested in Topview applications and provide a transition to the Microsoft Windows graphical interface. Nine members of Dynamical's technical development team will join Microsoft's systems software group.

Neither firm will disclose the acquisition terms. Microsoft made the move with newly available cash from its recent public stock offering, just weeks after the end of its quiet period following that offering.

"This is Microsoft's access to the Topview technology and a superior development team so they can further enhance Microsoft Windows," says Cameron Myhrvold, vice-president and a cofounder of Dynamical Systems.

Myhrvold says it is "ridiculous" to speculate Microsoft will abandon Windows. "Microsoft is interested in providing a transition path to support the somewhat orphaned Topview developers," he says.

But a clone-making competitor sees the acquisition as an expected bow to IBM's dominance.

"Microsoft's power came from the operating system it sold to IBM," says Therese Myers, president of Quarterdeck Office Systems, Inc., which produces the Topview-com-

See MICROSOFT page 95

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Lotus blossoms . . . selectively

From page 118

tion philosophy. "We feel no particular urgency to get into word processing or data base before it's too late," Kolowich says, alluding to an unnamed Torrance, Calif., firm that bought out Multimate International Corp. "You're going to see a lot more from us, but we'll use a building-block approach, rather than big gobbles."

In the rapidly consolidating micro software business, Lotus clearly holds a lot of the cards. It obviously can't sustain the growth rates from its days as a one-product phenom, but it isn't trying to duplicate that growth with major big-ticket buys.

The only danger of this approach lies in overestimating the strength of the company's core products, based on their huge success in the past. The percentage of Lotus revenue coming from products other than 1-2-3 and Symphony will continue to increase, but will that happen fast enough to fuel Lotus' trademark growth in a slowing marketplace?

The spreadsheet gurus of Cambridge, Mass., obviously think the answer is yes. If they are right, the strategy of sustained-yet-restrained acquisitions may prove to be a model for leaders in other consolidating market segments. ■

Data General Corp. and Wang Laboratories, Inc. must have forgotten the past, for they seem condemned to repeat it. When summer came to New England one year ago, 1,300 DG employees and 1,600 Wang workers found themselves with an early, unwanted vacation because of massive layoffs at both minicomputer firms.

Last week, Westboro, Mass.-based DG commemorated (approximately) the one-year anniversary of its downsizing by dismissing 500 more workers — after cutting 400 jobs a few weeks earlier. And Wang recently rekindled the Lowell, Mass., layoff rumors that have been swirling for months by announcing that further reductions in staff are necessary.

Along with the Boston Pops' Independence Day concert, Fenway Park and Cape Cod weekends, summer in New England has brought the computer industry a very unwelcome sense of deja vu.

IBM concentrates worldwide production of 9335 disk drives at single UK facility

By John Lamb
Computerworld News Service

LONDON — IBM will make its 9335 disk drives for the System/36 and System/38 minicomputers at one plant in Havant, England. The effort is said to mark the first time that IBM has concentrated the worldwide manufacturing of a mainline product at a single plant.

The drives, which are based on IBM's existing 3380 thin-film technology, can be combined to give up to 13.6G bytes of storage.

IBM plans to spend approximately $300 million on manufacturing 9335s during the lifetime of the product, according to IBM's UK chief, Tony Cleaver.

3370s made in West Germany

The existing disk units for the System/36 and 38, the 3370s, are also made in Europe in Mainz, West Germany.

IBM would not say how long the West German plant will continue producing 3370 disk units.

IBM recently won a Queen's Award for Export, the British way of recognizing company contributions to the balance of trade. However, International Computers Ltd., the British mainframe vendor, has criticized the award and has disputed IBM's contribution to the UK economy.

International Computers claims that much of IBM's exports are shipments to overseas subsidiaries, a charge which IBM has rebutted.

Microsoft buy-out mixed

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patible Desqview. "Now they're a clone maker like us."

She says she believes IBM has been quietly promoting Topview as a future necessity for PC-DOS compatibility. "We've believed for some time the standard will be set by IBM and that Topview is that standard," she says. "I think this validates our position."

Analyst Lefkowits says clone developers should be wary of a combination of Windows and Topview with or without IBM's blessing. In addition, Lefkowits notes that he is not optimistic about the fate of other operating environments, including Desqview.

"Other environments may have some niche market opportunities, but in terms of the wide acceptance of their technology, this could just be another nail in their coffin," he says.

Dynamical Systems was founded in 1984 and last year began shipping its sole product to OEM developers. This year it began retail sales, which will likely be discontinued under Microsoft's ownership, according to Dynamical.

Fanuc, GE to build automation plant

By Takehisa Kondoh
Computerworld News Service

CHARLOTTESVILLE, Va. — Fanuc Ltd., the top Japanese vendor of numerically controlled factory automation equipment, has entered a joint venture with General Electric Co. to establish a $200 million, equally owned factory automation manufacturing plant here.

The joint venture's product line will include factory control systems and software for designing and operating those systems, Fanuc said.

The jointly run company, to be called GE Fanuc Automation Corp., will have sales subsidiaries in the U.S., Japan and Luxembourg. Its work force, including the subsidiaries, will eventually reach 1,600, Fanuc said.

Tokyo-based Fanuc did not say, however, whether it will incorporate the new company, since the venture is subject to approval by the antimonopoly authorities in the U.S. and Japan. Some of the employees and facilities for GE Fanuc Automation will reportedly come from GE.

The deal will give Fanuc access to GE's networking and systems expertise, helping Fanuc move from depending heavily on selling numerically controlled equipment to marketing a full line of factory automation products. Fanuc has an estimated market share of numerically controlled equipment of 75% in Japan and 50% worldwide.

Fanuc has previously aligned itself with two other world leaders in factory automation. It codevelops computerized, numerically controlled machines with West Germany's Siemens AG, and it joined with General Motors Corp. in 1982 to establish a joint company, GMF Robotics, in the U.S.

Financial data market

From page 118

presence in the stock quote business that it had acquired from GTE in 1983. It now has an installed base of about 55,000 units, notes Ric Duques, president of ADP's Financial Services group.

"We went into the business with a desire to be No. 1," he says. "If we couldn't be No. 1, however, we wanted to be a strong No. 2. Bunker Ramo gave us that opportunity."

Microcomputers and satellite distribution are propelling Imnet into the market.

"When we started in 1984, we were the only one working with an intelligent workstation on the desk. Everyone thought that was insane, but now almost everybody agrees," Imnet's Higgins claims.

The IBM-Merrill Lynch joint venture is betting that satellite distribution of market data to individual clients' host systems, which can then be accessed by IBM Personal Computers, will enable it to win business from Quotron and ADP.

Imnet also recently began offering the capability for the PC to directly receive and display market data, competing with Lotus for business in this evolving market segment. In 1985, Lotus acquired Dataspeed, Inc., developer of an interface between Lotus 1-2-3 and stock quote information.

Wang also recently entered the market via acquisition. Earlier this year, Wang acquired Walsh, Greenwood Information Systems and its stock data and retrieval system, called Shark.

Imnet, despite some technology advances, has very little to show for its 2½-year existence. Some observers claim IBM has become disenchanted with Imnet's progress and is looking for a graceful way to withdraw from the joint venture.

"IBM is looking for a face-saving way to discontinue its involvement," says Lawton of "The Computer Services Report." "Some months ago, they reassigned some people from Imnet back to IBM."

An IBM spokeswoman said two IBM staff members working at Imnet had recently returned to the parent company because their assignments had been completed. She declined comment regarding IBM's future involvement in the joint venture.

Higgins attributes the firm's slow start to the complex undertaking of getting into the business. "We're off schedule, but not by much," he says. "Our parents have the staying power and synergy — IBM's technology and Merrill's market knowledge — to make it in the business."

Imnet's clout, however, may not be enough to overcome entrenched Quotron and ADP.

Many observers have speculated that Quotron would lose some major financial customers, such as Shearson Lehman Brothers, Inc., that consider themselves Citicorp competitors in financial services. But others contend that users will not sever long-established ties with the industry leader.

"The market is gone — locked up," Lawton says. "Unless you've got a new product that radically changes the way business is done, you don't stand a chance. It just takes too long and is too risky for people to change vendors."

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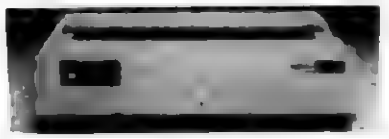
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Word-a-holics unite!

Trying to decide which word processor to buy is like trying to decide which college to go to. The decision will change your life forever, but you may never know if it was the best one. Here are five tried and proven professional packages. They all have spell checkers. None are copy-protected. And hard drives are recommended for all. See PC Magazine 1/28.



MultiMate Advantage 3.6 with Graphlink and On-File $299
Originally designed to emulate the WANG word processor, MultiMate is often referred to as the corporate word processor. It offers sophisticated networking capabilities, and, with two free-for-a-limited-time software programs (Graphlink and On-File), also has built in graphics and database.

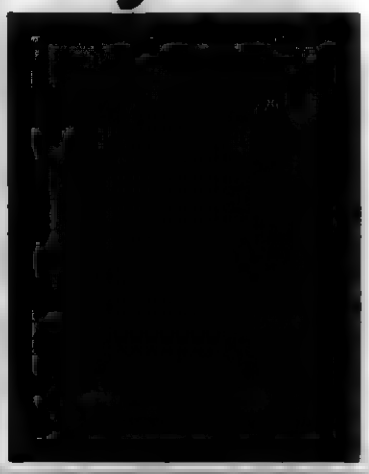
MicroSoft Word 3.0 with Outline $347
With a mouse and a graphics card, MicroSoft Word lets you move words around without touching the keyboard, and see what you got without squinting. Without a mouse or a graphics card it's still a powerful word-processor, with "Style Sheets" that simplify formatting, and a built-in outline program.

WordPerfect 4.1 ..... $239
We have a friend who writes for computer magazines. At one time or another he has used and reviewed virtually every major word processor. He now swears by WordPerfect and swears at all the others. Use this program for a while and you'll be able to touch type most of your commands with your eyes closed and your right hand tied behind your back.

WordStar 2000 Plus Release 2 ..... $295
WordStar has had some trouble shedding its image as the lumbering dinosaur of the microcomputer age. But hundreds of thousands of people use it. There are a lot of programs out there to back it up. And this new version gives it the same advanced features as any top-quality word processor. Even the control keys are starting to make some sense.

Volkswriter 3.0 ..... $147
[illegible] performance with a reasonable price continues to be Volkswriter's claim to fame. It's fast, and boasts one of the original what-you-see-is-what-you-get screens. With the new version's spell checker and more sophisticated print formatting, it is now able to compete functionally with the other high-end word processors. (Our new low price is pretty persuasive too).

Buy one. Get two.



Hey, got a friend? Don't know? Check your database! What? No database? Have we got a deal for you (and your friend). Until June 30, Microrim will send you a *complete* second copy of R:base 5000 free when you send in your warranty card and a copy of our sales invoice. So you can get together with your friend, split the cost for one and get two! Or, you can keep the extra copy at home, at a branch office, or down the hall. R:base 5000 is easy to learn and operate, and has the custom reporting features most users need. Remember, the two for one offer is only good from April 15 till June 30.

R:base 5000 ..... $359
(Additional R:base 5000 from Microrim) ..... $Free

Chips

Fully tested, factory fresh 9-chip sets from the leading chip manufacturers, such as TI, Samsung, NEC, Hitachi, Oki, etc. All chips and chip sets come with complete instructions.

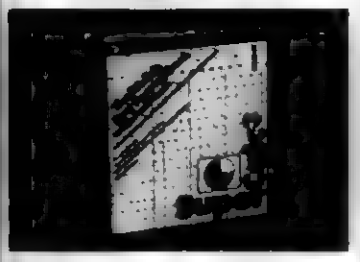
64K (200Ns)	$12 ea. set
64K (150Ns)	$15 ea. set
128K or 256K (150Ns)	$39 ea. set

Bernoulli Berserk!

We've got a problem. The prices we're able to offer on Bernoulli boxes are changing about 10 times faster than we can change this ad. Probably because the machines are selling about 10 times faster than anyone ever dreamed they would. The 20 Meg and 40 Meg versions feature two ½ height drives with removable cartridges. There's a 90 day warranty, and we're an authorized Bernoulli service center—turnaround on repairs is usually 24 hours. Here are our latest up-to-date-but-probably-obsolete-by-now prices!

Bernoulli Box 40 Meg $2499
Additional 20 Meg Cartridges $69
Bernoulli Box 20 Meg $1999
Additional 10 Meg cartridges $51
Bernoulli Care Kit $79

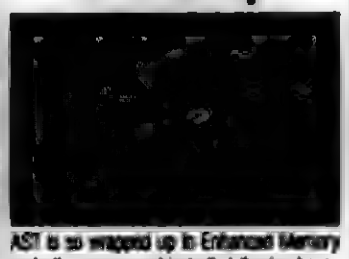
Supercalc ifragilistic!



SuperCalc 3 is the kind of product that you'd be proud to bring home to your mother. Like Lotus 1-2-3 it offers spreadsheet, information management and presentation graphics. But it only needs 128k of RAM, and is not copy-protected. It also is compatible with the Hercules Monochrome Card, as well as the Enhanced Memory (EMS) and Enhanced Graphics (EGA) standards. And you get a free copy of Sideways, the program that lets your printer think horizontal is vertical.

SuperCalc 3 2.1 (with Sideways) .....
[illegible] off our [illegible] low price—call!

SixPakPlus Minus$!



AST is so wrapped up in Enhanced Memory and other arcane subjects that they've been selling the price slip on their original claim to fame—the AST SixPakPlus, one of the original and best multifunction cards. So if you're just starting in computing, or outfitting a second unit for home, now's a great time to buy this basic piece of hardware. You get a clock calendar, serial port, parallel port, up to 384k of memory, and copies of two classic unprotected programs—Sidekick 1.5 and DESQView. A genuine deal.

SixPakPlus 64k $169
SixPakPlus 384k (fully populated) $219

Herculean rebate!

The Hercules monochrome graphics card has saved hundreds of thousands of PC owners from terminal myopia, by supplying crisp clean monochrome graphics. The Hercules color card is the industry standard for color graphics. Both come with a parallel printer port, and a *full two* year warranty. And from May 1 through August 31, Hercules is offering a $50 rebate on either card.

Hercules Monochrome Graphics Card $299
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Hercules Color Card (1/2 slot) $159
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COMPUTERWORLD

COMPUTERWORLD's paid circulation climbed to over 129,522 this fall. Folio 400 (Folio Magazine's study of trade publication performance) placed us first in total revenue. As the industry grows, so will **COMPUTERWORLD.** It will continue to offer the high quality news coverage and editorial content that has attracted its readers. What does that mean to you, our advertisers? Good news...in the form of wide exposure.

The Classified section of the newspaper is laid out in an attractive format and is easy to read. It offers classifications to solve a variety of problems:

Position Announcements, Buy • Sell • Swap, Micro Direct Shopper, Software For Sale, Software Wanted, Time & Services, Bids & Proposals, Business Opportunities, Real Estate, Auctions, Positions Wanted, Seminars & Conferences, Publications and The Bulletin Board

Our BULLETIN BOARD section is ideal for the smaller companies who want a low-cost way to sell pieces of equipment (hardware or software). The BULLETIN BOARD is laid out as a quick reference for potential buyers who know what they are after.

So, as a nationwide publication, we give you the exposure you want. As a weekly publication, we give you the immediacy your advertisements need.

A number of Executive Reports and Product Spotlights are scheduled to run in **COMPUTERWORLD** during 1986. Each of these features will focus on one aspect of the computer industry and give our advertisers a chance to reach a more select audience. These are some of the topics the features will cover:

Executive Reports

- July 21 - **PBX Networks**
- July 28 - **Management Training for DP Executives**
- August 11 - **Information Centers**
- August 18 - **On End-User Computing**
- Sept. 1 - **The MAP Marketplace**
- Sept. 8 - **Computer Leasing**
- Sept. 22 - **Communications Standards**
- Sept. 29 - **On-line Computing**

Product Spotlights

- August 4 - **Applications Generators**
- August 25 - **Image Processing**
- Sept. 15 - **Spreadsheets**

COMPUTERWORLD publishes every Monday with an ad deadline of 10 days prior to each issue date. The issue of July 28th will be closing July 18th. You may send in copy to be pubset or camera-ready material (velox or negative) via the mail. We provide telecopier service and will also take ads over the phone.

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Seven years technical support and/or system software experience including 3 years in a supervisory position required. This experience includes the installation and maintenance of IBM (MVS/XA, VM, CICS, TSO, VTAM via SMP) as well as other software, maintenance of a complex data communications environment with access to multiple CPUs. Experience with DEC, VAX, and MUMPS preferred. BS in Computer Science required. Master's preferred.

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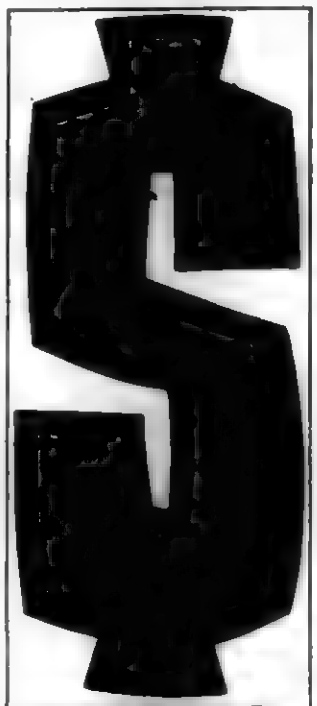
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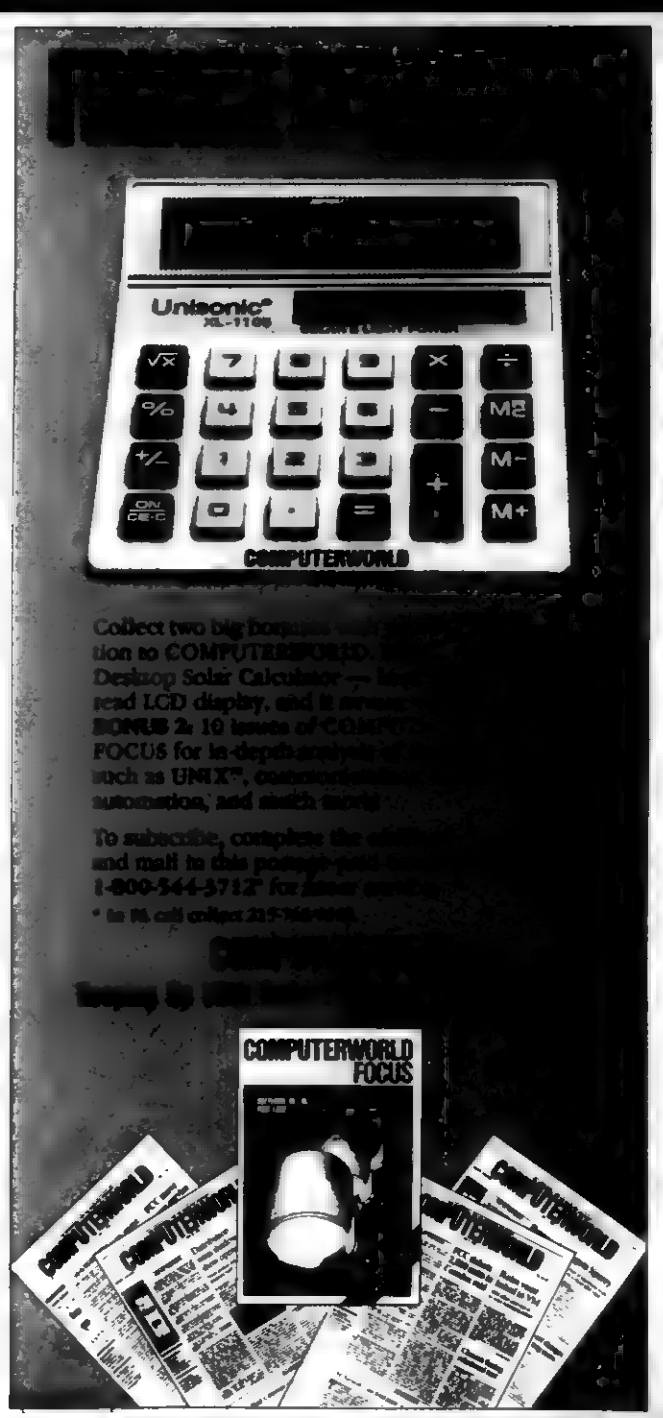
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Cost: Our rates are $161.70 per column inch. (Each column is 1 13/16") Minimum size is two column inches (1 13/16" wide by 2" deep) and costs $323.40 per insertion. Extra space is available in half-inch increments and costs $80.85. Box numbers are $15.00 extra per insertion.

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Computer software consulting engineer - to provide on site software consulting engineering services particularly in banking and financial fields, to company clients, for software development, system analysis, systems testing and integration; assume total responsibility in rendering such services re new products and existing systems of software including test tool design and coding; design and develop financial software systems including testing and fault analyses of financial software systems; work with and train client personnel on Burroughs Large System machines, employing FORTRAN, COBOL, ALGOL, PASCAL, Data Management System II, Site Management Facility & Burroughs Network Architecture and Burroughs Communication Processor CP 9500; 10% travel in U.S. paid by employer. Master's degree in Electrical and Communication Engineering required together with at least 2 years documented experience as computer software consulting engineer in design, development, testing and implementation of banking and financial application systems, using Burroughs Large System machines with ALGOL, COBOL, FORTRAN, PASCAL, Data Management System II, Site Management Facility II, Burroughs Network Architecture and Burroughs Communication Processor CP 9500 (all experience may be gained concurrently); must have graduate courses (1 each) in Data Structure, Digital Data Display Systems and Digital Signal processing; 40 hrs/wk, hrs. 9-5, $36,500 per year (no overtime) to apply: Mail or hand carry resume w/copy of ad attached to VEC, Dept. 3008, 1202 Franklin Rd. S.W., Roanoke, VA 24002-6081. J.O. # VA0688041

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To qualify for this position which will involve managing 3 professionals, you should have a BA degree plus 3–5 years' EDP Auditing experience, preferably in banking. We are seeking individuals who have participated in, or supervised pre-implementation, application, and data center reviews. A solid understanding of IBM's MVS Operating System, exposure to major programming languages such as COBOL, Natural or Culprit and familiarity with telecommunications software are required.

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We are seeking an individual who will be responsible for the technical design, programming and implementation of audit software to support the diverse activities of the financial audit staff. Other key aspects of this position involve assessing the quality/accuracy of data and assisting in technical reviews of all aspects of the IBM Operating System.

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Three to four years technical support and/or system software experience required. This experience includes the installation and maintenance of IBM (MVS/XA, VM, CICS, TSO, VTAM via SMP) as well as other software, maintenance of a complex data communications environment with access to multiple CPUs. BS in Computer Science required.

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This position demands a minimum of 6 years' programming/systems experience, degree in Business, Computer Science, Operations Research (or related field) and an in-depth knowledge of COBOL and database techniques. The ability to work in a team environment, as well as a strong creative ability, required.

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You will plan, schedule and perform various programming functions, including translating system specifications, testing/debugging and the preparation of required documentation. In addition, you will have some program design responsibilities.

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We offer a highly competitive salary, an excellent benefits program and a state-of-the-art environment. To apply, please forward your resume, including salary requirements, to: Ms. Kathleen Brittain, Employment Specialist, Kentucky Fried Chicken, P.O. Box 32070, Department-DP, Louisville, KY 40232. We are an equal opportunity employer M/F.

Kentucky Fried Chicken.

PROGRAMMER – Design, implement, maintain & enhance computer applications for various business programs. Utilize knowl of COBOL, ANSCOBOL, DL/1, LIBRARIAN, IMS, DB/DC, EASYTRIEVE, JCL, OS/MVS, CMS/EDGAR, JES2 & JES3, IBM mainframe hardware. Req: H.S. Grad, 3 yrs exp. Pays: $28,000/yr, 40 hrs/wk (9 AM - 5 PM). Send resume to: Job Service of Florida, 1307 North Monroe Street, Tallahassee, FL 32303. Refer to JO #FL-5413971



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Steven Yamada, Tokyo Representative Corp., Sanshin Kogyo Bldg., 2-10 Kando Jimbocho 3F, Chiyoda-ku, Tokyo 101, Japan. Phone: 230-4117, Telex: J26860 (reps for all CWCI publications except Computerworld Japan).

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INDUSTRY NOTES

DEC names senior vice-presidents

Digital Equipment Corp. last week named three vice-presidents to the newly created level of senior vice-president, effectively identifying three potential successors to President and founder Kenneth H. Olsen.

Promoted were Winston R. Hindle Jr., 55, vice-president of corporate operations; John J. Shields, 47, vice-president of sales, service, international and industry marketing; and John F. Smith, 51, vice-president of engineering, manufacturing and product marketing.

■

IBM named Paul J. Kofmehl as group executive of its **World Trade Americas Group**, responsible for operations in Canada and Latin America. Kofmehl had been president of IBM World Trade Europe/Middle East/Africa Corp.

■

IBM filed a shelf registration with the Securities and Exchange Commission for up to $700 million in debt securities offerings. The move is not itself a debt offering, but it clears the way for IBM to issue new debt quickly at any time within the next two years.

■

Further strengthening its move toward the mainframe software market, **Ashton-Tate** announced a cooperative marketing agreement with **Cincom Systems, Inc.** The agreement calls for joint marketing and mutual referrals and covers Cincom's PC Contact and Ashton-Tate's Framework II, for which the two vendors jointly developed integration tools.

DCA agrees to acquire Cohesive

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to develop internally quickly enough," said Andy Schopick, vice-president and senior analyst with Gartner Securities Corp. in Stamford, Conn.

"In DCA's efforts to build a company and enhance their ability to compete, this acquisition is strategically sound," Schopick added.

Cohesive was founded in September 1982 and in 1985 released its first product, CN-1, an intelligent network controller that integrates voice, data and video over 16 digital T1 lines. CN-2, also released last year, offers increased capacity with connection to 36 T1 lines.

Acquisitions

After it establishes a presence in the T1 market, DCA will look to acquire a strong company in the LAN market, analysts say. 3Com Corp. of Mountain View, Calif., has been mentioned as one possibility, although 3Com Chairman Robert Metcalfe has said the firm is not interested in being acquired (CW, June 30).

In February, DCA announced a joint development agreement with 3Com to produce a LAN gateway based on Irma technology.

Under the terms of the agreement announced last week, Cohesive is to become a division of DCA, with engineering and manufacturing operations continuing in Los Gatos. However, sales and marketing functions will be integrated with DCA, according to Nordin.

The agreement calls for DCA to issue up to 1.65 million new common shares to Cohesive shareholders. The transaction will be accounted for as a pooling of interests and is subject to Cohesive shareholder approval.

Ingredients for success

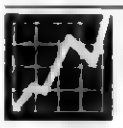
"We have great technology and great people, and DCA has its strengths in sales, marketing and service," said John A. McGuire, Cohesive president and chief executive officer. "Altogether, it adds up to the ingredients you need for success."

It has not been decided whether DCA's Netlink T1 multiplexer product will be integrated into the new Cohesive division, Nordin said.

"Netlink is a much lower-end, point-to-point product, while CN-1 and CN-2 are networking products," he added.

DCA's merger with Cohesive is expected to be completed in August.

Flat quarter seen for high tech; IBM, Honeywell dip predicted



ACTIVE ISSUES
Kathy Porteus

The computer industry's financial results for the quarter ended June 30 will not set off any fireworks. Nevertheless, when technology firms begin reporting their latest quarter, the numbers will likely confirm that the bad news is at least not getting worse.

Steven Milunovich, technology analyst with First Boston Co., says mainframe orders and shipments are still down year to year, but within a narrower range. He estimates IBM (IBM — 148⅝), Honeywell, Inc. (HON — 75⅝) and Amdahl Corp. (AMH — 17½) will report down quarters of $2.20, 75 cents and 5 cents per share earnings, respectively.

NCR Corp. (NCR — 52⅜) will be the exception, Milunovich says, earning an estimated 77 cents per share vs. 67 cents a year ago. NCR's sales are more exposed to the financial industry than to the manufacturing industry in which tougher business conditions exist.

According to Thomas E. McCrann, vice-president with Merrill Lynch, Pierce, Fenner & Smith, Inc., there is a risk of disappointing June quarter results for minicomputer companies other than Digital Equipment Corp. (DEC — 88⅛). McCrann estimates DEC will earn $1.50 per share and has a "reasonable chance of doing better."

But there was no industrywide increase in demand during the past quarter. McCrann estimates Data General Corp. (DGN — 35¼) will show operating earnings of less than 10 cents per share.

McCrann recently lowered his June quarter estimates for Prime Computer, Inc. (PRM — 18¼) to 15 to 20 cents per share from 20 to 25 cents. "The company is behind plan in terms of firm bookings, despite a high level of interest and activity," McCrann says.

Although most players in the computer-aided design and manufacturing market will experience flat earnings compared with the March quarter, there are a few exceptions, says John Rohal, vice-president with Alex Brown & Sons.

Sun Microsystems, Inc.'s (SUNW — 16) June quarter is slightly ahead of what Rohal had expected. Rohal now estimates Sun will earn 18 to 20 cents per share on sales of $72 million, up from 10 cents per share and $69 million a year ago. "In this environment, that is a nice increase," Rohal says.

According to Rohal, Cray Research, Inc. (CYR — 98½) and Autodesk, Inc. (ACAD — 38) continue their strong performances. He estimates Cray will report $1.20 in earnings per share, and Autodesk will earn 36 cents per share during its July quarter.

According to Paul Johnson, analyst with L. F. Rothschild, Unterberg Towbin, all large-capitalization semiconductor companies except Advanced Micro Devices, Inc. (AMD — 20) will show sequential sales and earnings improvment. Johnson expects Advanced Micro Devices will report a June quarter loss of 30 cents per share.

On the other hand, Intel Corp. (INTC — 22¾) may show a surprise on the up side, Johnson says. He estimates Intel will lose 15 cents a share, but if "June's business is as strong as May's, the company could do better." Johnson also estimates Motorola, Inc. (MOT — 38¾) and Texas Instruments, Inc. (TXN — 119¼) will earn 40 to 45 cents and 30 cents per share, respectively.

For investors willing to look beyond the next few months and into 1987, Johnson recommends purchase of Intel, Motorola and TI. "If you get any kind of an economic uptick toward the end of this year," Johnson says, "you'll have a very exciting group of stocks."

Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

ITT sells unit to European group

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business, as evidenced by lukewarm response to the System 12.

"ITT realized that the only way to win was to pump greater amounts of cash into the operation and cut short the life of System 12," said Kenneth Bosomworth, president of International Resource Development, Inc. in Norwalk, Conn. "They felt it wasn't worth it."

As expected, ITT will retain 30% of the new joint venture holding company, which includes CGE's Alcatel telecommunications unit. Completion of the deal is expected by the end of the month and requires approval of the French government, according to ITT.

CGE's European partners include Societe Generale de Belgique, the Belgian bank reported to have played a role in arranging the deal, and Telefonica, Spain's national telephone company.

Other European firms, including Britain's Plessey PLC, are reported to be interested in investing in the holding company.

Under terms of the deal, CGE would pay $1.8 billion in cash for ITT telecommunications, a figure that includes repayment of about $350 million in the unit's debt, an ITT spokesman said. ITT would also transfer $1 billion of its $2.6 billion in debt to the joint venture company, the spokesman added.

Disk drive maker to end production

By Maura McEnaney

CHATSWORTH, Calif. — After suffering an $18 million yearly loss, a severed contract with IBM and a $6 million patent infringement settlement with competitor Quantum Corp., Computer Memories, Inc. announced last week that it will discontinue its microcomputer disk drive manufacturing business.

Left with approximately $30 million in working capital, Computer Memories is attempting to save what is left of the business by proposing to buy another, perhaps unrelated, company or to be acquired. The company said it attempted to sell its remaining disk drive inventories in the quarter ended June 30.

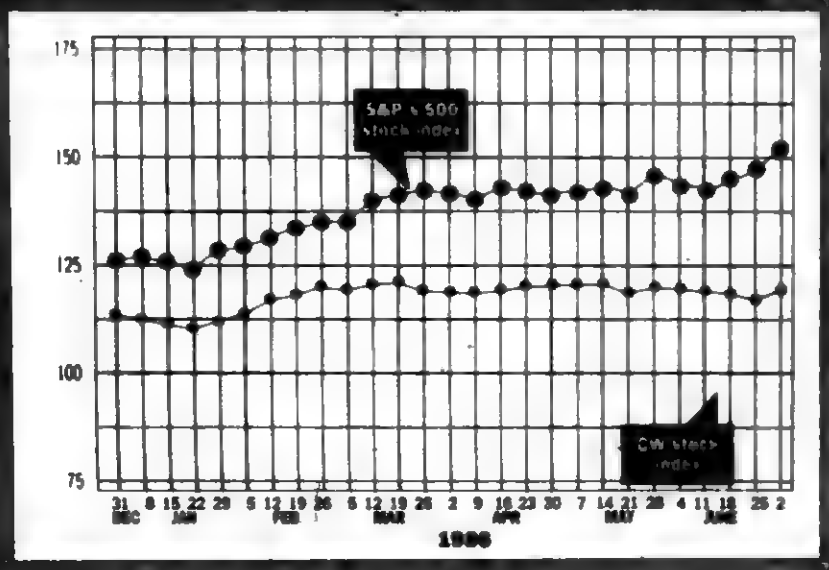
Computer Memories Chairman Irwin Rubin said the company would continue repair and warranty work on its installed base of 5¼-in. disk drives. The company discontinued production of its CM6000 20M-byte and 40M-byte disk drives in April, after it reached an out-of-court settlement with Quantum. Plans to manufacture a line of high-end CM7000 disk drives later this year were abandoned.
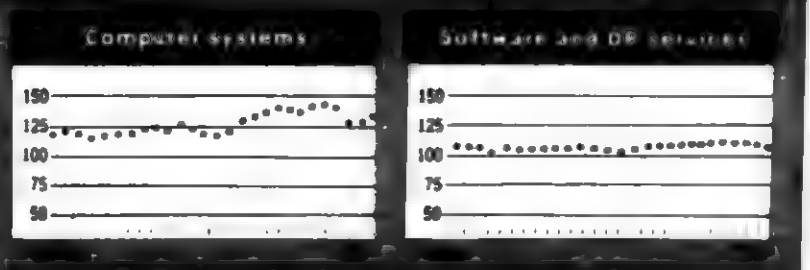
Computer Memories has been unprofitable since IBM stopped using its drives in the Personal Computer last year. IBM drives had accounted for about 80% of Computer Memories' business. Shortly after, the firm laid off more than 30% of its staff.

COMPUTER INDUSTRY

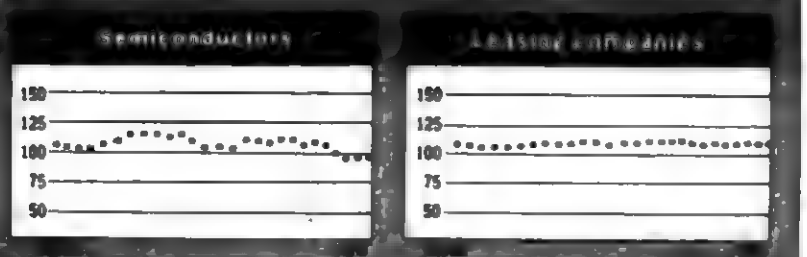
MITCHELL J. HAWES

Computerworld stock trading index









	6/25/86	7/2/86
Computer systems	125.5	128.7
Software and DP services	106.0	106.9
Peripherals and subsystems	122.2	124.1
Supplies and accessories	154.7	155.6
Semiconductors	93.0	93.0
Leasing companies	104.1	104.2
CW stock index	116.9	117.8
Standard and Poor's 500 stock index	140.8	141.1

Computerworld stock trading summary

CLOSING PRICES WEDNESDAY, JULY 2, 1986

EXCH		52-WEEK RANGE (1)		CLOSE JULY 2 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS					
O	ALPHA MICROSYSTEMS	5-	9	6	0	0.0
O	ALTOS COMPUTER SYST	9-	19	14 3/8	-1 5/8	-10.1
A	AMDAHL CORP	10-	18	18 1/8	+3/4	+4.3
O	APOLLO COMPUTER	9-	31	14	+2 1/4	+19.1
O	APPLE COMPUTER INC	14-	39	36 1/8	+1/4	+0.6
N	AT&T	19-	28	25 1/8	0	0.0
N	BURROUGHS CORP	52-	71	67 1/2	+6	+9.7
O	COMPAQ COMPUTER CP	5-	18	14 1/2	+3/8	+2.6
O	COMPUTER AUTOMATION	1-	9	2 7/8	-5/8	-18.9
A	COMPUTER CONSOLES	5-	14	9 3/4	-1/4	-2.5
N	CONTROL DATA CORP	15-	39	22 1/2	-5/8	-2.7
O	CONVERGENT TECHNOL	5-	13	7 3/4	+5/8	+8.7
O	CPT CORP	4-	8	4 1/4	0	0.0
N	CRAY RESEARCH INC	25-	97	97 3/8	+5 1/2	+5.9
O	DAISY SYSTEMS CORP	11-	38	11	-1/2	-4.3
N	DATA GENERAL CORP	31-	76	35	+2 1/2	+7.6
O	DATAPOINT CORP	5-	22	8	+1/8	+1.5
N	DIGITAL EQUIPMENT	42-	91	89 1/2	+3 7/8	+4.5
A	EECO INC	13-	20	19	-5/8	-3.1
N	ELECTRONIC ASSOC.	3-	7	5 1/4	-1/4	-4.5
N	FLOATING POINT SYST	18-	42	37 7/8	+5/8	+1.8
N	FOXBORO	22-	31	30 3/8	-5/8	-2.0
N	GOULD INC	20-	38	22	+5/8	+2.9
N	HARRIS CORP	22-	35	32 5/8	+1 1/2	+4.8
N	HEWLETT-PACKARD CO	29-	46	42 1/4	0	0.0
N	HONEYWELL INC	54-	87	76 3/4	+1 1/2	+1.9
N	IBM	117-	158	149 1/2	+2	+1.3
O	IPL SYSTEMS INC	1-	4	3 3/8	+1/2	+17.3
N	ITT CORP	28-	57	56 3/4	+7 3/8	+14.9
N	M/A-COM INC	13-	24	17 1/4	+1/8	+0.7
N	MANAGEMENT ASSIST	2-	28	2 1/2	-1/16	-2.4
N	MATSUSHITA ELEC(ADR)	46-	98	87 1/4	-2 3/4	-3.0
O	MENTOR GRAPHICS	13-	30	15 1/2	-1 1/4	-7.4
N	MOHAWK DATA SCI	1-	13	2 5/8	+1/8	+5.0
N	NBI INC	11-	20	12 1/2	-1	-7.4
N	NCR	28-	58	52 1/2	-1/4	-0.4
N	PERKIN-ELMER	22-	38	28 1/4	+7/8	+3.1
N	PRIME COMPUTER INC	15-	27	18 7/8	+1 3/4	+10.2
N	SPERRY CORP	38-	78	75 7/8	+3/8	+0.4
O	STRATUS COMPUTER INC	9-	25	21 1/2	-3/4	-3.3
O	TANDEM COMPUTERS INC	13-	34	32 3/8	+3/4	+2.3
N	TANDY CORP	24-	44	38 3/4	+3/8	+0.9
O	TELEVIDEO SYSTEMS	2-	4	3	0	0.0
O	TELXON CORP	6-	24	23 1/2	+1/2	+2.1
N	TEXAS INSTRUMENTS	86-	141	119 3/8	-1 5/8	-1.3
A	ULTIMATE CORP	9-	34	28 1/4	-1	-3.4
O	VECTOR GRAPHICS INC	1-	1	1 1/8	0	0.0
A	WANG LABS "B"	15-	29	14 7/8	-3/4	-4.7
A	WANG LABS "C"	15-	29	15	-1	-6.2
N	XEROX CORP	37-	72	57 3/8	+2 3/8	+4.3
	SUPPLIES & ACCESSORIES					
N	AMERICAN BUS PRODS	21-	36	33 1/8	+1/4	+0.7
N	BARRY WRIGHT	17-	29	20 5/8	-3/4	-3.5
A	DUPLEX PRODUCTS INC	13-	22	21	-3/8	-1.7
N	ENNIS BUS. FORMS	14-	28	28 1/4	-1 5/8	-5.8
N	3M COMPANY	74-	114	114	+2 7/8	+2.5
N	MOORE CORP LTD	15-	27	26	+3/4	+2.9
O	STANDARD REGISTER	22-	46	40	+1/2	+1.2
N	WALLACE COMP SERVICE	30-	46	46 5/8	+3 5/8	+8.0

EXCH		52-WEEK RANGE (1)		CLOSE JULY 2 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & DP SERVICES					
O	ADVANCED COMP TECH	2-	6	5 3/8	0	0.0
N	ADVANCED SYSTEMS INC	9-	20	18 1/2	+3/4	+4.2
N	AGS COMPUTERS INC	10-	25	20 7/8	+1 5/8	+8.4
O	AMERICAN SOFTWARE	9-	15	13	-5/8	-4.5
N	ANACOMP INC	5-	11	5 1/2	-1/4	-4.3
O	ANALYSTS INT'L CORP	2-	8	6	+3/8	+6.6
O	ASHTON TATE	6-	34	28 7/8	+1/2	+1.7
O	ASK COMPUTER SYSTEMS	7-	25	11 1/8	-1/2	-4.3
B	ASTRADYNE COMP INC	1-	3	1 3/8	-1/16	-4.1
N	AUTOMATIC DATA PROC	18-	39	35 3/4	+1/4	+0.7
O	COMPUTER NETWORK	5-	9	7 7/8	+1/8	+1.6
O	COMPUTER ASSOC INT'L	9-	25	25	+1 1/4	+5.2
O	COMPUTER HORIZONS	5-	11	12 5/8	-1	-7.3
N	COMPUTER SCIENCES	13-	39	39 3/8	+1/4	+0.6
O	COMPUTER TASK GROUP	7-	19	13 1/4	-3	-18.4
O	COMPUTER USAGE	1-	3	2 1/8	-3/8	-15.0
O	COMPUTONE SYSTEMS	3-	11	3 1/2	-1/8	-3.4
O	COMSERV CORP	1-	6	3 1/4	-5/8	-16.1
O	COMSHARE	7-	13	13	0	0.0
N	CULLINET SOFTWARE	12-	33	13	+1/4	+1.9
O	CYCARE SYSTEMS INC	13-	27	14 1/8	0	0.0
O	HOGAN SYSTEM INC	4-	12	11 1/8	+3/8	+3.4
N	GENERAL ELECTRIC CO	56-	82	81 1/4	-1/2	-0.6
N	GENL MOTORS E (EDS)	20-	49	48	+1/2	+1.0
N	GTE CORP	38-	55	55 3/8	+2 5/8	+4.9
O	INFORMATION SCIENCE	1-	5	3 1/4	-1/2	-13.3
O	INFOTRON SYSTEMS CP	13-	24	15 1/4	-1/2	-3.1
O	KEANE ASSOCIATES	10-	20	15 1/8	+3/8	+2.5
N	LOGICON	25-	43	33 1/4	+1/8	+0.3
O	LOTUS DEVELOPMENT CP	15-	38	37 1/4	+1 1/8	+3.1
O	MCI COMMUNICATIONS	7-	13	10 3/8	+1/4	+2.4
O	MNGT SCI AMER INC	7-	16	13 7/8	-3/4	-5.1
O	MATHEMATICAL APP GRP	1-	8	1/2	0	0.0
O	MICOM SYSTEMS INC	12-	36	12 3/4	0	0.0
O	MICROPRO INT'L CP	2-	4	2 1/8		+2.9
O	NATIONAL DATA CORP	8-	25	20 3/4	+1	+5.0
O	ON-LINE SOFTWARE INT	4-	18	13 3/4	+1/2	+3.7
N	PANSOPHIC SYSTEMS	14-	35	30 5/8	+3/8	+1.2
N	PLANNING RESEARCH	11-	23	19 1/8	-1/8	-0.8
O	POLICY MGMT SYSTS CP	18-	35	18 3/4	-1/2	-2.5
O	PROGRAMMING & SYS	4-	10	9 7/8	-1/8	-1.2
O	REYNOLDS & REYNOLD	30-	65	32 3/4	-1/2	-1.5
O	SEI CORP	13-	27	18	+1/4	+1.4
O	SHARED MEDICAL SYST	26-	38	36 1/2	+1 3/8	+4.0
O	SCIENTIFIC COMPUTERS	4-	8	4 1/2	0	0.0
O	SOFTWARE AG	12-	22	18 3/8	-1 1/8	-5.7
N	URS CORP	10-	18	16 1/4	+1/8	+0.7
N	UCCEL	11-	23	21 5/8	+1/8	+0.5
O	VM SOFTWARE	17-	31	28 1/4	+1 1/4	+4.6
	SEMICONDUCTORS					
N	ADVANCED MICRO DEV	20-	38	20	-1 1/2	-6.9
O	ADV'D SEMICONDUCTOR	7-	23	9	-1/8	-1.3
N	ANALOG DEVICES INC	14-	24	18 3/8	-3/8	-2.0
O	ANALOGIC CORP	11-	16	12 1/2	-1/4	-1.9
N	APPLIED MATERIALS CP	9-	19	16 7/8	+1 1/2	+9.7
O	AVANTEK	17-	28	18 1/2	+5/8	+3.4
B	HADCO CORP	3-	7	5 3/8	+3/8	+7.5
O	INTEL CORP	21-	33	22 1/2	-1 1/2	-6.2
O	MICRO MASK INC	5-	12	4 3/4	-1/8	-2.5
N	MOTOROLA INC	29-	48	37 7/8	-1 1/8	-2.8
N	NAT'L SEMICONDUCTOR	10-	15	11 5/8	+1/8	+1.0
N	TERADYNE	17-	33	22 3/4	+3/8	+1.8

EXCH		52-WEEK RANGE (1)		CLOSE JULY 2 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	PERIPHERALS & SUBSYSTEMS					
P	AM INTERNATIONAL	3-	8	6 3/4	1 1/8	14.2
A	ANDERSON JACOBSON	2-	5	2 1/4	+1/8	+5.8
O	AST RESEARCH INC	7	33	14 3/8	+1 1/2	+11.6
O	AUTO-TROL TECHNOLOGY	3-	13	4 1/8	0	0.0
O	AVANT-GARDE COMPUTING	3-	21	4	+1/4	+6.6
O	BANCTEC INC	6-	13	9	-3/4	-7.8
O	BEEHIVE INT'L	1	2	1/8	0	0.0
N	BOLT,BERANEK & NEW	20-	48	43 1/4	+1 5/8	+3.9
O	CAMBEX CORP	1-	3	1	0	0.0
N	CENTRONICS DATA COMP	3-	11	8 1/2	0	0.0
A	CETEC CORP	6-	9	7 1/4	+1/8	+1.7
A	COGNITRONICS	4-	7	3 7/8	+1/8	+3.3
N	COMPUGRAPHIC CORP	20-	36	19 1/2	-1/2	-2.5
O	COMPUT R TRANSCEIVER	0-	1	3/4	0	0.0
N	COMPUTERVISION CORP	9-	44	14 1/2	1/4	1.6
N	CONRAC CORP	12-	18	16 3/8	+1 3/8	+9.1
A	DATAPRODUCTS CORP	11-	20	14 5/8	5/8	-4.0
A	DATARAM CORP	4-	17	8 1/2	-3/4	-8.1
O	DATA SWITCH CORP	4-	9	6 3/4	+3/4	+12.5
O	DATUM INC	5-	9	6 1/8	+1/8	+2.0
O	DECISION BID CORP	10-	20	13 1/8	-1 5/8	-11.0
O	ENDATA, INC	2-	8	6 3/4	0	0.0
O	EVANS & SUTHERLAND	12-	27	22	0	0.0
O	GANDALF TECHNOLOGIES	5-	13	6 1/2	-1/4	-3.7
N	GEN'L DATA COMM BID	8-	21	12 1/8	-5/8	-4.9
N	HAZELTINE CORP	17-	30	20 1/8	+3/8	+1.8
O	ICOT CORP	3-	12	11	0	0.0
O	INFORMATION INTL INC	10-	17	16 1/4	+3/4	+4.8
O	INTECOM INC	3-	11	5	-1/4	-5.8
O	MEGADATA CORP	3-	8	3 5/8	+1/2	+16.0
A	MSI DATA CORP	7-	14	13	-3/4	-5.4
N	NASHUA CORP	24-	53	50	+3/8	+0.7
O	NETWORK SYSTEMS CORP	11-	27	13 1/4	+1/2	+3.9
N	NO AMERICAN PHILIPS	32-	47	44 7/8	-1/2	-1.1
N	NORTHERN TELECOM LTD	28-	41	29 1/4	-1/2	-1.6
D	OMEX	1-	3	1/2	0	0.0
N	PARADYNE CORP	6-	18	8 3/8	0	0.0
A	PENRIL CORP	6-	14	6 1/4	-5/8	-9.0
N	PLESSEY CO (ADR)	19-	38	34	-1 1/4	-3.5
O	PRINTRONIX INC	9-	18	13 1/4	-1/4	-1.8
O	QMS INC	6-	16	14 7/8	-3/8	-2.4
O	RAMTEK CORP	2-	7	5 7/8	+3/8	+6.8
N	RECOGNITION EQUIP	9-	17	12 3/8	3/8	-2.9
N	SANDERS ASSOCIATES	29-	54	54	+21 3/8	+65.5
O	SCAN TRON CORP	9-	24	23 1/4	1/4	-1.0
N	SCIENTIFIC ATLANTA	10-	15	10 1/8	-1/4	-2.4
O	SEAGATE TECHNOLOGY	5-	13	11 5/8	-1/4	-2.1
N	STORAGE TECHNOLOGY	1-	5	3 7/8	+1/2	+14.8
O	SYKES DATATRONICS	0-	2	3/8	+1/16	+19.8
A	T BAR INC	5-	9	5 7/8	+5/8	+11.9
A	TAB PRODUCTS CO	9-	15	14	-1/4	1.7
O	TANDON CORP	3-	9	8 1/8	-1/8	-2.0
A	TEC INC	4-	13	4 1/4	-1/2	-10.5
N	TEKTRONIX INC	47-	68	60	+5/8	+1.0
N	TELEX	34-	68	58	1/2	-0.8
O	TESDATA SYSTEMS CP	0-	3	3/8	0	0.0
N	TIMEPLEX INC	15-	23	16 5/8	0	0.0
N	TITAN CORP	4-	11	9 7/8	+3/8	+3.9
O	VISUAL TECHNOLOGY	1-	3	1/2	0	0.0
	LEASING COMPANIES					
N	COMDISCO INC	7-	24	22	+1	+4.7
N	CONTINENTAL INFO SYS	5-	12	11 7/8	+1/8	+1.0
O	FINALCO GROUP INC	3-	9	3 1/4	+1/8	+4.0
O	PHOENIX AMERICAN INC	2-	6	3 3/4	0	0.0
O	SELECTERM INC	6-	12	7 1/2	0	0.0
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COMPUTER INDUSTRY

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Token-ring patent claimant Olof Soderblom continues to press vendors for royalties/**90**

Microsoft's recent acquisition of a software firm sends mixed signals to the Topview/Windows market/**94**

INSTANT ANALYSIS

"What IBM needs to do is push a lot of software and peripherals to drain MIPS, so that their installed base needs more capacity and starts buying hardware again."

— **Charles Greco, vice-president, International Data Corp.**

DCA to acquire Cohesive

Second buy-out this year gains T1 network foothold

By James A. Martin

ALPHARETTA, Ga. — In a move to further expand beyond its flagship Irma product line, Digital Communications Associates, Inc. (DCA) last week agreed to acquire Cohesive Network Corp., a privately held T1 multiplexer vendor in Los Gatos, Calif., for approximately $30 million in DCA stock.

The proposed merger, the second for DCA this year, was seen as another step in the quest to become, through acquisition, a diversified data communications company. DCA earlier this year acquired micro-to-mainframe equipment vendor Forte Communciations, Inc. of San Jose, Calif. [CW, Feb. 3]. In a recent interview, President and Chief Executive Officer Bertil D. Nordin said that DCA was interested in entering the T1, local-area network (LAN) and gateway markets by acquiring one or more companies this summer [CW, June 2].

"We looked at all the companies with T1 products and saw Cohesive as having the most advanced," Nordin said last week. "In addition, it had products that are available now and not simply expected in the future."

Although DCA's fortunes were built on the Irma micro-to-mainframe terminal emulation board, industry analysts have noted that Irma will soon produce diminishing returns. DCA is threatened in the short term by competitive pressures from IBM and in the long term by changing microcomputer technology that could make Irma — considered the industry standard — obsolete.

"The Cohesive acquisition will alleviate some concerns about DCA's growth potential," said Mark Dunkel, vice-president of research for Robinson-Humphrey Co. in Atlanta. "This acquisition gives them a new product line in a rapidly growing segment of the communications market."

Cohesive "adds something to DCA's product set that was otherwise missing, something they would not have been able

See **DCA** page 116

ITT to sell unit to European group

By Alan Alper

NEW YORK — ITT last week agreed to sell controlling interest in its telecommunications business unit to a consortium of European firms, led by France's state-owned Compagnie Generale d' Electricite (CGE), for $1.8 billion.

The venture is expected to be a major factor in the telecommunications industry outside of the U.S., particularly in Europe and South America, analysts said last week.

"It signals ITT's total withdrawal from the U.S. market and a stronger emphasis on the European market," noted Jeff Kaplan, a telecommunications analyst with International Data Corp. in Framingham, Mass.

The joint venture company's product line would include CGE's Alcatel System E-10 central office switch and ITT's much-maligned System 12 central office switch. In addition, the new company would market products formerly handled by ITT's money-losing Business Information Systems group, including microcomputers and peripherals.

The venture would control 10% of the worldwide telephone switching business, with operations in 75 countries, and is expected to have annual revenue of about $9.6 billion, making it the world's second largest telecommunications company behind AT&T.

Although ITT Chairman Rand Araskog would head a supervisory group overseeing the venture, daily operations would be managed by CGE, ITT said.

Analysts last week said ITT was motivated by its mounting debt, which had begun to effect research and development expenditures, and its inability to increase market share in the central office switch

See **ITT** page 116

INDUSTRY INSIGHT
Clinton Wilder

Lotus blossoms . . . selectively

Michael Kolowich, the marketing vice-president of Lotus Development Corp., says that appearances can be deceiving. Even as he displays a chart depicting the five companies of which Lotus has either acquired 100% equity or specific product lines in the past 18 months, Kolowich insists that it's all relative.

Relative to what? Relative to the number of business plans that pass over Chairman Mitch Kapor's desk from microcomputer software companies that want to be acquired by Lotus.

"We take an extreme amount of care to not act like the kid in the candy store and eat more than we can digest," Kolowich says. "We think we've been very careful. Without exception, the number of potential deals flowing to Lotus is stronger than in any other company I've been involved with." And before life with Lotus, Kolowich formulated merger and acquisition strategies for Fortune 500 companies as a consultant with Boston-based Bain & Co.

Although Kolowich won't come out and say it, Lotus is trying to differentiate its acquisition strategy from that of the other micro software superstars, notably Ashton-Tate and Software Publishing Corp. Lotus emphasizes, with credibility, that virtually all of its acquired products can work with, enhance or provide gateways to 1-2-3 and Symphony (the company doesn't talk much about Jazz).

In other words, this is the "complement" rather than "diversify" acquisi-

See **LOTUS** page 94

Wilder is Computerworld's senior editor, computer industry.

On-line financial data market attracts diverse players

By Alan Alper

NEW YORK — The investment community's seemingly insatiable need for timely and relevant economic data is drawing a wide variety of deep-pocketed participants into the on-line financial information market.

Within the past six months, the market's two largest vendors — Quotron Systems, Inc. and Bunker Ramo Information Systems —have been acquired by Citicorp and Automated Data Processing, Inc. (ADP), respectively. Information service firms such as Bridge Trading Co., CMQ Communications, Inc., Knight-Ridder Newspapers, Inc. and Reuters Ltd. are battling for market share with computer heavyweights Wang Laboratories, Inc., Lotus Development Corp. and International Marketnet (Imnet), a joint venture of IBM and Merrill Lynch & Co.

"It follows that with increased demand for stocks and bonds, trading volume has gone up. So has interest in this business," notes Jerry Higgins, marketing vice-president at Imnet.

The allure, vendors say, is the expanding and somewhat fragmented international market for financial information. One thing is clear: Brokerage firms are no longer the only customers for stock and bond quote information and financial news.

Banks offering a full range of investment vehicles as well as insurance companies and private investors are now seeking access to such information, creating sundry market opportunities for the new entrants.

Those entering the market can differentiate themselves by offering new technologies, such as satellite distribution and intelligent workstations, to provide cheaper and more effective solutions for customers. Financial institutions such as Citicorp are rushing to offer value-added services, such as decision support systems, to achieve competitive advantages.

Citicorp recently completed a nine-month pursuit of Quotron and its market leading installed base of almost 80,000 installed stock quote terminals as part of a strategy to become a diversified provider of financial services and information.

"Citicorp's chairman, John Reed, has said all along that Quotron is a piece of the apparatus," says software and services analyst Tom Lawton, publisher of "The Computer Services Report" in Belmont, Mass.

Ownership by the world's largest bank holding company will provide Quotron with the resources to maintain its sizable market share. And Quotron sees growth beyond the stock quote data itself in channeling that information within user sites.

"We can move more heavily into the transportaton of information within brokerages and the banking community," says Milton Mohr, Quotron's chairman and chief executive officer.

Mohr says 55% of Quotron's $206 million in 1985 revenue came from those types of communications services. "That portion of our business will continue to go upward in the future," he projects.

ADP acquired Bunker Ramo from Allied Corp. primarily to bolster its

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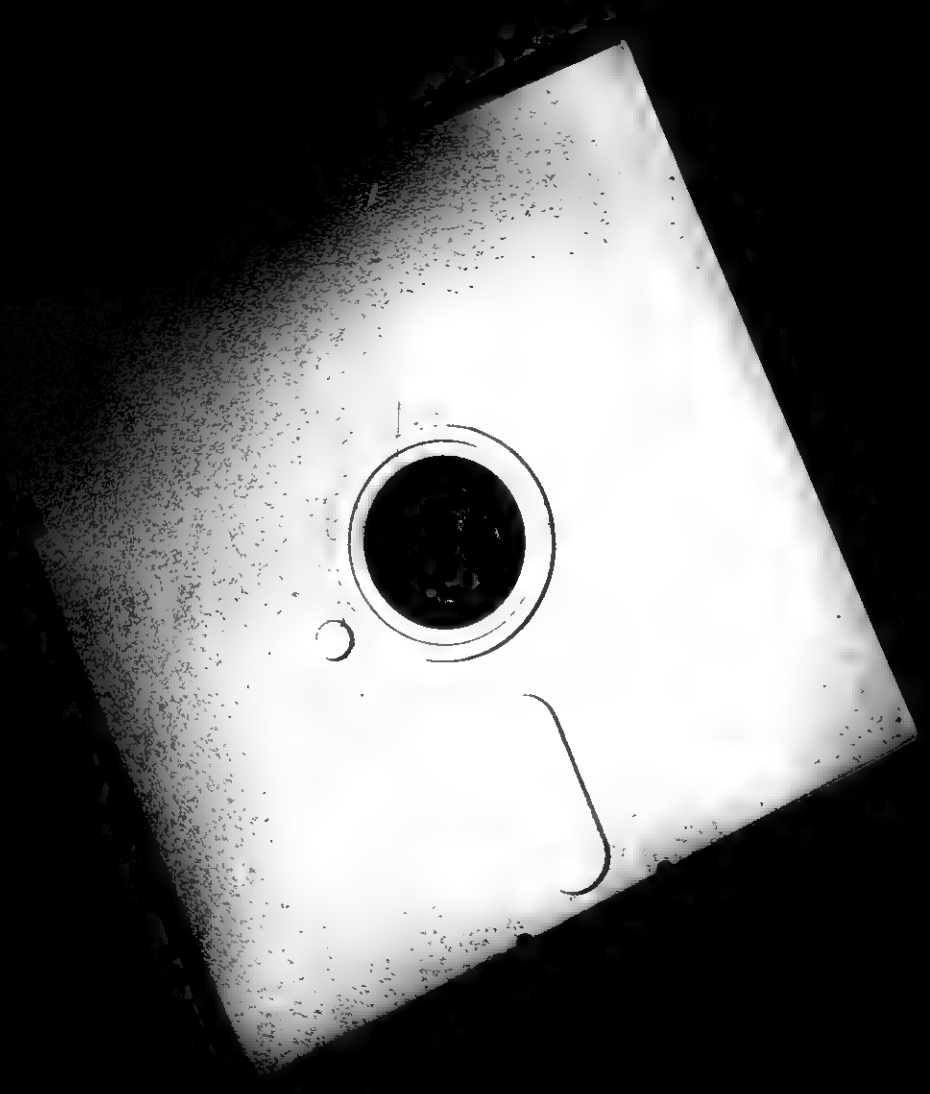
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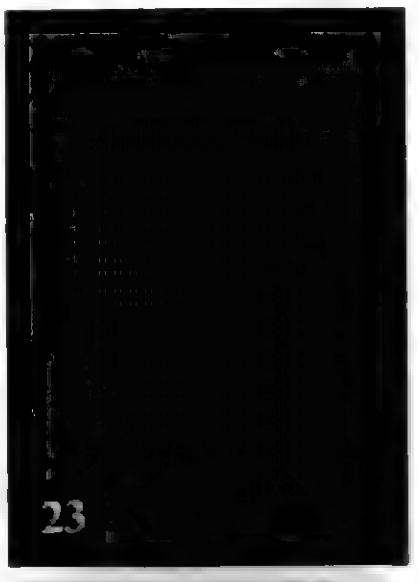
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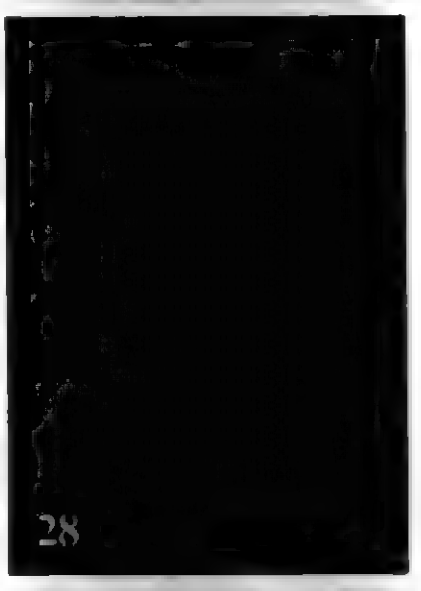
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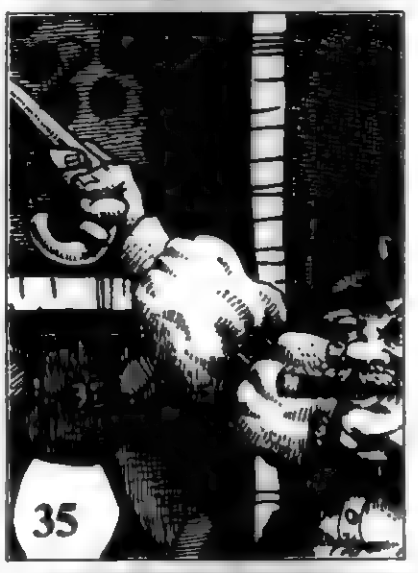
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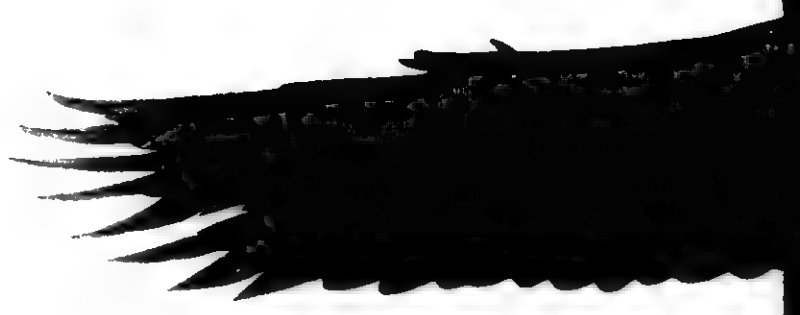
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VIEWPOINT

EDITORIAL

Select Software Wisely

The long-awaited increase in programmer productivity has still failed to materialize. Even with information centers and a variety of new productivity tools, the applications backlog in most shops is still three years or more. While programmer productivity may be improving, the number, kind and complexity of new program requests has far outpaced advances.

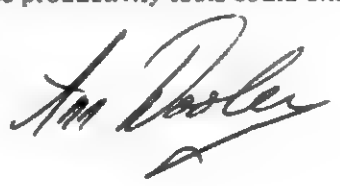
A new host of tools and methodologies, however, are allowing programmers to make significant advances in speed and cost of software development and in program reliability. But MIS managers should beware of the quick fix or one-size-fits-all syndrome. Each software project has its own special criteria and set of problems as does each organization. What this means for the MIS manager in selecting productivity tools is that there is no one tool for all projects. Shortening software schedules doesn't necessarily mean lowering software costs. No tool or method will work for every situation.

Vendors have been working hard to produce the latest in development workbenches, relational data base management systems, fourth-generation languages, program generators and application generators, for example, but these have done little to stem the backlog buildup.

Equipment purchases in the computer industry have fallen off in the last year. While this can be attributed to a number of things, one major reason lies with the available software. Hardware seems to be advancing at a more rapid pace than the accompanying software leaving MIS and end users with the equipment to work on but few new applications or necessary software to meet their needs. Until management sees evidence that the promised technology will result in real products to meet needs, growth will continue on its present course. In terms of backlog, this means that a number of solutions may be tried, none of which may end up satisfying the end user.

Vendors have too often promised a blue sky to organizations that has resulted in skepticism on the part of users. The frequent overselling of fourth-generation languages, for instance, has led a number of organizations to become distrustful of them and fail to see where these tools can actually be of substantial benefit.

Although we still don't have the ultimate productivity tool at our disposal that does everything, there are some that can do too much. If the wrong tool is selected, the real cost of performance can be high. Longer development times, additional costs of more skilled staff, greater error probability and the possible need for additional development systems to handle other parts of the development task may all become necessary. Remember, a number of helpful tools are available, but choose wisely and well or these productivity tools could only add to your backlog problems.



Dispelling Myths



INSIDER
Timothy J. Caffrey

It's tough to keep up. Yesterday's tributes to relational data base technology are now directed at the next wave — distributed data base management systems. Because data base management and administration are the focal points for most applications planning, understanding whether the next wave is a tsunami or a ripple is important. Assuming the mandate of myth buster, some of the most popular attributes of distributed data bases are explored below.

Everybody's doing it. This is an old enticement that is mostly myth. While a lot of people are talking about doing it, few can agree on what "it" really is. According to Bert Collins of Micromentor, Inc., a speaker at a recent industry conference, most companies have some form of low-tech implementation up and running already. Among those that he described was sneakernet, a means of distributing data by carrying a floppy disk from one desktop computer to another.

High-tech implementations are more elusive. The search for working, secure, fully synchronized, multiprocessor-based data base systems is often fruitless. A recent International Data Corp. survey of large-system sites claiming to have distributed data base systems yielded little more than sophisticated, centralized systems.

There is a product available, but it's still in beta testing and it probably will be for some time. "Distributed" has replaced "integrated" as the marketer's favorite product descriptor. Just as distributed processing systems often aren't, distributed data base management systems never are. There are some leaders in the field, however. Software AG of North America, Inc. and Cincom Systems, Inc. are generally acknowledged to be among the leaders in distributed data base system design. For the most part, however, potential buyers are urged to hold on to their checkbooks.

Having the product solves just half the problem. Right on. Micromentor's Collins claims that when the software becomes available, the real problems begin. His concerns are for a data flow run rampant, with individuals able to access and alter more data than could ever be useful.

The real challenge of distributed data base management systems is that they radically challenge the issues of control and ownership of data. When the data base operated in the centralized data center, questions of ownership and control did not come up. In a distributed system, the potential for decentralized or multiple ownership and control demands an entirely new view of data and its role in the organization. This is not an issue that is likely to be resolved when the product arrives.

The real drive to distributed data bases is hardware-based. Probably true. Despite the lesson about the cart and the horse, interest in distributed software is a reaction to the largely unplanned distribution of hardware. The stand-alone processors and application libraries on millions of corporate desktops have set the rules for distributed software implementation. That implementation must acknowledge the diversity of operating systems, transport mechanisms, data structures and access methods that define the systems architecture in many organizations. The implication is that selection of a product is the last step in a distributed data base implementation strategy.

Laissez-faire will work as effectively with data as with markets. An interesting claim. The operating assumption is that once the mechanism for distribution is in place, the need for control for most types of data will be minimized. Responsibility for data integrity would reside with those individuals who decide to use it.

Of course, some data will always require tight control. The challenge is to begin to distribute data and let the market determine its value. Unfortunately, the success or failure of such a proposition is likely to be proven only after someone tries it and reports the results. The potential to make or break both careers and companies is significant. The only certainty about distributed data bases is the degree of uncertainty surrounding possible strategies and directions. The impact on systems architectures, career direction and corporate success will be enormous. And that's no myth.

Caffrey is vice-president of office automation services for International Data Corp. in Framingham, Mass.

dB

BY RICH TENNANT



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VIEWPOINT

Writer Sees Danger In Equating Computer With Human Mind



Q&A
Theodore Roszak

Theodore Roszak is a professor of history and the chairman of general studies at California State University in Hayward.

Twice nominated for National Book awards, Roszak has written a new book, The Cult of Information, *a critical examination of the role of computers in business and society. He recently shared some of his insights with* Computerworld Focus *senior writer Stan Kolodziej.*

You seem to come down pretty hard on the computer industry in your book. While you see the industry making great strides commercially, you believe there has been a lack of awareness of the effects that massive computerization has on the way people think. Would you agree with that?

Let me make it clear that the book is based on a real appreciation of computer technology, which I consider to be ingenious. I am in no way suggesting that computers should not be a useful part of our society. What I'm concerned with is the tendency of those who are behind the building and disseminating of computers to present these machines as models of the human mind, of equating both the human mind and computer as information processors.

That concept derives from work in artificial intelligence.

Yes. AI has been pushing the concept of the model of the human mind as an information processing machine for a long time. With the spread of computers in schools and businesses, that concept is going to become more prevalent.

It's certainly true that the human mind can process information, and it's also true that the computer can do a very good job of imitating and even improving upon that aspect of the mind. The problem, however, comes with the assumption that you can reduce everything else the mind does to information processing, which is what the AI people are committed to achieving. So strong is this assumption that the current problems AI is experiencing in duplicating the human mind are presented only as temporary drawbacks. If more information is put into the machine, if the information is processed faster, if new technologies like parallel processing are brought in, then AI is sure the mind will yield all its secrets.

One touted leading-edge AI product that is proving popular in the commercial field is the expert system. You made the point in your book, however, that it might not be so leading edge.

Expert or knowledge-based systems have been around for two or three decades, yet it's the latest thing AI is selling. Again, I want to make clear that I think AI is a valid area of research for the commercial area, and I also think it is invaluable in clarifying how certain parts of the human mind work, but I also think it has major shortcomings.

Your concerns seem to lie more with computer software than the hardware technology. Where do you think software has fallen short?

In the way software is perceived. We all recognize that programs are the products of some human minds that decided on some order of priorities, some kind of emphasis on what's important and not important and then generally instructed the machine what to do with all this information. Again, it's the tendency to classify all of this as information in some fashion, suggesting it is still just information processing without some form of interpretation, shaping or assigning of priorities.

You have to do more than process information to understand how a program works, whether it's doing what you wanted it to do and whether it's a good program or not. You have to exercise some critical faculty. Unless this is overcome, software in all fields, including commerce, will always remain what everyone thinks it is, simply an information processing instrument and not a possible extension of the creative side of the mind.

You must find hope in human nature to overcome many of the problems you've mentioned?

The one basis of hope you always have is that people are educable, become sufficiently critical and can learn from mistakes. What makes this situation different and somewhat more threatening than anything in the past, however, is that the concept of the mind itself is a main player. I worry that a sufficient number of people may be persuaded that their minds are essentially information processing mechanisms. Once you've altered people's perceptions of what thinking is, then you've also crippled their capacity to be critical of their own experience.

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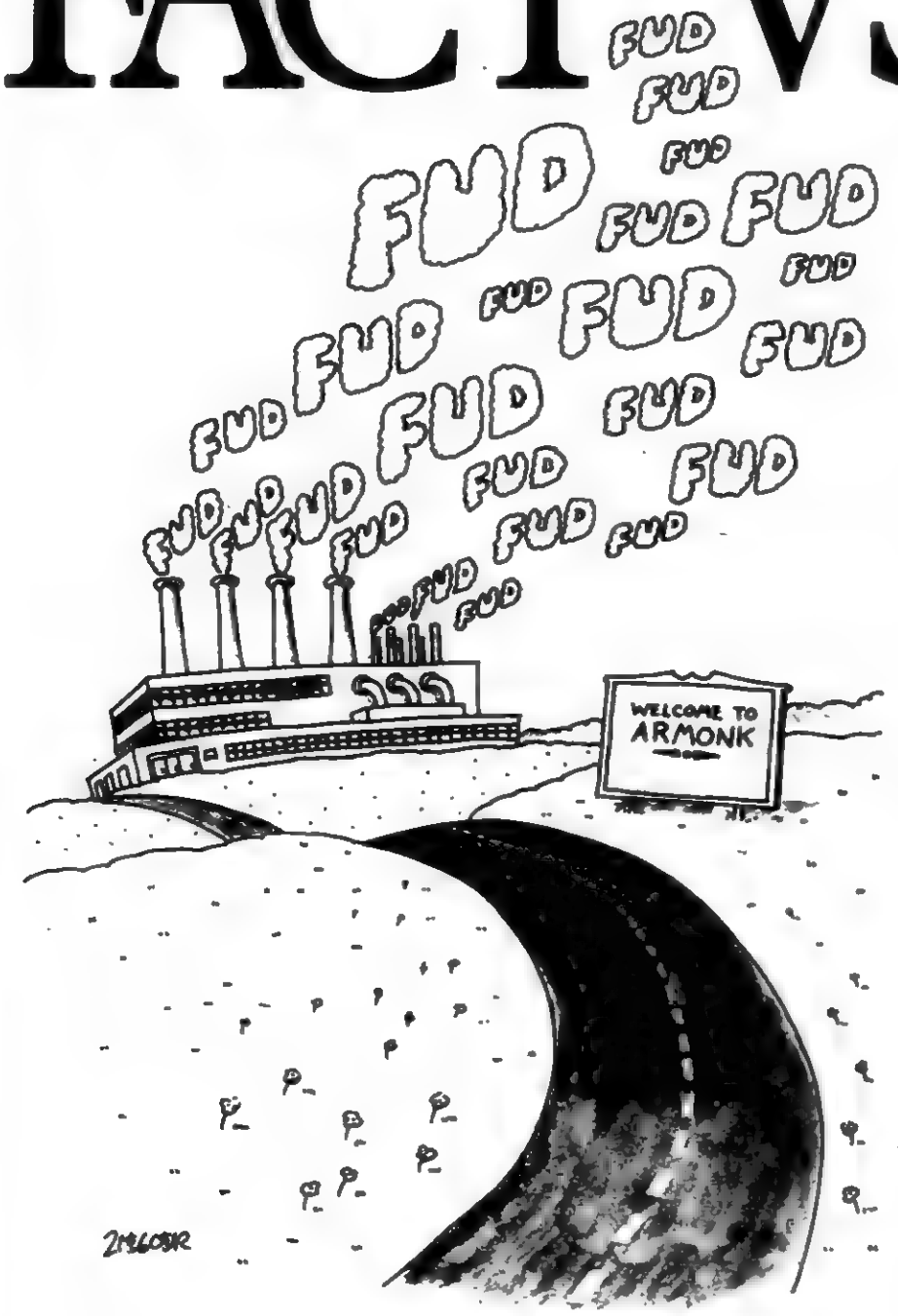
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CIRCLE READER SERVICE NUMBER 236

VIEWPOINT

Is Your Data Good Enough For Your Future?



Manager's Corner
By Jim Young

Some interesting fourth-generation software offerings are available today that provide whole new dimensions in usability and versatility. These tools can deliver power plus productivity to an analyst while offering convenience and ease of use to an end user.

You might think that with such revolutionary advantages, everyone would be using this software. Such is not the case. But I think there is an explanation. Fourth-generation language, decision support systems and other information center software are delivery systems that must rest on a foundation of accurate, well-organized, integrated data. Because most organizations do not have this prerequisite, it becomes one of the first obstacles to entering the fourth-generation's promised land.

It is not for lack of data tools because most of these packages work with data base management systems or at least with data manipulation interfaces to files. These tools won't help avoid a major data redefinition and cleanup if the basic data is in typical disarray.

Let's look at the ways you want to evaluate your data to see if it can be plugged into these new high-powered delivery systems.

Existing data

Existing data must be accurate (95% accuracy is the lowest level I have seen recommended). However, data must also be timely and well defined. Data elements must be used discreetly and consistently; there should be no overlapping meanings or fields that are used with different meanings at different times.

Programs can sort out these complications, users can't. Where relationships are important to the meaning of the data, they must also be clear and direct.

And while features do not impact the quality of the data, there are some that are needed for control. You should check that you know of all synonyms, where and how data is calculated or modified and where it is used.

While there will undoubtedly be the need for data that is not currently automated, there will also be the need to recast data that everyone assumes you already have. Just because a piece of data shows up on a report is no guarantee that it exists in a master file or in any accessible form. Many items of information are arrived at by complex or voluminous algorithms involving many transactions. Purchased applications frequently use this technique because it allows the data to exist in raw form until processed as needed. This approach is often unsuitable for global interactive response and is never desirable to try to replicate. You may want to produce frequently needed data of this type ahead of time.

Another problem is unsimplified data. This either changes during the course of processing, is redefined by reporting programs or is combined to a more simplified level for reporting. If such data is needed by user access software, it should be consolidated, summarized or created in fields of its own along with procedures to keep it accurate, timely and so on. This will help support statistical analysis that may have caused you to look at this advanced software in the first place.

Duplication of data

One way to deal with data that needs interpretation is to duplicate it. This method may offer the advantages of dedicated availability, special sanitization, simplicity, isolation and security. But at the same time it may offer problems in coordination, integrity and maintenance overhead. It is certainly not as nice as dealing with logical, top-down-designed data.

Administrative procedures of this data should also be evaluated and spruced up. For example, any potential remote data updating needs to be integrated carefully. Even for inquiry-only data, the timing of refresh updates or controlling the impact of obsolete data requires judicious evaluations. Security becomes even more of an issue. Access to data must be authorized and then monitored. Additional protective safeguards should be added.

Lastly, users must understand the data at which they are looking. At a minimum, data dictionaries should be available. More focused training and on-line assistance may be necessary to ensure that users are clear on the meaning, idiosyncracies, timeliness and sensitivity of the information.

With attention to the usefulness and management of data, your advanced software products will have something on which to use their power and features, and management can focus on the bigger issue of what data should be delivered. Then and only then will these tools have productive results. Only then will users embrace these software tools, and only then can we get on with the business of using productivity software and enter the fourth generation.

Young is principal and the director of consulting for Arthur Young & Co., Worcester, Mass. He has worked in the industry for 15 years.

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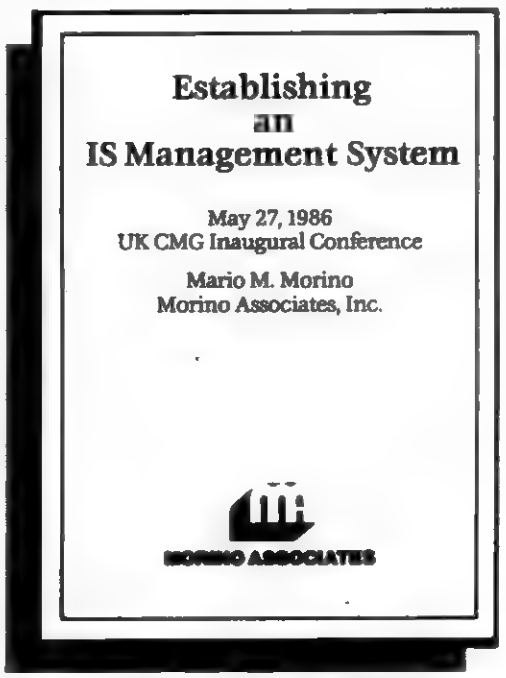
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CIRCLE READER SERVICE NUMBER 245

VIEWPOINT

IBM's Software Strategy: New Tools, New Allies



Blue Beat
Dale Kutnick

Notwithstanding personal computers and on-line interactive systems supported by relational data base management systems, fourth-generation languages, Cobol restructuring programs and a plethora of other new tools and utilities, the applications backlog in large user shops continues to be three to four years. Programmer productivity is improving, but not fast enough; there's more to do, and applications are becoming more complex.

Meanwhile, personal computer users are still unable to take advantage of the Intel Corp. 80286; most current IBM PC programs offer slight improvements over ones available on the original PC.

On the mainframe side, less than 30% of IBM's MVS customers have migrated to MVS/XA during the past four years because many of the main subsystems (CICS, IMS, TSO) do not take full advantage of the system yet, other than to offer virtual storage relief and faster, more efficient I/O (hardware benefits). Most independent software vendors, especially DBMS suppliers, do not even support MVS/XA's 31-bit mode — they simply run in IBM 370 mode. Users complain the 3090 is not different from the 3080 series machines — that there is no new software to support its advanced architecture. These factors have contributed to the computer industry slump.

IBM solutions

IBM is addressing the software issue from five directions: more on-line computer power through more powerful workstations and mainframes; a strong emphasis on relational DBMS; end-user tools; programmer application development tools; and soliciting the help of independent software vendors.

The first point is obvious. Relational DBMS (via DB2 and SQL) is now IBM's strategic direction, except in situations requiring high transaction rates. SQL is a proper subset of DB2, supported on the VM and VSE operating systems. It is becoming a de facto query language standard supported by Data General Corp., Cullinet Software, Inc. and others. IBM will likely offer support for SQL on the System/38 by the end of this year. IBM is supporting some of these vendors' efforts even though they are ostensibly competitors.

On the end-user front, IBM has been marketing its Application System product, which runs in both a VM and MVS environment and offers features/functions similar to those found on Information Builders, Inc.'s Focus. In addition, IBM offers The Information Facility and Query Management Facility across operating environment systems to facilitate end-user information extracts. Artificial intelligence tools will be important at this level, and third-party offerings will play an important role here.

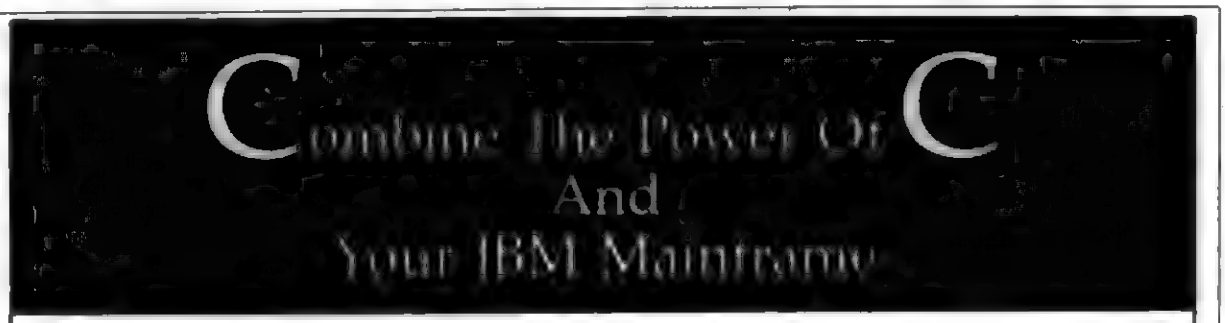
Programmer productivity tools continue to be a problem for IBM. ADF-II is powerful but too procedural, with limited flexibility and parameters. ISQL is a compromise — not powerful enough for complex applications, yet too procedural for most end users; it is nonetheless good for prototyping and writing simple programs. Cross Systems Product has recently become IBM's strategic development tool across all of its environments. It is interpretive, open and flexible and could be classified as a fourth-generation language, but it still suffers from performance problems and early bugs. It will be at least two years before it could be considered a worthy competitor of Cincom Systems, Inc.'s Mantis.

IBM could use some third-party help in this area and is actively soliciting third-party solutions. Meanwhile, it has released a new generation of languages (Cobol, Fortran and others) to take better advantage of MVS/XA. Fully 75% of mainstream commercial programs are written in old, reliable Cobol. IBM's Cobol Structuring Facility as well as comparable offerings from a few third parties such as Language Technologies and others will help to unravel spaghetti code. Artificial intelligence will have a role to play in this area and in other programmer development tools.

The bottom line is IBM is struggling with its software development tools — both in products it delivers to users and in its own, internal environment. Not only do third-party competitive opportunities abound in this arena, but IBM is working with independent software vendors through seminars, consultations and discounted hardware to combat the software lag.

IBM is acquiring and licensing a great deal of software and jointly marketing applications packages (from Oracle Corp., Hogan Systems, Inc. and others) to support PCs through mainframes. The user is clearly the target of these efforts. Indeed. Competition notwithstanding, IBM has finally realized that only through an open, supportive dialogue with independent software vendors can it hope to address the software logjam and put the information industry back on course.

Kutnick is executive vice-president of research at the Gartner Group, Inc., headquartered in Stamford, Conn.



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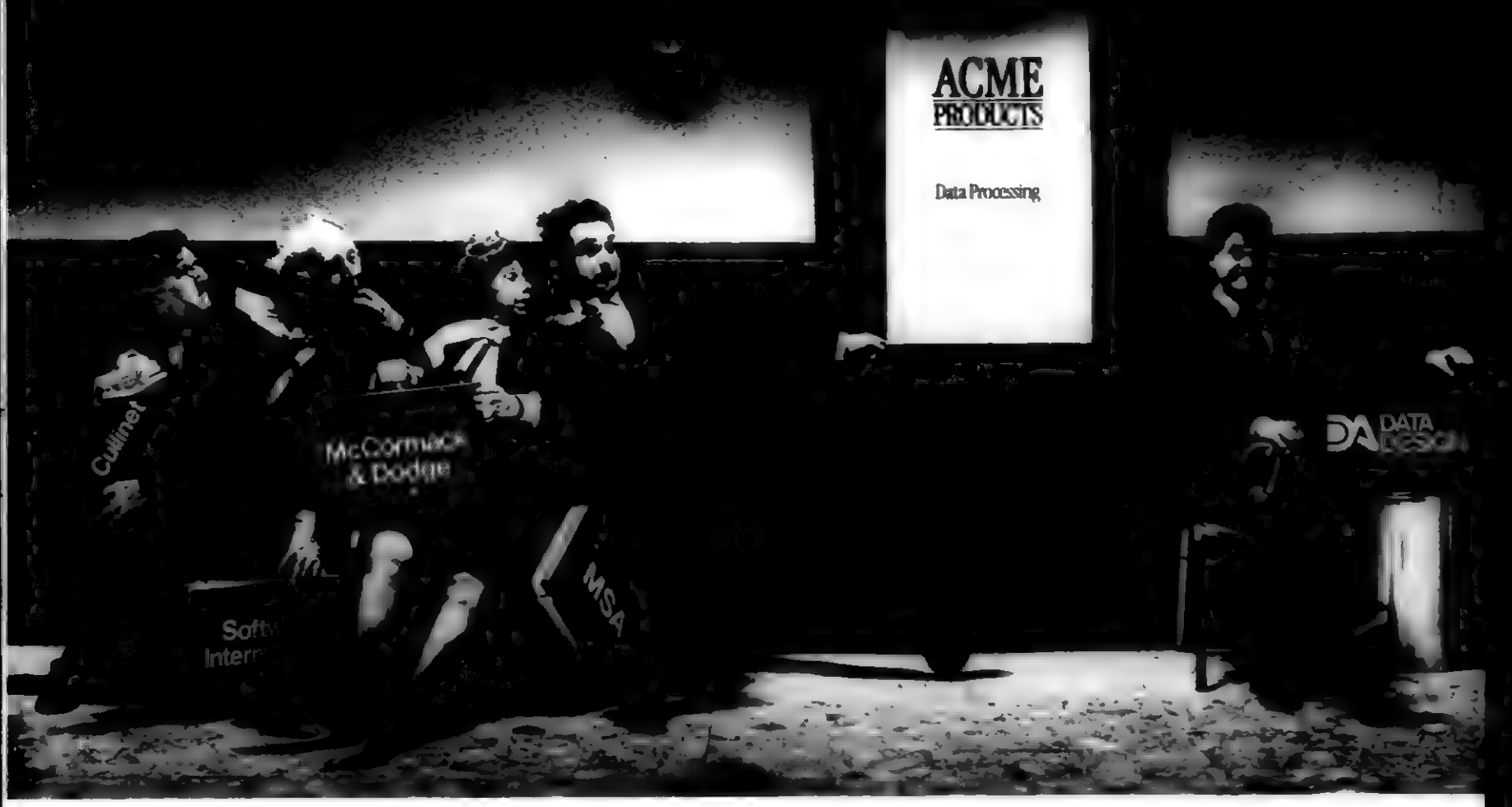
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CIRCLE READER SERVICE NUMBER 238

VIEWPOINT

Assessing The Application Software Resource



Issues and Answers
By Robert D. Gilges

Managing the application software asset is an increasing concern and responsibility of MIS executives. Application systems are expensive to create, even more expensive to maintain and enhance as a business changes and most expensive to replace.

Many corporate software libraries can be valued at tens of millions of dollars. A major Southeast bank, for example, has over 6,000 programs. There are 12 million lines of Cobol software code; at an average cost of $5 per line, the bank's software asset costs $60 million (and there are very few companies that can develop operational software for $5 per line of code).

Until the organization examined the real costs involved in this case, MIS executives had intended to replace all the older applications over the next five years. It became clear, however, that replacement in some areas through new development or even with software packages was not feasible. Alternatives were required. Thus, a new software strategic plan was developed to migrate current systems and target technical and financial objectives.

Most companies manage their software-related activities at corporate expense. Systems development and maintenance make use of people, computer time and related resources and, therefore, appear to be typical corporate expenses. However, these expenses are actually investments in corporate assets.

Needed: one replacement system

A West Coast utility had a 15-year-old customer billing system in which more than 3,000 documented changes had been made by more than 70 people and for which, over the years, all documentation had fallen by the wayside. With users looking for new features and functions, production runtimes increasing, testing time increasing and response time for changes lengthening, a replacement system was necessary.

Software packages were considered and found wanting. Further, even with nearly 300 new user features, the design of a new customer-developed system looked much like the old one. It was thought that almost all the new features could be accommodated by the old software if this software were revitalized by a reengineering. As a foundation, the current reengineered version uses structured retrofit. And so in seven months, the utility had its desired replacement system, one that performed satisfactorily for the company.

Today there are new software analytical tools that can assess the condition and vulnerabilities that exist in a software asset. The condition of existing application tools can be analyzed and both managerial and technical problem areas can be identified.

This type of analysis helps to define the way strategic investments in corporate software based on current plans and future objectives can be made.

A Midwest bank's project

A major Midwest bank had a trust system more than 15 years old that needed replacement. There were more than 600 programs, and the users had requested changes that required, among other things, the addition of data fields to system files and the modification of certain reports.

Because a major rewrite seemed the only solution, the project was postponed for several years. The bank determined, using software tools to analyze the applications' use of data and the complexity and architecture of the programs, that the job of engineering was feasible and could be done at a fraction of the alternative replacement cost.

With this in mind, the bank did not discard the existing trust software asset and proceeded to make necessary changes to it that would otherwise have been postponed once more.

Corporate planning is a process of devising strategies to gain competitive advantage. Such objectives often depend upon information systems that report on products, customers, costs, demographics or trends. Indeed, many corporations said they believe the responsiveness of their information systems can be either an advantage or a disadvantage for growth, profits or competitiveness. This leads to the conclusion that the quality and flexibility of these systems is paramount.

Software assessment tools permit the user to address the issue of how to invest strategically in software development, migration and enhancement. In this way, the software asset is continuously reevaluated and repositioned to provide the best current support in terms of corporate objectives.

Gilges is partner is charge, Information Systems Services Consulting Practice, at Peat, Marwick, Mitchell & Co. in New York. This article was written in conjunction with George A. Kettersbach, managing partner of Peat Marwick's Catalyst Group, which specializes in the area of software engineering services.

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LETTERS

Economics Of Education

Jim Young's "astonishment" voiced in the article "Hitting the Books" in the *Computerworld Focus* May 14 issue has another possible explanation: competition. Perhaps the reason hoards of professionals didn't flock to his "wide assortment of quality seminars" is simply a question of supply and demand. If the dozen or so solicitations for "educational opportunities" that I receive every week are any indication, he certainly doesn't have a corner on the market. The accumulated marketing overhead for all those glossies staggers the imagination. They all look "professional" and are accompanied by steep fees and travel expenses. Perhaps information management professionals are becoming inured to these daily doses of "extensive promotion." If my organization were to send a single individual to every seminar invitation we received, we'd be bankrupt in a year. What is needed is a planned approach to integrating education with organization goals. I would appreciate any concrete suggestions Young might have for how we can separate the wheat from the chaff.

William A. Seeley
Senior Systems Programmer
University of Maryland
Baltimore, Md.

■

Bring Back Memories

I've read so many articles about information centers (and have written a goodly number myself) that I wanted to tell you how much I enjoyed the article "New Life For the Info Center" in the *Computerworld Focus* May 14 issue.

Lee White captured the flavor of an information center through the people with whom she spoke.

The article brought back memories of my own days as an info center manager: No two days were ever the same, and as users grew more sophisticated and began to appreciate what computers could do (knowing just enough to be dangerous, in some cases), my challenges became larger. I was also interested to see that the info center's relationship with MIS is still as complex as ever. That relationship really needs to be managed carefully.

Keep up the good work!

Naomi Karten
President
Karten Associates
Randolph, Mass.

■

Worth 1,000 Words

I enjoyed reading the article "Getting the Most For Your Dollar" by Mark G. Rawlins in the May 14 *Computerworld Focus*. The article was fun to read and well-written.

One point struck me as very odd, however. The article focused on business graphics and yet there was not a single graph to be found. The author did make excellent use of two charts; perhaps the title should have been "Business Charts."

It seems the author has missed his own points.

If *Computerworld Focus* expects to assist readers in use of business graphics, it certainly would be nice to have an (another?) article that included visual as well as written material on the subject.

Thank you for the opportunity to make a comment. I'm sure I will continue to read your publication in the future.

Ray Mueller
President
Management Information Support, Inc.
Denver, Colo.


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NEWS

Software Trends In The Making

Critics might say the software industry has been stagnant lately, with no big breakthroughs. They're probably right. Under the calm surface, however, enough has been happening that may portend interesting software trends.

This year might be remembered as the breakthrough period for artificial intelligence, the time when AI finally left the laboratories and mainframes and made its first tentative steps into the commercial micro arena.

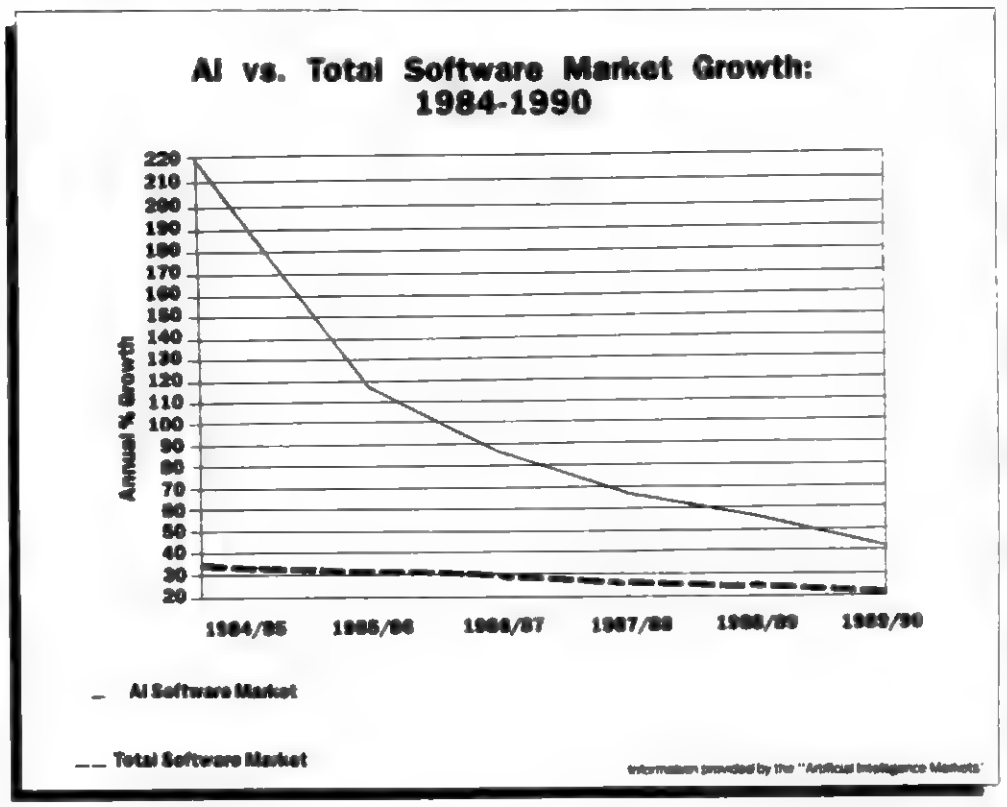
Companies like Xerox Corp. and Texas Instruments, Inc. have introduced micro-Lisp-based machines, and software developers such as Ashton-Tate and Borland International have entered the market with AI-based software. Philippe Kahn, Borland's outspoken president, produced a mini quake in the industry with the announcement of Turbo Prolog, a bargain-basement-priced ($99.95) "fifth-generation" language development system that Kahn claimed provided comparable performance to prototypes for the Japanese fifth-generation computers. IBM, it is rumored, is not far behind with its own micro-based AI product.

AI software hasn't been standing still in the larger system market either. Teknowledge, Inc. and the Carnegie Group, Inc. have been making breakthroughs in the area of expert systems. Teknowledge has rewritten its S.1 expert system software from a Lisp version to C and made S.1 development software available for minicomputers and workstations for as low as $25,000.

Carnegie Group has integrated Knowledge Craft and Language Craft, both part of the company's AI software development environments, into Version 3.1 of both products. Integrating the two, Carnegie Group officials said, will enable programmers to have greater access to natural language processing when developing expert systems while also giving users some natural language interfaces. Such announcements could give a needed boost to user/programmer relations in AI.

All of this is part of an AI software market that has been growing (see figure this page). Natick, Mass.-based Artificial Intelligence Markets estimates that the market will reach $500 million for expert systems tools, $350 million for AI languages and $200 million for natural language processing by 1990.

■



SOFTWARE UPDATE

The Lotus/Intel/Microsoft Expanded Memory Specification has been in the software news for some time, but it might have taken a breakthrough in micro hardware to really get it moving. Intel's introduction of its 80386 processor late last year, has put pressure on software developers to push the processing limits of Intel 8088 and 80286-based machines. These units are experiencing a sales boom because of lowered prices in anticipation of 80386-based machines, the first wave of which should hit the market in late '86 and early '87. Vendors such as Lotus Development Corp., Microsoft Corp. and Ashton-Tate are expected to introduce more powerful versions of their Microsoft MS-DOS-based programs this summer and fall to grab a greater share of this late sales spurt and form a software bridge to the more powerful 80386 machines.

■

The past six months have also seen strategic market reassessments by major software companies such as Lotus, Microsoft and Borland, who are busily involved in alternate technologies such as compact disk read-only memory (CD-ROM) and desktop publishing.

With the economic downturn and a resultant slump in microcomputer hardware and software sales, software companies are looking to expand from a traditionally volatile micro software market into potentially fast growth, future industries such as CD-ROM and desktop publishing. The optical disk storage marketplace has temporarily stalled, however, while it copes with the power plays of a number of companies trying to create de facto optical disk storage standards, but the optical disk industry promises to be a lucrative one for those who jockey into early market positions, especially before IBM makes a decisive move.

■

Lotus, in light of the rather disappointing sales for its Jazz and Symphony products, is trying to shake off the tenacious image of a one-product company. It has purchased data retrieval technology from a company called Infocenter Software and is planning on developing a range of microcomputer-to-mainframe products. Lotus' 1-2-3 might even find a bit of new life in the manufacturing environment, with the help of Laboratory Technologies, which has come out with a product called Labtech Real Time Access, a data acquisition/analysis package that directly plugs real time data into the 1-2-3 spreadsheet.

Lotus also finally came around from user pressure and introduced Version 2, its 1-2-3 upgrade, at the same time that it let customers know it would soon no longer support Version 1.1. Many users regarded this as a squeeze play by Lotus to get customers to upgrade quickly to the new release. Aggravating the situation is the feeling that the upgrade is a bit of a performance letdown.

■

Software firms are also beginning to look outside the U.S. for help. Many are betting that the next big market for U.S. software is in Asia, especially Japan, where personal computers are almost as widespread as they are in the U.S. Lotus is one company that has just opened a Tokyo office, planning to distribute a Japanese version of 1-2-3. Why the rush? Though Japanese computers are often faster and cheaper than foreign machines, Japanese business software lags several years behind U.S. products. Experts claim that few

See **UPDATE** page 14

Downsizing: Big Interest In Economies Of Small

Downsizing might just be the next catchword in computing. The term is pegged to the growing tendency of MIS departments to place new applications on minis, and even more powerful microcomputer systems, to off-load the escalating burden of mainframe application backlogs and try and improve computer price/performance ratios.

Though corporate MIS has exerted more control over user departments in the past few years, economic cutbacks combined with in-house demand for more applications are forcing MIS to place these new applications on smaller machines, relying on users and vendors to supply training and support.

"The fact is, there's still a lot of decentralization going on," explained John Manter, client marketing manager at Focus Research, West Hartford, Conn. "End users often want the same sort of application power they had been getting from mainframe-based software. The result is mainframe software vendors migrating their traditional mainframe-based software to minis and micros."

Ione Cockrell, vice-president of marketing at SAS Institute, Inc., Cary, N.C., said SAS has seen pressure from clients in the past year to provide microcomputer versions of the company's SAS System, mainframe software for statistical analysis. The company has recently obliged with the PC SAS System.

"End users want responsiveness from software, and they want to control it. They want to get at corporate data bases, but they still want to be in business should the mainframe go down. What is surprising us is the large number of sales coming from the user departments and not MIS. Another factor with downsizing is economics. Micro users often don't have to worry about chargebacks from MIS."

The trend to downsize seems to be going hand in hand with the economies of small in the computer industry.

According to Will Zachmann, vice-president of corporate research at International Data Corp., Framingham, Mass., "Superior price/performance ratios and increased flexibility in microprocessor-based alternatives are making it more and more attractive for users to downsize applications to take advantage of the economies of small. IBM's pricing, the microprocessor revolution, networks and standards in small systems have stood traditional pricing on its head. User organizations will find it increasingly necessary to take advantage of opportunities to downsize, simply to remain competitive."

NEWS

UPDATE from page 13

good Japanese language programs are available, so U.S. firms have decided it's time to fill the gap.

■

The desktop publishing market, despite some confusion in defining exactly what it is, is experiencing a flood of software companies hurrying to improvise and market software packages on micros, trying to get an early seat on what is perceived to be a desktop publishing gravy train in the next two years. However, users are putting up some resistance to micro publishing packages that are more often than not simply expanded word processing and graphics systems. In the meantime, legitimate low-end publishing systems from Apple Computer, Inc. and Xerox Corp. are selling briskly, early leaders in a market that IBM is now coveting and testing with some publishing software available on its new line of 32-bit, reduced instruction set computing (RISC)-based workstations.

■

IBM has had its share of software moments. Its LU 6.2 peer-to-peer communications protocol might be finally overcoming a wide credibility gap with computer vendors, though many vendors seem to be paying more lip service than producing LU 6.2 products. While everyone agrees LU 6.2 is the way of the future, the industry has locked itself into a "you go first" pattern that has slowed the appearance of LU 6.2-supported software. The rejection of LU 6.2 as a possible integrated Open Systems Interconnet (OSI) standard by the European computer community hasn't helped the LU 6.2 cause. The European rejection gained wide publicity in the West and has made many U.S. software developers think twice about LU 6.2.

IBM has had problems in other areas. Its RISC workstations have been praised for their hardware design, but sales might be slowed by the lack of third-party software products. Though it is IBM, and the technology has been around for several years, RISC is still considered too specialized and risky a proposition for software companies to jump in with products to support it. It doesn't help when IBM maintains its usual stony silence on exactly what its future plans are for RISC in the office.

On the bright side, IBM has been garnering outside support for its SQL relational data base retrieval system, bringing SQL closer to becoming a de facto standard. Most notable recent support has come from Software AG of North America, Inc., who recently introduced AdaSQL, the company's translation link between its Adabas data base management system and IBM's SQL commands.

■

Honeywell, Inc. was stung by the wrath of users recently when it announced it would discontinue its Multics operating system. Though Multics user firms reached a peak of only about 60 by 1983, they proved to be surprisingly loyal to Multics and gadflys to Honeywell, screaming to the press and giving Honeywell the kind of publicity it could do without.

Not to be deterred, Honeywell is busy trying to prove to its customers that it does indeed have a definite direction in the office. Honeywell's proof in the pudding is the Office Network Exchange Architecture (ONEA), an ambitious series of hardware and software networking components linking micros, minis and mainframes in the office with factories and building management systems. A big project, Honeywell hopes ONEA will launch the firm past Digital Equipment Corp., Data General Corp. and others and land the company directly behind IBM to become a major supplier of one-stop office computing.

■

Because fourth-generation languages are still getting the cold shoulder from MIS in the mainframe environment, vendors are trying to push the fourth generation into the micro and low-end mini market with application development tools that can handhold customers all the way through a program's life cycle, from design and prototyping through coding and maintenance. Sales haven't exactly been monumental, however, in a subindustry that is becoming known more for its product hype than its product help. User-friendly systems are proving more difficult than expected for end users, and MIS is finding the productivity claims generated by vendors are often a lot better than those generated in the trenches.

■

And now for Unix. AT&T's long-awaited Unix System V update entered the market just as corporate customers were widening a collective yawn on Unix in the office, and the big push from many Unix software vendors (still relatively few in number) was to integrate Unix with MS-DOS. Unix vendors seem to have come to terms with MS-DOS in the office, though many Unix vendors are hoping the upcoming Intel 80386-based machines will provide the vehicle to finally get users to see the benefits of Unix as a multiuser, micro-based operating system.

In the meantime, Unix vendors have been leaving the office and heading for the fast-growth manufacturing and professional workstation industries where they are finding welcome reception from hardware manufacturers looking to broaden their base of Unix applications.

As for the role of Unix in the office, the corporate perception is not encouraging. According to a recent survey of large corporations by Arthur D. Little Decision Resources, 2% said Unix was critically important, 19% said it was important and 79% said it was not important at all.

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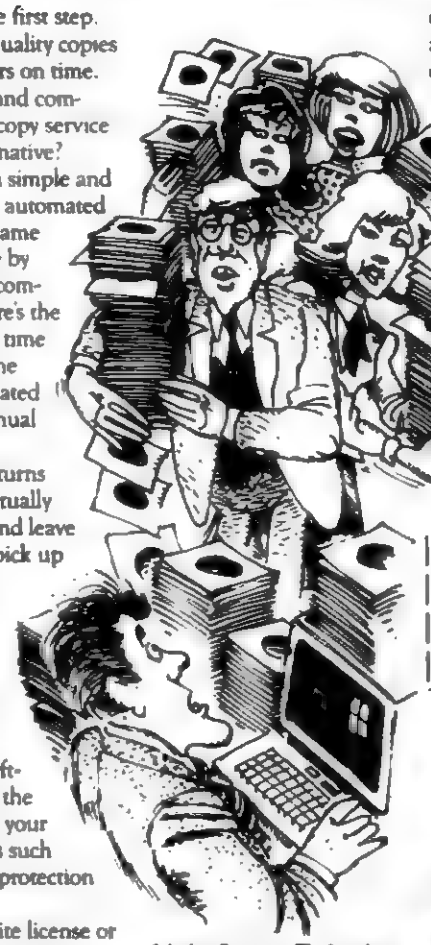
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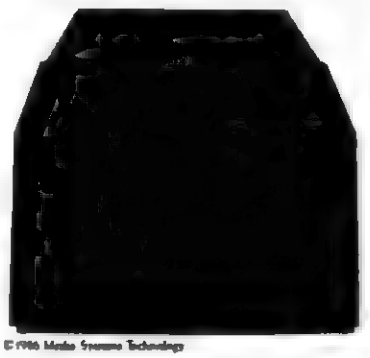
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NEWS

Forecast '86

The year 1985, also known as the year of the great softness, was not a good year for software vendors overall. Market leaders like Micropro International Corp., Information Science, Inc. and Walker Interactive Products, Inc. were hit hard, and even Management Science America, Inc., a high flyer in previous years, counted only a 7% revenue increase in 1985.

That's not to say there weren't exceptions. Strong performers such as McCormack & Dodge Corp. and Satellite Systems Software International were front-runners but suffered at the hands of sluggish software shipments and longer selling cycles.

Things don't look to improve much for 1986. Karen Kugel, senior research analyst, Software Research Programs, at International Data Corp. (IDC), Framingham, Mass., expected expansion in information spending to be fairly modest this year, about 8% to 10%.

IDC has also predicted 1986 would be a year of heavy price cutting to reach target revenue levels combined with low profits and disappointing sales performances. Over the long haul, however, vendors thought that as new hardware capabilities outdate old software applications and advances in things such as expert systems come into play, growth should maintain a healthy 20% to 30% in the industry-specific software segment.

Vendors offering cross-industry software products, however, were less optimistic. Although cross-industry markets such as accounting; human resource management and payroll; and word processing are expected by IDC to have a compound growth rate of 19% through 1990, the real action is expected to be in the less mature, industry-specific or vertical software market, which could maintain a compound growth rate of 24% or higher through 1990.

Why the difference? Kugel said the decline of cross-industry software revenue can be traced to the maturity of the accounting and human resources management markets, especially in the large-scale systems hardware market.

Growth in the application-specific software market, however, will be driven by vendors that not only provide vertically niched packaged software but that also offer a range of services such as professional consulting and turnkey systems. A new IDC report entitled "Application Solutions Providers: Coping With New Software Needs" explained that vendors of industry-specific solutions tend to view themselves as information processing service providers to the specific industry they serve rather than as package software vendors.

Kugel said one of the hottest application-specific markets is banking. The trend toward deregulation in recent years has had a dramatic affect on banks, increasing their cost of funds and reducing profits. The result is increased competition among banks, thrift institutions and stockbrokers. Banks are looking to computers and, more specifically, to vertical software aimed at the banking industry to stay competitive. A big mover is Hogan Systems, Inc. that has just signed a long-term agreement with IBM. Under terms of the agreement, IBM will sell, service and support Hogan's line of integrated banking software.

IBM Upgrades, Repositions DB2; Product's Role Poses Threat To Independent DBMS Vendors

IBM's new DB2 release just may have pumped some new life into a flattening U.S. mainframe data base management system market, increasing IBM's market share in the bargain.

IBM has attacked the market with two strategies. The first was a recent upgrading of DB2, replacing the original version introduced in 1983, which was characterized by many users as too slow in comparison with DBMS products from independent software vendors such as Cullinet Software, Inc., Software AG of North America and Applied Data Research, Inc. (ADR). The original DB2 was considered poor competition even against IBM's IMS Full Function, the company's aging hierarchical DBMS.

According to IBM, Release 2 of DB2 boasts performance increases of as much as 25%, depending on workloads and system configuration. IBM claims that using the MVS/XA operating system and an average workload, a user can achieve peak measurements of 5 transaction/sec. on a 4381 Model 2 processor and 45 transaction/sec. on a 3090 Model 200, both substantial increases over Release 1.

IBM's second frontal attack is a repositioning of DB2 in the marketplace, making DB2 useful for a broader range of customer applications — including transaction processing — and not just for low-volume, decision support applications. Bolstering words with action, IBM has instituted a plan under which first-time DB2 users can apply six initial monthly charges to the normal initial license fee, an offer running, however, only until Sept. 30. To help users identify and remove performance bottlenecks and track service levels with DB2, IBM has also added a performance monitor.

Observers said IBM is definitely positioning DB2 as a strategic weapon to be used in the future to manage extremely large, centralized data bases on IBM 370 systems that might act as controllers in distributed processing networks.

The independent software vendors could be in trouble, with analysts pointing out that DB2 might be the first serious challenge to independent DBMS vendors in several years. In IBM's view, it is about time. The computer giant's share of new DBMS installations at U.S. customer sites plummeted to a low of 20% in 1984 compared with about 65% in 1980, according to Focus Research, a West Hartford, Conn., research outfit.

"It's definitely an indication that IBM is going after the independent vendors," declared Robert Ashton, consultant with DB View, Inc., a Boston training firm.

The independents seem to agree. ADR and Computer Corporation of America have implemented their own DBMS rental and leasing programs. In the meantime, Cullinet, the leading independent mainframe software vendor, has seen sales slip for its IDMS/R product and is expected to follow soon with its own rental and leasing plan.

As for IBM's IMS system, the company insists it will continue to support IMS and IMS customers, pointing out recent enhancements to IMS Full Function. Others disagreed. "It seems clear that IBM wants to push DB2 into the IMS performance range and then push IMS aside," said Frank Gens, director of the IBM Systems Advisory Service at International Data Corp., Framingham, Mass.

U.S. Installed Base of IBM Mainframe-Compatible DBMS: 1985-1987

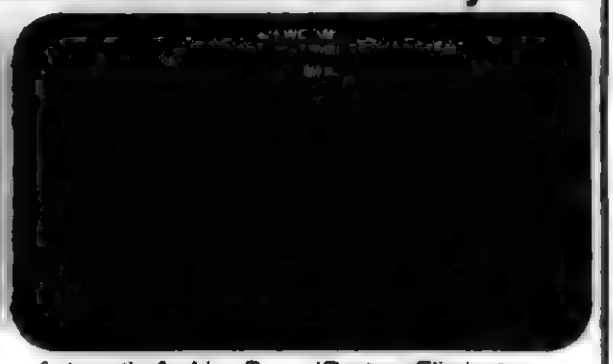
Vendor	1985	Market Share	Est. 1986	Market Share	Est. 1987	Market Share
Computer Corp. of America	375	3.1%	500	3.7%	625	4.3%
Software AG of North America, Inc.	1,000	8.3%	1,125	8.4%	1,225	8.4%
Cullinet Software, Inc.	1,500	12.4%	1,750	13.1%	1,975	13.6%
IBM DB2	300	2.5%	750	5.6%	1,200	8.3%
IBM IMS; DL/1	6,100	50.5%	6,100	45.8%	6,000	41.4%
IBM SQL	250	2.1%	450	3.4%	600	4.1%
Cincom Systems, Inc.	1,000	8.3%	1,100	8.3%	1,250	8.6%
Applied Data Research, Inc.	750	6.2%	950	7.1%	1,125	7.7%
Others	800	6.6%	900	6.8%	500	3.4%
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NEWS

The EDI Concept Is Simple; The Problems Are Many

Electronic Data Interchange (EDI) might not be getting much press to date, but some are touting EDI as the next great thrust in corporate computing. When that happens, there will be plenty of press.

EDI as a concept has been around for at least a decade, originating in the transportation industry then spreading to the automotive, drug and chemical industries. Current estimates place 20 to 25 industries using some form of EDI. The concept is simple: Create a standard for exchanging data electronically so companies can do business through computer transactions and do away with traditional paper business procedures. Straight buyer-to-supplier deals. The concept is simple, the problems many.

Saying that no one communications standard exists for industry at large would be an understatement. ANSI X12 has become a de facto standard used in manufacturing, distribution and transportation. The Transportation Data Coordinating Committee sponsors a family of standards used in the transportation, distribution and international communications industries and is promoted as well within the influential General Trade Development Institute in Europe.

Next, there are problems in trying to convince companies that EDI is worth it. Direct benefits include reduced paperwork, fewer errors in order processing, reduced inventory levels, more selling time for sales representatives and greater sales volume from customers. Despite these EDI plusses, many potential user corporations have been pushing the volume of paper transactions and their errors beyond reasonable limits, hesitant to step into what they perceive as a communications standards morass.

Where are the service companies?

Another stumbling block, however, has been the lack of adequate EDI service companies. To service EDI requires extensive networking facilities and standards know-how, and only now are a number of old-line, third-party network service firms such as McDonnell Douglas EDI Systems Co., General Electric Information Services Co. (Geisco) and Ordernet Services (a subsidiary of Sterling Software, Inc.) moving into position to grab early market positions when EDI is expected to explode.

Their optimism is warranted. The automotive industry has been making great strides in pushing ahead with communications standards such as the Manufacturing Automation Protocol, and the overspill into EDI standards and market is being felt, stimulating action.

ANSI, first of all, has been hurrying to fine-tune X12 standards. New York-based Nynex Material Enterprises recently sponsored a special telecommunications industry forum to create an action group to spur development of standards for computer-to-computer purchase orders and invoices. Attendees included representatives from Northern Telecom, Inc.; GTE Corp.; AT&T; Bell Communications Research Corp.; and various regional telephone holding companies. The group's objectives is to work within standards already established by ANSI.

Beginning Jan. 1, 1987, corporations will be able to initiate automated clearinghouse (ACH) transactions carrying virtually an unlimited amount of accompanying data, under a new payment format approved by the National ACH Association (NACHA). Officials at NACHA said the new Corporate Trade Exchange format is an offshoot of work undertaken earlier in 1986 to reconcile differences between bank-to-bank transaction standards and corporate-to-corporate EDI standards. Again, the new format will accommodate the movement of remittance/payment advice in accordance with the ANSI X12 standard.

There has also been some EDI movement in the computer industry. Last year, Control Data Corp. introduced a network transfer service allowing EDI for business partners on different networks. Qantel, Inc. has also introduced Release 6.1 of its QMRP manufacturing software system, which has the ability to link with Q-Auto, its EDI system.

What's in store for the future?

Though the EDI market is difficult to grasp in way of revenue and growth, estimates project an EDI market of up to $100 million in 1986 from about $20 million to $30 million in 1985. Some researchers see the EDI market mushrooming to about $1.5 billion in 1990, while others see it progressing gradually for the next few years before it picks up speed once standards entanglements are unraveled.

Geisco is one company in a good position to grab a large market share of EDI. Last year the company underwent a dramatic reorganization in response to a stagnant market for its traditional bread-and-butter remote computing services, targeting its services and sales forces for EDI as a fast-growth area. Geisco is specializing in a portfolio of EDI applications for vertical markets such as the transportation and office supply industries.

Explained Geisco's Bob House, manager of EDI product market development, "Once you can show businesses tangible benefits of EDI and not just technical benefits, their resistance decreases. That's happening now."

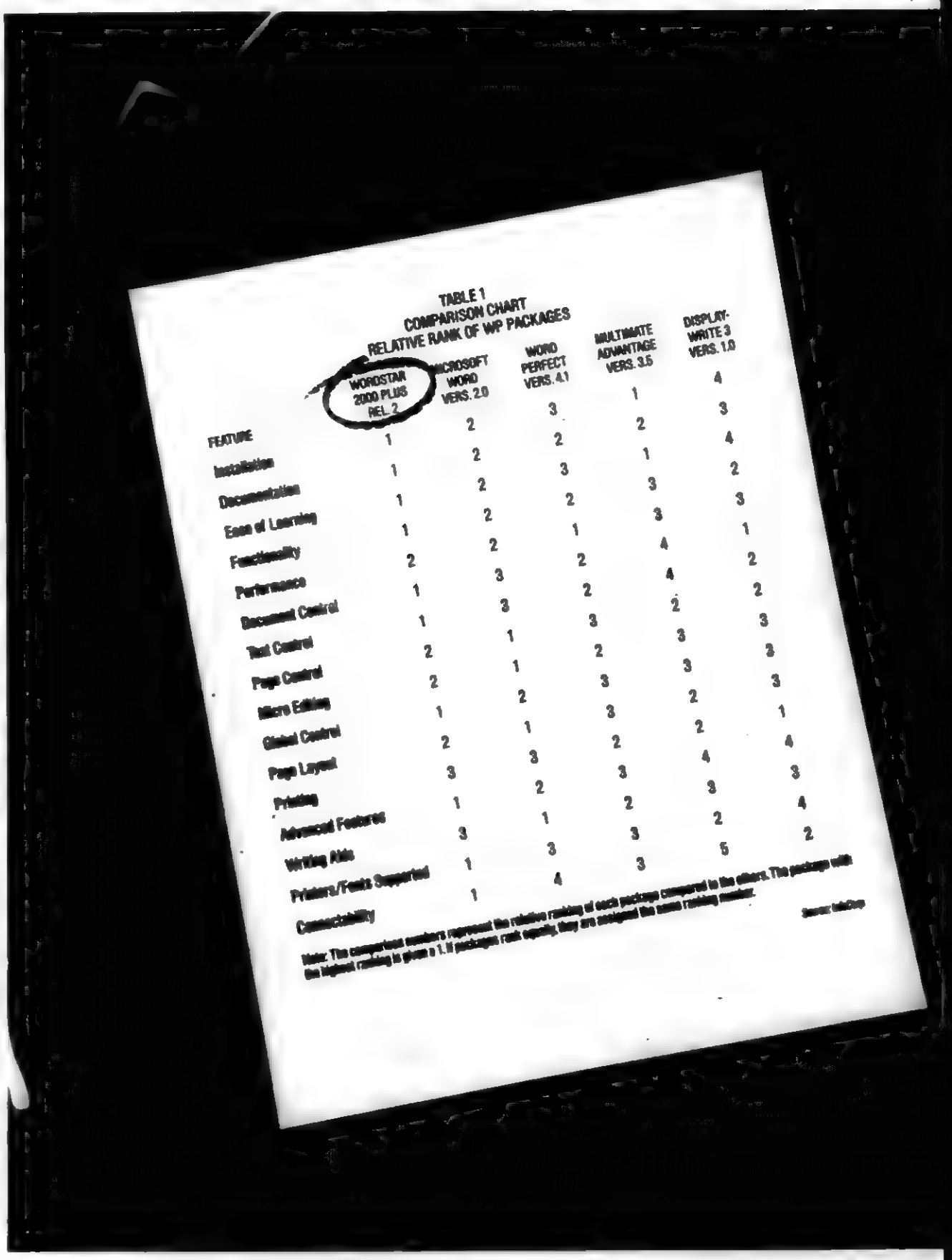


TABLE 1
COMPARISON CHART
RELATIVE RANK OF WP PACKAGES

FEATURE	WORDSTAR 2000 PLUS REL. 2	MICROSOFT WORD VERS. 2.0	WORD PERFECT VERS. 4.1	MULTIMATE ADVANTAGE VERS. 3.5	DISPLAY-WRITE 3 VERS. 1.0
Installation	1	2	3	1	4
Documentation	1	2	2	2	3
Ease of Learning	1	2	3	1	2
Functionality	1	2	2	3	3
Performance	2	2	1	3	1
Document Control	1	3	2	4	2
Text Control	1	3	2	4	2
Page Control	2	1	3	2	3
Micro Editing	2	1	2	3	3
Global Control	2	2	3	3	3
Page Layout	1	1	3	2	1
Printing	2	3	2	2	4
Advanced Features	3	2	3	4	3
Writing Aids	1	1	2	3	4
Printers/Fonts Supported	3	3	3	2	2
Connectability	1	4	3	5	1

Note: The competitive numbers represent the relative ranking of each package compared to the others. The package with the highest ranking is given a 1. If packages rank equally, they are assigned the same ranking number.

Source: InfoCorp

NEWS

Software Integration: A Mix-And-Match Business Solution

The last few years software developers have begun integrating their products with vendors' products in order to provide a more complete offering. This integration holds the promise of savings in development and marketing for vendors and of better business solutions for users.

"The one thing many people don't want to do is reinvent the wheel," said Paul Cubbage, senior industry analyst at Dataquest, Inc. Vendors want to concentrate on end-user applications, and software integration provides the means for using other developers' more general products. Examples of such integration strategies can be found at all levels.

At the microcomputer level, computer-aided publishing workstation vendor Texet Corp. resells Syntactics Corp.'s Crystalwriter Plus word processor. The companies worked together to build bridges between Crystalwriter Plus and Texet's publishing software.

At the mini level, Lincoln National Life Insurance sells turnkey office systems based on Prime Computer, Inc. machines. The software combines Marc Software International, Inc.'s Wordmarc word processor and Access Technology, Inc.'s 20/20 spreadsheet with Lincoln National's own OA functions.

At the mainframe level, Issco has linked its Tell-A-Graf and Iviss Manager graphics software with the Megacalc financial spreadsheet from The Mega Group, Inc. The combined package allows users to output graphics representations of their spreadsheets.

'Not a new trend'

"This is not a new trend," according to Peter Levine, director of the Gartner Group, Inc.'s software management stategies service. But he noted that the focus has shifted from solving technical problems to solving marketing issues. Instead of building applications around another vendor's software, developers are seeking OEM deals in which they can create an interface between their product and someone else's.

According to Levine, there is more activity because niche product software vendors see that the absence of a solution is an impediment to sales. "If you look at the alliances, you see that these are markets people would not or could not go into," Levine said. "With these alliances, the vendor can deliver a solution even though it's not his product."

For example, McCormick & Dodge Corp. includes Goal Systems International, Inc.'s Phoenix training application with its Millenium mainframe financial software. The user receives both applications on the same tape. "McCormick & Dodge is strong in financial software," said Rick Pinson, vice-president of sales and marketing for Goal Systems. "We're strong in training. Our companies joined to present a product for the market."

Software integration is coming to fruition due to several factors, said Tim Dwyer, vice-president of Marc Software. "Applications like word processing, spreadsheets and communications have each individually matured. Users are used to a nice spreadsheet."

Users have also matured, Dwyer said. "Now that they know how to use a spreadsheet or word processor, they think, 'Wouldn't it be convenient to have them combined?' "

Levine concurred. "Vendors have to create effective packaging. If users have to choose between three products or one, they'll choose one," he said.

The growing ratio for hardware price/performance is also making software integration viable. "To do this seven or eight years ago would have been very expensive," Dwyer said. "The cost for just the CPU was very high." With the computer resources available on superminis and Unix supermicros, Dwyer said he thinks people can put applications together at a reasonable price.

Interesting combinations

Users can purchase combinations of different developers' software for supermicros, minis and mainframes but not for IBM PC-DOS-based PCs. Dwyer cited two reasons for this. "At the DOS level," he said, "even the PC AT is still weak for having all the functions on a workstation." Dwyer said he believes this limitation will disappear when PCs go to the Intel Corp. 80386 chip.

A second limitation is that some DOS products are written in assembler, making them more difficult to integrate. "DOS packages are single user. They are very machine specific and generally are not meant to be integrated," Dwyer said. However, this is not a limitation for DOS applications written in C, he noted.

At the micro level, the integration of multiple vendors' applications broadens the user's choices, according to Dwyer. "Two years ago, the only integrated applications were products like Lotus' Symphony. The spreadsheet components are nice, but other companies have nicer word processing," he said. "Now there's the integration of full-featured spreadsheets and word processors that have a great depth of functionality."

For larger systems users, integrated software allows users to avoid the programmer costs of tying products together themselves, said John Ulf, director of corporate communications for Issco, and those cost savings are passed on to the customer.

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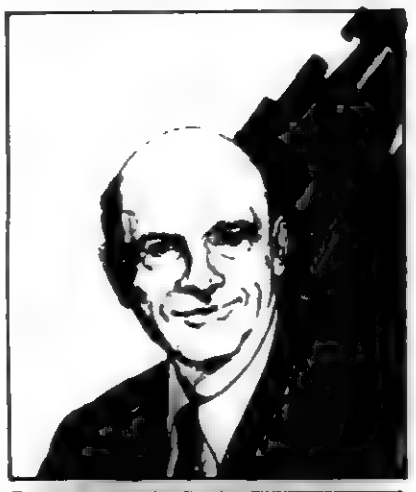
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CIRCLE READER SERVICE NUMBER 221

3 USERS. RELATIONAL DBMS. DIFFERENT EXPERIENCES.



MOBIL OIL *SOLUTION:* IBM

·BY·LEE·WHITE·

Edgar F. Codd, the originator of the relational model for data base management, is best known for his 12 rules used to determine whether a data base product is truly relational. His 12 rules are based on Rule Zero: For any system that is advertised as, or claimed to be, a relational data base management system, that system must be able to manage data bases entirely through its relational capabilities.

In a recent two-part article written by Codd and appearing in the Oct. 14 and Oct. 28, 1985 issues of *Computerworld*, Codd applied even more stringent rules for relational data base determination.

More often than not, however, organizations have their own set of criteria for selecting relational data base systems — regardless of the academic theories. The following is a sampling of how some companies are using relational data bases and what led to their purchasing decision.

Bill Tabachnik, manager of Operations Planning and Technology for Mobil Oil: IBM DB2 is "a true mathematically concocted relational system."

IBM's contribution to a relational data base discussion would be conspicuous in its absence, but finding a DB2 customer is not necessarily an easy task. Although the relational model for data bases was pioneered in 1972 by E. F. Codd, retired IBM Fellow and Turing Award winner, at the IBM Research Laboratory in San Jose, Calif., many other companies have taken the relational data base ball and run much farther and wider with it than IBM itself.

One respected industry analyst who prefers to remain anonymous lest the God of IBM let loose a thunderbolt from on high said jokingly (we think) that it was his understanding IBM was paying companies to be DB2 installations.

One respected industry analyst who prefers to remain anonymous lest the God of IBM let loose a thunderbolt from on high said jokingly (we think) that it was his understanding IBM was paying com-

panies to be DB2 installations.
Brody continued that among the reasons an organization would choose DB2 over another data base are that the organization believes in using only IBM software, that the organization has faith IBM will evolve DB2 to the appropriate performance levels or that IBM will bring together its data base products, like IMS and DB2, sometime downstream.

"It really depends on what the issues are," Brody said. "If a company has a very conservative posture and strongly prefers IBM software, then it's a good bet. But if you have a company that is very aggressive and wants to put in the hottest high-productivity software there is, then DB2 isn't a good bet."

Perhaps what it really boils down to is the definition of a true relational system. While Brody calls the term relational "a religious issue" upon which it is difficult to comment, Bill Tabachnik, manager of Operations Planning and Technology for Mobil Oil Corp. in New York calls DB2 "a true mathematically concocted relational system."

Mobil installed DB2 two years ago as an early evaluator for IBM. Mobil had been an IMS shop. While Tabachnik called the applications development process within IMS tedious, the productivity improvements were enormous. It was, he explained, a natural consequence to migrate from IMS to a relational data base structure.

Tabachnik said that the true relational nature of DB2 was extremely important to the systems staff at Mobil. "People may ask why we concern ourselves about whether it is in accordance with the definition of truly relational. The importance comes in the actual capabilities of a true relational system. [DB2] will answer every query, assuming the data is there. In the case of all those other pseudorelational systems, there is really just a front end to make it easier for the user to deal with information. Whether it is done in IMS or IDMS, you're not going to get an answer to that query."

Tabachnik regards the DB2 installation as very successful. While the early releases had some shortcomings, he expects Version 2, which they are installing now, to be vastly improved. "We expect to migrate slowly into the use of

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PYA/ MONARCH *SOLUTION:* ADR

Steve Hansen, PYA/ Monarch manager of Data Base Administration: The ADR implementation was smooth and the conversion process from VSAM painless.

Greenville, S.C.-based PYA/Monarch, Inc., the third-largest institutional food distributor in the country with 1985 revenue of $1.4 billion, was a Burroughs Corp. batch shop in 1981. The company's executives thought it was time to move into the on-line world, and they charged Tom Thomas, current vice-president of management information services who at that time was director of MIS, with the task of coming up with a plan. The result was a decision to become an IBM shop and find software that would allow for the development of common distribution kinds of applications like order processing, inventory control, purchasing and an upgrade of the financial applications.

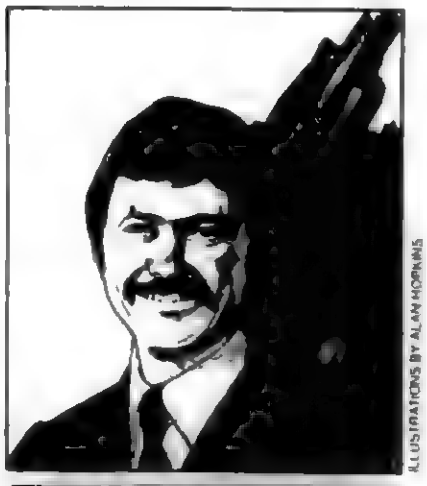
As the move was made from Burroughs to IBM, PYA/Monarch operated in VSAM, and there were problems inherent with VSAM operations in batch and on-line activities taking place simultaneously. "We knew that our management-level people were interested in the kinds of information summaries that could only be supplied by data base and, from a technical standpoint, we wanted to build all the new applications in a data base environment where we would not be facing the conflicts of batch and online working together under VSAM," explained Alex Becker, director of Technical Services and Communications.

The problems at PYA/Monarch were complicated by the nature of the business and the size and geographical location of the 20 divisions in the company. While there was nothing wrong with the VSAM structure itself, PYA/Monarch could not limit itself to doing on-line during the day and batch at night. Rather, it needed the ability to do both simultaneously.

"The technological answer," Becker explained, "was you need something called a data base because a data base, which controls all the access to the files, will handle the arguments between the programs over who is going to get what and when. It also helps that you get certain security and recovery and backup features that you don't have with VSAM. So management asked, 'How much?' We said, 'A couple hundred grand,' and they said, 'Go do it.' We really didn't care whether it was network, heirarchical or relational. Cullinet said they were coming up with some relational stuff, IDMS/R I think they called it, but the [Applied Data Research, Inc. (ADR)] people just happened to already have what we were looking for."

By 1983 the company had hired a data base administrator familiar with Cullinet's IDMS because management knew it was likely that IDMS would be the product chosen. As part of the data base administrator's early functions, he spoke not only with Cullinet's representatives but also with people from ADR about ADR/Datacom/DB and Computer Associates International, Inc. about CA-Universe. Of particular interest was a product that ADR had called VSAM Transparency. "The VSAM Transparency product would allow us to convert to data base quickly without redoing all the programs, and it appeared that ADR's relational product would be

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ILLUSTRATIONS BY ALAN HOPKINS

LITTON RESOURCES *SOLUTION:* CULLINET

Wayne Johnson, Litton Resources' DP manager: "We more than justified the cost of the [Cullinet IDMS] system. I think it was very good foresight planning."

Litton Resources Systems, a division of Litton Industries, Inc., has about 5,000 employees and is involved in oil and gas exploration. Wayne Johnson, manager of the data processing department, was hired in 1982 to help the organization choose and implement a manufacturing system.

Just after Johnson joined Litton, an economic downturn put the project on hold. In 1984 the decision was made to move the project to the front burner once more. With the added expertise of IBM representatives, eight people — including Johnson, some senior vice-presidents and other data processing people — formed a study committee to determine the problems that needed solutions. According to Johnson, the biggest problem was materials movement. "Ours is a worldwide operation, and just being able to move

See LITTON page 20

3 USERS. RELATIONAL DBMS. DIFFERENT EXPERIENCES.



MOBIL from page 19

DB2 for the high-level transaction processing applications as well as the information center types of applications."

Tabachnik admits there is still much to be done, citing the fact that IBM still has not produced overall dictionary, although the product does have its own directory. But he has high hopes for the future of the product. "The point is it is a mathematically based system, and I think you will see very high-level excellent application generators appended to it. In fact, I think they have recently appended [Application System] and they will also tie [The Information Facility] into it."

Even though DB2 may not be the leader in the data base race, companies like Applied Data Research, Inc. and Cullinet Software, Inc. should look over their shoulders and plan strategies for the future. Gartner Group's Brody said he thinks DB2 has a bright future. "People bring in ADR or IDMS because they have application systems they want to put up now, fast. . . . You bring [DB2] in because you think you're going to be married to it sometime in the future so you might as well live with it ahead of time to find out how it is."



PYA from page 19

easier for the development people to learn to use and easier for the data base department to maintain.

Eventually, PYA/Monarch chose ADR/Datacom/DB and with it got their dictionary, the Ideal development language and VSAM Transparency. They had also chosen an IBM 3083 Model J running MVS as hardware. The first conversion efforts were so successful that they went through all the old Burroughs-based batch systems and converted everything to ADR/Datacom/DB.

Although Becker praised the support given PYA/Monarch by ADR staff members, they required little in the way of help from ADR. "Speaking as a manager, the most important thing about the ADR product is that an application development person can learn to use it and not have to understand very much about the product. . . . We haven't had the ADR guy back since 1984," Becker said.

The implementation was smooth and the conversion process relatively painless. In fact, it took only about one year to get fully converted from VSAM to ADR/Datacom/DB. According to Steve Hansen, the data base administrator hired in 1983 who is now manager of Technical Support and Data Base Administration, PYA/Monarch does 85 million data base requests per week and 2.5 million CICS transactions each month. They also process 53,000 batch jobs in a month. "We have 12 branches [of the 20] converted, and as soon as we get a machine upgrade in [the company is upgrading to an IBM 3084 Model Q], we'll probably have the rest of the branches on data base in one weekend," Hansen said.



LITTON from page 19

materials and supplies to all the different crews that work around the world was a tremendous effort," Johnson said.

While Litton had successfully been conducting business for many years, the biggest question in management's mind was how Litton had been able to manage manually for all that time. The answer was that the company was relying on a few key people who had been with the company for many years and

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CIRCLE READER SERVICE NUMBER 230

had much of the critical business information in their heads.

"We looked at this and said, 'One of these days we're not going to have all these people, and [when that day comes,] there go all of our systems.' We had islands of information. One person would be knowledgeable but everything was in his head, not on paper or in a system. Therefore, he couldn't transfer that information to new people who came on board or quickly communicate to other people throughout the company's functional organization," Johnson explained.

Complicating Litton's decision-making process was a lack of appropriate hardware. The company had multiple IBM and Amdahl Corp. mainframes in its many data centers, some of which were in Houston, but most were handling scientific processing. A few of the larger computers were running business and financial applications, but none of the materials management or manufacturing applications resided on the big machines. The few materials systems they did have were running on System/34 processors, and communications between processors became a big problem.

The hardware choice was made pretty quickly. Because there was never a question as to whose hardware it would be, Litton scoffed up a used 3081 from one of its data centers and upgraded it substantially so that it would handle whatever software the firm chose.

Once the hardware was selected, the study committee came up with some criteria for the software. "Wherever we possibly could, we would buy off-the-shelf, canned software. We also decided that we would not modify the software for the first two years, if at all possible, so we really had to do a detailed review of all the vendors [and] their software," Johnson said.

The committee studied 18 products initially, quickly weeding that number down to five vendors: Comserv Corp., Xerox Corp., Rath and Strong Systems Products, Inc., IBM and Cullinet Software, Inc. While all these vendors' products were strong for the manufacturing resource planning applications, they were not equal on the data base side. Johnson had a particular stake in wanting a product that was also strong on the data base side. "For people like me who have to sustain the products, have to continue to build in the new things, it was important to educate and train the others, to explain what [a data base system] will give in the long term as far as branching out and expanding," he explained.

Eventually, the study team chose Cullinet's IDMS, and there is reportedly not a regret in the bunch. One of the most exciting by-products of IDMS has been the ease with which communciations has been achieved. According to Johnson, prior to IDMS implementation, communications was done primarily via Telex, but now communications is simple, no matter where you might be in the network.

Johnson took some bragging time to talk about the IDMS implementation. "We've been recognized as having the fastest implementation process that ever occurred in any company. We did all the conversion in four and a half months." At the end of 1984, Litton installed the information data base, all the manufacturing application software for purchasing, bill of materials, inventory, shop floor control, order entry, accounts payable, master production schedules and a cost control module. The first plant went into production in March 1985. "We had great cooperation from our data processing people, good interaction between data processing and the user community. They changed the way they did their day-to-day activities and the way the company functioned and worked," Johnson enthused.

Johnson also gave a great deal of credit to the Cullinet support staff, remarking, "I just can't say enough about the relationship and support they came in with."

Litton is now implementation plus one year. And while those of us who are purely energy consumers are thrilled with the low prices at the gas pumps and when we have our home heating oil tanks filled, companies like Litton are feeling the pinch. The technology has helped them weather the economic storm. "We've definitely had to do the job with fewer people, and at the same time, a lot of our key people — our senior people — decided to take retirement. I'm not sure we'd have been able to do that without [IDMS]," according to Johnson.

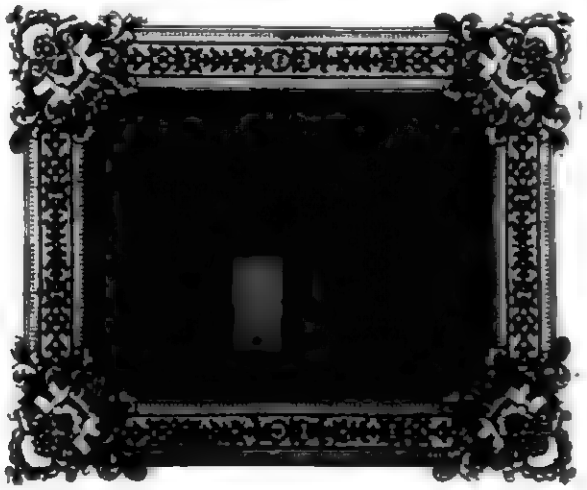
Johnson also said that when times improve, they will not have to rehire "masses and masses of people. It's a whole different world today, and we have to be much leaner in terms of overhead. We more than justified the cost of the system. I think it was very good foresight planning on our management level here, too. We didn't see a downturn coming, but hindsight tells me it was a good decision," Johnson concluded. ■

White is a senior writer at Computerworld Focus.

the Art of Visual COBOL

COBOL programming has just been elevated to an art form thanks to Visual COBOL from mbp. This comprehensive COBOL compiler package gives you mainframe screen management capabilities for your IBM PC. As a result, Visual COBOL turns your color display into a canvas on which you can create professional data entry screens and a very visual user interface.

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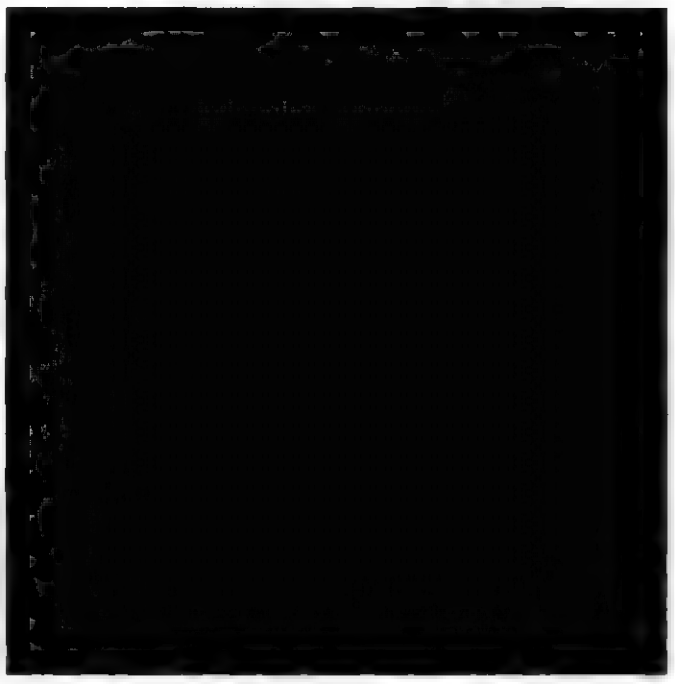
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DATA MANAGEMENT

Untangling Network Software Tie-Ups



GEOFF O CONNELL PHOTO

·BY·MICHAEL·R.·GUTTMAN·

The latest idea is that network users can share programs and data, even to the extent of replacing minicomputers and mainframes. This idea, of course, implies the existence of a reasonable base of efficient, network-compatible software for managing that shared data. Such software is only now beginning to hit the market.

The rationale for networking is undergoing a substantial change. Originally, vendors emphasized the value of sharing expensive resources such as hard disks and printers. Now that these items are no longer quite so costly, the latest idea is that network users can share programs and data, even to the extent of replacing minicomputers and mainframes. This idea, of course, implies the existence of a reasonable base of efficient, network-compatible software for managing that shared data.

Such software is only now starting to hit the market. The current offerings fall into three categories. The first category consists of single-user PC packages that are being upgraded to run on networks. The second category, a much smaller group, is comprised of software written earlier for various minicomputers (including minis that are mainframes), software that is being ported down to PCs. The third category, software designed and written specifically for networks, is as yet essentially nonexistent; in the long run, however, this category will no doubt become the most important.

It will soon become very difficult for a software vendor to sell into the business market unless he knows his package will at least run in a networking environment. Therefore, software vendors are now in a rush to upgrade their single-user personal computer packages to work on networks. Until recently, this presented a very difficult problem because these vendors were essentially aiming at a moving target — a networking market without standards or stable products. Now, however, the market seems to be at least temporarily shaking out in the general direction of IBM's PC-DOS 3.1 and/or IBM Netbios networking conventions. Although these conventions hardly represent the end-all in networking, most vendors will certainly follow this line of least resistance.

Even with a set of standards, implementing an appropriate scheme of network file and record sharing can be a challenge for a software publisher. Some types of software are relatively easy to modify while others can be very tricky. For example, a word processor, by design, typically involves having each person working on different documents, sometimes at the same time. Normally, the only data sharing involves users referencing the same dictionary or library of templates. Having multiple users reading the same data does not usually cause conflicts as long as provisions can be made to prevent users from editing files currently being edited by others or opening temporary files with the same name at the same time. Therefore, a word processor or spreadsheet should be relatively easy to upgrade for a network.

At the other end of the networking spectrum is a data base application such as accounting. Normally, each accounting user needs to link several files, and the updating of multiple files and records is commonplace. Simply to lock users out of files being updated would drastically limit the number of users who could coexist on the network. Therefore, it is necessary to use complex schemes of locking individual records while allowing other users general read access to files.

Implementing a bulletproof record locking scheme is not easy, especially for the type of on-line, interactive systems that PC users have come to expect and demand. Record updates usually take place in groups, such as adding a transaction and updating a master file, where all the records must be locked before and during the update. And because most data files are indexed to speed up retrieval, the necessary locking procedures may involve several index file records as well. Furthermore, if other users are accessing the updated file, they must somehow be informed of any changes going on or

DATA MANAGEMENT

they may get lost searching for deleted records or index pointers.

Some of these problems are less daunting for applications that were developed on minis or mainframes and ported down to PC networks. Many of these applications have already faced the problems of file and record locking long ago and are mature multiuser products. For some applications software, however, a large-computer parentage can be a mixed blessing. This is because real multiuser computers differ from networks in two important areas — performance and control.

The performance issue revolves around the fact that true multiuser computers can handle all requests for shared data directly in memory or via disk direct memory access, and all requests are carefully arbitrated to maximize throughput by the operating system. Networks operate quite differently and much less efficiently from a multiuser point of view. Requests and acknowledgments for transferring shared data must be communicated from PC to server over a relatively slow-speed network, and they must compete and contend with the requests of the other PCs on the network. Add to all this chatter the relatively slow transfer rate of the data itself and an efficient piece of multiuser software can quickly turn into a network hog.

The control issue

The control issue follows similar lines. An application on a multiuser computer can share a common piece of memory where up-to-date system status information is constantly and instantly available to all users. This might be used, for example, to deal with complex record updating conflicts. No such vehicle exists on a network, so the application software must either constantly pass messages (that must be properly sequenced) or give up some level of coordination and control.

Unfortunately, neither option is very attractive. If full control is preserved through message passing, the amount of network traffic generated could become astronomical and unacceptable from a performance standpoint. However, having to give up or modify the software's method of controlling the various users is a major design change and could significantly affect the feasibility of porting the system to a network at all.

All this might explain why the race to implement network applications software has not been proceeding quite as fast as industry boosters would like. It is becoming increasingly obvious that software already designed with either a single-user or multiuser computer in mind may not lend itself well to a networking port. Of course, this won't stop vendors from offering such products or users from buying them, and the results may be acceptable for certain kinds of applications and environments. There is no doubt, however, that users and vendors alike will soon discover that many of these existing applications will simply not work as required on a network.

Designing network software

A more rewarding approach may be to design software with networks in mind from the start. Obviously, this involves throwing away a good deal of software that has already been developed and tested and essentially starting from scratch. However, this would certainly not be the first time that the introduction of new computer technology has forced such a move. In any case, the new ubiquity of the PC basically assures that the problems inherent in designing networking software will have to be faced sooner or later.

One relatively simple way to implement an application on a network is to treat all the PCs in the network as simple semiautonomous data entry workstations.

Many applications can be written in such a way that each PC is used primarily as a collector, editor and concentrator of transaction data. Each PC handles its own screen generation and field editing and builds its own local transaction file. At a specified time, such as at the end of a day, a single program is run from a master workstation to update the shared data base with the batch transactions files generated by the individual PCs. The PCs can then begin another batch or be used to generate reports or satisfy inquiries.

There are several advantages to this approach. For starters, access by an individual PC to any of the application's common data such as a customer master file is always strictly read only, so any conflict between workstations is eliminated. Also, each individual PC can be upgraded locally as required to meet a desired level of performance, and new PCs can be added at will with very little affect on network performance and none on network integrity. Furthermore, the application can easily be ported to a mini or mainframe because only the batch updating function requires the services of



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DATA MANAGEMENT

> *Unfortunately, at present, a true distributive processing system for networks is expensive to design and tricky to implement.*

a host machine.

In fact, this type of approach also has the advantage of being very familiar to many data processing departments because it is much like many of the batch and even some of the on-line systems prevalent on mainframes today. Not only will this approach feel comfortable to DP, but it will also allow many functions to be easily off-loaded from busy mainframes without the DP staff losing total control of the data processing function.

Unfortunately, there are still many applications that will not lend themselves well to the simple batch approach. For example, a multistation order entry system typically requires that all transactions be updated in real time. In the past, such applications have required the services of a powerful mini or mainframe. Implementing one of these applications to work properly and efficiently on a network requires a good deal of finesse, and normally it can't be done by simply emulating the functions of a multiuser computer.

A more effective approach to dealing with this problem is distributive processing. One way to visualize distributive processing on a network is to think of all the PCs on the network as a pool of available workers who can flexibly be equipped and assigned, as needed, to the various application tasks at hand. This sort of distributive processing scheme is already in use in many mainframe and minicomputer installations; there is certainly no reason why it cannot and will not be applied to microcomputers as well.

In our order entry example, for instance, several PCs could be assigned to the task of data collection, as with our batch model. However, in this case each data entry PC would be tied to one or more data base PCs that would specialize in the process of managing all common data files in real time. If an entry station required data from a common data base, it would direct a request to the appropriate data base PC, which would handle all the overhead of searching, retrieving and, if necessary, decoding and reformatting. When updating the data base, a data entry PC would merely send the appropriate update information to a data base PC, which would then handle all the necessary record locking, event sequencing, data blocking, encoding and error checking required to complete the update.

This approach not only distributes the processing load among the various PCs but also allows each PC to be optimally configured for its specific task. For example, a data entry PC could be specially equipped for improved data entry graphics or to support functions such as windowing, document scanning or voice recognition. A data base PC, on the other hand, could be equipped with large disk caching memory, high-speed disk drive controllers or fault-tolerant redundancy systems.

Distributive processing also substantially reduces the amount of network traffic required to complete a transaction. For example, if a data entry station required a specific data field from a common data base, it could request and receive just that data from a data base PC. Similarly, specific data items could be updated by transmitting only those items, not the entire transaction from which they are derived. In both cases, the data base PC would handle extraction and/or insertion of the specified data elements into their parent transactions, simultaneously updating any indexes, dictionaries and so on.

Unfortunately, at present, a true distributive processing system is expensive to design and tricky to implement, and precious few tools designed to ease this burden are available. How soon then can we reasonably expect to see such systems come into production?

The power to implement these sophisticated techniques may already be within reach. IBM has already announced its clear intention to support distributive processing both on PCs and on its larger computers. Through the promulgation of its LU 6.2 networking standards, IBM is setting the stage for a variety of computers to communicate as equals on a local-area network. That these standards will be actively supported on its line of PCs has been underscored by the recent and almost simultaneous announcements of both its Token-Ring local-area network and its Advanced Program-to-Program Communications development package for the PC marketplace.

It is still hard to say whether these new developments in networking will be embraced or ignored by the data processing community. It is certainly possible that users will prefer to stay in charted waters for a while, no matter how inviting the horizon may be. However, the proliferation of both PC users and vendors and the continued absence of a standard for multiuser hardware or systems software makes networking, whatever its problems, a likely arena for many new developments in applications software.

Guttman is an independent consultant based in Marlton, N.J.

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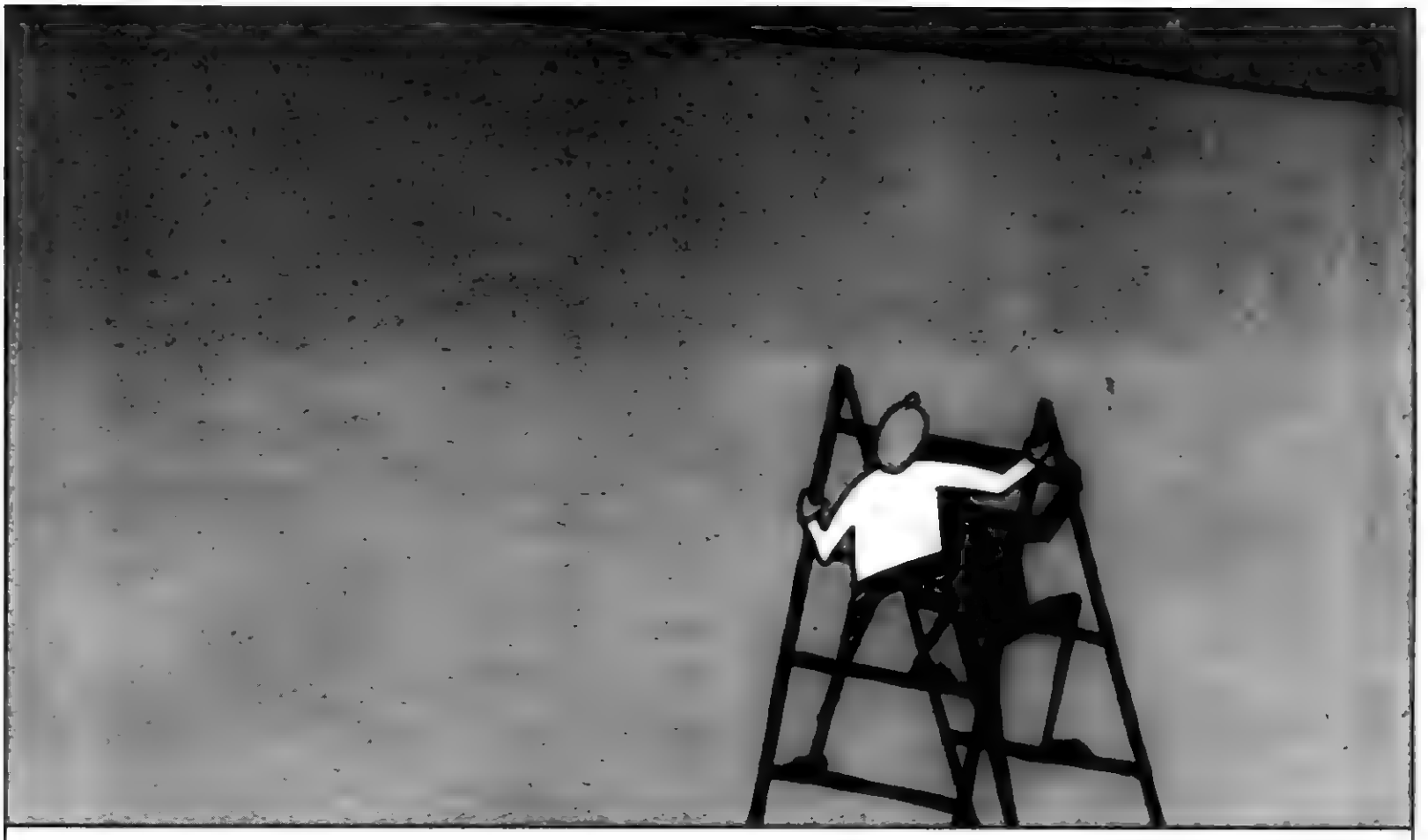
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The Golden

BY DAMIAN RINALDI

Within the walnut-clad corridors of more than a few large organizations, senior executives are sharpening their new strategic weapons. Executive information systems (EIS) are starting to come on-line to assist U.S. management in monitoring the critical success and failure of their own corporate empires.

EIS distill oceans of corporate data, capture relevant external information and present it with a consideration for human factors that gives these products a fighting chance to capture one of the last bastions of low tech in most corporations — the corner office.

But successful implementation of these systems has to include the active and enthusiastic participation of the chief executive officer supported by a coalition of key delegates from MIS and major staff and operational divisions. For an application with such high visibility and potential impact, EIS development often takes on the aura of a Central Intelligence Agency operation because of the sensitivity of the information being captured and presented.

Enough intelligence is leaking out, mostly from vendors, for International Data Corp. to estimate that a market in packaged software sales alone with a potential of more than $750 million by 1995 is opening up to support building EIS. The mainframe-oriented decision support system (DSS) vendors that have traditionally targeted the support staff of the senior executive class are eyeing this new opportunity as a natural extension of their existing business.

EIS vendor strategies are not completely uniform however, with Comshare, Inc. of Ann Arbor, Mich., and newcomer Pilot Executive Software, Inc. of Boston, offering products that are optimized for EIS.

On the other hand, Execucom Systems Corp. of Austin, Texas; Thorn EMI Computer Software, Inc. of Chelmsford, Mass.; and Information Resources, Inc. of Chicago, provide end users with a foundation for building their own EIS by taking advantage of the data base and configurability features of a more traditional solution. The common thread tying the market together is the building-block, tool-kit approach to customized EIS.

In the interest of providing a common standard and avoiding the lack of precision that supports almost every vendor's claims for providing some kind of decision support, it is useful to cut through some of the mythology surrounding the EIS concept. Explaining what EIS are not helps to establish some defensible borders.

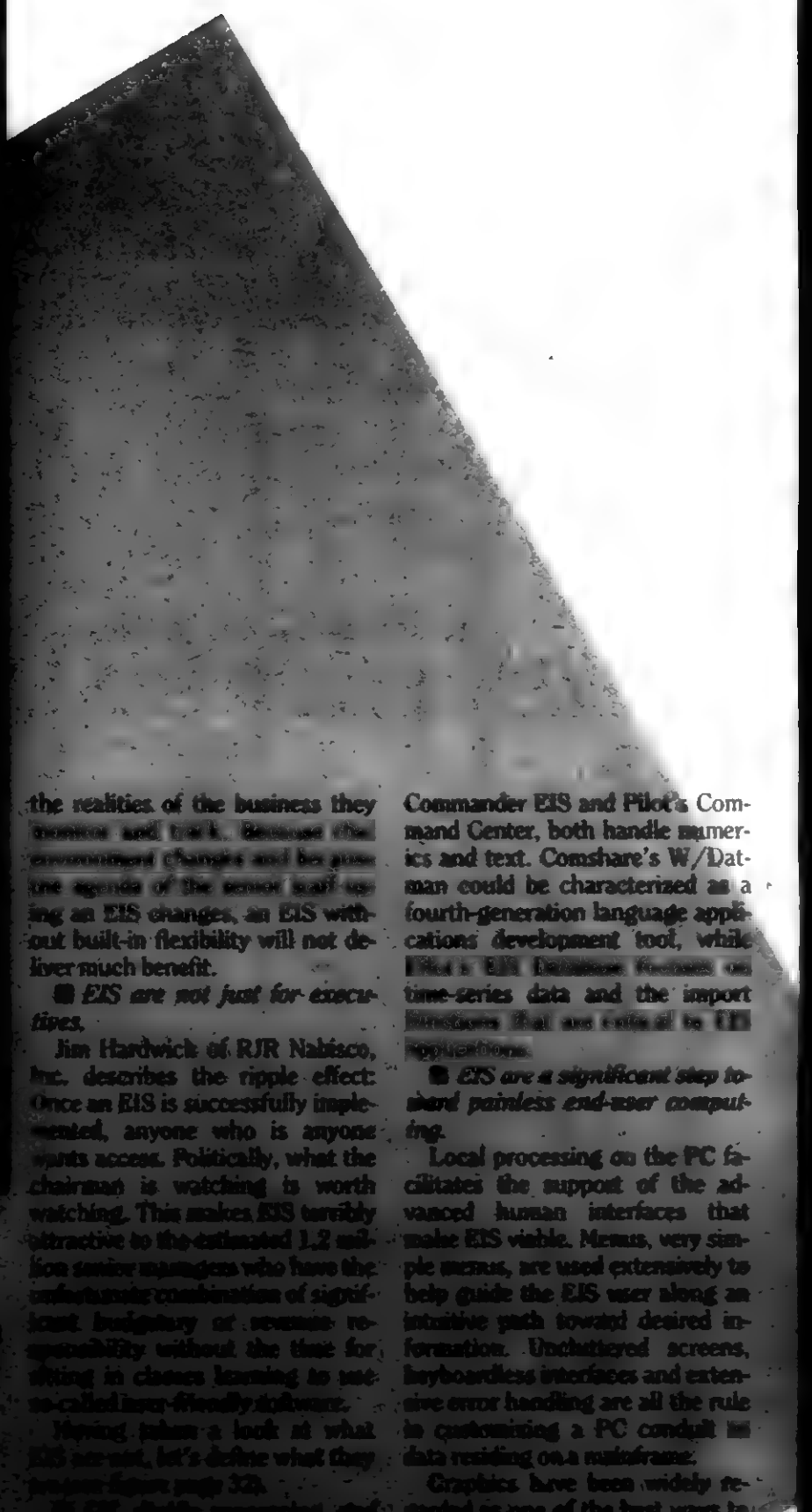
■ *EIS are not replacements for personal interaction.*

The vision of a chief executive entombed in a battle-star war room environment watching a dozen monitors and dealing with HAL 9000 is the stuff of science fiction. While such boy-toy concepts may actually inspire support of EIS at some level, that kind of implementation is more likely to reduce executive effectiveness than to enhance it.

The corner office is usually reserved for those individuals who have well-developed people skills. EIS need to be adopted in such a way that senior managers can more effectively use people skills and manage their scarest resource — time — in areas that demand attention.

■ *EIS are not decision support systems.*

EIS are more properly viewed as a subset or branch of decision support. While traditional DSS support analytical applications involving modeling and forecasting, EIS are optimized for tracking and monitoring a wide variety of corporate and external information. Another way of viewing this distinction is that DSS help answer questions including, "What if?" and "What causes?" and EIS pin-



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■ *EIS*
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Corporate
bases are enor
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to stumble into such a s
untutored and unguided.
of EIS is to distill all the

the realities of the business they
monitor and track. Because the
environment changes and because
the agenda of the senior staff us-
ing an EIS changes, an EIS with-
out built-in flexibility will not de-
liver much benefit.

■ *EIS are not just for execu-*
tives.

Jim Hardwick of RJR Nabisco,
Inc., describes the ripple effect:
Once an EIS is successfully imple-
mented, anyone who is anyone
wants access. Politically, what the
chairman is watching is worth
watching. This makes EIS terribly
attractive to the estimated 1.2 mil-
lion senior managers who have the
unfortunate combination of signif-
icant budgetary or revenue re-
sponsibility without the time for
sitting in classes learning to use
so-called user-friendly software.

Having taken a look at what
EIS are not, let's define what they
[illegible] page 32].

[illegible] daily processing and
storage functions, maintenance and
personal computers.

The key mainframe component
of an EIS is a dedicated, relational,
multidimensional data base that
serves as the collection point for
information distilled from all cor-
ners of the corporate empire. A
data import capability smooths the
integration of widely varying data
types from production systems,
analysis systems (including DSS)
and external data sources.

There are some differences in
detail, however. The data base
components of the two products
optimized for EIS, Comshare's
Commander EIS and Pilot's Com-
mand Center, both handle numer-
ics and text. Comshare's W/Dat-
man could be characterized as a
fourth-generation language appli-
cations development tool, while
Pilot's EIS Database focuses on
time-series data and the import
functions that are critical to EIS
applications.

■ *EIS are a significant step to-*
ward painless end-user computing.

Local processing on the PC fa-
cilitates the support of the ad-
vanced human interfaces that
make EIS viable. Menus, very sim-
ple menus, are used extensively to
help guide the EIS user along an
intuitive path toward desired in-
formation. Uncluttered screens,
keyboardless interfaces and exten-
sive error handling are all the rule
in customizing a PC conduit to
data residing on a mainframe.

Graphics have been widely re-
garded as one of the best ways to
convey the essence of information.
Even here, however, the science of
how to present information has to
be left up to the users for whom
EIS is customized.

An executive committee at RJR
Nabisco opted for standard tabu-
lar formats they were used to see-
ing because this was considered
more complete than graphical
summaries. Metaphor Computer
Systems, Inc. of Mountain View,
Calif., abandoned the PC interface
for their customers in the pack-
aged goods industry in favor of a
high-resolution workstation using
a mouse, icons and split screens.

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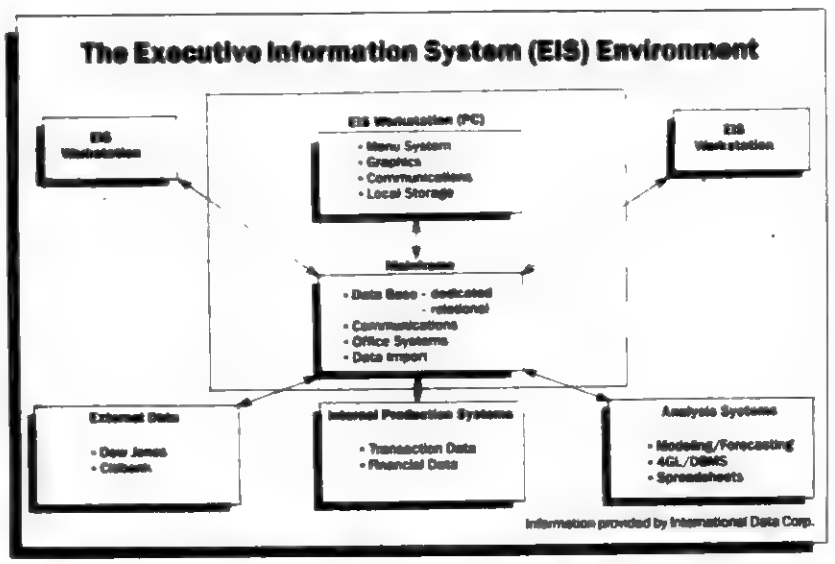
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EXECUTIVE TRENDS



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Hardee's Food Systems, Inc., operating over 2,500 restaurants worldwide, has recovered its investment in Pilot's Command Center within the first year of operation. Savings resulted from more efficient use of labor identified by the EIS. Through seven regional offices, point-of-sale data is collected using Hardee's internally developed nework, Info 2000, fed into a summary report that is then combined in the central, Digital Equipment Corp. VAX-based Pilot data base management system containing historical and competitive data as well as external information from on-line services (Gallup Poll, Dow Jones News Service and Standard & Poor' Register of Corporations). The PCs then run all the user interface software and a comprehensive screen management package that includes menu generation and color graphics programs.

When 15 top executives, including Hardee's chairman, turn on their PCs in the morning, Command Center activates the communications links between the PCs and the corporate VAX. These individuals have automatic access to a custom-built, top-level menu. The menu points the way through a system designed to monitor high-priority pricing promotions and campaigns and critical operational parameters including labor utilization and traffic levels at increasing levels of detail as they navigate through the system.

Dave Roberts, account manager, Strategic Decision Technologies, at Electronic Data Systems Corp. in Flint, Mich., has a team of four EIS specialists supporting 20 operations-level executives managing the vehicle products teams at a large automative manufacturer. Here, a decision support foundation for the EIS operates in an integrated micro-mainframe environment. The EIS component of their implementation of Comshare's Commander EIS tool kit is anchored with the W/Datman data base that is part of the system.

Roberts emphasized that systems integration is critical when viewing EIS in a large, complex environment. Other "DSS" products, including Information Builder, Inc.'s Focus, IBM's DB2 and IMS data bases as well as a host of PC-based solutions have to be integrated into a single, seamless system on a user's desktop. "Pipelines" that Comshare has built and continues to add to the EIS tool kit facilitate the transport of data between incompatible systems.

According to RJR Nabisco's Hardwick, the main corporate budget for his firm has been managed for years with Thorn EMI's FCS DSS. Because of the size of total investment in an entirely new EIS system, RJR Nabisco chose to use FCS's application development capabilities rather than buy another package.

The team implementing the EIS faced its share of challenges. Data gathering at each operating unit involved a unique interface with the systems already in place at corporate headquarters because corporate policy called for maintaining the autonomy of each contributing unit's unique systems environment. Optimizing ease of use required remapping keyboards to avoid confusing executives with keys that had multiple meanings. Success came after careful prototyping of several intermediate stages of the deliverable and through unwavering sponsorship from senior management.

Pressure from other areas of the company to make the EIS more widely available has also put the company's steering committee in a difficult position. It is beginning to try to balance the benefits of a valuable management tool against the status access of high-level strategic intelligence data without compromising the sensitive nature of the information.

As we have seen, the discussions on EIS have moved well beyond the question of whether executives are really afraid of keyboards to more substantive issues. Response time leads the check-off list for EIS implementation, with most executives requiring instant feedback. The data base configurations underlying these systems focus on data



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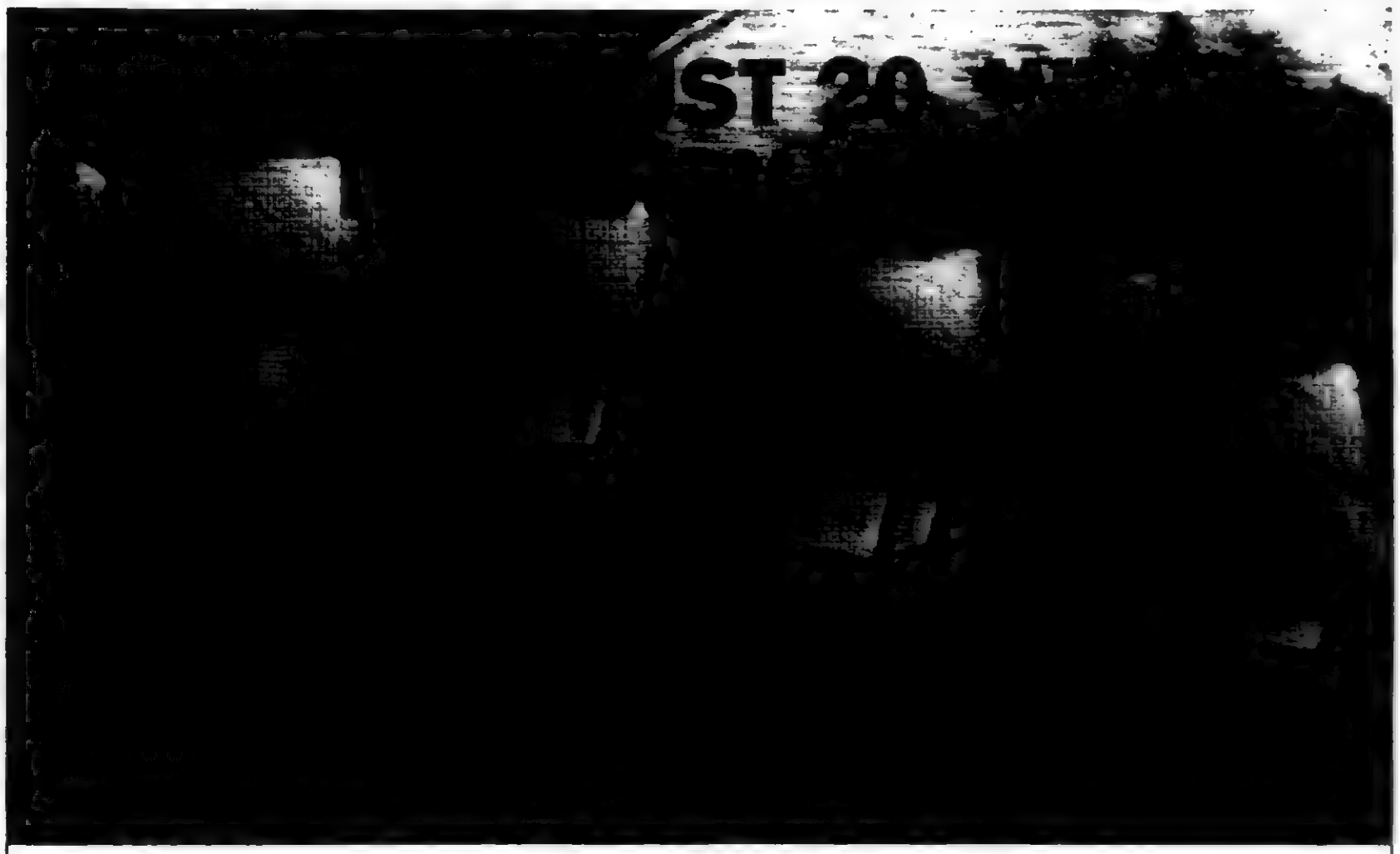
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access in homage to the response time issue. EIS designers have blown away the current definition of ease of use, and in the words of David Friend, Pilot's chairman, "Less is definitely more."

The learning curve for EIS should peak within minutes, and if the system isn't intuitive and built around the lowest common denominator of computing experience, it is doomed to fail.

Those systems that are actually in place have been implemented with the full support of the executives they are designed to serve, particularly CEOs. As with any rigorous specification, users have to be involved in the process of defining the information they need. Their involvement, enthusiastic support and clout are invaluable when it actually comes time to tap into the organizational fiefdoms where the real information lies.

Look for implementation of EIS to bring the issue of organizationwide data administration to the forefront. Data dictionary and seamless interchange will have to be far more prevalent than they are today. Today's support structure needs further fleshing out before the promise of EIS will be realized.

In their search for any advantage, the corporate shoguns are arming their own elite with the new swords of executive information systems. Born out of a need highlighted by constant reminders that information is an asset to be managed and used tactically and strategically, EIS are just beginning to take on a larger and more important role in the corporate wars for bigger profits and higher growth. ■

Rinaldi is director, Software Research, for International Data Corp. (IDC) in Framingham, Mass. Jastrzembski is a senior consultant for IDC.

EIS Topic Steals Show

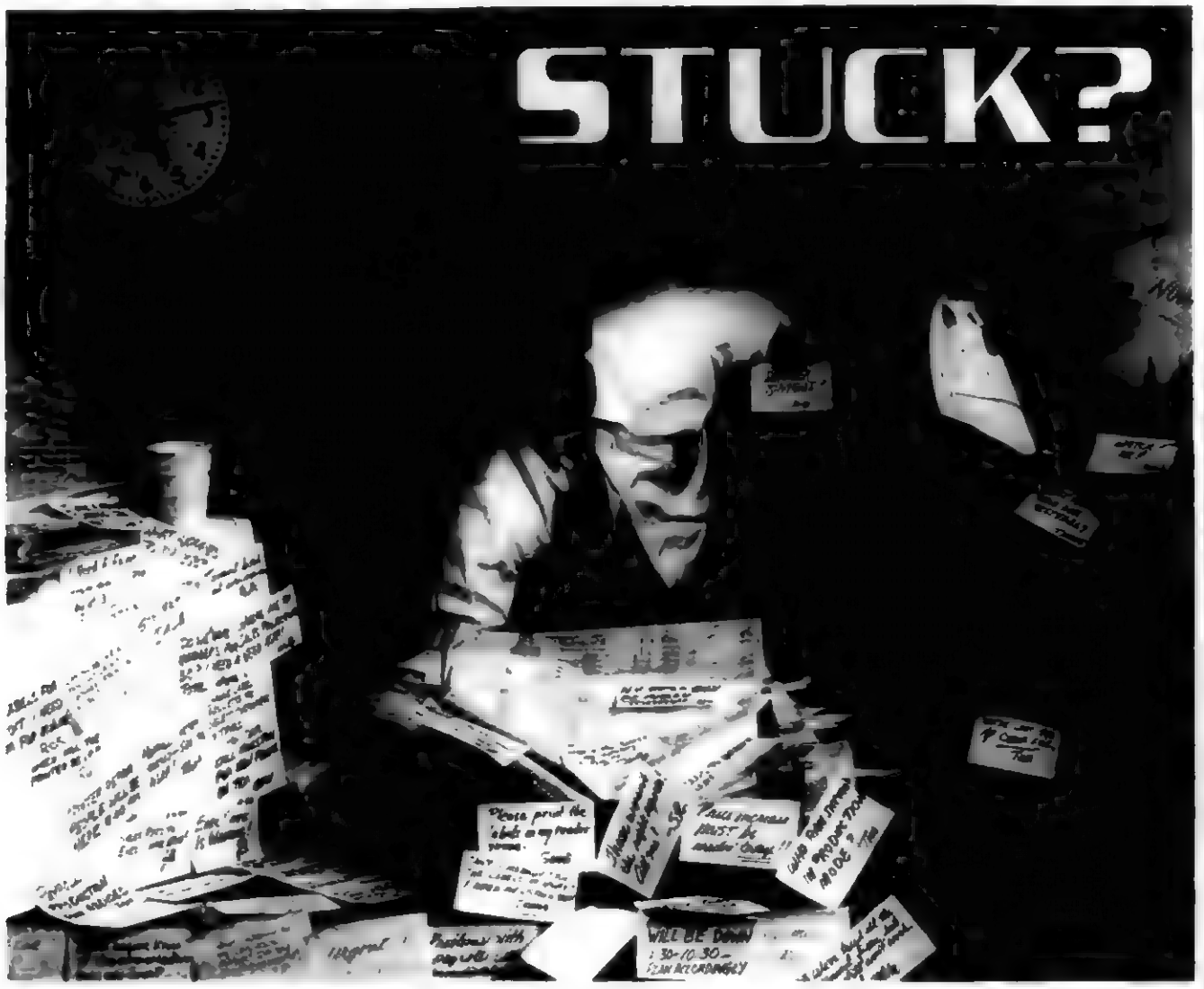
At last year's DSS '85 conference, show organizers weren't asking the classic decision support system (DSS) question, "What if?" Instead, they were wondering, "Should we even have a DSS '86?" The vendors, users and academics who support this conference that examines DSS technology, issues and research on DSS are bored talking about an area that has changed very little over the past four years. Peter Keen, a noted DSS guru, wryly referred to the unappealing prospects of reviewing one more paper comparing the decision-making performance of a group equipped with state-of-the-art graphics workstations with a control group suspended upside down from a trapeze.

DSS '86, held in Arlington, Va., in May, was a welcome and refreshing change for most attendees. The conference was administered for the first time by the influential 6,500-member Institute for Management Science. It would not be an exaggeration to say that the presentations and vendors focusing on executive information systems (EIS) stole the show.

The majority of more than 100 attendees flocked to a series of EIS presentations organized by Pilot Executive Software, Inc.'s David Friend, at the expense of the more traditional DSS tracks. Other hot conference topics included artifical intelligence, particularly expert systems implementations of traditional DSS applications.

In his closing address, Keen extolled DSS futurists to consider "semi-expert" systems that would provide managers with more guidance than current approaches without locking them into a prescribed solution. Keen and others challenged attendees to apply more energy to the "decision" part of decision support systems by unearthing the decisions that really matter in organizations. Ralph Sprague of the University of Hawaii highlighted the trend toward building better organizational support for DSS and EIS applications and suggested getting away from the Rambo-style, quick-hit applications that characterize traditional DSS efforts.

The decision to welcome EIS and AI proponents to rejuvenate the worn-out DSS concept was a refreshing example of the message matching the medium.



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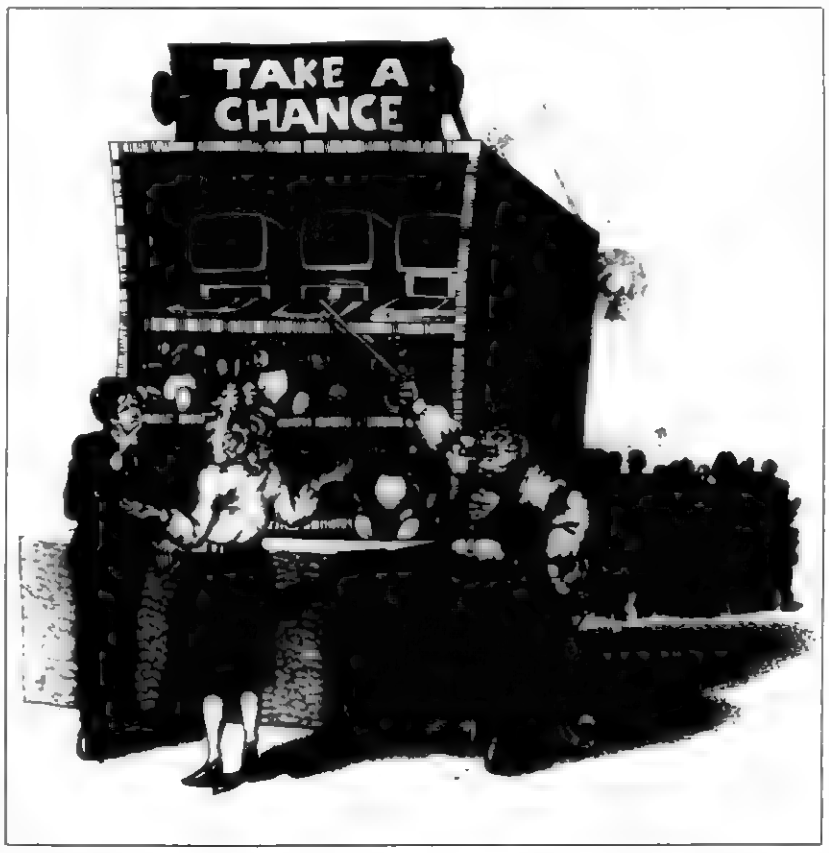
LONG-RANGE PLANNING

Tough Hardware Choices For Winning Software

·BY·LOUIS·MAZZUCCHELLI·
·&·READ·FLEMING·

How many times have you heard the claim: "This new software tool will make programmers obsolete?" or, "This one integrated product will totally eliminate your applications backlog?" Probably too many times. These and similar claims have been made for a wide range of products, from data base query languages to Cobol applications generators. Now, as the technologies of computer-aided software engineering (CASE) begin to enter the marketplace, we are beginning to hear lots of these same claims.

CASE attempts to do for software analysts, designers and programmers (whom we refer to as "software engineers") what computer-aided design (CAD) and computer-aided engineering (CAE) have done for mechanical, industrial, electrical and other "hardware engineers." CASE tools are designed to improve the software engineer's productivity by providing an efficient environment for the creation, storage, manipulation and dissemination of the software engineering products.



TOM BARRETT

While many such tools are presented as robust and stable solutions to some or all software engineering problems, the fact is the technologies are young, and many of the tools based on them have not matured to the point where they can handle real-world (large, complex, constantly changing, long-term) projects.

Think about where your own software development organization will be in future — what projects and problems might exist and what kind of environment would exist to deal with them. If you look ahead even only a few years, you'll probably find there is a growing diversity of problems, a growing complexity of problems and a changing technology base. To deal with the issue of diversity, be prepared to acquire multiple tools that are aimed at specific problems but can work together. To face the issue of growing complexity, look for tools that can scale up to the size of your problems. And to deal with changing technologies, look for tools that anticipate where technology will be, not ones that dwell on where it has been.

Software products of any kind, including CASE tools, can only be as good as their supporting system architectures. This means a buyer must consider issues including the host hardware, operating systems and, in light of future needs, the potential for growth. An investment in development tools is generally a long-term investment including not just the tools themselves but the training, the base of experience gained by the organization and the data

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generated in the use of the tools. Choosing a tool without understanding the capabilities of the host and how they relate to the future as well as present needs of a software development organization can lead to disappointment or, at worst, disaster.

Many of the software engineering tools available today are designed to run on today's personal computers, usually the IBM Personal Computer family and compatibles. How do the architectural capabilities of these machines affect their ability to support software engineering tools? And what is the future of these machines?

The basic components of any computer are a processor, memory, mass storage and connections to the outside world (displays, printers and so on).

In the IBM PCs, the processor consists of a member of the Intel Corp. 8086 family of microprocessors (8088, 8086, 80186, 80286). The smallest of these, the 8088, was initially designed into the PC to achieve the lowest cost at some sacrifice of performance. This processor was well-matched to the relatively small memory and generally slow peripherals such as the floppy disk drives offered with the original PC. In the Personal Computer XT, the limitations of the 8088 became apparent when the higher-speed hard disk was added to the system. Other manufacturers, notably Compaq Computer Corp., addressed this imbalance in system performance by using the 8086, which has total functional compatibility with the 8088 but a faster 16-bit bus, twice the width of the 8088 bus.



When buying software, consider issues including hardware, operating system and the potential for growth.

The Intel 80286 is a much more advanced processor than its predecessors but retains a compatibility mode (called real address mode by Intel) so that older software can run on it. The Personal Computer AT takes advantage of the 80286's extra speed and its wider bus but uses the compatibility mode to run existing software written for earlier members of the PC family. This is the same strategy IBM employed when it introduced the 360 series with 1401 emulation in 1964. Just as 1401 programs could not take advantage of the then-advanced capabilities of the 360, 8088 and 8086 programs running in compatibility mode cannot take advantage of the advanced capabilities of the 80286.

The most important architectural advances in the 80286 include support for very large amounts of real memory (16M bytes vs. 1M byte in the 8086); support for multitasking; and support for protected virtual memory to keep programs from interfering with one another and the operating system. In this respect, the 80286 compares very favorably to modern minicomputers.

All of this hardware capability is available to an applications program only if the operating system makes it available. The operating system used by the vast majority of PCs is Microsoft Corp. MS-DOS (sold by IBM under the name PC-DOS). This operating system was designed to support single-user, single-tasking applications. It does not utilize any of the advanced capabilities found in the 80286. Therefore, putting a 80286 in an MS-DOS PC is analogous to putting a turbocharger in a Volkswagen Beetle — it may be fast in a straight line, but it's still a Bug.

If we examine the way software developers (and their management) work, most have more than one task in process at any given time. On a developer's desk there may be documents relating to analysis, design and new code development for one project or several. It makes sense to have tools that support the way people actually work — tools that allow several activities to take place in parallel. However, MS-DOS only allows one program to run at a time. True multitasking is difficult, if not impossible, to do with a single-task system like MS-DOS.

To get around some of these limitations, windowing systems have been developed that run on top of MS-DOS and mimic multitasking behavior.

Examples include Microsoft Windows and Digital Research, Inc.'s Graphics Environment Manager. These systems still cannot take advantage of the enlarged real memory, multitasking and protected virtual memory features of the 80286. Programs and the operating system must contend with each other for the limited real memory of the basic PC architecture (the much-discussed 640K-byte barrier). It is also quite easy for a faulty program to bring down the entire system and

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cause data to be lost.

The shortage of real memory constrains not just multitasking but also individual applications programs as well.

Intel/Lotus/Microsoft EMS

One well-publicized attempt to deal with the memory space problem is the creation of the Intel/Microsoft/Lotus Expanded Memory Specification (EMS). A block of the normal PC memory is assigned to a set of buffers that hold data from a potentially larger extended memory. (The term buffer reflects how EMS appears to an application, not necessarily how it is implemented.) The use of these buffers to access information in extended memory is handled by each application. Several limitations to this scheme include the following:

- Access is restricted to data only — programs cannot run in extended memory.
- The buffers are small (16K bytes), so applications can only get at relatively small parts of the data at a time.
- There are only four buffers, so they become a scarce resource. If multiple applications are simultaneously running in a windowing system, they must agree among themselves on how the buffers are to be used because the operating system cannot control their use.
- EMS does nothing for the protection problem (keeping one program from bashing the code or data of another).

So while EMS helps to deal with the problem of growing spreadsheets, it does little to help large programs (such as complex systems development tools) run in an MS-DOS environment. Interestingly, EMS has its roots (like many aspects of microcomputers) in the mainframe and minicomputer world. The basic technique it employs is called bank switching, which was tried for many years with limited success before being discarded in favor of demand-paged virtual memory.

Software designers are involved in development activities analogous to those of hardware designers. Current research and past experience in CAD and CAE have shown that the efficiency of the design process is proportional to the amount of information available to the designer. While the design objects may differ (for example, entity-relationship diagrams in the software realm and floor plans in architecture) and the ratio of text to graphics may differ, the need for simultaneous views of multiple objects remains. To meet this need, a software engineering tool should take advantage of a truly high-resolution display.

Modern CAD and CAE systems rely on displays capable of showing at least 800,000 pixels, typically in a 1,024- by 800-pixel format. This allows viewing of complete objects like a printed-circuit board, an airplane or two pages of text side by side.

Contrast this with the typical high-resolution PC display that can show only 25% of this information. A windowing system running in such a display can only show small fragments of diagrams or documents, leading to much panning and scrolling on the part of the user.

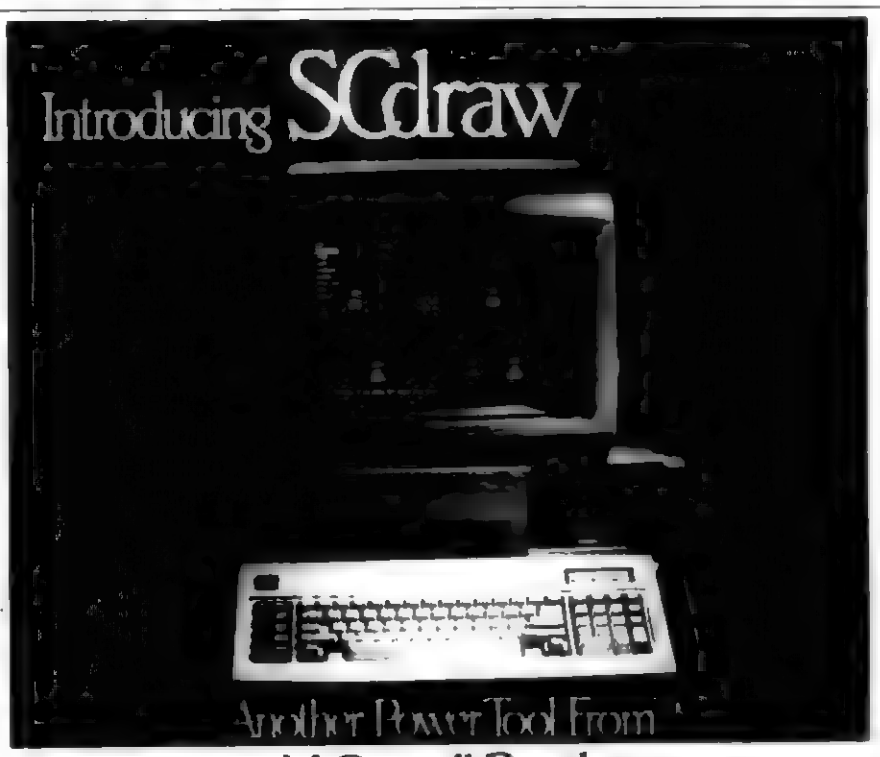
Very high-resolution displays can be attached to standard PCs, but because there are no standards for these devices, there is also no MS-DOS and varying or nonexistent applications support for them. In addition, performance usually suffers because the PC becomes overwhelmed with updating the screen. Also, because many objects can be displayed on a larger display, it is natural to want to operate on them simultaneously. This natural mode of interaction with a computer system requires multitasking support for a successful implementation.

One the most critical aspects of any development effort is making sure that all members of the project team have access to the same up-to-date information. In a traditional centralized computing environment (either on a mainframe or a minicomputer) this is possible because the data is centralized. However, each user's performance is affected by other system activity.

Personal computers help to provide a consistent computing resource for each user, but data is not easily shared among a team of users. Local-area networks currently exist to connect personal computers, but actually achieving data sharing and task-to-task communications requires special applications programs and operating system support. Sometimes, dedicated machines are required just to provide network capabilities.

Local-area networks are also not standard between personal computers. Like displays and memory extension standards, the capabilities, costs and level of support for personal computer local-area network vary widely.

The use of PCs is widespread in today's computing environment. The machines offer the



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ability to bring computing capability to the end user for a relatively low price; and they excel at many tasks such as spreadsheet manipulation and word processing. For these reasons and to control the proliferation of incompatible hardware and software, many companies have standardized on personal computer equipment configurations.

Unfortunately, not all applications work well on the same computing hardware. As noted above, software designers have much in common with other engineering users who have known for years that workstations are more productive for their design tasks than personal computers. The job that they are trying to do demands a more capable resource

> *PCs remain suitable for small application development projects that require a minimal amount of manpower.*

than can be provided by a personal computer-based solution.

A user in the standardized personal computer environment is not totally out of luck. For small projects, PC-based tools may be adequate. However, be prepared to invest in nonstandard networking solutions if you want to share data and also be prepared to outgrow the PC-based solution as the problems you try to solve and the required tools to solve them get bigger and more complex.

A more ambitious approach

A slightly more ambitious approach is to modify existing PCs to overcome deficiencies. You can add memory, larger displays, larger and faster disks, network connections, but unless you also change operating systems, many of these additions cannot be used. This approach also leads to a mostly nonstandard environment (where only the power supply, cabinet and keyboard are original equipment) that is hard to support.

Some conservative users will take a wait-and-see approach in anticipation of a new PC based on the Intel 80386. Such a machine, they hope, will address many limitations on PCs. In addition, it would allow older software to run but without compromising the features of the new machine.

The irony is that thousands of machines with all of these features exist and are in use today but have been largely ignored by the business market: engineering workstations.

The IBM RT Personal Computer; Apollo Computer, Inc. DN3000; Sun Microsystems, Inc. Sun 3; Digital Equipment Corp. Vaxstation; and the Hewlett-Packard Co. 9000 Series 300 are all off-the-shelf, fully supported products that provide platforms for software engineering tools.

These machines provide a similar level of performance to the hypothetical 80386-based machine. While their processors may vary, it is of little or no importance to applications written in high-level languages. Performance counts, not part numbers.

Many of these workstation products are in their second or third generation and have had the benefit of feedback from thousands of very demanding and technically astute users. In addition, some of these machines are available in quantity for well below $10,000 each, providing four to six times the performance of a PC AT, high-resolution graphics and integrated networking at a competitive price.

The IBM RT PC, for example, has a processor that currently runs at 2 million instructions per second, about equal to a mid-range 4300 series mainframe. It supports up to 4M bytes of real memory and a virtual address space of 1 terabyte (which is larger than IBM's mainframe offerings). It can be configured with up to 210M bytes of disk storage and its operating system can support multitasking and multiple users. In addition, a coprocessor option is

When You Investigate The Spectrum Of Possibilities, You'll Choose Compuware.

available to run MS-DOS applications.

The Apollo DN3000 is a similar machine offering display and networking capabilities and very attractive pricing. A DN3000 with a 1,280 by 1,024 monochrome display, 4M bytes of random-access memory, a 70M-byte Winchester disk, a 1.2M-byte floppy disk, network hardware and a multitasking operating system is available for approximately $16,000 in single quantities. Because demand-paged virtual memory is supported across Apollo's high-speed local-area network, a hard disk is not required for each workstation. Without a disk, a comparable DN3000 costs about $11,000 in single quantities.

These machines compare favorably to a highly modified PC AT configuration while they provide better performance and offer the advantages of full integration of all components and complete factory support. Later this year, an MS-DOS coprocessor is expected to be available for this machine.

Federal Express' case

Federal Express Co. is an example of a company that has automated much of its software development environment. Its software systems must handle more than 80,000 invoices and track 150,000 phone calls every day to ensure that their overnight delivery packages arrive on time and their customers are billed quickly and accurately. To do this, Federal Express uses more than 20,000 on-line terminals. This reality makes maintaining existing applications and developing new ones a major challenge to its staff.

Using a workstation-based tool, Federal Express has estimated more than a 100% increase in productivity for certain phases of its development process. Previously, manual methods would have meant a typical expenditure of four manweeks to perform completeness and quality-checking tasks on a system specification. Using its workstation-based tool, these tasks can now be completed in about 10 minutes.

Due to significantly increased productivity and faster applications development, Federal Express estimates the payback for this workstation-based system will take less than one year.

With a wide range of workstations and personal computers to choose from, DP/MIS management must select the environment that will best increase the productivity of their software developers. While PCs remain suitable for small projects that require a minimal amount of manpower, they lack many of the features needed for the development of today's large, complex applications.

> *Workstation-based tools provide the capabilities needed for complex applications development, now and in the future.*

With the prices of workstations nearing those of high-end PCs, performance becomes the most critical factor in selecting a development tool. It is clear that workstation-based tools provide the best capabilities needed for complex applications development, now and in the future.

Workstation-based tools are being recognized as significant contributors to improved productivity. In the future, the distinction between PCs and workstations will disappear as PCs evolve to the level of today's workstations. However, many organizations need help now. These firms can greatly benefit from workstation technology today, but only if they are willing to look beyond PC-based solutions.

Mazzucchelli is chairman and cofounder of Cadre Technologies, Inc., a manufacturer of workstation-based automated software development tools located in Providence, R.I. Fleming is vice-president, research and development, of Cadre Technologies.

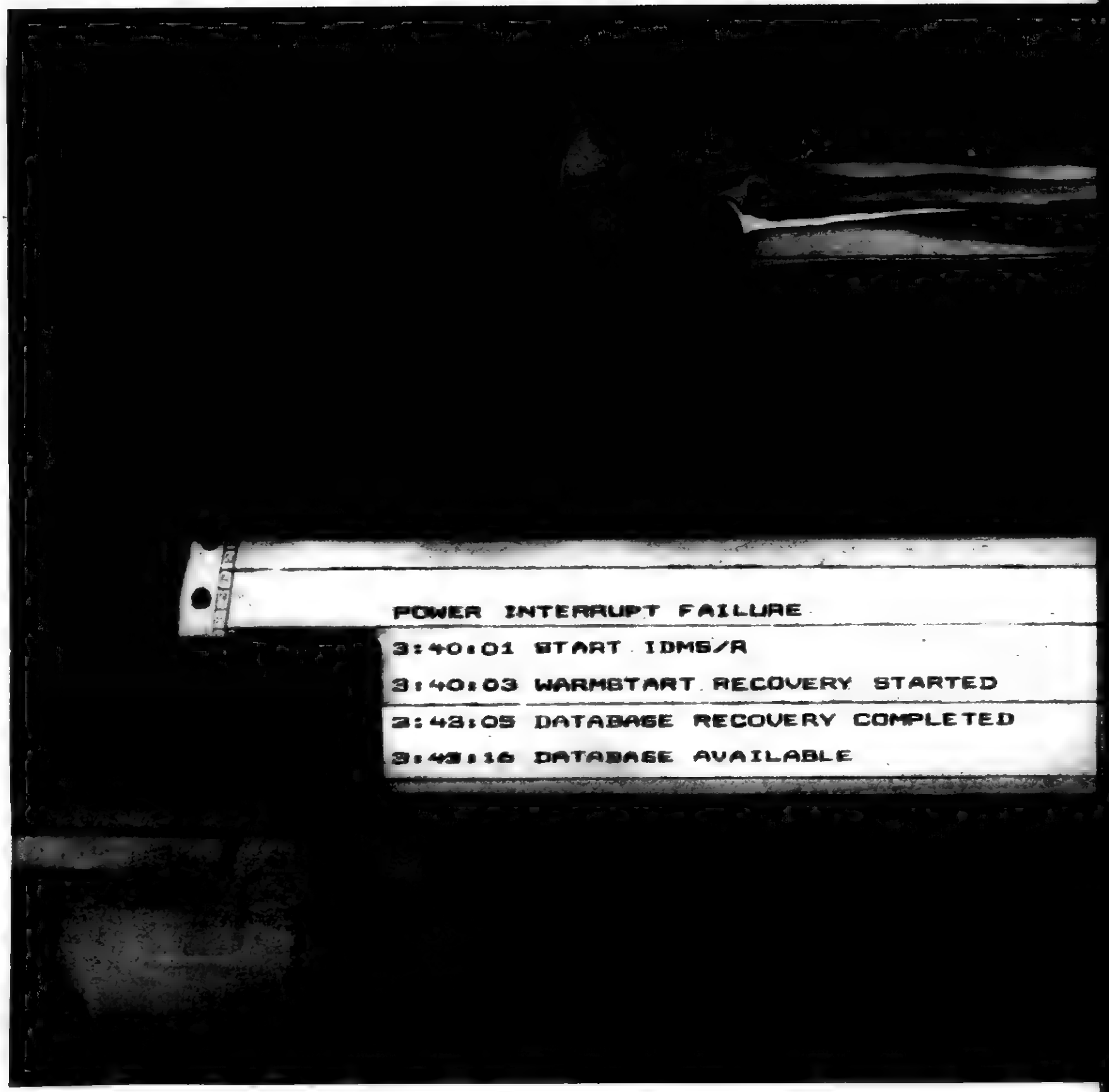
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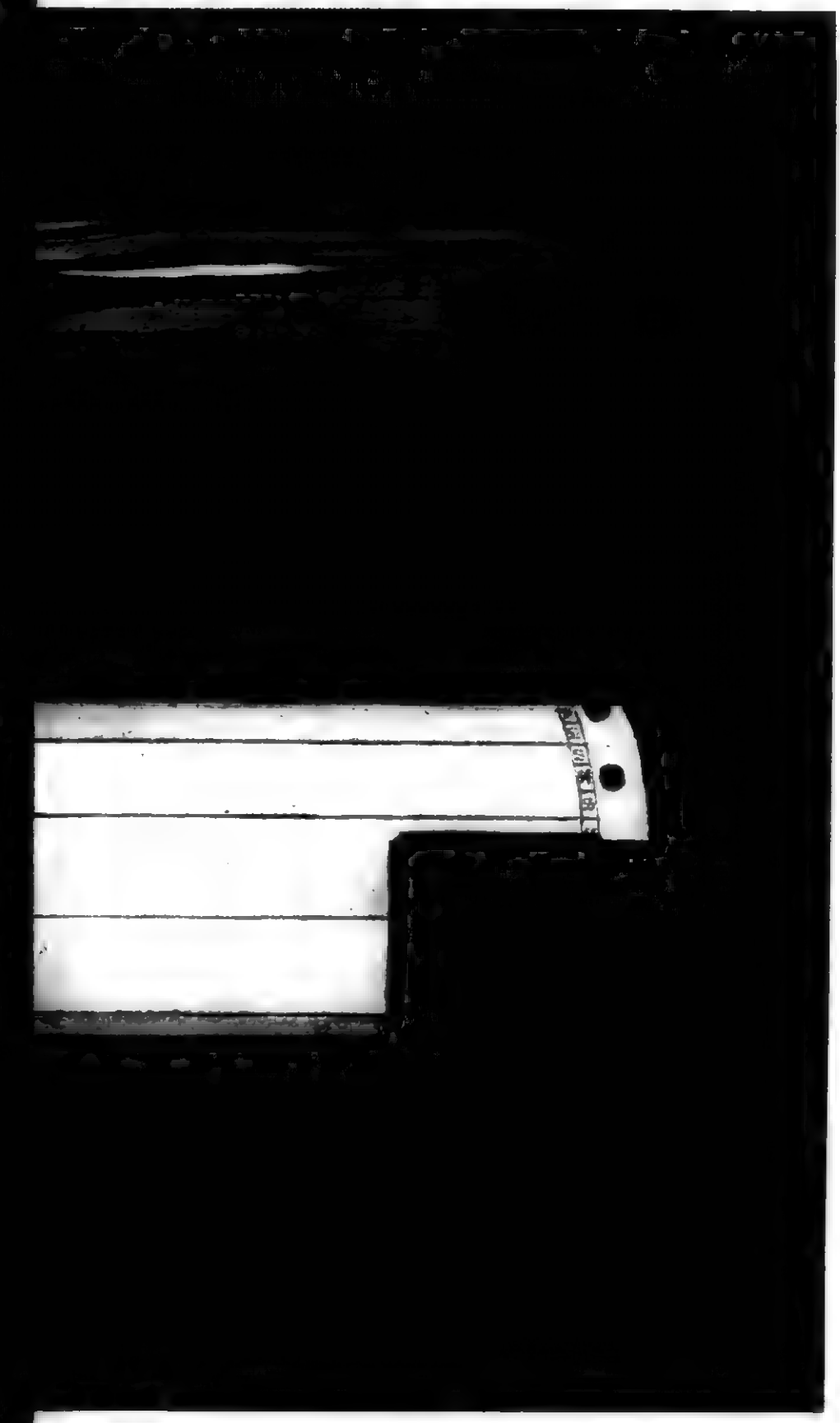
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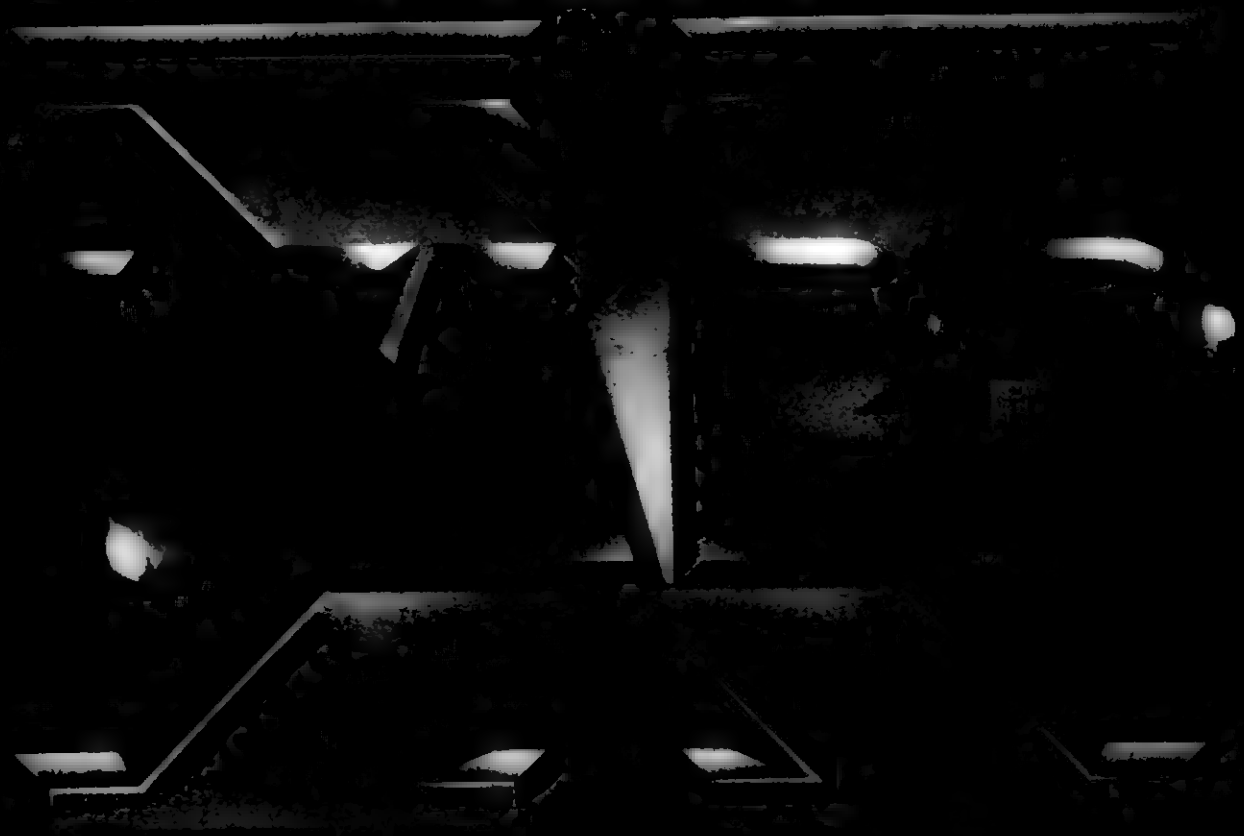
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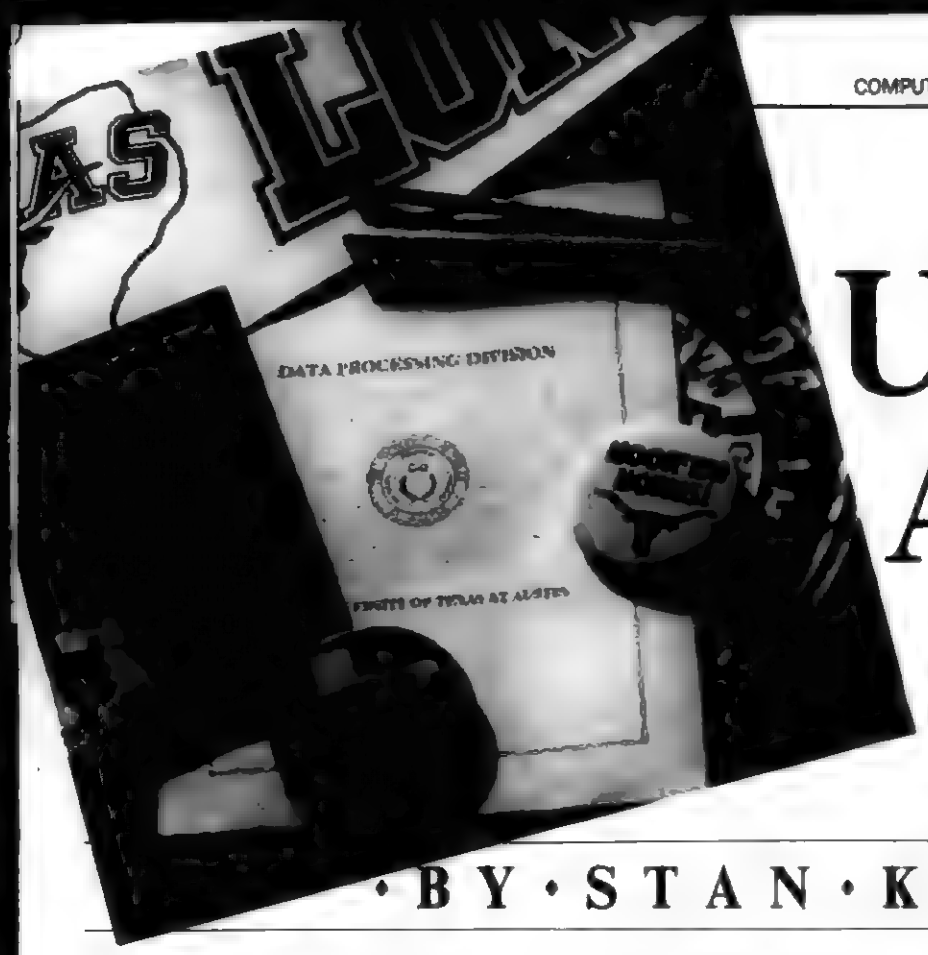
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CORPORATE ACCOMPLISHMENTS

Users Shine At Lone Star Campus

·BY·STAN·KOLODZIEJ·

In an age of MIS stories documented by long applications backlogs, maintenance problems and user dissatisfaction, a bright light is shining from the Lone Star State at the University of Texas, Austin.

Consider these facts: Within five years, with a minimum of heartache, the university's administrative arm has gone from a traditional, centralized Cobol shop to a distributed resource operation via a fourth-generation language and development tools; more than 40,000 programs now exist at the Austin campus, almost all written in a fourth-generation language, a good number of which were written by end users; a synergy of cooperation and communication seems to exist between end users and the data processing department that is genuine and thriving.

If people can learn by example, then the university's situation is a case in point for those who advocate that successfully integrating computers into the fabric of organizations is as much a question of attitude as technology.

Though the school's computing environment is unique in many ways, there are also factors that are shared by other organizations both in the private and public sectors.

The first is size. The university's Austin campus caters to 48,000 full- and part-time students and thousands of administrative employees. There are 200 departments, 1,200 computer terminals and about 2,600 active computer users. The data bases and applications can be formidable: the housing administration keeps track of nearly 6,000 apartments, for example, and there are, at last count, about 120,000 active student records. About 400,000 computer transactions are handled campuswide each day.

Robert Simpson, director of the data processing division, explained that keeping track of student records and course scheduling alone is like handling the heavy throughput of airline reservations.

The university also shares some history with many DP organizations. Automating in Cobol in the 1960s, the university ran into problems with application backlogs and what Wes Henderson, head of operations, termed a communication gap with users.

The University of Texas, Austin, has achieved a synergy of cooperation and communication between end users and the DP department founded in the belief that integrating computers into the fabric of organizations is as much a question of attitude as technology.

At that point Simpson was brought in as director to try and turn things around. A primary goal was to bolster the confidence of the DP staff and users. Meetings were frequently held to produce monthly application schedules and prioritize programs. DP staff was increased. The first data base system was put in place.

Henderson said things improved, but there were still problems. "We came to realize there was probably no single DP department in the world that can get a backlog down without help from the users," Henderson explained. "We thought a large part of the work had to be distributed out to the users. We also thought the best way to do it was through a fourth-generation language."

According to Simpson, "In the past we had serviced not the end user but the person servicing the end user. There were a lot of departments here that felt that the university existed so they would have jobs. These departments didn't want to give service to the end user and we [DP] were caught in the bind."

Several years ago Simpson and others decided to begin converting existing Cobol programs into Adabas, a fourth-generation relational data base from Software AG of North America, Inc., and all new programs would be written in Natural, Software AG's fourth-generation programming language, bringing much of the programming into the hands of the users.

In the meantime, the groundwork for a new style of communication between end users and the university's administrative DP department was under way. A large part of the change in communication, according to Simpson and Henderson, can be traced to Lawrence Hall, manager of programming services and the one responsible for DP hiring.

Hall has been interviewing DP hopefuls since the late '60s. He has also honed a definite set of character traits that he looks for in new people before they are hired. "We'll probably see 150 people before we hire one programmer," Hall said. "We want great listening skills, good communication skills and the right attitude. Attitude is a belief, not a feeling. The person we hire has to be accessible to end users. We are very permissive with our people, and we don't target a trainee for a specific area. What we don't want to do is define that individual to a point where he has to live up to all his definitions."

Hall's careful screening has paid off over the years. Almost everyone who has passed through the DP side has been hired by Hall, and there seems to be a remarkable commonality in the sense of mission of the DP staff.

Besides such character compatibility, the tendency is to hire people with little or no programming experience, unusual for most DP shops. The programming skills of the new people are then gradually nurtured through extensive in-house training, educational programs and work in the field with end users. New staff members become adept at programming in Natural after about three months, and with further experience can become systems analysts after 18 months on the average.

In most cases, experienced programmers and analysts coming from outside the university need not apply. "I find that many programmers and analysts coming from other jobs often have preconceptions, a sort of tunnel vision about who they are and what their role is with the end users," Hall claimed. "We offer opportunity paths here, not career paths.

CORPORATE ACCOMPLISHMENTS

We're not in the supervisory business. That's when organizations get large, and we want to stay lean."

New DP staff members may have backgrounds in English, mathematics, linguistics, whatever. They bring with them little baggage of what a data processing organization is and what it should do. "That allows us to encourage open communication with end users," Hall added.



'In the past we had serviced not the end user but the person servicing the end user.'

— Robert Simpson
director, DP division
University of Texas

Such communication is strengthened, however, by another unusual approach to end-user/DP relations. Over the years, as the larger university administrative departments bring applications on-line, DP programmers and analysts are seeded within these departments to become full-time departmental DP employees — and users. The placing of DP talent among user departments has patiently helped build a flow of communication between DP and end users that exists at the university today.

"It's always better if a person understands what users are going through," Hall explained. "You have to understand the impact computers can have on users. I call it the 'law-of-the-beast syndrome.' [Users say,] 'They're going to come and plug this beast into the wall, and if I don't do it right, then this machine will chew my hand off.' As a rule, users fight change: they're secure in their manual methods. So you have to be flexible, you look at the needs of the users because they're the ones who are going to determine what you do."

The flow is not all one way, however. Users are encouraged to take advantage of DP training sessions to acquire programming skills, and the DP department makes available six consultants who go into the field to help users with applications. An information center, employing two full-time staff, fields questions by phone. Several end users also provide voluntary time at the information center each week.

John Camden, systems analyst and information center officer, said the center is as much a concept as a facility. "To me there is no such thing as a terminal and a mainframe, only computer systems," Camden explained. "The goal of our data processing department is not to own any files. Users own the files, and we give them the tools to manage the data. Control is with users, and even most of the documentation is done by them. There are centralized systems, distributed systems and shared resources. We're the latter."

According to Hall, "The whole thing is to get away from the traditional three-party system. Usually, you have DP and the users on one end and the data base on the other end. Users had to speak to a consultant or programmer who would go to the data, massage the data, then bring the answer back to the user. We're evolving into a two-party system, just the users and their data. DP is a consultant to that process. Like anything, the closer you get the users to the data, the more they'll understand what they want and the more responsibility they'll assume."

A good example is Connie Schade, a programmer in the university's Health Center. Originally supervisor of medical records at the center, Schade became a programmer and soon began writing various programs such as inventory, billing and physician tracking in Natural under the guidance of DP. Schade is also in the process of creating several insurance-related programs to help speed medical payments.

Linda Casarez, in charge of the university's job applicants division, is another user who has worked with DP to create some tight, integrated applications. During a peak hiring period, there will be as many as 4,500 active applicants in the job applicants system pursuing any number of positions open within the nearly 530 job classifications on the campus. Casarez has helped create a series of programs that assemble and collate applicant data, then automatically produce and update daily counselor reports and correspondence with applicants. From this data, further programs generate statistical reports on applicant profiles for use at the university as well as state and federal government agencies.

Some departmental applications at the university can get big. Physical Plant has created a large maintenance system in Natural that keeps track of more than 8,000 pieces of equipment, printing out schedules two weeks in advance that tell employees what pieces of equipment have to be checked and what items have to be looked at. Further reports that tell whether the maintenance has been done are then automatically generated.

The next project at Physical Plant will involve creating an on-line campus billing system for students making long-distance phone calls that will be tied into the campus Northern Telecom, Inc. SL-100 private branch exchange.

With 40,000 programs already out there, however, and a growing backlog of new program requests, there has to be some guiding, centralized control.

Programming standards for such things as naming conventions, systems designs and screen designs are documented by the DP side, although John Wheat, in charge of departmental accounting, said a special effort is made to account for exception reporting, and the standards committee also includes many users.

Most proposed departmental applications are screened by DP as to their feasibility, but again, there is leeway given. "We err on the side of the user," Camden said. "To build an on-line system requires an Adabas file that needs approval by data processing and the vice-president of business affairs. To get a file approval users have to have a file design. Seven of every 10 user applications might be disasters. Those three [user] applications that succeed, however, are worth the failures."

Maintenance and efficiency reviews are handled on an ongoing basis and kept track of through utility programs that produce reports logging the departmental uses of data base records and files. Inordinate usage is traced to the source, where DP staff can often help users streamline programs and make better use of data.

According to Mark Miller, a systems analyst, "In many cases it's just a matter of putting more descriptors on the files, and in some cases the result has been dramatic, decreasing the number of user calls for a file from hundreds of thousands to perhaps 10,000."

Less maintenance time than industry

Miller added that DP spends about 35% of its time maintaining existing programs compared with an industry average of about 60%. Miller attributes lower maintenance time to the intrinsic ease with which the fourth-generation language can be programmed and altered. "We can do some tricky programming with Natural," Miller said, "but we recommend to users that they keep the code simple even if it costs them a little bit more in program size. That also makes maintenance easier."

In the past year, the university has put in place an internal DP audit counsel whose mandate is to write internal controls and operational audits for the Austin campus.

Campuswide systems such as departmental accounting and student affairs provide centralized financial data used by a number of departments, access to which is delineated and controlled by file and field security levels through a software traffic controller called DPuser, which was developed in-house and resides on the IBM 3081 mainframe.



'The [programmers] we hire have to be accessible to end users.'

— Lawrence Hall
manager of programming services
University of Texas

The departmental accounting system, in fact, has been a proving ground at the university for other users. "We were the first big users group," Wheat said. "We came up with the command-driven, menu-augmented dispatcher module architecture that's the standard around here. It accommodates two levels of users. Novice users can use menus if they can't remember the commands. More experienced users can bypass menus and get from function to function in the system by a chain of commands."

Despite its successes, the university's transition to a fourth-generation language hasn't been all gravy. The DP side has had to deal with a recalcitrant payroll department in the past (though they say payroll is now a big supporter), departments have tried to place their own computing interests ahead of others and there was even a surprisingly large resistance to the removal of an impact printer that was replaced by a laser printer.

"Perhaps the lines of communication aren't as clear as they might be," one systems analyst explained. "Users are often not clear as to whether something is a standard or just a suggestion from DP. Or, if it is a suggestion today, will it be a standard tomorrow and will users be held responsible for the fact that they didn't follow last year's suggestion. This is an interesting flip of the usual DP stance saying they can't change. At the university, it's DP saying there must be change, and it's the outside that is sometimes unable to cope with it."

Despite optimism expressed by the DP department at the University of Texas, the administration will also have to cope with economic repercussions from the oil crisis, which has helped put a temporary freeze on university hiring.

Accustomed to a centralized, terminal/mainframe computing site with a stress on distributed resources, the DP staff must now also formulate some sort of strategy to assimilate the flow of micros into departments. As the influx of micros increases, DP will have to address considerations such as micro-to-mainframe communications and local-area networks along with the creation and distribution of more localized data bases.

As for the tendency of many MIS people to regard fourth-generation languages as inefficient, Simpson quickly dismissed the notion. "One of the big complaints is that fourth-generation languages create bottlenecks with I/O," he said. "We've found the opposite. If we go in and convert an application to Natural [from Cobol], the I/O on the CPU should go down on the application. We've never had problems."

The achievements of the administration's computing facilities are no doubt due as much to attitude as anything else. As more departments and users came on-line through the years, the administration has avoided some of the common pitfalls and mistakes that have come back to haunt many other MIS departments in the form of user estrangement and lack of common goals.

The school's experience might be a lesson in the value of making sure the lines of communication remain open.

"If you tie 2,000 people out there to terminals, you're looking at 2,000 nervous stomachs," programming services manager Hall concluded. " But you're also looking at 2,000 potential programmers."

Kolodziej is a senior writer at Computerworld Focus.

SPECIAL SECTION:
PRODUCTIVITY SOFTWARE

Making A Case For CASE



DAVE RIDLEY

·BY·ALBERT·J.·CONNOR·
·&·ALBERT·F.·CASE·JR.·

Computer software has now joined the major league in business problems for the 1980s and 1990s. The challenge for corporate America in a growing information and service economy is to build reliable software faster.

The need for more software, however, does not translate into an automatic increase in systems development budgets and staffs. Instead, senior corporate management is demanding increases in productivity from all the areas of business, including systems development. This translates into a need to get more and higher quality software from each system developer.

The systems development industry has seen a steady growth in the application of technology to the problem of systems development. Third- and fourth-generation languages, better source code editors, application generators and data base management systems (DBMS) have all contributed to improving productivity. These technologies, however, focus on only part of the problem — programming. Until very recently, analysis and design have not benefited from the same technological advances.

The main emphasis in analysis and design has been on building better, more reliable systems through the application of engineering disciplines such as structured analysis and design and data structured design techniques. Structured techniques result in lower maintenance requirements through more modularity in design. They also result in systems that more closely meet the needs of end users. These disciplines, however, are tedious, highly labor intensive and time consuming. Their impact in terms of productivity is long term.

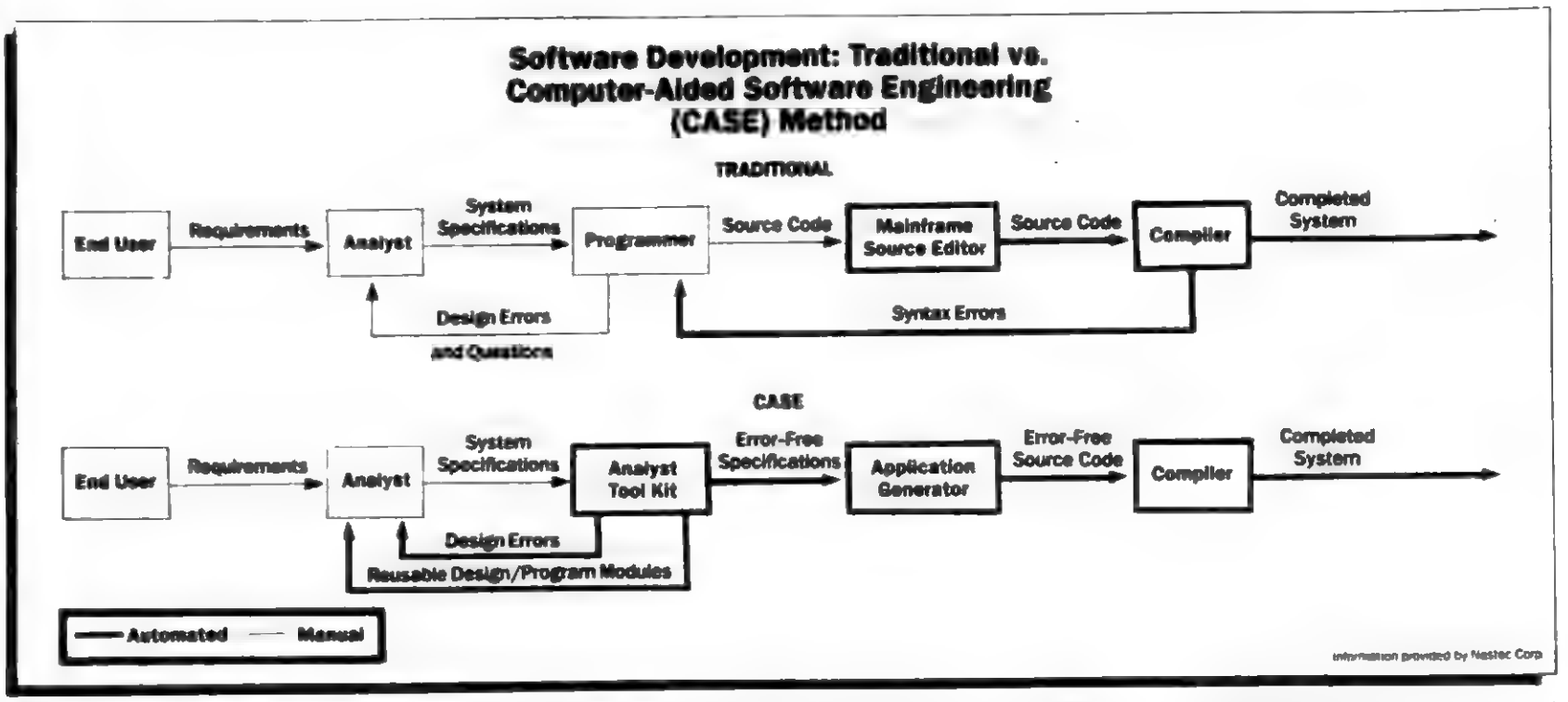
Perhaps software developers can learn some lessons from the electronic and mechanical engineering industries. Like software development, these engineering disciplines follow a life cycle or orderly series of predefined tasks to achieve their design objectives. These industries first focused on improving productivity by automating tasks later in the life cycle, tasks related to manufacturing the products the engineers designed. The domain of these tools was the factory. Later, as the engineering disciplines matured, they began automating the design functions for mechanical and electronic components, tasks performed by the engineers themselves earlier in the life cycle.

The earliest systems used computer-aided drafting, which assisted in the development of mechanical and electronic component diagrams and schematics. Later these systems evolved to using computer-aided design and manufacturing for mechanical engineering and computer-aided engineering (CAE) for electronic engineering. CAD/CAM/CAE systems went far beyond merely drawing circuit diagrams and blueprints. They included programs for analyzing the diagrams to detect errors in the design specifications and included bill-of-material processing systems to identify and catalog reusable electronic and mechanical subassemblies. In addition, many CAD/CAM systems directly controlled some aspects of the manufacturing process such as automatically programming numerically controlled machine tools. The latest generation tools, called computer-integrated manufacturing (CIM) tools, include CAD/CAM/CAE functions as well as management information features for project and manufacturing control and capacity planning.

The benefit of the CAD/CAM/CAE and CIM systems include improvements in the quality of the product and increases in engineering and manufacturing efficiency. These benefits are proven by the dramatic price/performance improvements in computer hardware systems over the last 10 years, a feat that never could have been achieved without the application of these technologies.

The software development industry is undergoing a similar pattern of automation. Like other engineering disciplines, software development first began automating the later tasks in the life cycle through improvements in

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programming technology. Sophisticated third-generation language compilers, fourth-generation languages, DBMS and program/application generators have been around for some time and are widely used in the computer industry. These automated tools focus on the software "manufacturing" process — programming. Like any other manufacturing process, programs must be designed. Improved programming technologies allows programs to be developed more rapidly. However, these advances do not assist in reducing the labor intensity and tedium of performing analysis and design tasks. Poorly designed programs require significant maintenance. With improved programming technologies, developing poorly designed programs faster simply compounds the maintenance requirements.

Structured design techniques improve the quality of software and, subsequently, reduce maintenance. The drawbacks to these techniques lie in their complexity and labor intensity. These drawbacks frequently lead to shortcuts that get the projects completed faster but do not necessarily have the desired effect of increasing system reliability and reducing maintenance. Like electronic and mechanical engineering, software analysis and design can benefit from automation early in the life cycle.

The first step

Like computer-aided drafting for engineering, early attempts to automate software design focused on documentation. Products for creating diagrams, flowcharts and narrative specifications emerged in the early 1980s. Economically feasible tools for processing both graphics and words were made possible by the emergence of powerful, low-cost micros.

Two of the early tools in this area were Nastec Corp. Graphitext and McDonnell Douglas Automation Co. DFD-Draw. These tools enabled developers to develop and modify specifications quickly. They provided the first opportunity for software developers to create structured specifications on-line, reducing initial specification time by 15% to 20% and documentation revision time by up to 60%. These early documentation tools introduced a whole new class of automation for software development. This emerging technology has been labeled computer-aided software engineering (CASE), a term coined by John Manley, director of the Software Engineering Institute at Carnegie-Mellon University.

In 1983, emerging CASE systems provided not only computer-aided drafting and, occasionally, WP, but actually validated the specifications created to ensure completeness and accuracy prior to programming. These CASE tools decrease the time to create and modify specifications and substantially reduce the labor intensity and complexity of using software engineering disciplines (see chart). The tedious and repetitive tasks of cross-referencing documentation, balancing various design documents and eliminating redundant design specifications are automated with CASE. Now software engineering techniques are more efficient. Design flaws can be detected with a high degree of accuracy and corrected early in the development life cycle when correction costs are the lowest. CASE system cross-referencing design dictionaries or design data bases make location and reuse of design and program modules feasible through automated reporting. These systems can reduce design time by 50% or more while still yielding high-quality, error-free program specs.

The closest engineering analog to CASE is CIM, which includes tools for engineering as well as tracking and control. Similarly, sophisticated CASE systems include tools for planning a project, directing the work of developers through on-line communications, controlling and securing the specification data base and automating software quality reviews. These CASE systems include subsystems that manage the entire software development life cycle. Linking management tools to the software engineering tools, these advanced CASE systems become complete management information systems for software development.

Management can assess the impact of requesting a change to a specification of a current system by inquiring against the design dictionary. This information coupled with the availability of a program and specification "parts catalog" of reusable components yields more accurate software project estimates.

The successes of computer-aided technologies for engineering and manufacturing are proven. They have substantially contributed to the recent revival of the U.S. automotive industry through decreased manufacturing costs and higher quality consumer products. Similarly, the application of CAE to electronic hardware design slashed prices while boosting performance.

Looking at the future of CASE technology, some exciting developments are on the horizon. For example, this year CASE analysis and design systems have been interfaced to Cobol application system generators, marking the first interface between design automation and programming automation. The merger of these technologies means that 80% to 90% of the final system can be generated directly from the design specifications. This new level of CASE technology could be described as a specification compiler. The specification compiler accepts structured specifications as input, checks the design syntax and translates the specifications into a programming language. This process has long been accepted as the way to translate human-written programs into machine instructions. The drawback has been the inability to get the structured specification into machine-readable form, a problem solved by CASE. The benefits of a specification compiler are much greater than those achieved through the use of third- and fourth-generation languages.

Another bright spot in the future of CASE technology is expert system technology, a branch of artificial intelligence. Simply stated, expert systems transform a professional's knowledge to a set of rules stored in a knowledge base. The expert system program (shell) then processes data according to rules in the knowledge base — allowing the computer to solve more complex problems than previously possible.

Software engineering is an excellent candidate for the application of expert system technology. The creative and challenging aspect of software engineering is in defining users' problems and requirements. Much of the remaining work in analysis and design is transforming those problems and requirements into a design, transforming the design into programs and transforming the programs into working machine instructions. Incorporating expert system capabilities in CASE systems frees the developer to concentrate on the creative tasks in software engineering and delegates the routine transformations to the computer.

CASE technology enables software developers to take aim at the problem of software development productivity — increasing efficiency, improving quality and reducing maintenance. At last, software developers as well as their end users can achieve productivity improvements through the use of computer technology. ■

Case is director of Consulting and Education Services for Nastec Corp., Southfield, Mich., and author of Information Systems Development: Principles of Computer-Aided Software Engineering *(Prentice-Hall, 1986). Connor is vice-president of Market Development for Nastec.*

Selecting A CASE System

The following is a list of features that can be found in computer-aided software engineering (CASE) systems and environments:

- ***Computer-aided drafting.*** Features for creating graphics and narrative documentation.
- ***Computer-aided design.*** Features allowing the computer to analyze specifications for completeness and accuracy.
- ***Design data base.*** A design data base in which the specifications and cross-reference information is stored.
- ***Integrated programming tools.*** Program or application generator interfaces that capture input from the design specifications, eliminating redundant entry.
- ***Management.*** Tools to manage the development process that share a common data base and interface with the design and programming tools.
- ***Human factors.*** Supporting the system by the best educational and technology transition support.

SPECIAL SECTION:
PRODUCTIVITY SOFTWARE

Betting On 4GLs Or Cobol


DAVE PROLEY

·BY·N.·ADAM·RIN·

User experience with fourth-generation languages has now been substantial, with results not entirely in line with early expectations. While productivity gains are real, the hope that these languages would quickly replace Cobol has not been realized.

An examination of productivity tools now being installed shows that they include a substantial number of Cobol program generators as well as fourth-generation languages. This suggests that there are certain pragmatic reasons for adopting a Cobol program generator or a fourth-generation language, depending on the application, objectives and corporate attitudes toward various classes of tools.

The implications of introducing productivity support systems are of particular importance to two groups of DP professionals: those who are currently in the process of evaluating and selecting high-productivity tools and those who are selecting a data base management system and may wish to install a fourth-generation language or other productivity tool either concurrently or later. This is because there is often a strong link between development productivity systems and DBMS.

End-user fourth-generation languages are of two types, although there can be overlap between the two. They can be either language driven or forms (menu) driven. Typical examples of the language-driven systems are Martin Marietta Data Systems Ramis II, Information Builders, Inc. Focus and D&B Computing Services, Inc. Nomad2. Forms-driven (menu-driven) products usually have a retrieval and reporting orientation and include IBM QMF and Computer Corporation of America's (CCA) Access/204.

Despite vendors' claims, these systems are not really suitable for building major transaction processing applications but are useful for many other purposes. Language-based products can be used very effectively for applications where simplicity is characterized by both functionality of the system and volumes of data to be handled.

The menu- and forms-driven products can be used for applications that do not require an algorithmic capability or the processing of heavy volumes of data.

The restriction on the use of these systems is partly due to the fact that they do not possess the functionality of a full programming language.

Furthermore, language-based, end-user fourth-generation languages often offer a simplistic syntax that may not be suitable for complex applications. It is even possible that for a complex algorithmic application you could write more lines of fourth-generation language spaghetti code than you would using structured Cobol because some end-user fourth-generation languages lack structure, standards and methodology, which may also lead to maintenance problems. Typically, these systems are excellent for the kind of information center use for which they were originally designed. They often have interfaces to DBMS that improve their usefulness; some have even started growing their own embryo DBMS facilities.

As they develop, the difference between end-user and other fourth-generation language offerings is becoming blurred. However, because they do not offer a full functional replacement for Cobol, these tools are not considered suitable for building major production applications.

Production program generators are a full functional replacement for Cobol. The products are fundamentally Cobol generators and include CGI Systems, Inc. Pacbase; Pansophic Systems, Inc. Telon; CCA Accolade; and Tarkenton Software, Inc. Gamma.

For a long time this type of productivity aid had been written off because the sense was that Cobol was old technology. However, there has been a resurgence in demand for Cobol generators, primarily because of the perception that they can offer a simple and safe way to achieve productivity gains.

The overselling of fourth-generation languages by some vendors and consultants as well as a

SPECIAL SECTION: PRODUCTIVITY SOFTWARE

history of misapplication has led a number of installations to become distrustful of these tools. The perception that fourth-generation languages have failed to meet their promise has helped bolster the case for the program generator. Program generators offer real productivity gains, relative to using native Cobol, with a minimum of disruption.

In terms of facilities, program generators interface with traditional files and typically with one or more DBMS. Human engineering is in the form of interactive and forms-driven facilities for data definition, screen definition and procedure definition. Some program generators are available in PC versions — such as CCA's Accolade, PC — as well as on the mainframe. These versions permit IBM PCs to be used as workstations for development and testing so that the completed application can then be uploaded to the mainframe for production implementation without change.

Production application fourth-generation languages differ from end-user fourth-generation languages in that they are offered as complete functional replacements for Cobol, including being suitable for on-line transaction processing applications. The major difference between the two types of production application fourth-generation languages is that some are integrated with their own DBMS while others are interfaced to other vendors' DBMS.

Examples of products that incorporate their own fourth-generation language and DBMS include Applied Data Research, Inc.'s Ideal with its Datacom/DB; Computer Corporation of America's Workshop/User Language with its Model 204; Cullinet Software, Inc.'s ADS Online with its IDMS; and Software AG of North America, Inc.'s Natural with its Adabas. These products are all intended for building major production systems. In addition to providing an interactive means of defining data and screens, these systems include a language that is at a higher level of abstraction than Cobol.

A second important feature is that these languages are packaged with the vendor's DBMS. The extent of the actual connection between the language and the DBMS varies substantially, ranging from an interface to complete integration; this in turn affects performance, ease of use and other usage characteristics.

> *Given the range of productivity tool options, users must determine what they really want and what they are prepared to compromise to achieve desired results.*

Examples of production application fourth-generation languages that are independent of a particular DBMS include Pansophic Systems Gener/OL and Martin Marietta Data Systems UFO. This category of system is also offered as a functional replacement for Cobol, and such products typically work with IBM's VSAM and IMS so as to take advantage of Big Blue's shortcomings in the fourth-generation language area.

These systems have much more functionality than report writers. The nature of their links to DBMS vary, and, because the linked systems come from different vendors, the level of integration may not provide the same ease or efficiency of tools such as that found when all systems have been developed together.

Production program generators and production application fourth-generation language tools have certain facilities in common. Data definition is typically dictionary-based and carried out interactively using forms-driven processing. Screen definition is performed in a similar way using screen painting techniques. In addition, most offer ways of writing both transaction and batch procedures. However, there are differences between program generators and fourth-generation languages in terms of how procedures are written, the level at which the language operates and the development environment that each creates around it.

Program generators enable programmers to continue more easily with their established procedures and to continue to support existing standards but in a more productive way than native Cobol. Fourth-generation language products enable users to execute an application interactively and as it is written.

Given a range of productivity tool options, it is essential for users to determine what they really want and what they are prepared to compromise to achieve desired results.

There are those whose DBMS plans might short-circuit any other fourth-generation language selection process. Others need to determine what their specific needs are in relation to productivity, performance, class of application and level of change their installation can support in moving toward those goals.

It is reasonable to assume that anyone with an interest in improving productivity over writing new applications in native Cobol would consider one or both of these classes of products. Starting from that premise, it is worth assessing the immediate considerations.

First, an installation cannot move from writing native Cobol to any of the productivity tools overnight. There are many factors to consider, including the fact that systems currently under development are probably better left in their native Cobol state.

In addition, there is a need to maintain Cobol programs that will continue. Also, those programmers earmarked for working on a new system will have to be trained and will go through a transitional phase while they hand over their earlier work to others.

A multilevel approach needs to be developed that could include a move to a program generator for certain applications; the introduction of a production application fourth-generation language for others and to pave the way into the future; and the possible acquisition of an end-user fourth-generation language for information center work.

A comparison of the unique benefits of using a program generator or a fourth-generation language is one way that helps to show which starting approach is preferred. One of the benefits of using a program generator is the



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sense of security that comes from working with a language that is understood and that minimizes MIS' ties to a particular vendor. Another is the greater familiarity of the process because development style does not change as much.

Evaluators, however, should be careful not to overestimate the extent of these benefits. Many products generate Cobol that is so cryptic as to be unusable at the object level. There are also some fourth-generation languages that are so unstructured and cryptic that they are hard to maintain at the source level. It is likely every viable DP department is going to make a move to fourth-generation languages for at least some of its development.

Another benefit of generating Cobol is that it is more portable than fourth-generation language-produced systems. Again, though some fourth-generation languages can demonstrate functional and performance parity with Cobol, the genre as a whole is sometimes regarded as immature. This may be enough to cause some managers to hesitate before introducing the technology.

In all, for many applications, program generators may not offer the same degree of productivity gains, but they are certainly a lot more cost effective than using native Cobol. In fact, they offer twofold to threefold programming productivity gains. Furthermore, a Cobol program generator may give a greater degree of flexibility in its procedures and through its Cobol source generation than many fourth-generation languages when solving problems for which a fourth-generation language does not offer any particular advantage. An example may be an application with highly algorithmic processing of a non-data base, traditional file, where many fourth-generation languages do not offer a distinct advantage.

It is clear then that production fourth-generation languages must offer substantial benefits of another kind. That difference is primarily seen in productivity improvements, which can be up to 10 times the speed of using Cobol for many applications.

The difference in productivity of production fourth-generation languages over program generators is attributable to their higher level and/or less procedural language; a more streamlined interactive process from writing through execution; often, an interactive workstation development environment with a whole suite of development, editing, debugging and maintenance aids tailored to the language; and for some of the DBMS-linked fourth-generation languages, the exploitation of the power of the underlying DBMS.

More advantages

Additional advantages have to do with the organization as a whole and its attitude toward DP. The introduction of such a language makes a statement about how MIS sees itself within the organization. DP moves away from a preoccupation with low-level procedurality to an emphasis on business problems. Important data management decisions can now be made in light of what is good for the organization as a whole, rather than what is necessary to meet narrow technical requirements.

From the point of view of departmental morale, the move to a fourth-generation language makes another significant statement: The department is a progressive one in which career development can take place at the forefront of commercial DP technology.

The message is clear: It is time to stop writing native Cobol. There has been and will continue to be a decreasing amount of new development in Cobol, with a resurgence of generator-supported Cobol. There will be a corresponding decrease in the maintenance of Cobol systems, with many being replaced by new systems written using fourth-generation languages. There will be an increase in the use of Cobol program generators for a decreasing segment of the development mix. End-user fourth-generation languages will continue to spread, but the biggest growth can be expected in the implementation of systems written using DBMS-based production application fourth-generation languages.

In the future

There will be some move to extend the power of production application fourth-generation languages to end users. Because the interaction between end users and computers is very different from that of DP professionals and computers, there will most likely be forms- or menu-driven facilities for the less sophisticated user.

Future products will almost certainly include some hybrid that offers the benefits of both the fourth-generation language for development and the generator for production use. This will have the effect of keeping a user's options open at all times.

More attention will be paid to the front end of the design life cycle. There will be an increasing number of products addressing requirements definition, data base design, analysis and so on. Linked to the DBMS and the language or to the program generator, these hybrids could increase productivity by an order of magnitude.

Finally, the idea of the programmer workstation will become increasingly viable as more of these products become available on PCs. By offering identical functionality, these products will be able to exploit the desktop productivity of real-time response and will also add the benefit of off-loading CPU cycles. The use of a PC will serve to diminish partially the development productivity differences between fourth-generation languages and application generators.

These products are not far away. Certainly they will be in heavy use before Cobol is dead, and Cobol and fourth-generation languages can be expected to coexist for a good many years. The key to successful DP management has always been to take advantage of technological opportunity without locking into a dead-end product. The tools are there for this approach with regard to development productivity. ■

Rin is vice-president, Product Planning and Development, for Computer Corporation of America of Cambridge, Mass.

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SPECIAL SECTION:
PRODUCTIVITY SOFTWARE

Dealing With Data Control



DAVE RIDLEY

·BY·MICHAEL·D.·DEWID·

Fourth-generation language technology has gained industrywide recognition for savings in productivity and costs by providing reductions in coding, testing and maintenance of applications. Indeed, DP management views this tool as a revolutionary product that will eliminate the backlog of user application requests at a substantial savings to a company. However, this technology is not the miracle cure for all backlog woes and is in some cases creating unforseen problems for DP managers.

The major challenge management must overcome for the fourth-generation language to sustain its widespread acceptance is that of control; control of access, change, process and configuration must all be taken into account.

With the introduction of online programming, the amount of code a programmer can produce has been enhanced. Fourth-generation languages present the same benefit. As development activity increases, this process becomes more difficult to control. Managing development in today's sophisticated and diverse environments is impossible without automated methods.

Initially, control may not be a priority or even a concern to the prospective buyer of fourth-generation languages. The buyer may intend to use the language to model the design phase of product development. Control is not essential because the application will not enter the production environment. Although the objective of design improvement is of great value and may be the sole justification for purchasing the fourth-generation language, it most likely will be short-lived.

A top priority of the DP manager is to improve end-user satisfaction because if a user served by DP is pleased with the quality and timeliness of application development, then the DP department has bargaining chips for a bigger budget appropriation. Today, a firm cannot be competitive or even make daily business decisions without prompt and accurate processing of data. Eventually, the need to enhance service-level commitments or to minimize slipped project schedules and mounting application backlogs will compel management to place fourth-generation language code into the production environment.

The system development life cycle is by definition concerned with constructing efficient and stable application software. The application process starts with defining user requirements. Designing the application is next. Several levels of design detail are iterated until the user accepts the approach and sample outputs. Once the user endorses the conceptual approach, a project is initiated to allocate manpower and determine a schedule. Development personnel then begin translating the requirements and design documents into an application. The completed application passes through several levels of testing and is then put into production.

The development life cycle's primary purpose is to provide a level of control to prevent unauthorized or unexpected changes that impact other components of an application from being introduced into the production environment. The challenge of control is complicated because DP must manage hundreds of program components within hundreds of applications. Standards, conventions and access controls must also be introduced, further complicating the control issue.

With the advent of fourth-generation language applications, managers must apply the same level of discipline (control). The primary objective still is to minimize the risk of errors entering the production environment. In addition, there must be a means to track changes in programs to verify that only approved modifications are incorporated.

What to control becomes a crucial question. The vendor companies that developed program librarian software reported as early as 1969 that source code was the only important factor to control. Later, some vendors decided that the control of executable code was also important.

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The issues involving what to control should not be dictated by aged librarian software. In fact, the librarians available today cannot manage components that should be controlled such as design documents, panel layouts, data base accessories, executable code for fourth-generation languages, code generators and other retrieval products. Anything short of controlling each and every item composing an application is inadequate control.

The new discipline

Change management is vitally important for software development and maintenance. Changes made to source code, for example, can have far-reaching effects on a large number and wide variety of associated components such as object code, executables, job control language (JCL), procedures and documentation. As a programming system increases in size, the connections among its parts become more complex, and the need to control who makes what changes to what information grows accordingly.

Another area requiring control involves the management of all component interrelationships. It is essential to know exactly which components make up an application for a given release. Often, users track changes with burdensome paperwork and perform configuration management only with manual procedures. These methods are time consuming, inaccurate and ultimately unreliable. These problems can be resolved only with change and configuration control.

Data processing management must track changes to all types of information related to software development and production. Changes made in the host operating environment may occur, for example, through editing or linking. Change tracking requires records of who made changes, when they were made, exactly what changes were made, what names or labels were associated with the changes and even why the changes were made. By associating a change name with an individual component or even lines of code, management can obtain a complete audit trail for tracking a change request. This trail provides an invaluable cross-reference for tracking the impact of change across many applications and a record for program maintenance or reconstruction in case of errors.

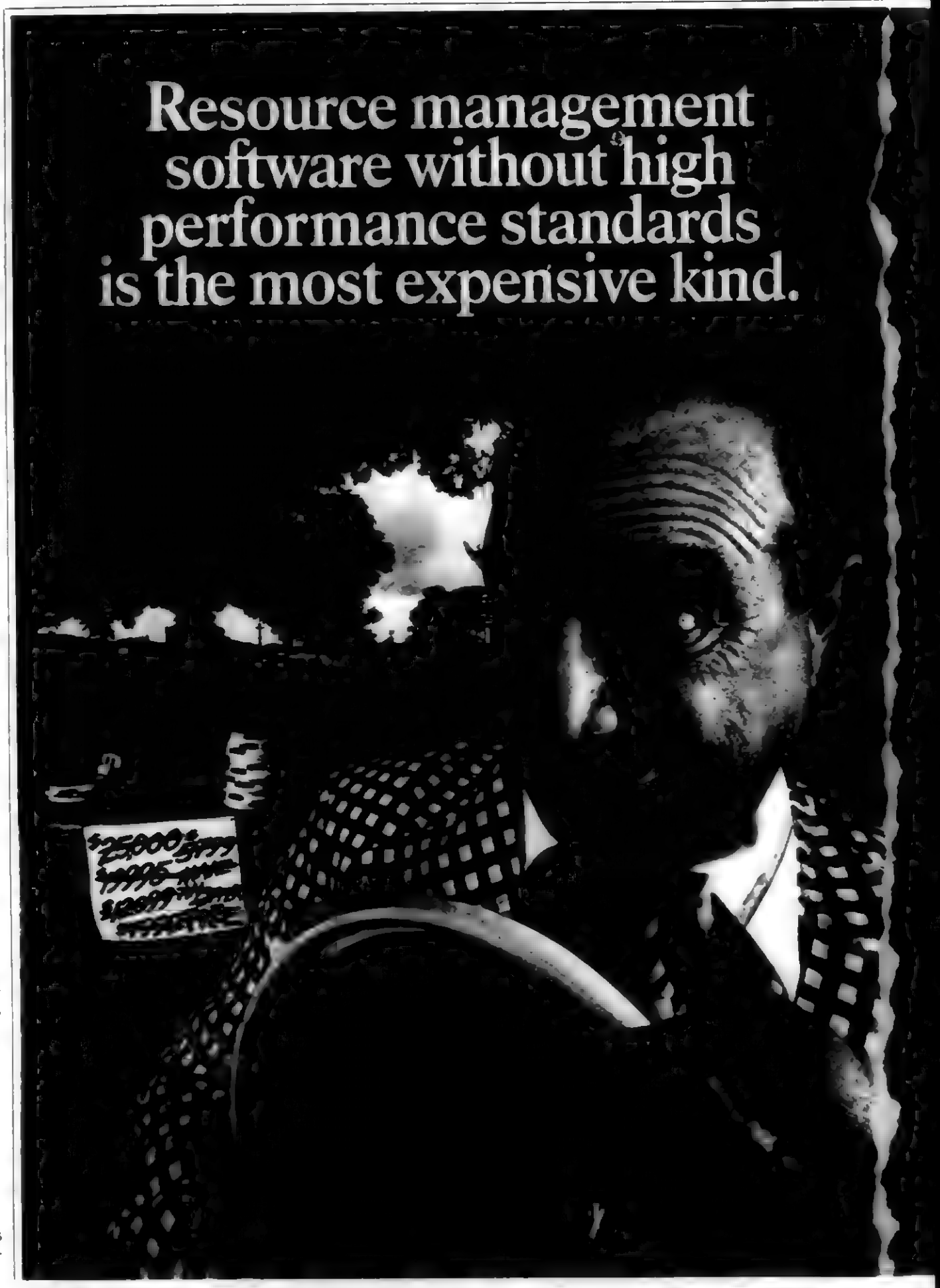
By storing only the exact changes in a given component from version to version, revisions of each information item become traceable while retaining efficient use of space. Furthermore, any previous versions of a component may be re-created on demand.

A configuration is a collection of all the related elements of an application such as requirements documents, source and object code, executables, JCL, data base accessories and any other related elements. Configuration management is defined as the organization and management of all components of an application as a single unit.

Configuration management provides several benefits for an organization. The automatic tracking of component dependencies eliminates the possibility of promoting either an application with missing components or one with incorrect component versions. The configuration management discipline guarantees the completeness and integrity of the production application. Moreover, the re-creation of an application in its entirety can easily be accomplished. In an accounting application, for example, the payroll system as of some previous date could be re-created with one command.

You do not have control over the development, maintenance or production environments unless each component can be protected or re-created on demand.

Whenever a particular release of an application is fixed — or frozen — its current components, each with its own change history, must be identified precisely. Thus, there are never any questions about which pieces of software belong to which release or which version of the corresponding documentation needs to be included with the software program. This is essential for performing maintenance on a failed application. With a control system in place, the development staff has



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no trouble identifying which component version needs repair.

When a particular release is frozen, it must be possible to derive from it a new configuration, with exactly the same structure and information, for continued modification or development. In this case, information must be shared between virtual copies to eliminate redundancy and reduce storage space.

Information sharing also permits development activities to occur along parallel paths. This flexibility is required to simultaneously support, for a given application, multiple development projects, emergency maintenance activities and quality assurance testing.

Configuration management procedures such as change tracking and status accounting must also be available. To enforce DP standards, configuration management procedures must be automated and take into account process control over the entire development life cycle. In addition, flexible reporting should be available, on demand, for project leaders, administrators, developers and auditors.

Change and configuration control allow management to track the development of any standard or nonstandard programs or elements as well as identify component interrelationships. Standard system protocols such as IBM Interactive System Productivity Facility can prevent users from avoiding the control required to maintain DP standards. Transparency can therefore be retained and productivity remains high.

The problems facing the control of the fourth-generation language are not new. Any solutions that have the potential to improve productivity dramatically will cause a loss of control. For example, from the early 1970s to early 1980s the report writer was a software solution to improve productivity. Like the fourth-generation language, report writer features such as reduced code and testing helped reduce the application backlog. The momentum gained in the development environment pushed report writing into the production application environment, where control problems arose. Most organizations that continue to support report writers in production today are unaware of how the report writers are evolving to new end-user specifications.

> *Control problems will continue until they can be solved by automated control methods.*

Control problems will continue to plague software production and development until they can be solved by automated control methods. For example, code generators now promoted for developing sophisticated hybrid systems and personal computer development workbenches offer further productivity increases. With these increases will come a corresponding loss of control. Now is the time to prepare to face this control loss.

DeWid is vice-president of marketing and the current head of IBM's marketing efforts for Softool Corp. of Goleta, Calif.

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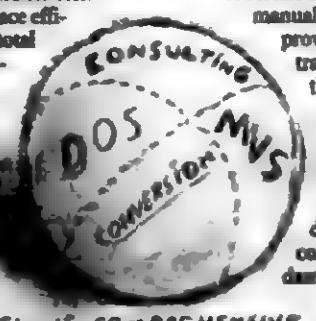
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SPECIAL SECTION:
PRODUCTIVITY SOFTWARE

Selecting To Fit Your Needs



DAVE RIDLEY

·BY·JEFFREY·BERNKNOPF·

Increasingly, both end users and DP professionals are turning to fourth-generation languages as the answer to increasing productivity. But how do you determine which fourth-generation language product to choose? Your choice is limited by the environment (computer hardware and operating system software) chosen by your organization.

Every environment has advantages and disadvantages as well as a limited number of fourth-generation language tools available to assist you in your endeavors. The availability of fourth–generation languages for your environment and an understanding of the environmentally related issues is of fundamental importance in selecting the proper product.

During the feasibility phase of most DP projects, the hardware and software to be used is determined. Sometimes that involves introducing a fourth-generation language product where none existed previously or bringing in a second fourth-generation language that better meets the requirements of the project. In other cases, converting to a new operating system or purchasing a departmental processor for system development may be the answer.

End users who have budgetary control over projects can bring about similar changes, often relying on DP departments and information centers to make recommendations about their environment. Their primary consideration is ease of use.

End users are also very interested in personal computing. The PC revolution has put micros in most user departments and, in many cases, on each user's desk. Many fourth-generation language vendors have targeted their products at the PC environment. DP managers are only slowly beginning to appreciate the role of the PC in the application development process.

Environments range from the simple to the complex. The more complex the environment, the greater the need for products that are available in multiple environments. However, environmental availability is only the first issue that should be examined when selecting or using a fourth-generation language in your environment. Portability from environment to environment is a closely related issue. Other key product issues include efficiency, file type support, device support, vendor support and connectability.

When investigating portability, you must first consider the environment in which the fourth-generation language was developed. Many fourth-generation language vendors have concentrated on IBM operating environments for years and are branching out and moving into non-IBM environments today. Their expertise, philosophies and software experience are, therefore, oriented to IBM mainframes. Information Builders, Inc.'s product, Focus, is one example. Other products like Relational Technology, Inc.'s Ingres, have been available for some time on Digital Equipment Corp. machines and other hardware and have only recently been ported to IBM environments. Then there are products like Oracle Corp.'s Oracle and Pro Computer Sciences, Inc.'s Pro-IV that were designed with portability in mind.

The exact mechanism for transferring a product from environment to environment is also a concern. There are three basic strategies that relate to portability employed by vendors when designing their product:

- Coding the product "completely" in a portable language like C. Result: high portability.
- Coding most of the product (70% to 80%) in a fairly portable language like Fortran and developing the environment-specific components in assembler. Result: medium portability.
- Coding the product completely in assembler language for efficiency and completely rewriting the product for each new environment. Result: low portability.

There are various environments targeted by fourth-generation language vendors. No fourth-generation language operates in all environments. Very few of these languages even come

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close. Most products are designed to run in one environment, the one with which the product developers are familiar. In many cases that environment is IBM. Most fourth-generation languages that were not developed by the hardware vendor have a version that runs in at least one of the IBM environments.

The selection process

The first step in selecting a fourth-generation language is to find one that operates in your company's environment(s). Next you must decide on the scope of projects to which your fourth-generation language will be applied. When selecting tools for end-user computing, products like Focus; D&B Computing Services, Inc. Nomad2; Martin Marietta Data Systems Ramis II; Oracle; Ingres; and IBM Application System are the tools to be considered. Most of these products are also applicable to complete application development, but they should be scrutinized — including benchmarks at size and performance characteristics of the application.

Products like Applied Data Research, Inc. Ideal; Cullinet Software, Inc. ADS/Online; Software AG of North America, Inc. Natural; Cincom Systems, Inc. Mantis; and Computer Corporation of America User Language provide complete application development facilities with products that are clearly oriented toward programmers and application developers. These products provide fast response times, high transaction rates, access to very large data bases and optimization for high performance. Each product is also closely tied to a high-performance data base management system, written in reentrant code, and to a teleprocessing monitor like CICS.

Project scope relates closely to efficiency. A frequent argument is that machines are becoming cheaper and user time should be optimized. While this is true, the argument is no comfort when your CPU is 100% utilized, there is no extra DASD and response time is two minutes. Fourth-generation language benchmarks are often the best way to assess efficiency, but very few benchmark results are available.

Inefficiency has always been a major problem with fourth generation languages. Fourth-generation language vendors expend a great deal of time, effort, research and money on this issue. In the IBM world, efficiency translates in such areas as the following:

- Reentrancy. A reentrant product provides one copy of the product to all users. This saves on disk I/O, virtual paging and user region size (memory). Of the end-user, fourth-generation languages, only Nomad2 is fully reentrant.
- Optimized I/O. Accomplished by techniques such as rewriting the low-level EXCP routines, automatically recognizing the difference between sequential and random access, and a B-Tree index to provide rapid random access.
- High-performance sorts. Often required for queries and reports.
- Minimizing the instruction path length, which is the number of instruction required to turn fourth-generation code into machine language.

Other criteria for evaluating fourth-generation languages is device support and file type support. IBM products should support the features of a 3270-type terminals like the IBM 3179 and 3279 as well as terminals that are wider (greater than 80 columns) and deeper (more than 24 rows). File type support is even more critical. To maximize flexibility, a product should be able to read a standard IBM access method file, a data base file from another product or a nonstandard file.

For the BUNCH

Fourth-generation languages in BUNCH company environments are few, which leaves users with a limited choice. From a fourth-generation language view, Honeywell, Inc. is the most popular of the BUNCH, with the widest variety of proucts. On Burroughs Corp. and Sperry Corp. machines, almost the only product available is provided by the hardware vendor. No fourth-generation languages are available for the Control Data Corp. Cybers or the NCR Corp. V-8600 series mainframes when running their native operating systems. Several products like Ingres can be run on these machines when the Unix operating system is chosen. However, both Oracle and Pro-IV are available on the NCR Tower minicomputer running Unix.

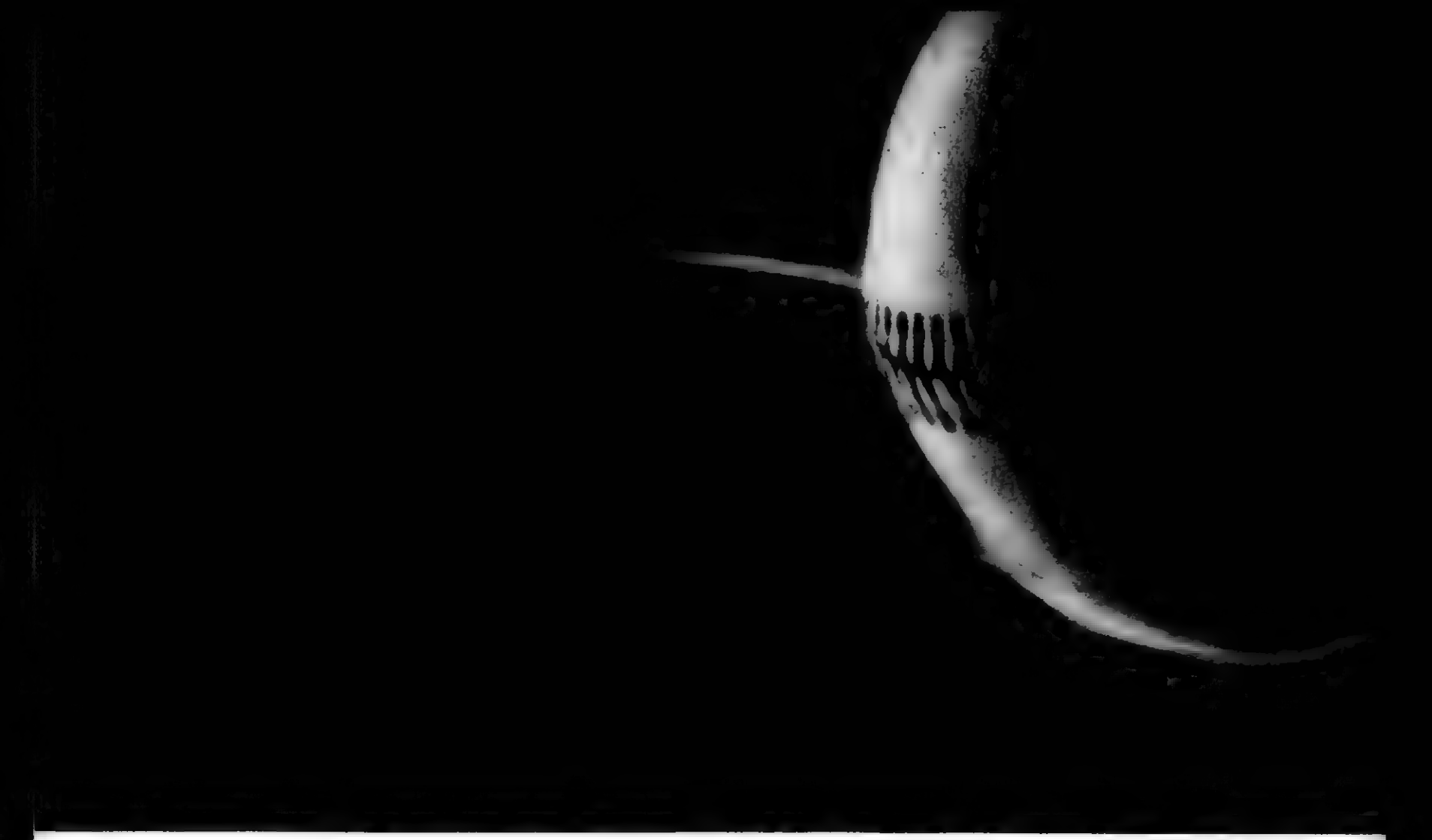
Several fourth-generation languages are available for Honeywell's DPS series with its GCOS operating system. Both the environmental champs, Oracle and Pro-IV as well as a version of Mantis and Henco Software, Inc.'s Info, can be found in this environment. In addition, Honeywell recently introduced its own fourth-generation language, the Integrated Query System (IQS), which includes features like relational file access, rapid application development, report and query from existing or IQS files and a front-end menu system.

Burroughs has developed its own product, Linc II, which runs on all of Burroughs' major computers and is well integrated with its DMS II data base software program.

Linc II is oriented toward applications development and was designed as a replacement for Cobol development. The product provides a comprehensive set of nonprocedural functions that include a menu-assisted application development process, report and screen painting capabilities, integration with a data dictionary and generation of on-line documentation. The creation of a data base is relatively simple as is the process for generating queries. All functions of this fourth-generation language, including application generation and network



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SPECIAL SECTION: PRODUCTIVITY SOFTWARE

definition, are available from the main Linc II Activities Menu. No other fourth-generation languages are available on Burroughs machines.

Sperry has targeted its product, Mapper, for the end-user audience. Mapper provides a set of functions that allows for the rapid development of reports through a variety of nonprocedural functions. Good integration is provided with graphics, allowing data to be plotted on a UTS 60 color graphics terminal in the form of high-resolution pie charts, bar charts and so on. Mapper contains its own data base system that is built around a file cabinet approach. Interfaces are also provided to word processing and office automation functions, financial modeling and to the PC. A Help facility and tutorial are also provided with the product. Oracle is the only other fourth-generation language product that is available on the Sperry 1100 series machines.

The most popular mini targeted by fourth-generation language vendors is the DEC VAX environment. DEC is the second largest hardware vendor and, with recent expansions in the 8600 series of the VAX line, provides a variety of processing capability. Throw in the Microvax II and you can develop systems for three to five people just as easily as you can for 70 to 80 people. With the VAX cluster concept, additional processing power can be added as needed.

Adapting and executing in a VAX/VMS environment is very different from an IBM mainframe. In many cases, end users or departmental development groups have purchased the VAX because they want to move away from the centralized IBM environment in which they had low priority and poor response times. Adapting means supporting a VT100, VT200 or VT220; it also means optimizing packets when integrating systems through Decnet. Because the DEC unit works with character I/O and the operating system sees and echoes back each character, a product must be very conservative with terminal I/O. File type support is also important.

In looking at minicomputers, you find the same fourth-generation language vendors. For the Prime Computer, Inc. Series 50 machines running the Primos operating system, there are versions of Ingres, Oracle, Pro-IV and SAS Institue, Inc. SAS. The same set of products, except Pro-IV, is available on the Data General Corp. MV series machines under the AOS operating system. On the AT&T 3B line running Unix, only Ingres, Oracle and Pro-IV are available. A version of Focus will soon be released for the 3B machines.

Another minicomputer in wide use is the IBM System/36. To date, however, only one fourth-generation product, Pro-IV, is available for this machine. Most vendors have taken a wait-and-see attitutde as IBM continues to evolve its minicomputer strategy.

Fourth-generation language vendors, when faced with the issue of supporting PCs, have three basic routes to choose from: develop a complete PC version; provide integration through micro-to-mainframe communications, mostly with upload and downloads; and run the IBM CMS version of their product on the IBM Personal Computer XT or Personal Computer AT/370. This last alternative is very limiting because few XT/ or AT/370s are installed in corporate America. Similarly, a micro-to-mainframe solution is limiting because you cannot perform stand-alone application development with a familiar tool (the mainframe product) and application prototyping and development of mainframe systems.

Developing a complete PC version is a tremendous undertaking. Thus far, only Focus, Oracle and Pro-IV have PC versions that contain most of their mainframe features.

To a much more limited extend, SAS and Ramis II have PC versions of portions of their product available.

Personal computer versions of Applied Data Research, Inc. ADR/Datacom/DB with Ideal and Nomad2 are currently under development.

Bernknopf is president of New York-based Fourgen Information Systems, a consulting firm specializing in fourth-generation language technologies.

CIRCLE READER SERVICE NUMBER 211

SPECIAL SECTION:
PRODUCTIVITY SOFTWARE

Performance Benchmarks For 4GLs

By Al Hendrickson

The label "fourth-generation language" is applied to a wide variety of products, and any benchmark program that attempts to compare the performance of one product with another must take into account the differences in the nature of each product.

Obviously, the types of programs that are used to test the performance of third-generation language products cannot validly be applied to fourth-generation language offerings. Fourth-generation languages were not created with general-purpose programming in mind. The benchmark programs used to test a fourth-generation language must be oriented toward generic functions. These tests can be put into the following five general categories:

- Data definition and data base administration functions through the data dictionary.
- On-line input and validation of data.
- Ad-hoc query processing.
- Production reports.
- Transaction processing functions.

The best type of benchmark is one that incorporates these five functional areas in a simulated application environment. That is, instead of testing individual features of the language, it defines a reasonably complex application requirement and processes a standard set of data through the application.

It is very important that the benchmark specifications allow flexibility in application design. The program designer must be able to prepare a solution that matches the characteristics and capabilities of the product and must not be constrained by physical appearances such as screen layout and report format. The design of the data files to be used should be left to the program designer.

On the other hand, the benchmark specifications should represent a standard set of transactions and information requirements. The specifications should include realistic data. This means some of the data should be incorrect, and corrections and Help requests should be included in it. All tests should involve simultaneous access to multiple files.

The standard used to measure performance should be throughput (characters or transactions per minute), and measurement should be done in a multiuser test environment. Stand-alone measures of CPU usage do not account for the capabilities of overhead activities such as terminal management and concurrency controls.

A good benchmark test for a fourth-generation language would be to define a set of requirements for an application. The benchmark specs would include a set of customers, inventory items, orders and payments for the program to process as well as a set of standard reports such as sales reports. The specifications should also include one or more bulk processing requests. A selection of queries on the data such as "Who has bought product X?" should also be defined.

Ideally, people experienced with each product would prepare a solution to the benchmark application requirement and then measure throughput for the orders, standard reports and other benchmark functions. It is important that the people writing the programs understand how to use their fourth-generation language because the benchmarking tests capabilities of the programmer, not the product.

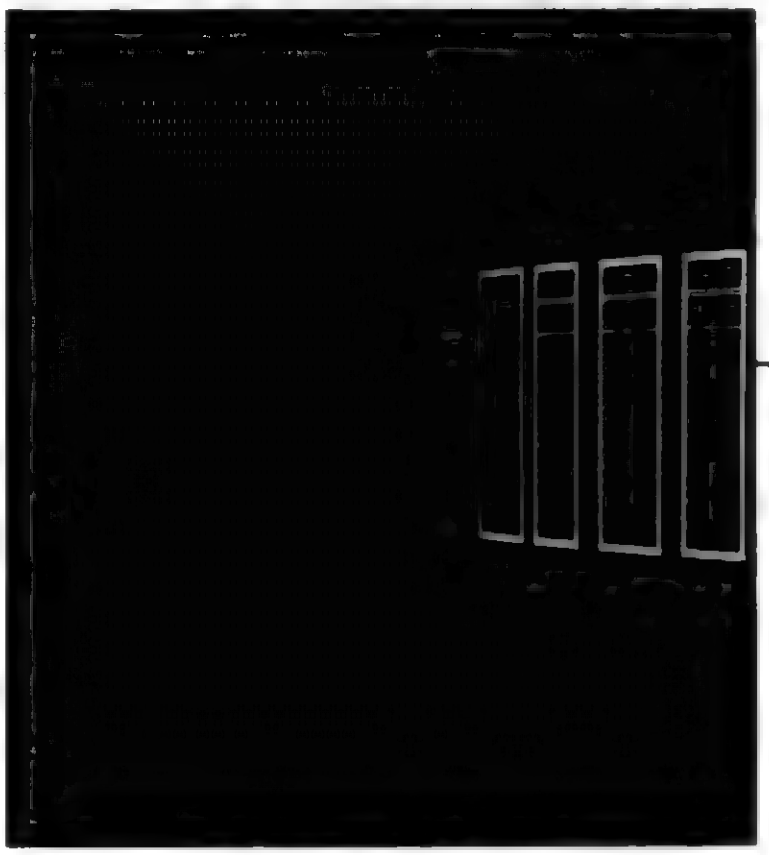
The most important considerations in benchmarking a fourth-generation language are the following:



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- That the benchmark be oriented toward a typical application of the product and that the designer be given sufficient freedom to prepare a solution that meets the requirements within the philosophy of the product.
- That the test be oriented toward measuring throughput of a standard set of data and processing requests.
- That the benchmark requirements are complex enough to represent a typical application — including multiple users, multiple files, data errors, corrections and so on.
- That the people preparing the programs to be used are experienced with the product and understand how to optimize data file design and application programs.

Hendrickson is manager, product specialist services, at Cognos, Inc. in Ottawa. His chief area of specialty lies in fourth-generation language development methodology.



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CIRCLE READER SERVICE NUMBER 214

MARKET STRATEGIES

Taking Account Of Big 8 Software



·BY·STAN·KOLODZIEJ·

The Big Eight accounting firms have cultivated a certain serious demeanor when it comes to business. It goes with the territory; auditing and tax work do not easily lend themselves to splashy advertisement.

While the Big Eight firms are low key about their bread-and-butter work, they are beginning to come out of the closet about their fast-growth track in computer software and services. Companies such as Arthur Andersen & Co., Price Waterhouse & Co., Arthur Young & Co. and Ernst & Whinney are aggressively working in-house and with top-notch software houses to churn out everything from micro-to-mainframe packages for auditing, tax and general accounting to expert systems and information systems project planning tools that use the latest artificial intelligence techniques the firms have mustered from academic research.

The Big Eight are heading directly for MIS and pitching themselves as complete systems vendors. Their consulting services are branching out into current hot industries: manufacturing, distribution and applications development. Their auditing and tax divisions are beating a path to MIS too, consolidating their marketing thrusts on systems people, realizing that the MIS purchasing reach is extending corporatewide.

If possible, the Big Eight firms are trying to be discreet about all the activity for good reason. Just a few years ago, Arlington, Va.-based ADAPSO, Inc. put a scare into the Big Eight by screaming conflict of interest and threatening legal action if the firms persisted in supplying software to clients they were auditing. Though the threat of legal action has subsided, ADAPSO's position has not changed. "We still think that firms doing auditing for clients they have also installed software for will not have the same objectivity about their own systems," said Dave Sturtevant, ADAPSO's vice-president of Public Communications.

Allen Phelps, national director of Computer Advisory Services at Touche Ross & Co., New York, disagreed. He said that people at his firm audit Touche Ross' installed client systems with the same diligence as they would any other. "If you don't, it'll eventually backfire and come out in the wash. You could lose a lot of clients that way."

Outsiders are also divided on the issue. "The ADAPSO people are the ones complaining, not the Big Eight customers," claimed Paul Cubbage, senior industry analyst at Dataquest, Inc. "Providing software is a good way for them [the Big Eight] to smooth out the ups and downs of a volatile consulting field."

Another analyst, who wished to remain anonymous because of his extensive work for Big Eight clients, explained that because of the intense competition among the accounting firms and the finite number of clients, the Big Eight firms have, by necessity, stepped up their push to develop systems and micro software to offset shrinking sales margins. "There are only so many companies to be audited," the analyst said, "so the [Big Eight] firms have to push their computer consulting services. You

MARKET STRATEGIES

have to look at it historically. There is a potentially enormous market opening up. In the past, most divisions of large corporations have resorted to consultants. Marketing people use consultants. Financial people use consultants. Everyone has used consultants except MIS, but that's changing. MIS can't cope with the applications backlog anymore. They're under too much pressure to get everything in gear. Now more often than not, the consultants they turn to [in order] to revamp their old Cobol and Fortran systems and help plan future MIS projects are from the same company doing their auditing and taxes," the analyst concluded.

In light of these market conditions and the financial and lobbying clout of the Big Eight accounting firms, ADAPSO has confined itself in recent years to holding meetings with members from the Big Eight firms to try and blunt some of the Big Eight's incursion into their business, but they are in a lame-duck position.

"They [ADAPSO] don't understand auditing, and that's what this whole thing revolves around," said Ed Pringle, national director of Management Consulting Services at Coopers & Lybrand, Floral Park, N.Y. "It's funny. We've found a lot of common ground with ADAPSO in the past on issues such as protection of software and the development of international business. On this point, however, we're at loggerheads. They haven't rescinded their position, and that's a sore point with us."

As the Big Eight consulting services have grown enormously over the years, the companies have become adept at producing software for their own internal purposes and spinning it off for their clients. In the past this has stemmed from the auditing and tax divisions, but lately, the brunt of Big Eight software has come from consulting divisions, and little of this business concerns the traditional accounting breadwinners. A firm like Cleveland's Ernst & Whinney can go to a client and present something called Concept 2000, which is the firm's answer to a client's systems development problems.

Combining in-house engineering software with systems from Spectrum International, Inc. and Nastec Corp., Ernst & Whinney consultants are in a position to carry systems development life cycles from the planning stages through to the maintenance of major applications. "What we've developed are automated tools that help our consultants go in and develop systems," said Marc Moresky, director of the Implementation Management Group at Ernst & Whinney.

"Over the years these methodologies have been honed so that we can offer them to clients as a packaged part of our service. Basically, we have the resources to cover the board. If the client wants an outside development system installed, we can do it and customize. If he wants to plug in some outside packages, we can do it. It can be financial, manufacturing or office automation," Moresky explained.

What Moresky also made clear is Ernst & Whinney's positioning of its software as a bundled part of its consulting billings. "The software we produce in-house is not sold separately or prepackaged. It's priced into our consulting services. We don't want to compete head to head with Ashton-Tate and Lotus Development Corp."

Ernst & Whinney is not alone. Other Big Eight firms are careful in how they are perceived as software suppliers in the marketplace. As primarily financial software suppliers, the Big Eight firms concentrate on producing vertical application packages, many dealing with esoteric niches such as international tax. They scrupulously stay clear of general micro packages such as spreadsheets and word processors, where the margins on single and group sales are low. The vertical applications are instead bundled into mainframe systems where the margins on such sales can be lengthened by burying them into the broader context of larger systems and service billings.

"The Big Eight firms can get clever in the way they charge for their services," said Damian Rinaldi, director of Software Research programs at International Data Corp. (IDC) in Framingham, Mass. "They can price with much more leeway."

That is also one reason it is difficult to get anywhere near

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exact figures for Big Eight software sales. Al Crossman, associate director of applications at Arthur Andersen of Chicago, said the company's design and installation services amounted to $40 million in 1985. "That included consulting and software leasing fees," he explained. Hardly a breakout of software details, but other Big Eight firms are even more equivocal."

"You can make a quick rule of thumb by attributing $100,000 in sales to each consultant in Arthur Andersen's consulting group," claimed George Colony, president of Forrester Research, Inc., Cambridge, Mass. "You can't get exact software figures."

IDC's Rinaldi said his group stopped trying to research Big Eight revenues at the end of 1985. "They're tight lipped," he concluded.

Of all the Big Eight firms, Arthur Andersen is the most aggressive in expanding software sales outside its traditional client bases. It is also probably the most aggressive in promoting its software. Arthur Andersen advertises in target-specific trade journals to promote its Mac Pac series of manufacturing software, its Distribution Control System and various accounting packages, and it has initiated joint development deals with high-profile mainframe software vendors such as Management Science America, Inc. and McCormack & Dodge Corp. Others, such as Ernst & Whinney; Price Waterhouse; Arthur Young; and Peat, Marwick, Mitchell & Co., are targeting focused publications and trying to arrive at joint marketing and research agreements with outside firms like James Martin Associates.

The gray exterior of some of the Big Eight firms hides a flurry of computer research activity in which they are now getting involved. These firms are using their beefed-up computer consulting expertise to research leading-edge technologies, and some of this research promises to have an impact on the way corporate America perceives and handles its data processing.

Arthur Young is a good example. The company has designated artificial intelligence — and more specifically AI's subset, expert systems — as one of its big commercial software growth areas. Arthur Young has been working with several research groups at MIT in Cambridge, Mass., to develop a series of expert systems software for current overriding concerns such as the impact of micros on corporations, group decision making, the managing of corporate experts, expert systems in information sharing and application management.

Some of the five-year projects that come under the umbrella name of "The 1990s" have been under way at MIT for a few years. John Sifonis, Arthur Young's national director of Information Technology Consulting in the Information Technology Group, explained that the company hopes a number of expert systems applications will result from the venture to be supplied to future clients over a period of several years. "We've classified these projects as fifth-generation applications that will be taken to clients and marketed as strategic tools that will make a company more competitive. Their ideal use would be to develop strategic corporate plans for information systems."

Sifonis said one such expert system is being fine-tuned by Arthur Young and Central and South West Service, Inc., a Dallas-based utilities holding company and client of Arthur Young. The system, which has no formal commercial name as yet (though Sifonis said it is slated to be available this fall), is being used to estimate and plan applications development for MIS.

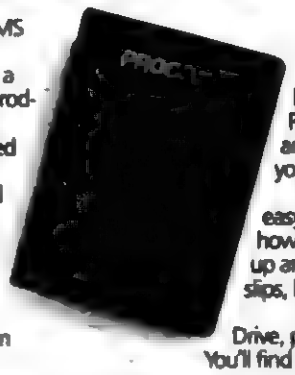
"A planning manager in MIS can typically get 600 requests for applications from end users," Sifonis explained. "Managers will have a set of project planning questions that end users would have to fill out, such as, 'What are the end-user functions?'; 'What sort of impact would the application have on the user, the department and possibly the rest of the organization?'; 'Costs?'; 'Is it on-line [or] batch?' The answers would go to MIS, and there they would be prioritized.

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making suggestions and surfacing what it thinks are the important facets of the application to the user and organization."

Sounds impressive, but Mike Intille, Central & South West's vice-president of information services, said there are bumps to iron out of the system. "The question parameters were taken from research at Harvard [University], but the primary, initial problem with the system concerned the need for the end user to answer all the questions before the system would begin to evaluate," Intille said. "That's been resolved. We pared down the number of questions from about 200 to the important 20. We looked at some commercial MIS estimating packages, but this is closer to the artificial intelligence we wanted."

> *Some Big Eight are serving notice they will not be left out of future computing.*

The system is micro based, running on IBM PCs and PC ATs, but it can also run on the mainframe, accessed by terminals. "I imagine there are a lot of companies in the same position we were," Intille explained. "Just a few years ago we had some PCs, and there was still a select set of users we were in constant contact with. Then we brought in 750 PCs, extended distributed processing, became geographically dispersed, and that same contact became impossible. We hope this system can extend the arm of MIS and help us keep in touch with end users. The whole thing is to make us more productive."

Big Eight accounting on the leading edge of corporate AI? Maybe not, but other Big Eight companies are not standing still. Price Waterhouse is developing expert systems in-house with an aim to spin them off to clients. Mike Bealmer, national director of Systems Development Consulting at Coopers & Lybrand, said his company is producing claims adjustment expert systems for insurance companies and universities while working on tax expert systems for the Coopers & Lybrand staff. Peat Marwick and Ernst & Whinney are also involved in knowledge-based systems. The Big Eight firms are not making a big industry splash, but for those who listen, they are quietly serving notice that they will not be left out of being a big part of future computing.

Not all the Big Eight are serving notice, however. Companies such as Coopers & Lybrand and Deloitte, Haskins and Sells state bluntly they have little intention of becoming forces in supplying homegrown software for clients or, for that matter, aggressively selling software from third parties. "We're just not fast off the dime for marketing third-party software," Coopers & Lybrand's Pringle said. "We're not a marketing organization and don't intend to be. We'll stay with our strengths."

One analyst who said he has followed the Big Eight for some time explained that when he first started he thought the Big Eight firms were all the same. "Now I know they can be slotted into three categories. Arthur Andersen is in a bracket by itself, the most aggressive in computer consulting and the most onerous, if you like, in its courting of clients it audits. There is a middle slot of companies that might be evasive about what they do, getting into gray areas of ethics. The third group won't offer products or recommend other products for clients they audit."

Still, with competition heating up among the Big Eight computer consulting services, it can be expected that tact among the Big Eight will slip. When Microage, a Tempe, Ariz.-based computer retailer, searched for a new distribution control system recently, Price Waterhouse, Microage's auditor, tried to dissuade it from using what Microage thought was the best system it could find on the market. The system just happened to be from Arthur Andersen.

Kolodziej is a senior writer at Computerworld Focus.



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TECHNOLOGY INSIGHT

Examining Expert Systems

An expert system attempts to represent and use knowledge in the same way a human expert represents and uses knowledge.

• BY • JOHN • B. • LANDRY •

Expert systems is the newest buzzword in data processing organizations worldwide. Artificial intelligence technology, on which expert systems is based, is perceived as new in DP circles, though it has been in development at Stanford University, MIT and Carnegie-Mellon University for nearly 15 years. Until recently, its evolution within the academic environment has created the impression that AI and its various branches remain of limited use to the commercial world.

Besides expert systems, other branches of AI include disparate technologies such as natural language processing, machine vision and robotics. Each of these deal with machine emulation of human senses — seeing, hearing and touching. Expert systems go one step further and address another human trait — thinking. An expert system attempts to represent and use knowledge in the same way a human expert represents and uses knowledge.

Specifically, an expert system is a computer software system that acts as a consultant in decision making. The system contains information on a particular subject in the form of a knowledge base. The representation of this knowledge is in the form of if-then rules, or production rules. A reusable program, called an inference engine, permits the system to apply a knowledge base to a particular problem. The problem is usually discussed with the user in an interactive session, or consultation.

Expert systems technology is appropriate for applications that resist conventional algorithmic solutions, for problem areas that change rapidly and for problems that are now laboriously and expensively solved by human experts. The technology differs from conventional programming in many ways but most notably in its ability to react to change. In a conventional language, the order of instructions is critical. By adding or deleting code to an existing program, an error in the location of the change can modify the entire program to yield the wrong result.

In a rule-based expert system, rules can generally be grouped in any order because execution is controlled by the inference engine, not by the order of statements. An expert system is driven by the data being entered during the consultation, not by the sequence of production rules. This not only makes the program more readable but, more important, makes maintenance easier.

Expert systems got their start in the early 1970s. The most well known of the expert systems developed at the time was Mycin, a Stanford-developed system dedicated to diagnosing blood infections. Mycin represented the knowledge of physicians who were experts in blood infections, and it provided the ability for other physicians to consult with the experts, aiding in the diagnosis of blood infections and even recommending treatment.

Mycin illustrates some common features of early expert systems. The early systems tended to represent the knowledge of experts in the true sense of the word, that is, doctors and others practicing within narrowly defined domains of knowledge. At first, early forms of these systems did not separate the knowledge base from the inference process. However, these two components were separated in subsequent releases, most notably in the form of Empty Mycin, or Emycin, which separates the knowledge base containing rules about blood infections from the inference engine. This breakthrough allowed Mycin's inference engine to be used with other knowledge bases, thus introducing the concept of an expert system shell.

This separation of inference engine from knowledge base provided the conceptual foundation for the commercially available expert system builders that have recently



been introduced. Many AI researchers have formed corporations to exploit their knowledge of this technology and provide it to the corporate environment. Product introductions include M1 and S1 from Teknowledge, Inc., Knowledge Engineering Environment from Intellicorp and Automated Reasoning Tool from Inference Corp.

> *Most commercially available shells operate on personal computers or on a variety of very expensive, single-user AI workstation products.*

These shells, however, are not well integrated into the commercial DP environment, from either a hardware or software point of view. Most of the commercially available shells operate on either personal computers, which typically run out of gas in systems exceeding 100 rules, or on a variety of very expensive, single-user AI workstation products from vendors such as Symbolics, Inc., Xerox Corp. and Digital Equipment Corp. Furthermore, most are written in Lisp, a language not well understood in commercial DP and historically considered to provide inadequate performance for multiple-user commercial work. Typically, these products cannot access commercial data bases and are not accessible to the large user community already connected to central-site mainframes or minicomputers.

Therefore, the use of expert systems is severely constrained by the hardware/software platforms that current technology provides. Admittedly, some vendors have responded. IBM introduced its own expert system product last year, accessible in either MVS or VM, but it provides no hooks to the data base management system and is not callable from higher level programs. Symbolics has announced an IBM Systems Network Architecture gateway product, connecting its machine to the mainframe, but this clearly does not open Symbolics-based expert systems to the masses.

As a result, expert systems technology applies to only small and isolated applications, domains suitable to dedicated machine processing. Use requires people trained in specialized languages such as Lisp or Prolog, forcing a second and potentially elitist programming staff. Purchase of dedicated and expensive hardware is required. Without access to the corporate DBMS, it forces data to be duplicated and imbedded within the knowledge base — a well-known no-no in commercial DP. Because data from the outside world is supplied exclusively via a consultation Q-and-A with the user, applicable problem areas are further narrowed.

A different scenario

If expert systems technology is to be successful in the commercial environment, it must overcome the limitations described above. Beyond that, however, this technology can be most effectively used in commercial DP by imbedding expert components in industrial-strength applications software.

The examples of early expert systems illustrate how expert systems emulate human experts, normally in narrowly defined domains of knowledge. What has remained unrecognized, however, is that multiple experts can be found in even the most typical commercial DP applications.

Take order processing. Order processing systems are complex, typically requiring frequent and expensive maintenance. In corporate environments, new marketing campaigns can affect components of the system, particularly the part of the system that deals with pricing orders. Seasonal promotions on certain products can frequently wreak havoc on the pricing code, code that is so fragile from frequent maintenance that it is already in danger of breaking.

Yet pricing is an expert function. There are experts in the organization who have developed the "rules" for pricing, but, historically, commercial DP has chosen to represent those rules as algorithms. However, it is preferable to represent rules as rules and to rely on an inference process to determine when to "fire" the appropriate rules when called upon to do so. By allowing the on-line or even the batch order processing system to call the inference engine when required and to provide the inference engine with direct access to the corporate DBMS, you can imbed this expert component within an application.

Within this single application are many other expert components such as an order hold expert (What are the rules for putting orders on hold?), an inventory allocation expert (What are the rules to allocate inventory if we are running out of goods?), an order sourcing expert (What are the rules regarding substituting items and shipping from alternate warehouses?), a carrier selection expert (What are the rules for selecting the most appropriate transportation?) and so on.

The above components illustrate the expert metaphor. You can visualize the presence of a human expert making the decisions in each of the problem domains

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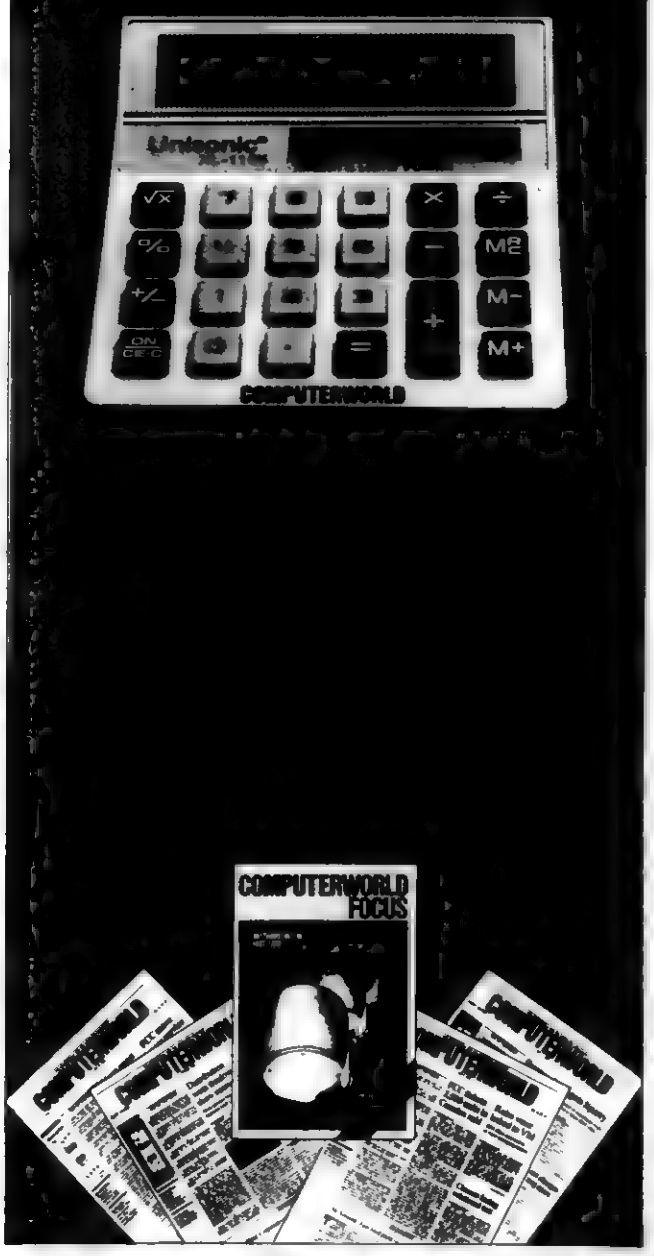
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described. In fact, the expert components often exist in the commercial applications software areas found most difficult to parameterize and most likely to be maintained.

Imbedding the expert components in an application represents a new architecture for large-scale application software. Developed in this manner, the application becomes a superstructure of programs atop a host of expert components. This new development environment compares favorably against the criteria used to describe an ideal development environment.

Rules are excellent communication vehicles; they eliminate the confusion that develops between analyst and user in describing the problem. Their English-like language is far less intimidating to a user than structure charts and pseudocode. The rules specification actually represents the system itself; no further translation to design spec and then to programming is required. This situation results in less cost because the analyst actually builds the system and eliminates the risk of things being lost in translation.

The interactive consultation environment can be used to validate the system before it is imbedded in the production application. This environment strongly supports prototyping, acknowledged to be the best method of ensuring that the system fulfills the user's requirements.

Finally, this type of system can be highly portable across machine size and manufacturer boundaries. Because the knowledge base is merely data, all that is required to move the system to another environment is the porting of the inference engine.

Input and output

The discussion thus far has been limited to applying expert systems technology to the processing components of applications systems. This technology also has uses in the two bookends that border process: input and output.

Let's look at input, or data-entry. Nearly all on-line commercial applications use a forms-based metaphor as the vehicle to communicate between system and user. A form (for example, an order form) is presented on the screen and the user fills it in and presses Enter. The system accepts the transaction or issues an error message indicating some validation edit was violated. The user corrects the error and the process is repeated. On forms that are frequently utilized, a user gradually becomes aware of a system's sensitivities and encounters fewer errors.

The problem is that the 80/20 rule applies to the number and frequency of use of forms in the system. That is, 20% of the forms are used 80% of the time. The forms used less frequently usually involve maintenance of system parameters or master files. Because they are used infrequently, users normally turn to the documentation and guess their way through.

What does this have to do with expert systems? Plenty. The forms metaphor works best with those transactions that were originally paper, that is, orders, invoices and journals. However, infrequent transactions might best be entered by the user engaging in an interactive Q-and-A session with the system, the very method an expert system shell provides in a consultation. Furthermore, an expert system consultation does not ask any questions deemed irrelevant based on its analysis of responses to previous questions.

> *Further enhancements to expert systems technology will lead to fifth-generation application development tools to be used in building intelligent production applications.*

In this way, the application uses itself as the expert, guiding the user through the dialogue and asking only the questions relevant to type of transaction being entered. As is typical in expert systems, the user can inquire why the system is asking a question or ask for help, providing on-line documentation precisely at the point it is required. Successful termination of the consultation can cause the appropriate record to be added or updated.

Imbedded expert components can similarly augment information output applications. By combining these components with report writers, for example, experts can be employed to analyze report information in ways historically considered impossible.

Expert systems technology is not a stand-alone discipline nor does it reside exclusively in the domain of pure research. Knowledge-based technology can immediately be imbedded in today's traditional commercial applications. Further enhancements will lead to the creation of fifth-generation application development tools to be used in building intelligent production applications. Expert systems can provide a degree of flexibility in the definition and execution of real-world applications never before possible.

Landry is chairman of the board of Distribution Management Systems, Inc., a distribution logistics and warehouse management software systems vendor located in Lexington, Mass.

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TECHNOLOGY INSIGHTS



Building The Best Data Base

·BY·WILLIAM·INMON·

All too often, the basic technology needs of users can change by the time products come to market. This can leave designers in a reactive stance, trying to explain why yesterday's notions don't fit today's needs.

Consider the concept of what a data base is supposed to be and how the concept has changed over time. It is likely there are many practitioners and theoreticians who would agree with the following rough definition of a data base: A data base is a nonredundant collection of data relating to a major subject relevant to the enterprise. However, this notion of a data base is dated and does not apply to much of the data base processing (especially decision support and end-user computing) that is occurring in the mid-1980s. The concept of what a data base is in the 1980s may not have changed in theory but has changed in practice.

Much of the discrepancy between practice and theory has to do with the issue of redundancy of data.

Two salient points should be made about the definition of what a data base is as previously defined — a data base is organized around the major "subjects" of the enterprise, and the data in a data base is nonredundant. Consider the origin of these two concepts. Prior to the data base idea there were master files associated with an application and, at least initially, were almost exclusively run on a magnetic tape file media. Over time, as the processing needs of the enterprise grew, the increasing number of application-oriented master files proved to be awkward and intractable primarily because of the large amount of redundancy of data across all the many master files.

By organizing data around subjects rather than individual applications, the redundancy of data that related to the subject was reduced or exhausted entirely.

In response to the shortcomings of master files — which were initially on a sequential media such as magnetic tape and in later years on direct access storage devices used as a replacement for magnetic tape — the concept of data base with a nonredundant subject orientation arose. At this point in the evolution of data base there were few choices of data base management systems (DBMS) — historically, IBM's IMS; Cincom System, Inc.'s Total; Software AG of North America, Inc.'s Adabas; and MRI Systems Corp.'s System 2000. Furthermore, these early software packages had to satisfy all needs for data base processing, which fit well with the then-current notion of data bases being filled with nonredundant and subject-oriented data.

But the volume and diversity of demands for DBMS processing and the data bases controlled under the DBMS soon outgrew the capabilities of the existing software. In particular, the demands for the ability to manage large volumes of data, a high degree of on-line availability, consistently fast on-line response, access to data at a detailed level, access to data at a summary level and rapid development and change of systems stretched existing software to its limit. A new type of software sprang up. Easy-to-use, fourth-generation languages (such as Information Builders, Inc.'s Focus; Martin Marietta Data Systems' Ramis II; D&B Computing, Inc.'s Nomad2) addressed a need that the then-existing DBMS software did not adequately address — the need for decision support systems (DSS). Existing DBMS software at that time had its hands full addressing the issues of performance and availability.

Almost imperceptibly, the concept of what a data base is changed as the fourth-generation languages began to enjoy widespread use. The advent of fourth-generation languages signaled the end of nonredundancy of data. With the powerful language constructs under fourth-generation

languages, a single repository of data to serve all needs was unworkable for performance reasons alone. In addition to the power of the language, users of fourth-generation languages demanded autonomy of processing and took their data to separate, private processors such as PCs or individual address space on a time-sharing processor.

A changing notion

With the end user's autonomy of processing, the concept of the data base was extended beyond the notion of nonredundancy of data. Autonomy of processing by the end user and nonredundancy of data are mutually exclusive and will remain that way. The source of the data serving the many end users is the production data serving the day-to-day operational needs of the organization. The service relationship between the two types of data — production (or operations) and end-user, DDS data — was made by an extract process (sometimes called a snapshot, download or a strip) in which operational data was scanned and selected records were sent to the end user.

The extension of the data base concept to include data that serves both end user and production was termed the dual data base concept, where one data base served high-performance production needs and the other served end-user DSS, fourth-generation language needs (hence the name dual data base).

As originally evolved, a dual data base strategy implied a dual DBMS strategy as well because the historical perspective of most DBMS software packages has been polarized to the point that the DBMS meets either high-performance production needs or DSS needs, but not both. But at least in theory, a dual-DBMS strategy is not necessary even in the face of dual data base.

Consider a "modern" software DBMS package like Applied Data Research, Inc.'s ADR/Datacom/DB and its associated software. Using the same data base technology, the product can access data across a network of large processors. ADR/Datacom/DB can access data across different size processors as well, all under the control of the same dictionary. The tool can access data either a set at a time or a record at a time, allowing the user to utilize the software as a high-performance tool or use it in a fourth-generation language mode. As a result, ADR/Datacom/DB is an example of a single software package that can handle redundant (that is, production and end-user) data, proving that dual data base does not necessarily imply dual DBMS.

But the evolution from master files to the single, nonredundant, subject-oriented data base to the dual data base approach only leads to the recognition of a more fundamental division of data — the division between primitive and derived data.

Primitive data measures or describes a single event for a single customer of the enterprise. Derived data measures or describes the activities of either multiple events and/or customers of the enterprise. In general, primitive data is the source for derived data. Classically, production data is composed mostly of primitive data, DSS data is composed mostly of derived data. The split then in the concept of data base caused by the advent of fourth-generation languages is natural and leads to the more fundamental split between primitive and derived data. In other words, early notions of the data base referred only to primitive data.

In fact, the very nature of derived data is one of redundancy. Suppose a bank wants to determine the average savings account balance and the number of monthly deposits for all accounts with a balance greater than $5,000 as of Jan. 1. At a primitive, detailed level there will exist many accounts with balances greater than $5,000 on the specified date. Each of these accounts will enter into the calculation of the averge balance and the number of monthly deposits. The final derived data — average balance and number of deposits — will indirectly reflect many detailed, primitive occurrences of data.

Even though the derived data is a single element or occurrence of data, it is formed from multiple occurrences of primitive data, and in that regard, primitive data is redundantly represented in the individual, primitive occurrence of data and cumulatively in the derived data.

Viewed from the perspective of the differences between primitive and derived data, the evolution of the concept of the data base makes sense. Without the perspective of primitive and derived data, the progression of what a data base is in practice has so many anomalies as not to make sense.

Old problems, new flavor

With dual data base and the deliberate split of primitive and derived data come some old problems with a new flavor. Whenever there is redundancy of data, as there necessarily is in the end-user DSS environment, the question of consistency and accuracy of data arises. However, the problems of redundancy of data in the dual data base DSS are very different from the problems of redundancy as were experienced in the earlier single data base environment (or truth data base environment, as it is sometimes called) because of the following:

- *In the truth data base environment* primitive data was stored at a detailed level and was used to service customers' day-to-day operational needs. Using the bank example, when a customer's balance was $100 in one file and $500 in another, either the customer or the enterprise was in for a rude shock. But in the DSS environment, derived data is not used the same way and there is a certain tolerance for inaccuracies of data that inevitably arise with redundancy. DSS data is used as a basis for managerial decisions. As a consequence, the impact of data is not as severe in the derived, DSS environment as it is in the primitive, operational environment.
- *In the truth data base environment* primitive data is kept at a detailed level, but in the DSS environment, derived data is kept at a summary level. The accuracy of primitive data that forms the basis of derived data becomes unimportant as DSS data is summarized, averaged or considered from the perspective of many customers. Frankly, if two or three detailed records out of 10,000 records are inaccurate, the inaccuracy is irrelevant as the records are taken together as a whole.
- *In the truth data base environment* primitive truth data is accurate as of the moment the data is accessed (that is, it is accurate up to the second). Derived DSS data is only accurate as of the moment the data was extracted or otherwise derived. It is thus fundamental to the derived DSS environment that the timeliness of data must be factored into any processing. And

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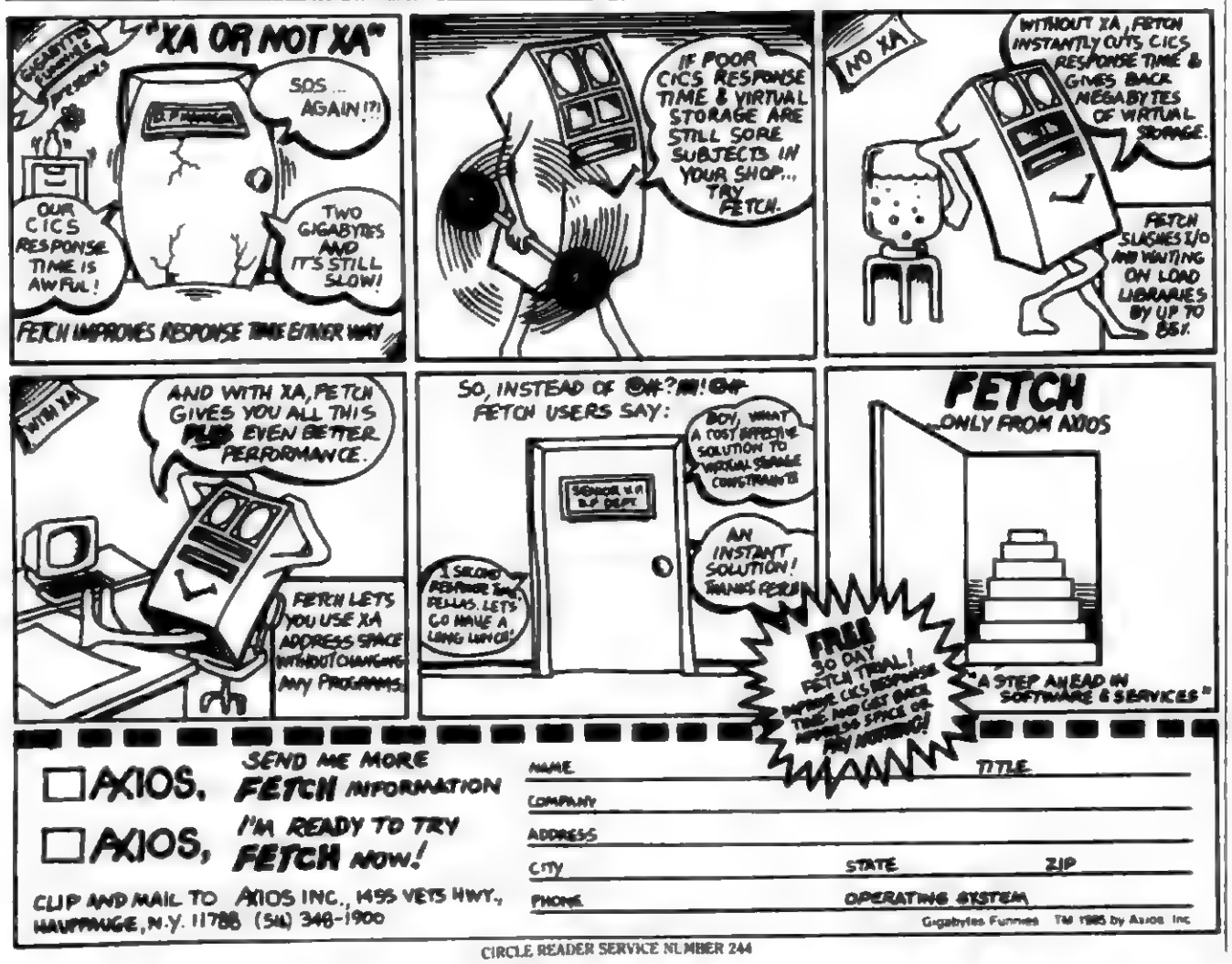
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when the same data base begins to have periodic extracts or derivations made, the derived data is necessarily redundant across time. It can be argued that DSS data should always be derived from a single operational source.

But many kinds of DSS processing — trend analysis, "what if" analysis, demographic analysis — absolutely require that an extract of primitive data be made once and only once. For those kinds of DSS processing (which, in fact, are at the heart of DSS processing) a dynamic, ever-changing base of primitive data simply cannot serve as a basis for the many iterations of DSS processing that are done. The DSS processing of necessity must operate against data that is frozen, and the extract process is ideal for creating frozen copies for DSS data.

For the above reasons, the issue of data redundancy that was so central to the truth data base environment is not nearly the same issue to the DSS environment. But wholesale redundancy of derived DSS data can lead to inconsistency of processing and results and, on a large enough scale, inconsistency of results in the DSS environment leads to an overall lack of credibility of the DSS environment.

Achieving DSS credibility

It is understood there will be discrepancies of accuracy in processing in the DSS environment due to the inherent redundancy of derived DSS data and the autonomy of processing of the end-user environment. As long as the discrepancies are not major, the differences in final results are not a concern. But when the differences of opinion are gaping, the DSS environment risks losing all of its credibility unless the major differences can be reconciled. Thus the reconciliation of redundant DSS derived data is one of the cornerstones on which the credibility of DSS processing rests. There are three primary reasons why derived, redundant data becomes unreconcilable in the DSS environment.

Reason 1. Because of the difference in timing of the extract of data from the operational to the DSS environment. Is it reasonable to expect the DSS analysis of data done from an extraction made on Sunday night will yield compatible results with a DSS analysis done from an extraction made on Wednesday afternoon?

Reason 2. Because of the extract and derivation algorithms used to select which data flows from the operational to the DSS environment. Is it reasonable to expect the DSS analysis from an extract that selects data from all accounts with a balance of $500 or more will yield the same results as a DSS analysis that selects data for accounts that have more than 10 activities per month?

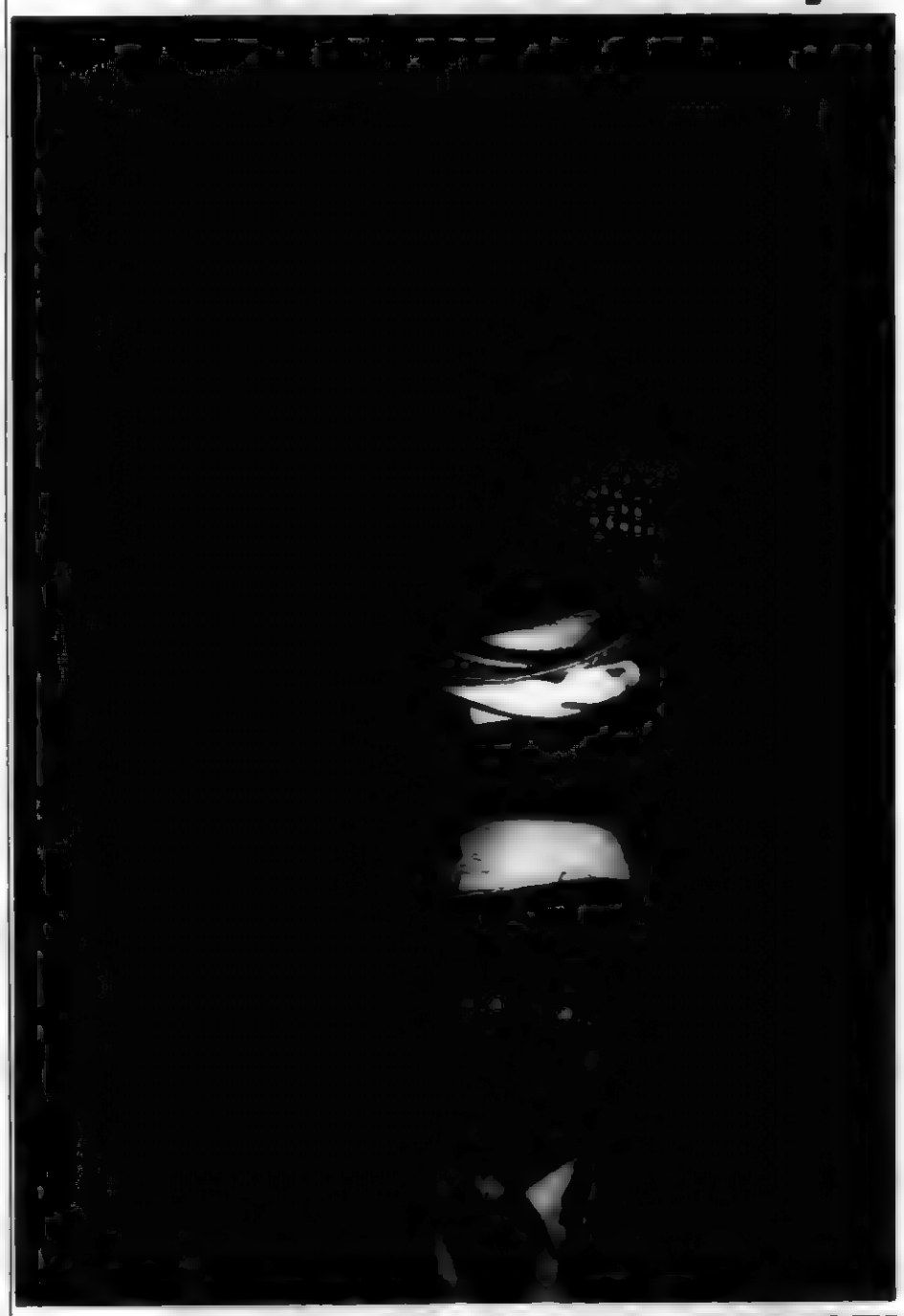
Reason 3. Because of the generations of extracts that are done. If the normal extract and derivation process merely used data directly from the operational environment, the problems would be minimized. But it is normal practice for extracted data to be further extracted, through more iterations, to the point where the origin of any DSS data is questionable.

An architecture that accounts for the above discrepancies will allow redundant DSS data to be reconciled when there is a discrepancy of major consequence.

The concept of the data base has been changed by the advent of fourth-generation language technology. This technology used to any extent at all mandates that data be redundant. In particular, data bases can be classified as primitive data base and derived data bases, each with its own appropriate practices. The early notions of a nonredundant subject orientation of data apply to primitive, operational-oriented data. Derived data is oriented toward DSS processing and is necessarily redundant. While DSS redundancy is a fact of life, when discrepancies between redundant stores of data are very large, there is the possibility the entire credibility of the DSS environment will be lost. To create an atmosphere of credibility in the DSS environment, huge discrepanices between redundant stores of data must be reconcilable. The reconcilability of DSS data is achieved by a disciplined approach to the building of DSS systems.

Inmon is a senior principal at American Management Systems, Inc. and a noted author on the subject of data base design.

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PRODUCTS

Wang, IBM Units Communicate Easier

LOWELL, Mass. — Wang Laboratories, Inc. has introduced three communications software products that simplify communications between Wang and IBM systems, the company said.

The Wang Office/Disoss Gateway has two upgrades (software Releases 1.5 and 2.0) that offer users the choice of IBM's LU 6.2 or Wang's Information Distribution Services (IDS) as VS-to-IBM mainframe transport options, support for IBM Distributed Office Support System (Disoss) library and distribution services, the ability to incorporate Disoss users into the Wang Office directory and support for both revisable and final-form documents.

Pricing for the Gateway depends on the transport being used. Common elements for both LU 6.2 and IDS are, for example, gateway software on the VS, priced at $4,000, and Document Content Architecture (DCA) to Wang word processing translators on the VS, priced at $2,000.

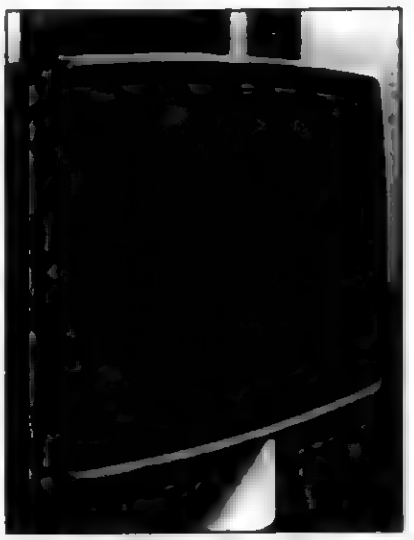
The Wang/Profs Gateway has a new release that adds functions such as exchanging messages between Wang Office and IBM Professional Office System (Profs), incorporating Profs users into a Wang Office directory and using a single VS as a gateway to other VS in a Wang Office network, eliminating the need for a dedicated communications line between each VS and the IBM mainframe, the vendor said.

The Wang/Profs Gateway consists of software on the VS ($2,000) and software on the IBM mainframe ($20,000).

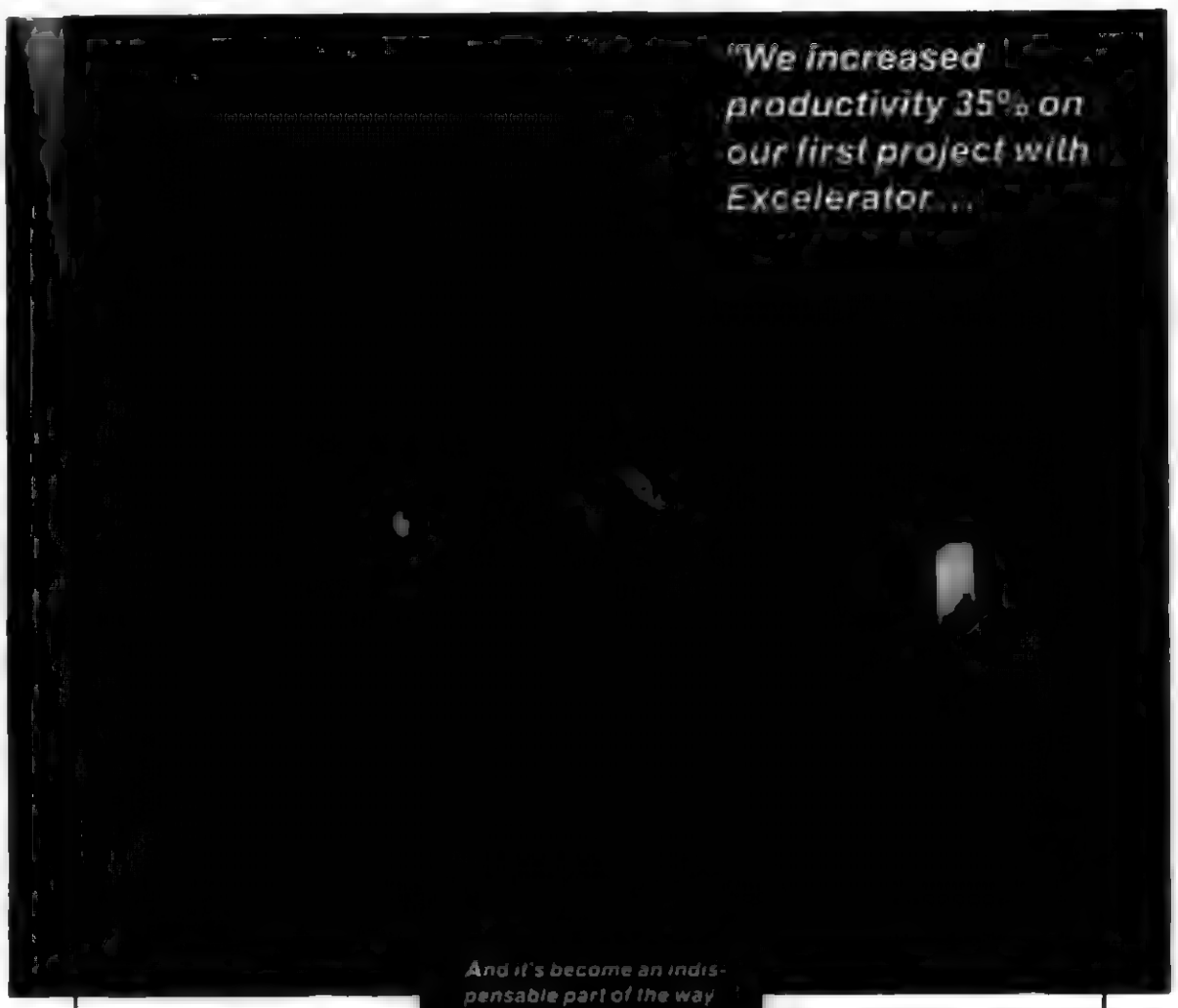
The new Wang 3270 VS Logon allows IBM 3278 terminal users to access Wang VS applications such as Wang Office and Professional Application Creation Environment and resources such as disks and printers. Software for the 3270 VS Logon resides on the mainframe and costs $2,000.

For further information, contact Wang Laboratories, Inc., One Industrial Ave., Lowell, Mass. 01851.

Circle Reader Service Number 245



Wang 3270 VS Logon on IBM 3278



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CIRCLE READER SERVICE NUMBER 240

IBM Network Wares Offered

RYE BROOK, N.Y. — IBM has introduced several network management software programs reportedly designed to allow central computer operators more flexibility in configuring and managing IBM networks.

Netview is a combination of three current IBM network management software programs: Network Communication Control Facility, Network Logical Data Manager and Network Problem Determination Application. Some functions from two other IBM programs, VTAM/Node Control Application and Network Management Productivity Facility, are also part of Netview. IBM said that with Netview the operator can detect hardware and software errors and problems with accessing a particular application. Netview's monthly license charge is $1,255 for MVS/XA systems, $1,060 for MVS/370 systems and $940 for VM systems.

Availability for MVS systems is fourth-quarter 1986 and first-quarter 1987 for VM systems. IBM's enhanced Version 3, Release 1.1 of the Advanced Communications Function/VTAM (ACF/VTAM), residing in the host, allows users of VM operating system to have the same Systems Network Architecture communications capability as MVS users. ACF/VTAM Version 3, Release 1.1 has a basic initial license charge of $6,255 under MVS/XA, $5,130 under MVS/370 and $3,535 under VM. Availability is July 1986 for MVS systems and September 1986 for VM systems.

Also introduced were enhancements to IBM's ACF/Network Control Program (ACF/NCP) Version 4, Release 2, allowing it to work with the new IBM 3270 and enhanced IBM 3725 communication controllers, IBM's new modems and the IBM Token-Ring Network adapter. Finally, the Multiple Applications From A Single Screen (MXXX), is part of VTAM host software and enables users of IBM 3270-type displays to switch between applications without having to log off. ACF/NCP Version 4, Release 2 has an initial license charge under MVS and VM of $2,085 and a basic monthly charge of $695. MXXX has a $8,000 one-time charge or basic monthly license charge of $365. For more information, contact IBM, Information Systems Group, 900 King St., Rye Brook, N.Y. 10573.

Circle Reader Service Number 248

PRODUCTS

TASC Unveils Cobol Tool

READING, Mass. — A computer-assisted software tool involved with Cobol program maintenance was recently introduced by The Analytic Sciences Corp. (TASC). The product, called Fastbol, is part of TASC's Cobol Renewal Series and reportedly enables Cobol programmers to understand Cobol programs quickly, cutting down on an activity that accounts for a great deal of programming time and financial resources in many DP departments.

The product fits into any IBM MVS/TSO or VM/CMS environment, uses standard IBM systems software and works closely with program editors. Fastbol also enables users to make a menu selection by pointing to it or typing it into a command line.

Fastbol features a set of five commands.

Logic Flow helps trace the path of logic while How-Set and How-Used show variable relationships. How-Set shows the entire process that determines a variable's value, from input to final calculation. How-Used shows how a particular variable is used to affect the value of other variables through a hierarchy of variable relationships. The other two tools, Comments and History, provide better access to existing documentation and make it easier for programmers to leave better documentation for successive programmers. Comments provides access to notations left within the software program. History gives access to a Fastbol-maintained log of previous maintenance actions.

Fastbol is available immediately with a single-quantity price of $25,000. Volume discounts are available. Included in the cost are Fastbol software, user documentation and installation instructions. For more information, contact The Analytic Science Corp., One Jacob Way, Reading, Mass. 01867.

Circle Reader Service Number 247



Intech's XL/Interface Series

Intech Line For Excelerator

CAMBRIDGE, Mass. — Index Technology Corp. (Intech) has announced the XL/Interface series, a group of tools that allows Intech's microcomputer-based Excelerator design environment to work with other software.

The XL/Programmer Interface extracts data from the Excelerator dictionary for use in C programs and costs $395.

The XL/Interface-MFS reformats Excelerator screen designs for input to IBM's Message Format Service (MFS) mainframe screen production facility for the IMS data base management system and is priced at $195, according to the vendor.

The XL/Interface-GDDM formats Excelerator graph files for IBM's host-based Graphical Data Display Manager (GDDM) for output on any graphics device supported by GDDM — including laser printers, graphics terminals and graph printers — and is priced at $195.

Finally, the XL/Interface-Datamanager offers a two-way exchange with Manager Software Products, Inc.'s data dictionary for IBM hosts and is priced at $695.

For more information, contact Index Technology Corp., 101 Main St., Cambridge, Mass. 02142.

Circle Reader Service Number 249

Mathcad Software Targets Engineers

CAMBRIDGE, Mass. — Mathsoft, Inc. has announced Mathcad, a product that allows an engineer to use a personal computer like a scratch pad, where equations can be entered and calculated, plots can be created and text can be entered and edited, all on the same screen.

Mathsoft said Mathcad's word processor style allows users free-form entry, text-like editing of equations with familiar keystrokes and equations appearing on the screen just as they would appear in textbooks or on a blackboard. Its single-keystroke computations result in a single number or plot, and users can print all screen information as a document.

Mathcad runs on Microsoft Corp. MS-DOS 2.0 and higher and runs on the IBM Personal Computer, Personal Computer XT, AT and compatibles. The product needs at least 384K bytes of memory and a Hercules Computer Technology Co. monochrome, IBM color or IBM enhanced graphics card for color display. The company added that Mathcad support the Intel Corp. 8087 and 80287 coprocessors, the IBM graphics printer and the Hewlett-Packard Co. Laserjet printer. Mathcad is priced at $189.

For more information, contact Mathsoft, Inc., One Kendall Sq., Cambridge, Mass. 02139.

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CIRCLE READER SERVICE NUMBER 237

PRODUCTS

DEC's Message Gateway

MAYNARD, Mass. — Digital Equipment Corp. has announced the Message Router X.400 Gateway V1.0, a layered VMS application that provides a communications path between a message-router-based network and any other message transport system that conforms to the 1984 CCITT X.400 recommendations for message handling systems.

DEC said the X.400 Gateway allows users of mail agents running on a message router (such as DEC's All-In-1) to send messages to other X.400 mail systems in other networks or within the same network. Hardware requirements include any valid VAX, Microvax II or Vaxstation II system configuration that supports the Decnet Phase IV network plus a communications interface that supports VAX PSI V4.0. Software requirements include VAX VMS or Micro VMS operating system V4.4; Decnet-VAX, PSI V4.0 VOTS V1.1 or any mail system running on a message router (requires VMS mail Gateway V2.1 for VMS mail connection).

Prices for the Message Router X.400 Gateway are as follows: $2,400 for the Microvax II; $6,240 for the VAX 8200 and 8300; $8,000 for the VAX 8500, 8600 and 8650; and $12,000 for the VAX 8800.

For further information, contact Digital Equipment Corp., Maynard, Mass. 01754.

Circle Reader Service Number 250

PCs Get Statistical Software From SAS

CARY, N.C. — SAS Stat, a statistical software package for IBM Personal Computers and compatibles, has been introduced by SAS Institute, Inc. According to the company, SAS Stat performs both simple and complex analyses for regression analysis, analysis of variance, common factor and component analyses, discriminant analyses and scoring — applications aimed at statisticians, researchers and analysts. The package can be used separately on a PC or in combination with host data.

SAS Stat runs on the IBM Personal Computer, Personal Computer XT, Personal Computer AT and compatibles. The first year license fee is $2,000 for corporate customers with up to 50 workstations.

Under the site licensing agreement, users receive software updates and technical support free of charge. For additional information, contact SAS Institute, Inc., Box 8000, SAS Circle, Cary, N.C. 27511.

Circle Reader Service Number 251

ADR Updates ADR/Ideal, Touts Better Processing Times

PRINCETON, N.J. — Applied Data Research, Inc. (ADR) recently announced a series of enhancements to its fourth-generation application development system, ADR/Ideal.

Release 1.3 reduces transaction storage requirements, decreases pseudoconversational storage requirements and reduces the usage of CPU resources, according to the vendor.

Additionally, enhancements to batch processing reduce processing time and also take advantage of ADR/Datacom/DB's sequential processing.

The company said that by using the table access strategies in ADR/Datacom/DB Release 7.4, I/O functions have dramatically been reduced during complex data base selection and in sequential batch processing.

The performance improvements in sequential batch processing include a 50% reduction in CPU time and in elapsed time.

ADR added that other enhancements in the release included wide-screen support, support for the distribution of production applications to multiple sites, enhanced data-view security and more direct and flexible management of interactive applications.

Available for various environments

Release 1.3 of ADR/Ideal is available under CICS for DOS/VSE, OS/MVS and MVS/XA environments on IBM 370, 3081, 3083, 3084, 3090 Model 200, 4331, 4341, 4361 and 4381 mainframe computers and plug compatibles, the vendor said.

The permanent license price for ADR/Ideal is $97,000 for OS environments and $72,000 for DOS environments.

For further information, contact Applied Data Research, Inc., Route 206 and Orchard Road, CN-8, Princeton, N.J. 08540.

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19	39	59	79	99	119	139	159	179	199	219	239	259	279	299	319	339	359	379	399
20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400

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Street _____

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- 2 ☐ Finance/Insurance/Real Estate
- 3 ☐ Medicine/Law/Education
- 4 ☐ Wholesale/Retail/Trade
- 5 ☐ Business Service (except DP)
- 6 ☐ Government — State/Federal/Local
- 7 ☐ Public Utility/Communication Systems/Transportation
- 8 ☐ Mining/Construction/Petroleum/Refining
- 9 ☐ Other User _____ (please specify)

Vendors
- 10 ☐ Manufacturer of Computers, Computer-Related Systems or Peripherals
- 11 ☐ Computer Service Bureau/Software/Planning/Consulting
- 12 ☐ Computer/Peripheral Dealer/Distributor/Retailer
- 13 ☐ Other Vendor _____ (please specify)

B Please check your main job function (check one)
- 1 ☐ Corporate Management
- 2 ☐ Financial Management
- 3 ☐ MIS/DP Management
- 4 ☐ MIS/DP Operations
- 5 ☐ Data Communications Management
- 6 ☐ Data Communications Operations

C Reason for this inquiry (check one)
- 1 ☐ Immediate purchase
- 2 ☐ Future purchase
- 3 ☐ Information only

D Is this your personal copy of Computerworld Focus? (check one)
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Circle the # that corresponds to the number at the bottom of the item in which you are interested

1	21	41	61	81	101	121	141	161	181	201	221	241	261	281	301	321	341	361	381
2	22	42	62	82	102	122	142	162	182	202	222	242	262	282	302	322	342	362	382
3	23	43	63	83	103	123	143	163	183	203	223	243	263	283	303	323	343	363	383
4	24	44	64	84	104	124	144	164	184	204	224	244	264	284	304	324	344	364	384
5	25	45	65	85	105	125	145	165	185	205	225	245	265	285	305	325	345	365	385
6	26	46	66	86	106	126	146	166	186	206	226	246	266	286	306	326	346	366	386
7	27	47	67	87	107	127	147	167	187	207	227	247	267	287	307	327	347	367	387
8	28	48	68	88	108	128	148	168	188	208	228	248	268	288	308	328	348	368	388
9	29	49	69	89	109	129	149	169	189	209	229	249	269	289	309	329	349	369	389
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- 4 ☐ Wholesale/Retail/Trade
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- 6 ☐ Government — State/Federal/Local
- 7 ☐ Public Utility/Communication Systems/Transportation
- 8 ☐ Mining/Construction/Petroleum/Refining
- 9 ☐ Other User _____ (please specify)

Vendors
- 10 ☐ Manufacturer of Computers, Computer-Related Systems or [redacted]
- 11 ☐ Computer Service Bureau/Software/Planning/Consulting
- 12 ☐ Computer/Peripheral Dealer/Distributor/Retailer
- 13 ☐ Other Vendor _____ (please specify)

B. Please check your main job function (check one)
- 1 ☐ Corporate Management
- 2 ☐ Financial Management
- 3 ☐ MIS/DP Management
- 4 ☐ MIS/DP Operations
- 5 ☐ Data Communications Management
- 6 ☐ Data Communications Operations

C. Reason for this inquiry: (check one):
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- 2 ☐ 501-1,000 employees
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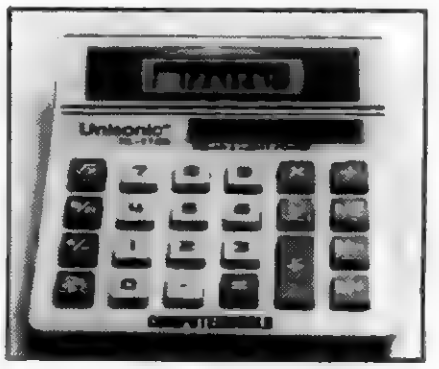
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VAX-Based Software Out

ST. LOUIS — Poly-Share, a Digital Equipment Corp. VAX-based software product that enables users of personal computers and the VAX/VMS operating system to build libraries of personal computer applications, has been announced by Polygon Associates, Inc. The company said that Poly-Share users can check text or binary file entries into and out of the Poly-Share library, reducing repetitive data entry, using screen menus and fill-in-the-blanks formats.

To transfer files, Poly-Share prompts users to choose one or more entries, then the program automatically invokes Poly-XFR software on the VAX computer and Poly-COM software on a PC to transfer the entries to or from the user's PC. No separate file transfer commands are needed, and the user doesn't have to leave the Poly-Share program to handle delivery of library entries to or from the PC.

Poly-Share uses Polygon's Poly-XFR file transfer software on the host VAX system and either Poly-COM, Poly-COM/220 or Poly-COM/240 terminal emulation and file transfer products on the personal computer. Poly-Share pricing begins at $995. Contact Polygon Associates, Inc., 1024 Executive Pkwy., St. Louis, Mo. 63141.

Circle Reader Service Number 253

On-Line's Stabilize/CICS Bows

FORT LEE, N.J. — On-Line Software International, Inc. has announced Stabilize/CICS, a product that helps maintain continuous system availability for a CICS operating environment, the company said. According to On-Line, Stabilize/CICS prevents CICS system outages by automatically repairing corrupted system code while the diagnostic component provides on-line diagnostic information.

The product offers three levels of protection. The first level activates Stabilize/CICS as a diagnostic tool only, logging errors into a file that can be accessed on-line. Under the second level, the product carries out error detection and restoration at the same capacity it would under full stabilization, but the company said it will not take any action that could affect data integrity. The third level provides full stabilization. If a transaction cannot be repaired, the product will remove the task entirely. The company claimed that Stabilize/CICS can cut CICS outages by 90%, repairing most abends in less than one second.

Stabilize/CICS costs $12,000 for a one-year license and $36,000 for a three-year license. The product is available for all MVS environments. For more information, contact On-Line Software International, Inc., Fort Lee Executive Park, 2 Executive Drive, Fort Lee, N.J. 07024.

Circle Reader Service Number 254

DOS and OS and CICS/VS

PROGRAM PRODUCTS

Thirty-day free trial on all products. Full documentation on request. Marketing agents in most countries.

BIMWNDOW—VTAM Multiple Session Manager
Multiple sessions active at one VTAM 3270 terminal simultaneously. OS: $4800 or $240/mo. DOS: $2400 or $120/mo

BIM-PDQ—POWER/VSE Dynamic Queueing
Eliminates 85% of the I/O to the POWER spool queue by satisfying all queue read requests from memory. Dramatic performance improvement. With shared spool support $4000 or $200/mo. Non-shared spooling $2400 or $120/mo.

BIMSPOOL—DOS/VSE POWER to Terminal Printer Spooling
Retrieves batch print from POWER queue, converts and prints on 3270-type terminal printer under CICS. CRT functions may be used to view jobs or control terminal printer operation. 500 users worldwide. $4000 or $200/mo.

BIMSPOON—On-line to Batch Print Spool
Used by DOS/VSE CICS application programs to create batch print reports. If used with BIMSPOOL, reports may be spooled to terminal printer. $1000 or $50/mo.

BIM-FMAP—On-Line BMS Map Development
Develop and update BMS maps on-line. OS: $3000 or $150/mo. DOS: $2000 or $100/mo.

BIMSWAP—CICS BTAM Terminal Switching
Permits local BTAM 3270 CRT's to be switched between DOS CICS partitions without special hardware or extra ports. $1800 or $90/mo

BIMSERV—DOS/VSE Library and VSAM Catalog Display
Displays directories and entries in DOS libraries, VSAM Catalog, Label Area, VTOC's, on CICS CRT's. $1600 or $80/mo

BIMSUBMT—DOS/VSE Job Submission
On-line job stream editing, storage, and submission under CICS. $1000 or $50/mo.

BIM-EDIT—On-line Program Editor
DOS/VSE CICS program editor designed to address recovery, function, performance and ease-of-use problems in ICCF. Includes over 25 features ICCF can't match. $4800 or $240/mo.

BIM-ODIS—CICS System Status Display
Summary, detail, and analytic displays of CICS and operating system control blocks. Periodic automatic scan for CICS problems. OS: $5000 or $250/mo. DOS: $2600 or $130/mo.

BIMCMPRS—CICS 3270 Data Compression
Reduces 3270 data transmission significantly, improves response time. OS: $2000 or $100/mo. DOS: $1600 or $80/mo.

BIMTEXT—Document Composition, Word Processing
Create formatted documents from free-form input. Margin justification, numerous othes formatting options. OS: $3400 or $170/mo. DOS: $2600 or $130/mo.

BIMCNSOL—DOS/VSE Multiple/Remote Console
Display-only or full input and display remote console facility at CICS terminal. $2000 or $100/mo full function, $1000 or $50/mo display only.

BIMMONTR—DOS/VSE System Status and Queue Display
DOS/VSE system activity, performance measurement, and POWER queue and job display. $1200 or $60/mo.

BIMECHO—CRT Screen Duplication
Copies 3270 CICS output at one CRT to another concurrently for problem determination, and demos. $1600 or $80/mo.

BIMP3270—CICS/DOS CRT Screen Printing
Several functions related to screen image printing. $800 or $40/mo.

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CIRCLE READER SERVICE NUMBER 248

Honeywell Offers Office Modules

BILLERICA, Mass. — Honeywell, Inc. has announced a number of departmental software systems as part of its new Office Network Exchange Plus (ONE Plus) networking capability, which runs on Honeywell's new DPS 6 Plus family of 32-bit minicomputers.

The first group of software modules, which the company said will be available in September 1986, includes Onemail, an electronic mail system providing peer-to-peer communications ($1,350); Onetext, for document processing ($5,455); Onecalc, an electronic spreadsheet ($2,100); Onedial, a menu-driven facility allowing users to access public data networks, public data bases or other equipment using a TTY protocol for asynchronous communications ($2,500); and Onelist, a service enabling users to create, update



Honeywell's ONE Plus Runs On The Firm's DPS 6 Plus Line.

and maintain single or multiple office-level data bases ($1,870).

Other systems to be available in December 1986 are Onexchange, a document library module of ONE Plus, allowing users of different systems to exchange information and create documents ($2,500); Onetext Plus, an enhancement to the Onetext document processing module; Onedocument, an option under Onetext that lets users integrate text with graphics ($1,010); Onebase, a departmental information base designed to let departments extract, format and make queries of data originating in other systems ($6,000).

ONE Plus Integrated Office System (Onexchange, Onemail, Onetime, Onetext) is $8,930; ONE Plus Office Exchange System (Onexchange, Onemail) is $3,275. All prices listed are for initial license fees. Contact Honeywell, Inc., 300 Concord Road, Billerica, Mass. 01821.

Circle Reader Service Number 255

Borland Unwraps Data Base Business Package

SCOTTS VALLEY, Calif. — Reflex Workshop, a package containing data base models for specific types of business activities, has been introduced by Borland International.

According to the company, this product is used in conjunction with another Borland product called Reflex, The Analyst, to build and customize data bases in four areas: finance and accounting; administration; sales and marketing; and production and operations. Specific examples include purchase order entry and analysis, facilities planning, sales lead tracking and analysis and project scheduling. .

The company added that each application includes a summary of the application and its objectives, files needed from the Workshop diskette, appropriate Reflex features and functions, field names and global formulas, problem analysis and, if applicable, report generation.

To use Reflex Workshop users must first have a copy of Reflex, The Analyst Version 1.0 or later; an IBM Personal Computer, Personal Computer XT, Personal Computer AT or compatible with 384K bytes; a graphics board; two double-sided, double-density floppy disk drives or one floppy disk and one hard disk drive; and an IBM PC-DOS Version 2.0 or higher.

Reflex Workshop is priced either separately for $69.95 or bundled with Reflex, The Analyst for $149.95.

For more information about this product, contact Borland International, 4585 Scotts Valley Drive, Scotts Valley, Calif. 95066.

Circle Reader Service Number 256

Goal Systems Announces FAQS/VM

COLUMBUS, Ohio — Goal Systems International, Inc. has announced FAQS/VM for VM users who work with multiple guest operating systems. According to the company, FAQS/VM provides extended control for VM console and spool files at operations, systems and applications levels and is divided into two major components: Viewsp, which provides capabilities for VM spool files, and Viewcon, which aids in console file management.

Viewsp is divided into three parts: Vmenu, Vedit and Viewextr. Vmenu is menu-driven and provides spool file purging, transferring, ordering and printing, providing a menu of all VM spool files on the system. Vedit is a spool file editor that provides macro, synonym, extract and other capabilities. Viewextr simplifies communication in the Exeq or Rexx languages. The company said that an on-line Help facility is also provided for all of FAQS/VM's functions.

According to the firm, Viewcon provides enhanced console file management, including real-time scrolling and hard-copy file archiving to tape. FAQS/VM costs $4,760 for a permanent license or $119 a month for a three-year, renewable license. Contact Goal Systems International, Inc., Goal Systems Building, 5455 N. High St., Columbus, Ohio 43214.

Circle Reader Service Number 258

Sorcim Net Manager Out

SAN JOSE, Calif. — Easyplus Network Manager, a product that enables users to run windows on a network, has been introduced by Sorcim/IUS Micro Software.

The company said that its network manager uses network software and hardware to operate two or more microcomputers on a local-area network. Up to four users can share the same copy of the program and data base information that is said to be updated instantly and available for use by all workstations on the network simultaneously. Each workstation can also handle several tasks in separate screen windows. The company said the product was designed with file and record locking capabilities.

Each Easyplus Network Manager disk contains four network units allowing up to four workstations on a network. The number of windows each station can access and the number of workstations on the network can be increased by installing more network units. Up to 100 units can be installed on each network server.

The Easyplus Network Manager runs on IBM PC user stations with 256K bytes and requires a PC server station with a minimum of 512K bytes of hard-disk memory. Currently available for 3Com Corp.'s Etherseries, the product will soon be available for Novell, Inc.'s Netware, the vendor said. The network manager utility disk is $395 for four units, $595 for eight units. For more information, contact Sorcim/IUS Micro Software, 2195 Fortune Drive, San Jose, Calif. 95131.

Circle Reader Service Number 257

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Compile a 10,000 line program in 76 seconds.
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CALENDAR

July 14-16, Boston — **Expanding Uses of Dbase III.** Contact: The American Institute, 55 Main St., Madison, N.J. 07940.

July 14-16, Cambridge, Mass. — **Buying, Installing and Maintaining a Telecommunication System.** Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402.

July 14-17, Boston — **Software Trends for Executive Planning and Strategy.** Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

July 15-16, New York — **Intercompany Networks.** Contact: The Yankee Group, 89 Broad St., Boston, Mass. 02110.

July 16-18, San Francisco — **Telecommunications Management.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

July 21-22, San Diego — **The IBM PC XT/AT: Maximizing its Potential.** Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

July 21-22, Boston — **T1 Networking and Bypass.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

July 21-23, Hilton Head, S.C. — **The APICS Zero Inventory/Just-In-Time Seminar.** Contact: American Production and Inventory Control Society, Inc., 500 W. Annandale Road, Falls Church, Va. 22046.

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July 28-30, San Francisco — **Computer Networks.** Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402.

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August 17-20, Washington, D.C. — **The White House Conference on Small Business Exposition.** Contact: The White House Conference on Small Business Exposition, P.O. Box 17413, Washington, D.C. 20041.

August 18-20, Boston — **Data Networks: Management, Operation and Control.** Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402.

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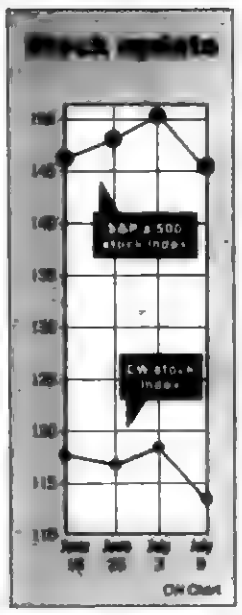
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Wang Laboratories cuts an additional 1,600 jobs, mainly through retirement incentives. **Page 134.**

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Control Data revamps Cyber 180 line with boosted memory and lower costs. **Page 4.**

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GEISCO scraps bank clearinghouse scheme and blasts the Fed's policies. **Page 9.**

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Hewlett-Packard HP 3000 users are anxious to buy Spectrum models. **Page 2.**

■

Computervision offers conversion tools to aid users porting its CADDS software to workstations. **Page 19.**

■

Honeywell laid off 75 employees late last week in the manufacturing operation of its Phoenix-based Large Computer Products division. A source inside the division said some 400 additional jobs will be cut within the next two months, but a company spokeswoman denied that any further reductions are planned. The demand for Honeywell's manufacturing resources has been lowered by the firm's private labeling of NEC mainframes as its DPS 90 series.

■

ADAPSO last week discarded its controversial hardware-based lock-and-key proposal for combating micro software piracy, because of an underwhelming response from vendors and users [CW, Jan. 13]. The software trade group distributed more than 1,500 copies of the proposed standard, but fewer than 100 ballots were returned. "It is clear that interest in developing this type of technical protection standard has dwindled in the last 12 months," said Jerome L. Dreyer, ADAPSO president.

■

AT&T's laptop plans are on permanent hold, an industry source claims. The company has several prototypes under development but has no plans for introduction or production in the foreseeable future.

See **NEWS** page 9

Owners resist filing net info

Disclosure of proprietary plans feared in Utah ruling

By Elisabeth Horwitt

SALT LAKE CITY — Private network owners and operators are fighting a proposed state agency rule that would require businesses to disclose proprietary information about their communications facilities.

Critics claim the Utah Public Service Commission is intruding on private business and that reporting requirements would be expensive. They charge the rule would ultimately force companies to make public sensitive details regarding their internal communications systems. This would effectively provide the companies'

See **OWNERS** page 8

Cobol standard add-ons flayed

By Charles Babcock

A committee of the American National Standards Institute this week will launch a process to add features to Cobol without waiting for another full revision of the language. If the process gathers momentum, it will cause horrendous implementation problems for compiler vendors and users, one committee member charges.

If approved, the controversial addendum procedure will allow ANSI's X3J4 committee to add features to the language more quickly than with the standard update. ANSI's Cobol 85 standard, for example, took 11 years to complete.

See **COBOL** page 12

Lotus aims at micro-MIS data transfer

By Douglas Barney

NEW YORK — Marking its long-expected move from desktop dominance to an all-out assault on MIS shops, Lotus Development Corp. last week announced a line of software products that allow personal computers to extract data from a variety of mainframe applications.

The IBM mainframe-oriented modules of The Application Connection, which are enhanced versions of the Ilink products acquired from Infocenter Software, translate data from mainframe application formats to PC formats. With TAC, both the tedious job of rekeying mainframe data into PC spreadsheets and the need to write data extraction programs are eliminated, Lotus claimed. In addition, data can be uploaded into mainframe data bases and applications.

Lotus founder Mitch Kapor resigns, opts for "unstructured" lifestyle. **Page 6.**

TAC will be available in September, and a typical configuration involving two mainframe applications will cost roughly $30,000.

In a radical departure from Lotus' previous policy of selling products exclusively through computer dealers, Lotus will sell TAC directly through a 50-person sales force and will select value-added resellers with experience in the mainframe world.

"TAC is a positive step. It allows Lotus salesmen to walk into a large corporation with a checklist of things. It is a very powerful selling tool that emphasizes the fact that Lotus' 1-2-3 is a corporate standard," said Bob Therrien, a member of Paine Web-

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CW SPECIAL REPORT

Micro managers: Changing role demands business acumen

By David Bright

Much as the MIS manager's role has changed in recent years, the job of microcomputer manager today is quickly evolving from that of personal computer specialist to corporate assets manager. Today, instead of simply installing one PC after another, micro managers are increasingly expected to be sensitive to the overall strategic direction of the business and to contribute to the bottom line.

For example, John Sykes, office automation manager at Lummus Crest, Inc., a Bloomfield, N.J.-based engineering and construction subsidiary of Combustion Engineering, Inc., is often called upon to participate in contract proposals that could lead to multimillion-dollar contracts for his company.

By taking an active interest in engineering and construction as well as in end-user computing, Sykes says he is better able to help set up reports and graphics within contract proposals because he has a clearer idea of what the potential clients are looking for.



Manager Sykes

Sykes warns his peers not to fall into the shortsighted trap of concentrating on the installation of "a PC here, a printer there."

When information centers were coming into vogue three years ago, the mandate at many corporations "was really just to get an available body," according to Sykes.

At that time, Sykes recalls, microcomputer managers could write their own job descriptions. If a person had some technical expertise — say, a background in mainframe systems analysis — and an interest in PCs, he was in demand as a corporate PC coordinator. That is no longer the case.

Since the typical microcomputer manager has installed hundreds of corporate PCs and Lotus Development Corp. 1-2-3 packages and taught a good number of corporate personnel how to use the technology, that manager has become

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NEWSPAPER

Users eager for Series 930, first HP Spectrum machine

Survey says about 240 orders will be placed

By Maura McEnaney and Donna Raimondi

With less than six months to go before Hewlett-Packard Co.'s high-performance Spectrum machines head out the door, customers seem anxious for their arrival.

Since its February debut, HP's line of products based on reduced instruction set computing (RISC) architecture has garnered much interest. Although HP is keeping quiet about orders for the Series 930 — the first Spectrum machine slated to ship by year's end — early indications point to a positive user response.

"Users of the current HP 3000 line have a tremendous pent-up demand and have been waiting a long time for the new processing techniques," says Don Lewis, vice-president of information resources at Allegheny Beverage Co. in Cheverly, Md.

Evaluating Spectrum

Allegheny has been evaluating Spectrum for use by some of its subsidiaries, among them a food and vending company, retail furniture stores, coin-operated laundromats and a building and cleaning supplies company. Allegheny now uses six HP 3000s in its telemarketing program and for office functions such as word processing and accounting.

Approximately 12% of the users of high-end HP 3000 Series 64 and 68 systems plans to acquire a Spectrum by the end of next year, according to a recent survey by Framingham, Mass.-based International Data Corp. (IDC). IDC's survey of 100 HP 3000 users also found that approximately 30% of the respondents this year will upgrade to the new HP 3000 Series 70. Announced along with the release of the first two Spectrum products in February, the Series 70 incorporates traditional HP architecture and is said to provide a 20% to 35% performance increase over the Series 68.

A 12% purchase rate means delivery of about 240 machines, and a price tag of about $225,000 translates into more than $54 million in sales, all of which should boost HP's bottom line.

But some observers are skeptical about the number of projected Spectrum orders. "That's a significant number of machines," notes consultant Omri Serlin of Itom International Co. in Los Gatos, Calif. "In view of the fact the machine isn't going to ship until December, I don't see why so many people would commit at this point."

Users point to two main reasons for waiting patiently for the Spectrum machines. "We have not considered leaving HP at all," says Richard T. Schwartz, director of MIS at communications products company General Datacomm Industries, Inc. in Middlebury, Conn. "It is an integrated part of our infrastructure. For us to move to a different vendor would be prohibitively expensive at this point."

Another reason for staying with HP is that its hardware is "bullet-proof," according to John Proffitt, data processing manager at Hitco, an aerospace manufacturer in Gardena, Calif. "I have worked around for a few years, and I can't believe how reliable and dependable the HP hardware is. You can't break that machine."

Forest Evans, information systems manager at Evenflo Juvenile Furniture Co. in Piqua, Ohio, agrees. "HP is cost-effective, reliable, easy to run, easy to put new applications on. That is why people are loyal."

At Kirke-Van Orsdel, Inc. in Des Moines, Iowa, the simple need for more horsepower forced the insurance brokerage firm to place its early order for a Spectrum Series 930.

"We have a Spectrum 930 on order for the first quarter of 1987, and we intend to take delivery," systems development specialist Thomas Evans told *Computerworld*. "We were between a rock and a hard place. Our machine usage was up to about 95% during the day, and that made our response time very low."

In May, Kirke-Van Orsdel installed two Series 70 upgrades, which process data for various insurance carriers. According to Evans, the company's increased processing needs left little choice but to buy a Spectrum. "It was either that or order another 3000," he says.

Other users interviewed by *Computerworld* say it may be a few years before they order HP's RISC-based machines.

A Series 930 could make its way to H. P. Metzler & Sons by 1988, according to MIS director Bill Hardy. The Del Rey, Calif., agricultural organization has a Series 68 and plans to upgrade to the Series 70 in about six months.

Hardy is the former manager of computer services at HP and worked with one of the company's in-house Series 930s. "The 930 is every bit as good as the competition's right now," Hardy says. "It is miles ahead of Data General Corp., and although Digital Equipment Corp. has features like speed of processing which are better than HP's, the HP machine is easier to use and easier to get applications up on," he notes.

Wait-and-see attitude

General Datacomm's Schwartz is taking a wait-and-see attitude on his company's Spectrum purchase.

He currently has three networked Series 68 machines, a Series 42 in Toronto and a Series 39 in London. Within 12 months, the company expects to buy the Series 70 upgrade.

Schwartz said he is likely to bypass the Series 930 and purchase the Series 950 — said to have three times the system throughput of the Series 68 — within three years. He plans to hang on to the company's Series 68s.

"We have definitely looked into the Spectrum machines. I'm reasonably comfortable with the hardware but not with the software," comments Schwartz, who says he thinks converting applications to a new operating system data base management system could be cumbersome. "I don't want to be one of the first," Schwartz says. "I'll let it work into the environment first."

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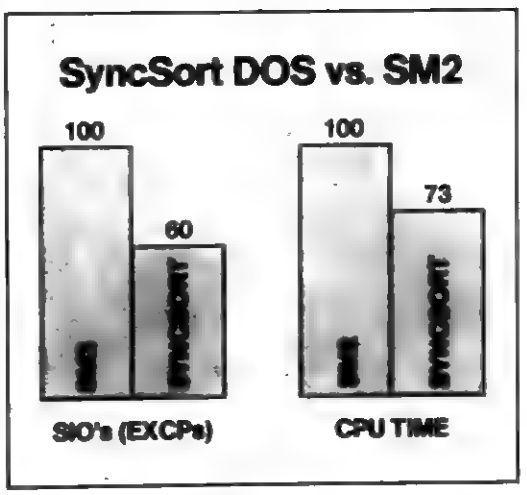
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CDC enhances, cuts price of Cyber/180 line

Says competition, lower costs prompted slashes

By James Connolly

MINNEAPOLIS — Control Data Corp., citing reduced manufacturing costs and competition from IBM and Digital Equipment Corp., last week slashed prices by up to 30% on its Cyber/180 line and enhanced that family of superminicomputers and mainframes.

CDC introduced nine enhanced models of the 2-year-old Cyber/180 product line. The three low-end models feature lower prices and double the memory capacity of their predecessors. The four mid-range models offer the same memory as before but have lower prices and a new I/O subsystem. The new high-end Model 990E and 995E dual processors feature lower prices as well as quadrupled memory.

"We have been on a learning curve, and we have had a goal of continuing reductions in the manufacturing costs of this family of computers. So it is a balancing of a reduction of manufacturing costs and a reducing of pricing to stay competitive and still trying to maintain your margin," said Jim Murdakes, CDC vice-president of sales and marketing for computer systems and services.

Some of the sharpest price cuts and memory boosts were in the high-end models. Where a Model 990 previously had a maximum memory of 32M bytes, the 990E and 995E now offer up to 128M bytes of memory. A 990 used to cost $3.35 million for an 8M-byte system, while a 16M-byte 990E now costs $2.35 million. CDC also announced a high-speed I/O option for both models.

The new low-end models are the 810A, 830A and 830A Dual CPU superminicomputers. The 810A costs $121,000 with 8M bytes of memory, compared with $125,000 for a 2M-byte 810. The 830A with 16M bytes costs $175,000, $5,000 less than a 2M-byte 830. The 830A Dual CPU with 16M bytes costs $252,000, rather than the $290,000 that the 830 Dual CPU cost with 2M bytes of memory. Memory for all three low-end systems was doubled from 32M bytes to 64M bytes.

Prices for the mid-range 840A, 850A, 860A and 870A units range 18% to 25% below their predecessors. A typical 840A with 16M bytes costs $580,000, and a typical 870A with 16M bytes costs $1.98 million.

While memory remains the same in the mid-range systems, the new models feature a field-installable I/O subsystem that was designed to double the ability to transfer data from main memory to peripherals. The subsystem costs $290,000.

Net manager offers quality voice packeting

Stratacom jumps into field while AT&T stalls

By Stanley Gibson

NEW YORK — Applying packet switching to voice transmissions, Stratacom, Inc. last week introduced a T1 network management system. Its Integrated Network Exchange (IPX) is apparently the first commercial product to offer high-quality voice packetization technology.

Richard Moley, Stratacom president, said the advantages of the system are a four-to-one improvement in bandwidth efficiency, greater reliability and more flexibility in configuring a network. The Cupertino, Calif.-based company plans to sell the product to companies that manage their own T1 networks.

Packet switching, introduced in the 1970s for data transmission, has not been successfully applied to voice transmission before, owing to the different natures of voice and data. According to Moley, traditional packet switching systems typically transmit approximately 1,000 packets per second over a T1 line, a rate that is acceptable for data but not for voice. The Stratacom system transmits 160,000 packets per second over a T1 link, resulting in high-quality speech, he said.

Another barrier

The other barrier to packetized voice is the fact that, unlike data, voice packets that arrive out of sequence cannot be retransmitted, since voice exchanges occur in real time. Stratacom circumvented this problem with an algorithm that drops all packets that arrive out of sequence, rather than trying to retransmit them. The company claims this procedure results in no perceivable degradation of transmission quality.

Voice packetizing is "a technological breakthrough because instead of having to allocate separate channels for voice and data, you can combine the two in the same channel, permitting far more efficient utilization of bandwidth," said Joaquin Gonzalez, senior analyst at the Gartner Group of Stamford, Conn.

Stratacom's product is "extremely sophisticated from a technical point of view" but may never get off the ground because AT&T Bell Laboratories is working on a similar technology that is likely to be the industry standard, Gonzalez added. "Companies are likely to hold off buying from a small company and instead wait for the standard that the gorillas of the industry will use."

Following a technological path parallel to Stratacom's, AT&T Bell Laboratories said it recently completed a field test of its own voice packetization system in the San Francisco area.

Bell Labs said its voice packets travel at one million pulse code modulations per second and achieve a fivefold improvement in bandwidth efficiency. However, a Bell Labs spokesman said AT&T has "no immediate plans to implement it."

Both systems achieve voice compression by interleaving different voice conversations over the same channel, thus making use of the silences inherent in normal speech.

Stratacom said it uses adaptive differential pulse code modulation to gain another two-to-one improvement in performance, resulting in a four-to-one improvement over conventional speech transmission. In this way, it is possible to send 96 voice circuits over a normally 24-channel T1 carrier.

Stratacom said its IPX has been tested by and is compatible with AT&T and Rolm Corp. equipment. The IPX offers a D4 format that supports channel banks, multiplexers compatible with AT&T's Digital Access Cross Connect Switch and value-added T1 transmission carriers. IPX was also designed for Integrated Services Digital Networks integration, Stratacom said.

Stratacom is now setting up a direct sales force and is "looking at OEM and strategic alliances," Moley said.

Prices for an IPX system range from about $50,000 to more than $1 million, depending on the number of T1 lines and nodes in the network.

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Crowds jam PC Expo show

Show succeeds despite lines, confusing layout

NEW YORK — Despite few major product announcements and some minor glitches such as long, slow registration lines, the PC Expo show, held last week, was a success, according to exhibitors and attendees.

Unlike other trade shows, such as Comdex and the National Computer Conference, PC Expo attempts to limit registration to corporate buyers.

Ralph Ianuzzi Sr., the show director, said the show attracted approximately 30,000 attendees.

Other PC Expo coverage, Page 8

Product announcements, although large in number, were not the show's strong suit, according to attendees.

Personal Computer AT compatibles

Among the more than 25 firms announcing products at the show, Wyse Technology, Inc. introduced a line of IBM Personal Computer AT compatibles priced from $2,499.

Core International, Inc. announced a 1000M-byte internal hard disk drive for the IBM PC AT, along with the Atomizer, an IBM AT-compatible that Core will sell with a choice of two 260M-byte hard disk drives or its 1000M-byte unit.

Lotus Development Corp. made the biggest splash when it unveiled The Application Connection (see story, page 1), a line of products that allow PCs to extract data from a variety of mainframe applications.

Other announcements focused mainly on communications and included new modems, enhanced networks and terminal emulation.

While most attendees were pleased with the show, some were critical of the show's lack of organization. "It is terrible to go see an exposition where people are trying to sell you things and have to wait in line for an hour. You don't wait that long at Disneyland," said Ben Lichtenstein, president of Alexander Ross Associates Inc., a New York-based search firm. Another key criticism was the confusing show floor layout, which made booth location difficult for some attendees.

Other showgoers were disappointed by the lack of new products. "There is a lot of a faddishness. I see a lot of people trying to sell the same types of things. But it is upbeat," said Charles Rosenbaum, training specialist for the New York City Department of Social Services.

— Douglas Barney

Kapor resigns as Lotus chair; turns legacy over to Manzi

By David Bright

CAMBRIDGE, Mass. — Moving on to an "intentionally unstructured period," Lotus Development Corp. founder Mitchell Kapor resigned as chairman last week.



Mitchell Kapor

Kapor will remain on the board of directors and serve as a consultant to the company while formulating personal plans that do not involve Lotus. Jim Manzi was named chairman of the $225.5 million software giant and will remain president and chief executive officer as well.

Lotus' primary product — the Lotus 1-2-3 integrated spreadsheet package — was a major factor in making the personal computer an important business tool and has spawned hundreds of imitations. Founded in 1982, Lotus now employs some 1,200 people and boasts approximately two million customers. Lotus has lately been on an acquisition binge, acquiring all or parts of five firms in the last 18 months.

Despite all that activity, Kapor told *Computerworld* last week that he needs some breathing room in order to do his best at this point in time. He is unsure what his next venture might be.

"It is my actual intent to go into an intentionally unstructured period, because I have done well in the past when I did that." Since that was the type of period he was in when he created Lotus, "it might lead to something like that," he added. However, his next challenge, as yet undetermined, could be outside the computer industry. "Before Lotus, I was a mental health worker, I was a disc jockey, I was a meditation teacher," he said.

"It's not impossible that the next thing could be as different from Lotus as Lotus was to those things. What excites me at this point is the opportunity to go on a great adventure that's personally meaningful. To do that, you have to be willing to explore things."

Kapor said he will complete the software project he has been working on with research and development vice-president Ed Belove and other staff members. That project involves a product that is neither a spreadsheet nor a word processor but an aid to the organization of text and ideas, he said.

Although Lotus has entered a critical stage in its history, Kapor maintained the company will be in good shape without his close direction. "The people running the company — Jim, the management team and the people here — are the ones with the vision and the fire and the capability to make Lotus be successful from the stage it's in now to the next stage."

While his name has been synonomous with Lotus' for nearly four years, Kapor said the post-1-2-3 legacy would belong to Manzi.

Lotus aims at micro-MIS mart

From page 1

ber, Inc.'s technology group.

Bruce Watts, an analyst with Morgan Keegan, an investment firm based in Memphis, Tenn., said he believes Lotus' pricing is fairly aggressive. "I don't think, however, that it is priced so aggressively that they won't make any money on it," Watts said.

TAC consists of three elements: PC software, mainframe software that works with specific fourth-generation languages and data bases and a central connection module for either VM or MVS.

Most of Lotus' enhancements to Ilink focus on the PC software, which was originally written in Basic and later moved over to C. Lotus added pop-end menus and roll bars similar to those in 1-2-3 and improved the speed of the PC software, said Mussie Shore, TAC product manager for Lotus.

In addition, Lotus developed optional programs for 1-2-3, Symphony and Ashton-Tate's Dbase III that allow for the use of TAC without exiting PC applications and use the applications' own interface when extracting data. These options will sell for less than $100.

Lotus also streamlined the mainframe interface and increased the performance by 30% for the MVS version and 20% for the VM version. "The old mainframe interface had a whole bunch of questions it would ask the user. We were able to remove those questions and code the intelligence to figure it out itself," Shore said.

TAC currently includes versions to extract data from languages such as Martin Marietta Data Systems' Ramis; Information Builders, Inc.'s Focus; SAS Institute, Inc.'s SAS; IBM's SQL/DS, IC/1 and ADRS2; D&B Computing Services Co.'s Nomad2; and Business Information Systems, Inc.'s ADL/DI, Lotus claimed. This data can be translated into PC formats such as WKS, WRK, WK1, WR1, DIF, CSV, PRN and Sylk.

Lotus developed the Nomad2 and SQL/DS connections itself and said a version for IBM's DB2 will be in beta test by the end of the year. TAC works with the IBM 370; IBM 4300 processor series; 3030, 3080 and 3090 series; and compatibles.

The product announcements at last week's PC Expo show drew a mixed response from micro managers and corporate buyers. Some wondered whether Lotus has the sophistication to sell into the new market.

Others were disappointed that the Lotus offerings do not work with more machines. "The problem is they only acknowledged that firm with three initials that is also Blue. When I asked 'Can you do the same thing in the Digital Equipment Corp. environment?,' they say no," commented Raye Schwartz, DP manager for Townley & Updike, a New York-based law firm.

Lotus officials, however, say they believe the ability to work with IBM mainframes is currently more important than working in the DEC environment.

"There is a significant critical mass on the IBM mainframe side," said Alexander D. Crosett III, information center group manager for Lotus, citing IBM's large installed base of mainframes.

Commenting on moving the product line over to the VAX, Crosett said, "It is a future-oriented thing." The main problem in moving to the DEC environment involves issues of distributed data bases on minicomputers, Crosett said. "There is nothing about the architecture that doesn't lend itself to more complex network topologies," noted Peter Meekin, marketing director for Lotus.

Users of the earlier versions of Ilink, however, were pleased with the announcement. "Users will see results faster. It is going to be much easier to use," said Denise Smith, information center analyst for Wright Line, Inc., a Worcester, Mass.-based computer supplies manufacturer. "It will be much easier for me to use for ad hoc requests for users and to train someone who is going to use it on a regular basis."

Post-merger Burroughs eyes telecom

By Takehiko Kondoh
Computerworld News Service

TOKYO — In an effort to allay the fears of Japanese customers, Burroughs Corp. Chairman W. Michael Blumenthal pledged here Friday to keep both Burroughs' and Sperry Corp.'s existing and future hardware and software lines separate and distinct. The two companies merged six weeks ago.

The company that will arise from the merger, Blumenthal maintained, will orient itself during the next 10 years toward systems integration and telecommunications. The company will fine-tune its strategies toward regional markets, he said.

The merged company, he elaborated, will also "continue to support, develop and enhance the separate individual architectures and software developments of the two companies. There's no change in that at all," Blumenthal said.

Blumenthal met with the press during a week-long trip to Japan. During that trip, he said he conferred with representatives of "many hundreds of Sperry and Burroughs users."

Sperry Chairman Gerald G. Probst, who accompanied Blumenthal, said Sperry is "completely in accord [with Burroughs] in terms of the ways in which we plan to operate."

Sperry and Burroughs products are distributed in Japan by Nippon Univac Kaisha K.K. and Burroughs Co., respectively.

The merger, he predicted, will make the new company united and stronger, both financially and technically. Blumenthal called the merger a "historic event," representing a "very important change in the structure of the world computer industry and [creating] the second major force of great size and importance to the industry."

Both companies, he elaborated, had been "doing well separately, [but realized] we could do even better together."



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Big Blue cuts to dealers seen double-edged

By David Bright

BOCA RATON, Fla. — IBM early this month quietly reduced dealer prices on selected models of its Personal Computer line. The action was seen by observers as both a retaliation against the growing legions of low-priced clones and as a clearance sale to make room for a new generation of Personal Computers expected later this year.

The action became public last week and resulted in price reductions to dealers of as much as 18% on selected models of the PC line. Industry insiders fear that in addition to competing through lower prices, IBM may soon start directly pressuring retailers to stop selling copycat machines, which the firm has reportedly already attempted to do in the U.K.

While not revealing the exact amount of the reductions, a spokesman at the IBM Entry Systems Division confirmed that wholesale prices on two IBM PC models and one IBM PC AT model had taken effect for a limited period of time. "We consider this to be a routine type of promotion, the type of promotion that we offer periodically throughout the year," the spokesman said. However, he said such promotions normally occur during the fourth quarter.

Price cuts on slow-selling models

"I'm surprised it took them so long [to cut prices]," said Aaron Goldberg, vice-president of microcomputer services at International Data Corp., a Framingham, Mass.-based market research firm. Goldberg pointed out that the price reductions are only on slow-selling machines — the older IBM PC and the 6-MHz version of the PC AT, which has not been selling well since IBM introduced an upgraded 8-MHz version three months ago [CW, April 7]. Goldberg predicted that IBM will discontinue the basic PC by the end of the year.

Any significant dealer savings will be lost as the highly competitive climate forces dealers to reduce their retail prices, predicted Norm Dewitt, an analyst with Dataquest, Inc. of San Jose, Calif.

Dewitt predicted that as soon as late third-quarter '86, IBM will release a PC replacement family based on the PC Convertible architecture.

According to Patrice Johnson, president of the 200-member Association of Computer Retailers in Michigan, dealers will "absolutely" be dropping some clones. If they do not, she said, IBM may put pressure on them by withholding support and advance sales information.

The war has already been waged extensively in England, where the clones have caused IBM's sales to slip, sources said. One dealer told *PC Business World* that outlets selling Compaq Computer Corp. and Olivetti Corp. IBM compatibles were feeling the strain. "Our IBM salesman asked us to remove our Compaq promotional material and replace it with advertisements for the IBM PC," he explained. IBM spokesmen in the U.K. were unavailable for comment.

Connectivity, clones top concerns at PC Expo

Attendees are cool on IBM's Token-Ring

By Alan Alper

NEW YORK — Communications products that would serve their firms into the next decade were on the wish lists of many MIS managers attending the PC Expo trade show held in New York last week.

A number of MIS managers also said that for the first time, they were seriously looking at lower priced IBM Personal Computer clones. Others, however, said they worry about the software compatibility of the clones.

"Sharing information and connectivity are the biggest issues," noted Elizabeth Clark, technical officer at Manufacturers Hanover Trust Co. in New York.

Because of its worldwide presence, the bank is always looking for more effective means of communicating within and from outside the organization. "We're always looking at 3278 and 3279 emulation for communicating locally," Clark said. "We'd also like to develop a means for people traveling outside the organization to transmit data back to the office. We're looking at portables with tools like Borland International, Inc.'s Sidekick and things like that."

Ira Ehrenfeld, senior technical advisor at Buck Consultants, a Harmon Meadow, N.J., benefits consulting firm, said mainframe-to-micro connections would be the focal point of his endeavors for some time to come.

"Everyone has been talking about the IBM Token-Ring for the last two years. They'll probably be talking about it for the next few years as well, but the key issue at our firm is the need for PCs to be able to access data from the mainframe," he said.

Buck currently has one IBM PC XT 370 that can access files from a mainframe operating under IBM's VM. That is grossly inadequate for a firm with 250 stand-alone PCs located in 20 offices nationwide, and in which several departments need to get at the same data, Ehrenfeld said.

Russell Harding and Robert Harkins of The BOC Group in New Jersey, a manufacturer of gases and welding supplies, were searching for a local-area network. "We looked at the IBM Token-Ring, but we don't think it's there yet," said Harkins, who is the firm's PC coordinator.

Harkins is troubled by the fact that one PC AT on the network has to be a dedicated file server. Other vendors' schemes also permit the PC AT handling file serving to function as a workstation, he said.

Surveying the various PC clones on the exhibit floor, many of which were priced 15% to 20% below comparable IBM products, a number of MIS managers seemed tempted to try the non-Blue micros.

"We have no apprehension about going with non-IBM micros," noted Thomas Finnessey, of Urbach Kahn & Werlin, an accounting firm in Albany, N.Y., that currently uses IBM micros exclusively. "As long as we can get service for the products, it doesn't matter who builds them."

Some firms are afraid to venture outside of Big Blue's calm, compatible waters, however. "If we had to evaluate all the other clones to make sure they are compatible, our department would have little time for anything else," noted Jerry Garson, an accountant at Mobil Corp.

Owners resist filing net info

From page 1

competitors with access to critical strategic information.

While the current proposal would only affect organizations in Utah, the Telecommunications Association (TCA), a national user organization of telecommunications managers, claims the rule could establish a precedent for other areas of the country.

"Every time people start talking about this rule, you see the hair on the backs of their necks rise," says Stephen Merrill, telecommunications administrator at the University of Utah. Private network owners "do not like the government prying into their affairs," he adds.

The Utah Telecommunications Managers Association, a state users group, is "united around this particular issue: We're against it," Merrill says. "I'm taking the stance that the university is exempt from the reporting requirement because it is a public institution and, therefore, has no private network, even though we use private lines."

Gary Robinson, a technical engineer at a Salt Lake City broadcasting company, Bonneville International Corp., says his company opposes the rule and will claim exemption on the grounds that commercial broadcasting ventures fall under the jurisdiction of the Federal Communications Commission.

"We are claiming exemption not only for our broadcast facilities but also for private network operations such as our satellite and microwave links," Robinson says. "Even though some of those links could be considered bypass, they all relate to our primary business, which is FCC licensed." Both Merrill and Robinson concede the commission could disagree with their interpretations.

Utah Public Service Commission staff director Doug Kirk says the intent behind the rule is for the commission to monitor, not control, private networks that bypass local operating company facilities. "Just over a year ago, the state legislature passed a law allowing us to do this."

Kirk adds that the rule "is likely to be altered in response to the comments that have been submitted."

In its current form, the rule would require organizations to send a notice to the commission on existing private network installations and report on additions and changes within 30 days after implementation.

Each notice would contain 20 items of information, including size of network facilities, types of users, types of lines, operations costs, reasons for installation and identification of "facilities and/or services previously provided by a local carrier that were eliminated or reduced as a result of the system's construction or expansion," the ruling states.

TCA takes issue with ruling

In the filing, the Utah Public Service Commission says that "compliance costs for affected corporations and persons will be minimal." In comments it filed with the commission, the national TCA disagreed, taking issue with the reporting requirement in three areas.

First, the rule "will impede or discourage the development of private telecommunications systems" by imposing "a heavy compliance burden in terms of cost and resources needed to prepare and file the reports," the TCA says. "It could take considerable effort to answer all 20 questions; not all companies have kept complete records of their installations," says Michael Woody, the TCA's vice-president of regulatory affairs.

The rules also would require that network owners make a report every time they add a new customer or expand their networks.

The user organization's second objection is that the public reporting of proprietary information would have an anticompetitive effect on the owners and operators of private lines. "Once the information is on file with the commission, anyone can look at it," Woody says. "A telecommunications manager of a competing company can find out what my network capacity is, where it goes and whom it serves. That's serious."

The TCA also believes the requirement is "inconsistent with federal statutes and policies and is preempted by order of the Federal Communications Commission."

Michael Senkowski, a partner at Riley & Rein, the law firm that acts as the TCA's general counsel, helped draft and submit the comments. The Utah Public Service Commission claims that the purpose of the proposal is to help it enforce FCC regulation Part 94, Senkowski says. Part 94 allows, but also restricts, the resale of excess capacity on private fiber-optic and microwave networks.

"The FCC has stated that Part 94 preempts state involvement in this area," Senkowski says. "We plan to get the FCC involved if the Utah Commission looks serious about passing the rule," he says.

The TCA suspects divested Bell operating company Mountain Bell is a prime mover behind the proposal, Woody says. "I don't *know* that Mountain Bell is behind this, but it's very suspicious that the rule requires private network owners to identify 'any facilities and/or services previously provided by a local exchange carrier.' This tells them how much revenue they are losing as a result of private network installations."

Mountain Bell has taken a neutral position in regard to the proposed rule, according to spokeswoman Carol Dunlap. "We are not behind the rule. We are taking no action for or against its adoption," she says.

Mountain Bell, she adds, is "pro-competition and pro-deregulation. Private network technology is already here, and we don't see how it can be effectively policed, even if the rule goes into effect."

GEISCO scraps plans for automated clearinghouse service

Federal Reserve retains near-monopoly in mart

By Mitch Betts

General Electric Information Services Co. (GEISCO) last week announced that it is scrapping its plans to create a nationwide automated clearinghouse service for banks, partly because of what it called unfair competition from the Federal Reserve System.

GEISCO, based in Rockville, Md., claimed it had spent more than $10 million to position itself to enter the automated clearinghouse business, a service that clears electronic payments for banks. The attempt was part of a new GEISCO strategy to use its global teleprocessing network to handle electronic payments and document exchanges in vertical markets [CW, May 5].

The GEISCO decision was a disappointment for supporters of private-sector competition to the Federal Reserve, which has a near-monopoly on bank automated clearinghouse operations. William R. Moroney, president of the National Automated Clearing House Association (NACHA), said banks support competition in hopes of getting lower fees, better service and "innovative stimulation in the marketplace."

Other companies that have expressed interest in starting an automated clearinghouse business are AT&T Communications, Automatic Data Processing, Inc., J. C. Penney System Services, Mastercard International and Visa USA, Moroney said. GEISCO operates a regional automated clearinghouse in California, a move that was considered a stepping stone to a national operation.

David A. Shepherd, manager of GEISCO's payment services operation, said the decision against launching a nationwide automated clearinghouse was based on the slower-than-expected growth in the volume of the business and policies of the Federal Reserve Board.

"The overriding issue, simply stated, is that the Fed, in its dual role as regulator and service provider, has established and maintains a framework for providing automated clearinghouse services which enables its 28 automated clearinghouse processing centers to enjoy preferential treatment over any private-sector providers," Shepherd said.

Specifically, he complained that the Fed's access deadlines, fees and settlement conditions are not equitable or compatible with a private-sector clearinghouse business.

A Federal Reserve Board official could not be reached for comment, but the Fed reportedly has denied that it has an unfair advantage over private automated clearinghouse operations. In March, the reserve board made several rule changes intended to create a more favorable climate for private-sector competitors.

NACHA President Moroney said the Fed's rule changes in March were a step in the right direction but that more reforms were needed to encourage private-sector automated clearinghouse businesses.

GEISCO's Shepherd said that in the future, if the Fed makes policy changes favorable to private-sector automated clearinghouse processors, GEISCO may change its decision.

An automated clearinghouse in the banking industry processes certain types of electronic funds transfers, such as direct-deposit payroll and Social Security payments, utility payments, insurance premiums and other preauthorized payments.

TOP OF THE NEWS

NEWS from page 1

AT&T officials told Daniel Rosenbaum, editor of "Wiretap" newsletter and a *Computerworld* columnist, AT&T developers reportedly could not achieve the right combination of screen readability, low cost and portability. The company would have persevered with its marketing plans for the laptop if it had landed the Internal Revenue Service laptop contract [CW, March 3] or if demand for laptops seemed to be increasing. AT&T would not comment.

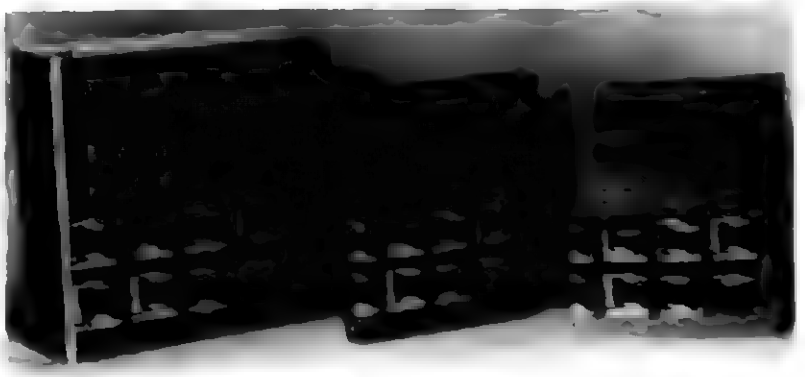
■

Intel Corp. announced Friday a second-quarter loss of $20.3 million, or 17 cents per share, on revenue that declined 15% from year-earlier levels to $305.2 million. The figure included an extraordinary revenue gain of $2.5 million. In the year-earlier quarter, Intel earned $9.2 million, or 8 cents per share, on revenue of $360 million. Chairman and CEO Gordon Moore said it will "continue to be difficult to make progress" because of excess semiconductor industry capacity and soft computer demand.

■

Parallel Computers, Inc. of Santa Cruz, Calif., will introduce three machines in its series of on-line, transaction processing systems today. The new supermicro and minicomputer products are said to be hardware fault tolerant, with each critical component having a twin. Prices will range from $21,000 to $100,000 for the 200XR, 400XR and 500XR models.

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Elxsi says CPU, chip revamps will double 6400's power

Processor compatibility key to memory boost

By James Connolly

SAN JOSE, Calif. — Promising its customers twice the previously available power, Elxsi plans to introduce today a central processor and denser memory chips for its System 6400 parallel multiprocessor.

The company said it will announce its M6420 CPU for field upgrades of its older M6410-based systems and for new System 6400s. Elxsi, a subsidiary of Trilogy Ltd., claims to have more than 70 of its systems, with configurations ranging from one to 12 CPUs, installed in the aerospace industry, electronics firms, government laboratories, universities and the Unix marketplace. The company targets scientific and engineering markets as well as limited business applications.

Elxsi also plans to announce a quadrupling of the physical memory capacity of the System 6400 to 768M bytes and an increase in cache memory from 16K to 64K bytes. Trilogy President Gene M. Amdahl said last week that Elxsi also plans to use 1M-bit memory chips to increase physical memory to 2G bytes next year.

Elxsi President Peter Appleton-Jones said a key element of the announcement is the ability to add the new processors to Elxsi's existing 320M byte/sec. system bus. "To our knowledge, this is the first time two processors using different designs have worked together on the same system bus with no hardware or software modification," Appleton-Jones said.

Appleton-Jones added that the M6420 has shown performance gains ranging from 1.7 to 2.3 times the earlier M6410, with a typical application mix runnng twice as fast on the new processor. He said the old and new processors, each consisting of a three-board set, can run on the same system with the M6410. Appleton-Jones rated the single-CPU performance of the M6420 at 10 million instructions per second.

The performance gains, according to Appleton-Jones, come from streamlining and increasing the performance of the instruction unit on instructions such as loads, stores and branches; increasing the cache size; improving the computerized instruction speeds in the execution unit; and software and firmware improvements.

He also claimed that the System 6400 provides a performance range that bridges the gap between the Digital Equipment Corp. VAX 8650 superminicomputer, which Elxsi claims the System 6400 outperforms by 10% to 50%, and the Cray Research, Inc. Cray-1 supercomputer, which Elxsi claims is comparable to a fully configured 12-CPU System 6400.

The cost to upgrade an M6410-based System 6400 to an M6420-based system is $140,000. A two-CPU system with 32M bytes of memory costs $475,000 with the M6410 and $625,000 with the M6420.

One Elxsi user who learned of the announcement last week said his company probably will move up to the faster processor and denser memory. "We are going to have a 6420 fitted. We have just about used up the capabilities of our machine now, and we are looking forward to seeing whether it does give us the double performance," said Jeff Robinson, director of engineering for General Datacomm, Inc. of Middlebury, Conn. The company uses a six-CPU Elxsi system for circuit designs.

Elxsi system 100 times faster

Robinson said the Elxsi system is 100 times faster than General Datacomm's earlier DEC VAX-11/785 for most applications and that the additional memory will provide users with more flexibility. "I don't see us buying any more cabinets or any more computers, although I do expect to add memory and swap CPUs in the cabinets that we have now," he added.

Robinson acknowledged that he had considered it a gamble to buy an Elxsi system two years ago because of the shortage of software for the machine. However, he said the ability to run Unix, as well as Elxsi's EMBOS, allows access to a greater software library.

Trilogy's Amdahl previously said that his firm's merger with Elxsi was, in part, intended to provide the means to use technology developed by Trilogy. He reported that little Trilogy technology is used in the current System 6400, one reason being the recent agreement to sell Trilogy's packaging technology to DEC for $10 million.

"That technology won't show up in our products for two or three years. The reason it will not show up is that at the time we sold it to DEC, we agreed to give them a two-year head start. Even if we had decided to use it ourselves — and we still retain the right to — it would have taken two years to implement it, so the most we would have gained is a year. Also, at this level of performance, there would have been a marginal gain in performance," Amdahl said.

Appleton-Jones noted that the greatest benefit to Elxsi from the Trilogy merger has been the cash infusion that Trilogy provided.

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Cobol standard add-ons flayed

From page 1

During the next 30 days, members of the X3J4 committee, who represent major compiler vendors and users in the U.S. armed services and the private sector, will cast their ballots on the question of adding "intrinsic functions" to Cobol. These would provide Cobol with mathematical functions now associated with the Fortran language, such as the ability to calculate square roots and perform trigonometric calculations. Cobol currently possesses limited mathematical capabilities.

ANSI panel members agree that proposed features would improve the language. But several committee members fear the addendum process itself will pollute the standards process, resulting in a stream of approved additions that will confuse vendors and users alike.

Because the proposed additions were omitted from Cobol 85, the addenda — if approved in the upcoming balloting — will be optional for compiler writers. According to X3J4 committee members, writers can choose on their own whether to add the mathematical functions to the standard Cobol 85 language.

"The spirit of the addendum process was to allow you to add new features without going through a 10- to 15-year cycle. But the implementation has not been clearly thought out," says Lawrence K. Madison, committee member and data processing director at Travelers Insurance Co. in Hartford, Conn.

"I've been opposed to addenda," says Lemuel Skidmore, principal of Skidmore Resource Management in Clinton, Conn., and vice-chairman of the ANSI committee. Adding features on a spot basis strays from the committee's charter to make Cobol a more uniform language, he says. Each feature may be desirable on its own, but as compiler writers contemplate a growing list of optional addenda, "the implementation will be horrendous," he predicts.

The optional nature of the addenda is troubling even to advocates of the addendum process. If the committee detects an error in Cobol 85 and adopts an addendum to correct it, the question is whether that correction should be optional, says Bruce Gaader, a member of the committee and director of computer services at Macalester College in St. Paul, Minn. He is the representative of the Digital Equipment Computer Users Society on the committee.

Committee member Jerome B. Garfunkel of Garfunkel Associates in Litchfield, Conn., thinks the first step of the addendum process does not go far enough.

"The original addendum was much fuller. It's been chipped away by people who want to see this addendum process go away," he claims.

With both advocates and doubters on the committee, the fate of the initial addendum appears to lie with the vendor representatives, who occupy 14 of 21 seats. Some of them may be inclined to vote against the addendum, Madison says. If addenda were added regularly, vendors would be under pressure to constantly revise their compilers, he adds.

Skidmore, another user representative on the committee, says the issue of how often the addendum process will be used is a valid concern. "What had been a stable standard will start changing every few months," he charges.

The debate over addenda occurs at a time when many Cobol users are still trying to decipher how they will be affected by the changes incorporated into Cobol 85. Part of the reason is that few compiler vendors have yet to produce Cobol 85 products. They have until Oct. 1, 1987, to get Cobol 85 compilers validated by the General Services Administration, Garfunkel says.

As committee members explain it, the addendum process is an outgrowth of the Cobol 85 revision process. The goal of the Cobol 85 drafters was to reduce its ambiguities, add function and allow it to make use of modern, structured programming concepts, committee members agree.

The revision process was cut off in June 1978 to reach decisions on what was presumed at the time to be Cobol 80, later referred to as Cobol 8X, as a storm of negative comment dragged out the public review process.

Much of that comment was directed at features being added to Cobol that increased its portability but also increased its incompatibility with earlier versions of the language, committee members relate.

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A1

Xidex 3480-type cartridge to debut

By Donna Raimondi

SANTA CLARA, Calif. — Xidex Corp. this week is scheduled to announce tape cartridges for use in IBM's popular 3480-type subsystems.

The Xidex 34800 tapes, manufactured in Omaha at the site of the former Control Data Corp. Business Products Division that was acquired by Xidex in December 1985, will be in full production by August, the company said.

CDC and Xidex both had 3480-type tape products in the works when CDC was acquired, according to Bert Zaccaria, executive vice-president of Xidex.

"CDC was further ahead of us in development, and that is why we can start selling this in June," Zaccaria explained.

No tape drive system will be forthcoming, he added, as the company supplies storage media, not hardware.

The product will retail for a single-quantity price of $20 per tape.

Diet firm says Datagraphix blocking used COM sales

Files suit alleging federal antitrust law violations

By Jeffry Beeler

SAN FRANCISCO — A firm's inability to sell a used computer output microfiche (COM) system has prompted that company to sue the equipment's manufacturer for allegedly violating federal antitrust and racketeering laws.

In a complaint filed in U.S. District Court last month, Cambridge Plan International, Inc. (CPI) accused Datagraphix, Inc. of engaging in pricing practices that have effectively stifled competition in the aftermarket for its own used products.

The complaint, filed in San Francisco, also alleges breach of implied covenant and written contract by Datagraphix, the U.S.' largest COM hardware supplier and a subsidiary of General Dynamics Corp., a giant defense contractor.

Through its attorneys in both San Francisco and San Diego, where its headquarters is located, Datagraphix last week declined to comment on the suit except to deny CPI's allegations and promise a legal reply at an undisclosed date.

CPI asked the court for $65,000 in damages, which would automatically be trebled under federal antitrust and racketeering laws. The Pacific Grove, Calif.-based firm may also be entitled to punitive damages, the exact amount of which would have to be set by a jury.

Scuttled attempts

CPI's breach-of-contract claims stem from allegations that Datagraphix deliberately scuttled the plaintiff's attempts to resell its used COM system to another user on the open market.

CPI, originator of the once-popular Cambridge Diet plan, said in its suit that it had tentatively persuaded a neighboring user, the Santa Cruz County government, to buy the hardware for $65,000. But the county later balked at the deal when Datagraphix demanded $43,285 to transfer the machine's maintenance agreement to the prospective new owner, according to the complaint.

The fee, which the vendor purportedly required for the system's refurbishment, struck CPI as excessive for a damage-free unit that had seen less than 200 hours of use, the complaint said.

Datagraphix's actions in the CPI case form part of a nationwide pattern of activity calculated to monopolize the firm's share of the used COM equipment market, the court document alleged.

To support its contention, CPI cited two instances in which other user organizations reported similar problems in unloading their used COM systems because of Datagraphix's steep refurbishment charges. One of the companies is National Business Systems, Inc., a Minneapolis-based COM service bureau.

"We have a couple of pieces of used Datagraphix equipment sitting in our warehouse right now," said Joe Tafs, general manager of National Business System's COM division. "We really haven't even tried to sell the machines because we've learned the hard way that Datagraphix would charge the buyers $30,000, $40,000 or $50,000 to transfer the maintenance agreements."

For the money it would have to spend to buy an old COM system and transfer the all-important maintenance agreement, a user organization could probably acquire a late-model unit fresh from the factory.

So in part, the intent behind Datagraphix's pricing policies is apparently "to entice companies to buy new equipment rather than used," Tafs said.

"If CPI's experiences are typical, Datagraphix has managed to insulate itself from competition in the secondary market and can dictate almost any price or availability terms it wishes," according to the plaintiff's attorney, James Gilliland.

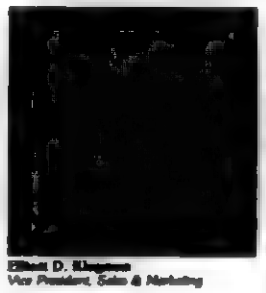
At the heart of CPI's complaint is a Datagraphix Model 2280 COM system that the user bought for $154,000 in November 1982. But after September 1983, when business soured and CPI declared bankruptcy, the company decided to liquidate many of its assets, including the COM equipment, to pay off its creditors, Gilliland said.

In spring 1985, when CPI finally found a prospective buyer for its system, two Datagraphix technicians were dispatched at Santa Cruz County's request to inspect the merchandise, which by then was lying in storage.

Although the inspection took less than a day, it cost $2,500, which "is grossly in excess of the $200 to $500 charge for certification inspections of computer equipment," the complaint said.

After a delay of several weeks, Datagraphix initially sought $98,000 to transfer the equipment's maintenance agreement to the county and then lowered the figure to $43,285 when the potential buyer protested.

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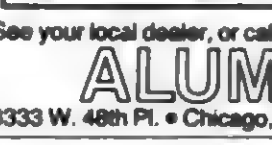
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Micro execs' role changing

From page 1

much more expendable, many observers say.

Some managers predict that if an economic downturn prompts businesses to cut expenses, the micro manager's job will be among the first cut, because the major tasks have already been accomplished.

Therefore, many microcomputer managers and consultants agree that it is time for managers to expand their horizons.

Some former micro managers who have become consultants now strongly urge other managers to acquire those crucial business skills. One such consultant is Randy Casto, president of the Casto Group, Inc., based in Overland Park, Kan.

"The information center manager today must have business acumen to understand not only what the technology can do but also how it directly relates and contributes to the company," Casto says. He stresses that this is true whether the manager is involved with microcomputer and mainframe computing or just PCs.

Typically, in the "novelty period" — the first 12 months of an information center's existence — the manager has "pretty much an easy time," Casto says.

But in the following "corporate contribution period," the manager is required to show that his center is indeed an asset to the company's overall direction.

So that managers will be prepared for this second stage and the final "maturation" stage, Casto urges them to understand their companies' business goals early on.

Wholeheartedly agreeing is Hilarius Fuchs, information center director at Continental Grain Co. of New York. Fuchs holds a doctorate in agricultural economics, and his second-in-command lends financial expertise gained from working in the controller's department.

"Our emphasis here is to move away from rebuilding the same old financial, payroll and human resource systems again and again to make them faster, nicer and smoother," Fuchs says. "They don't do very much for the bottom line. What we're emphasizing is those projects that impact the bottom line. The questions are, How can we make more money? How can we save money for the company?"

Consequently, Fuchs and his staff must be concerned not only with computers but also with such corporate essentials as cost structures, the ability to move products around quickly and the ability to obtain products to fulfill contracts.

> ***'The information center manager must have business acumen to understand not only what the technology can do but also how it directly relates and contributes to the company.'***
>
> — Randy Casto
> Casto Group, Inc.

This business awareness is particularly important in the time-sensitive grain business, Fuchs says. "In a lot of businesses, if you're a little bit late getting the information to the people, they'll say, 'Okay, fine. We can still use it.' But in the grain business, if a merchandiser making a deal doesn't have the information available to him to make a bid on a contract, and he doesn't feel comfortable making that bid, that contract doesn't come back again. You've lost the business."

Coca-Cola's micros

Such is the case at Coca-Cola USA in Atlanta, where a staff of 10 administers some 500 microcomputers. "We want to make the company more effective, not just more efficient," says John Grimsley, manager of end-user computing.

Toward that goal, everyone on Grimsley's staff has a business specialty, such as bottling, fountain service and finance. Because the staff members spend most of their time in the specific user departments, they sometimes move on to become members of those departments.

Although Grimsley has a systems analysis background on the fountain service side of the business, he intends to stick with microcomputers. He says he feels that as personal computing continues to evolve, microcomputers should play an even bigger role in Coca-Cola's strategic direction.

"It's just fun to ride that trend to its natural conclusion," he adds.

But while Grimsley and many of his peers are convinced that they need to take an active role in their companies' businesses, some managers maintain that the microcomputers alone will keep them busy indefinitely.

One senior office systems supervisor at a financial services company says that in the future, she should have her hands full keeping track of new product developments, a growing number of microcomputers within her company and a deluge of training requests.

"Once people get trained, they want advanced courses," she says. "They want more. If they're in Lotus' 1-2-3, then they want a data base course. Also, there's a constant influx of new people who need to be trained. Our waiting list for training is never less than 30 or 40 people."

She adds that users' steadily decreasing reliance on programming staffs translates to more work for microcomputer groups like hers.

Business techniques

Along the same lines, some microcomputer managers say that in particular businesses such as brokerage, the rule is to learn general business techniques rather than specifics.

This is because mainframes usually handle the specific business functions, while microcomputers are used in back-office jobs such as accounting, says Bob Duste, information center manager at Charles Schwab and Co. of San Francisco.

"I don't think it matters too much whether we're in the financial business or the banking business or the airline business," Duste says. He stresses that accounting, finance and cash control departments perform similar business functions regardless of the industry.

However, if a microcomputer manager should have a need to become more involved in his company's particular business, he should not panic, some managers say. "I think it's easier to get the business skills than it is to get the technical skills," observes Donna Dufner, information center manager at Manufacturers Hanover Trust Co. of New York.

"If a person has a technical aptitude and training and is bright," Dufner says, "we can usually teach him the business skills, because they are analytical skills, only with a different perspective. But to take somebody with a business background or sociology or psychology and try to teach them the conceptual data processing is very complicated."

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NEWS

WORLD DIGEST
Computerworld
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MUNICH, West Germany — Karl Heinz Beckurts, vice-president of the Research and Technology Department at Siemens AG, was killed last Wednesday morning by a bomb blast on his way to work in Munich. Red Army faction terrorists claimed responsibility for the bombing. Beckurts, 56, had been director of the Institute for Applied Nuclear Physics and president of a nuclear power research institute before joining Siemens in 1980.

AMSTERDAM — TPM Europe acquired Business Solutions International from Control Data Corp. as a first step toward creating a European network of third-party maintenance companies. The firm supports hardware from most vendors but specializes in Digital Equipment Corp. and IBM environments, according to Managing Director John Stancioff.

New offices will be announced in London in September, in Paris in October, in West Germany in January 1987 and in other European countries later, he added.

TOKYO — After waiting for a year and a half, Fujitsu Ltd. now plans to begin construction of a semicustom chip plant in Gresham, Ore., within the year. The facility will reportedly be operational by mid-1987 and will produce gate arrays and standard-cell integrated circuits.

Fujitsu reportedly will initially invest between $18.7 million and $25 million in the plant, which is Fujitsu's second U.S. manufacturing facility.

BEIJING — The People's Bank of China has purchased two Burroughs Corp. A 3 mainframes and supporting peripherals for a branch office and a provincial headquarters. The deal is valued at $1 million. Other sales may also be in the offing for mainframe vendors; the bank is considering installations for branches in 14 cities. Hitachi Ltd., which already has several installations at the bank's headquarters in Beijing, may be the leading contender for those contracts.

TOKYO — Hitachi Ltd. has acquired the manufacturing and sales rights in Japan for Cupertino, Calif.-based Fairchild Semiconductor's FACT high-speed CMOS logic devices. Hitachi is set to deliver samples beginning in late 1987. According to Hitachi, some Japan-produced FACT products will be shipped to the U.S. market. FACT currently is being produced in Japan by Nippon Fairchild K.K., a Fairchild subsidiary.

TOKYO — A group composed of Nippon Telegraph and Telephone Corp. and eight other Japanese behemoths will join forces to establish a research firm for space communications in October. Some $62.5 million will be funneled into the new venture over the next 10 years to develop vital equipment for trailblazing satellite and mobile communications technologies.

Tentatively named the Space Communications Development Co., the planned firm includes representatives from Kokusai Denshin Denwa Co., Japan Broadcasting Corp., Toyota Motor Corp., Tokyo Electric Power Co., Toshiba Corp., Mitsubishi Electric Corp., Hitachi Ltd. and Fujitsu Ltd.

ZURICH — Swiss DP managers spend 40% of their departmental budget on personnel, 25% on hardware, 10% on maintenance and 8% on external software purchases, according to a recent survey of computer use by corporations in Zurich. The survey also found that 8% of the DP budget went for external data processing.

The study said the Swiss spent from $6.5 billion to $8.6 billion on data processing in 1985. Overall market growth reached only 22% in 1985, substantially less than the 54% growth recorded in 1983.

TOKYO — Sluggish Japanese demand and a continuing decline in exports combined to cause Japanese production of telecommunications gear to decline 1.5% in April from its level one year earlier. Japanese telecommunications hardware production in April totaled $829 million. Exports of such products were down 6.9% to a total of $291 million.

LONDON — Ministers from the 18 countries involved in Europe's Eureka program agreed earlier this month on a list of 58 new research and development projects, bringing the total investment of the governments and companies involved in the joint European high-technology research effort to more than $2 billion.

Projects dealing with software, robotics, communications, expert systems, industrial automation and chip technology dominate the list of new programs approved by 40 ministers from the participating countries. The group also voted to let Iceland join Eureka.

SHANGHAI — China entered the diskette business in late June with a diskette production line at an electronics plant in Shanghai. The first production run of 200,000 floppies shipped to Hong Kong. Chinese officials claim their floppies are near equals of 3M Corp.'s standard-setting product. The Shanghai plant reportedly can make 9.6 million diskettes per year.

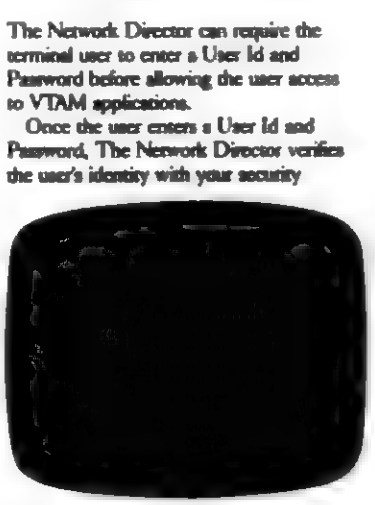
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VIEWPOINT

EDITORIAL

Keeping Cobol alive

Any language must grow, change and adapt to its evolving environment if it is to survive, and programming languages are no exception. Such change has been slow and painful for the old-timer among programming languages, Cobol. Since its birth in 1959 — spawned by a consortium of vendor and Pentagon officials seeking greater software productivity and portability — the world of commercial data processing has been totally reshaped.

Yet efforts to change Cobol have been slow and laborious: Its last major revision — Cobol 85, the successor to Cobol 68 and 74 — took *11 years* to gain approval from the American National Standards Institute and the International Standards Organization.

Why? A controversy stemming from Cobol 85's perceived incompatibilty with earlier standards for the language sidetracked the process for years. The data processing community wanted more easily maintained, more structured and more portable Cobol, but it didn't want compatibility problems. The result: a certain schizophrenia among MIS managers and the members of the standards committee.

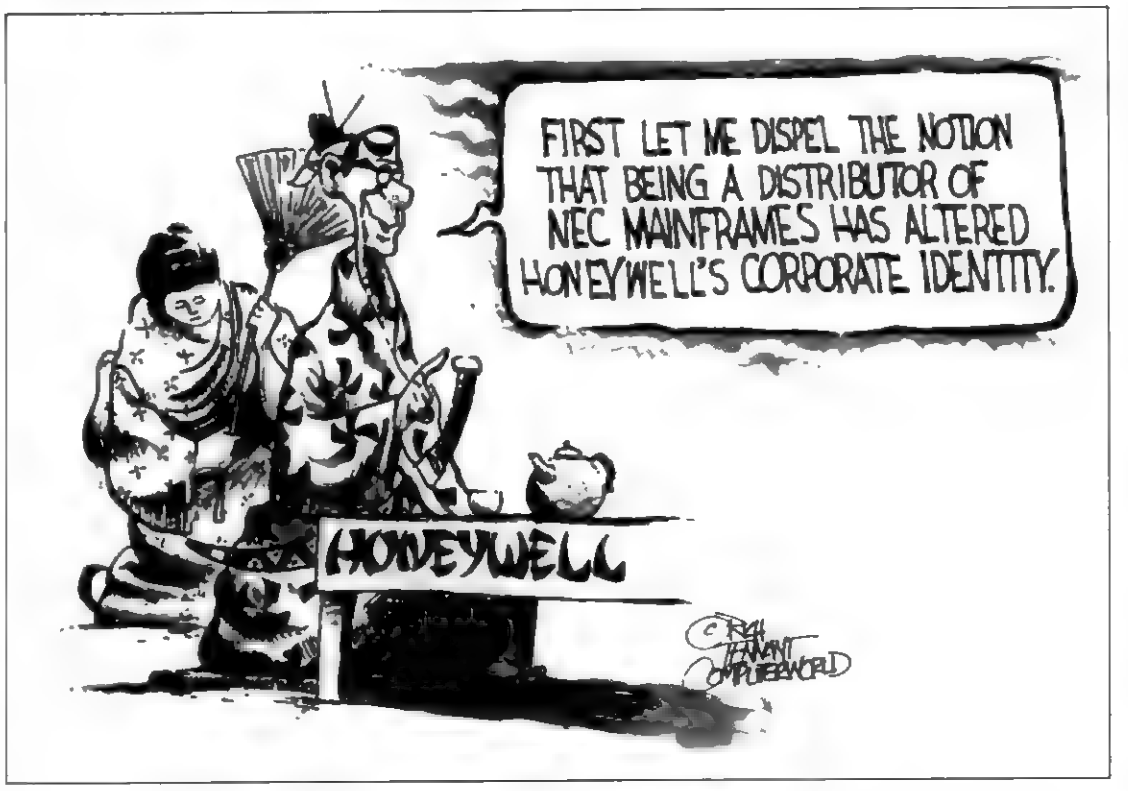
To avoid such wrangling and to speed up revisions, standards-setters last year attempted to reform the approval process by using addendum: Essentially, Cobol will now be given new features, or addenda, every two or three years, and the language will be fully overhauled every decade. Introducing as addenda those changes likely to be included in the next full version of Cobol gives users and vendors a chance to get accustomed to them before they're adopted.

This week begins the initial test of the addenda process, as the ANSI committee responsible for changes in Cobol votes during the next 30 days whether to add certain mathematical features to Cobol.

All of this sounds good. Who wants to argue with an effort to more quickly update a language so important to the data processing community? The rub comes, as always, in the implementation. As the list of addenda grows longer, how do you prevent widespread confusion among software vendors and users, particularly since the addenda are optional?

We come down on the side of those critics, including some standards committee members, who argue that the whole addendum process causes more problems for the data processing community than it solves, that an evolving standard is no standard at all. Sooner or later, users, vendors and standards groups are going to have to decide whether they want compatibility with the earlier versions of Cobol or an upgraded language.

Given those choices, it seems clear that the data processing community must have an upgraded Cobol and a reasonable, timely revision process that guarantees it. Age is no reason for Cobol to grow feeble and die; neither is an unwieldy, ineffective revision process, one that ironically may be the biggest threat to the language it is supposed to renew.



LETTERS TO THE EDITOR

AT&T reports no such error rates

David Bendel Hertz, in his article on SDI software reliability, "SDI demands trillions of instructions, 99.9999999% reliability," [CW, June 2] cites "an AT&T report . . . that there were an average of 300 'serious errors' in every 1,000 lines of code at some 200 major corporate installations."

AT&T has produced no such report. Hertz may have obtained the data from an article that appeared in the Nov. 26, 1984, issue of *Computerworld*. Referring to a study by T. Capers Jones III of the Nolan Norton Co., the article cited those exact figures.

Our own experience is far different. We continually collect data from more than 70 AT&T projects, some involving millions of lines of source code, and we have documented an average error rate of less than one per thousand lines of source code.

In addition, with existing techniques of error checking, fault recovery and redundancy, a software system can deliver reliable performance though it may contain some errors.

Edward Fuchs
Director
AT&T Bell Laboratories Quality Assurance Center
Holmdel, N.J.

User effort prompts vendor action

The story, "Users await protocol fixes," [CW, May 19], refers to the reluctance of some companies to commit to Manufacturing Automation Protocol (MAP). The article states that many manufacturers are waiting until the factory communications standards are more complete.

This waiting game that we Americans play is dangerous and foolish. It is dangerous because by waiting, rather than acting, we are slowing down the very process that will result in complete standards. This process is called participation. Until users begin to commit themselves, vendors will not produce the products. Until vendors produce the products, the users will not commit themselves. Nobody seems willing to take the risk.

The Japanese are gaining more and more market share because they are willing to invest in the long term, often for much smaller productivity potentials than MAP has to offer. We Americans have a chance to commit to a long-term investment that will initiate a snowball of automation capabilities. If ever there existed potential for long-term profit, it does now.

The sad part is that, although there are some holes in the MAP standards, there is still a lot a manufacturer can do today to prepare for tomorrow. For example, MAP will use broadband cable; we can start installing this cable. Also, there are several vendors today that offer ready-to-use products that will allow you to receive the benefits of MAP right now.

If you cannot commit your company at this time, you can at least help in other ways. If you do not send anybody to the MAP users group meetings, do so now. And when you are there, instead of complaining about what is not complete, how about committing your time or energy by contributing ideas or by attending a subcommittee meeting? The more effort that users make in this direction, the more action we will see from vendors.

Frank K. Welch Jr.
Consultant
SEI Information Technology
Los Angeles

Don't write off Datapoint yet

I am constantly amazed at the imagination your writers and editors display in your special reports. The way you routinely manage to develop articles on minicomputer installations, local-area networks and office automation integration without mentioning Datapoint Corp. is an incredible example of seeking facts with your eyes shut and minds closed.

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You are doing a disservice to the industry and to your readers by neglecting to include Datapoint products and customers in your research and special report presentations. Don't write Datapoint off yet — it is still an innovative leader in its marketing area.

Cynthia Casentini
Director of Data Processing
Hayward Lumber Co.
Salinas, Calif.

VIEWPOINT

Piecing together the IBM product puzzle

The National Computer Conference's occasional sojourns in Las Vegas are an ideal opportunity for high tech to meet high tack. But the 1986 NCC barely met the qualifications. With only 400 exhibitors (and almost no minicomputer or personal computer software vendors of note), there wasn't very much high tech. The tech-to-tack ratio got out of hand.

But IBM came to the rescue, opening its cornucopia on Monday morning, right at the beginning of the four-day show, to announce 124 products and product enhancements.

The Big Blue Las Vegas blizzard follows IBM announcement extravaganzas, which were nearly as large, in January and April. It has occurred to us that this is an IBM plot. We can just hear them up in Armonk:

"Those consultants are really giving us a hard time, always complaining about what we haven't announced yet. We need to find something to keep them busy."

"Why not have more announcements?"

"You mean [shocked tone] give them what they're asking for?"

"No, no. I just mean announce so many things that they can't figure out what we're doing."

"Do we have enough stuff to announce?"

"Are you kidding? We always have stuff to announce. Besides, it's not so much what we announce; we just have to package it up so every announcement has lots of complicated little pieces. And then we'll mix up all the pieces and put them back together in really illogical ways. It will drive them crazy. . . ."

Of course, that couldn't have really happened. But the result might be the same:

• The press is having a terrible time trying to figure out exactly what IBM has done or whether it is significant. This means that people who are very busy, very junior or very lazy will rely on statements from IBM executives as to what really happened, rather than try to study announcements that are too long and complicated to read, much less analyze and understand. They'd like the consultants to help them out, but . . .

• The consultants are spending all their time trying to figure out what IBM did, what was changed as a result and what they should tell their clients to do. This is akin to trying to figure out whether the Senate or the House version of the tax bill will pass and what to do with your real estate investments in the mean time. Of course, the consultants have almost no time at all to criticize IBM for what it hasn't announced yet; in fact, they're afraid to assume that anything hasn't been announced — maybe it's buried in all that paper.



By AMY WOHL

• The customers aren't sure of what is going on. On one hand, their favorite vendor is doing a lot of something, which means more choices, and everybody knows that's good. On the other hand, their favorite consultants seem very busy, and they're not sure what that means.

Now, if this works just right, the consultants and the press will be so busy explaining things to each other and pondering the announcements' importance that the customers will have to buy things on their own, from the very best marketing organization in the world. Guess what — they'll probably buy something for the sweet relief of having it over and done with!

Setting a precedent

Then we'll have set a precedent. All the other vendors will play copycat and put together their own 156-item announcements. Can you imagine the press and the consultants having an extended powwow to discuss a 300-page Spurroughs announcement? The news sections of every trade journal will blow their page budgets — and I'll need to buy five more filing cabinets.

What's a customer to do?

Keep the faith and depend on common sense. Big fat announcements aren't necessarily any more important than lots of little announcements. The right question to ask is, What really happened here and, Did anything I really care about change?

In fact, the smart customer throws those questions right back to the vendor. Let him who wants to sell you something explain what he now has to sell — and why you should purchase it.

If you like to keep score on your own, here's how:

• Divide up the announcements by product and/or subject areas. And immediately put away the ones you're not interested in.

• Look at the areas you're interested in tracking. Look for promises being fulfilled, new products you weren't expecting, things that provide platforms for activities that interest you.

If you suspect something important happened, check it out with an editor at your favorite newsletter or trade publication. The smart analysts aren't fooled at all — and they know how to read this stuff. In fact, being a fast, smart reader is a requirement for the job.

You'll want to tune into that level of insight if you need to make (or remake) decisions quickly — or if one of the announcements was in an area that directly affects your information systems strategy. Otherwise, just wait. In a summer in which the computer industry is slowly recovering from a slow year, there will be plenty of time to analyze, reanalyze and finally understand just what the Blue Giant is up to — and whether you need to do something about it.

Wohl is president of Wohl Associates in Bala-Cynwyd, Pa., and editor of "The Wohl Report on End-User Computing" newsletter.

Computer monitoring: Boon to employee and manager?

READER'S PLATFORM

By VICO E. HENRIQUES

Automatic measurement of work done on a computer can be an effective management technique. By counting, for example, the number of checks processed, the number of customer accounts corrected or the number of keystrokes entered into the computer, an automatic measuring device can help managers to set reasonable productivity goals, identify problems, price products and services and reward high-achieving employees.

Computer work measurement can also help employees meet their own and their employers' goals.

But like many new steps in workplace technology, "computer monitoring," as this measurement is termed, has become controversial. Opponents emphasize its potential for decreasing employee morale and increasing stress and are introducing bills into state legislatures to outlaw any measurement of work done on a computer.

Legitimate gripes

While computer monitoring is not substantially different from the familiar manual procedures that measure the quantity and quality of work, there are some legitimate employee gripes about the way some monitoring systems are used:

• When measurements are taken over short periods of time, employees may be subject to undue stress. For instance, while the vast majority of employees might be able to meet a goal expressed in terms of number of keystrokes per week, few of them would be able to meet that goal comfortably if they were required to enter the hourly average of keystrokes every single hour.

Energy levels vary. Some employees may need to work faster in the morning and more slowly in the afternoon. Or some might encounter a particularly difficult task that requires more time. Thus, goals should be established that allow each employee to vary his speed.

• There is a fear that monitoring can be used for "speed-ups" where employees are required to do more work with no increase in pay. While there has been no publicized case of a manager increasing keystroke quotas without compensation for data entry workers, such an action certainly could occur.

Unless original production goals were well below national norms, or unless new work flow techniques made additional productivity possible, such speed-ups would be counterproductive and would anger employees, whose output quality would most likely plummet.

Advantages outweigh abuses

But the many advantages of monitoring productivity clearly outweigh the theoretical abuses. Many organizations use monitoring to provide incentive pay for data entry operators who produce above a minimum expected output.

Employees then regulate the speed at which they work to meet their desires for additional pay. There are other advantages: The computer is fair. It shows no favoritism. In addition, managers appreciate the fact that computer monitoring allows them to spot problems early in their origin and to react by offering additional training or individual assistance.

Nonetheless, a campaign is under way to prohibit computer monitoring. Such pressures are as senseless and as economically counterproductive as would be a campaign to prohibit quality control in the manufacturing process.

Critics of computer monitoring cite the several European countries that prohibit the gathering of individual productivity figures. But such a prohibition is yet another example of the labor and managerial rigidities that consistently undercut European prosperity.

American entrepreneurial values

Far from rekindling the oppression of the sweatshop, the modern concept of quantity control through computer monitoring has the potential for bringing some traditionally American entrepreneurial values back into today's workplace: workers have greater flexibility in determining their own production schedules; workers and supervisors can deal with each other as individuals rather than simply as "labor" and "management"; a worker is compensated beyond a respectable base wage for additional skill and effort; and promotions and rewards can be objectively determined without regard to race, religion or other bias.

In summary, computer monitoring cannot be discussed simplistically like another example of "man vs. machine." Quite the contrary.

To the extent that it accelerates the trend toward personal initiative and flexibility in the workplace, computer monitoring should be accepted as yet another technical improvement in U.S. competitiveness that can benefit U.S. employees.

Henriques is president of the Computer and Business Equipment Manufacturers Association.

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SOFTWARE & SERVICES

SOFTLINE
Gary Robins

Technical edit cause of delay

If I were a manager responsible for the development of application software, I'd pay close attention to the technical editing of the application's documentation.

I wouldn't be so concerned as to whether the resulting documentation was accurate — for the most part, final documents are accurate. I would be concerned, however, with the amount of time the technical editing process delays the project.

The familiar cry of "Documentation is late again!" may be factual, but the shrewd manager may be able to see through this statement and point to a lack of control in the technical review process.

The technical review process is a neglected area that often adds weeks to the length of a project. For the uninitiated, the technical review process can be briefly explained in four steps: a writer finishes a draft; the writer distributes copies of the draft to the programmers and project leader to be reviewed for technical accuracy; the programmers and project leader return the copies of the draft with their corrections to the writer; the writer incorporates the corrections. There are minor variations from company to company — there may be formal reviews of the corrections — but the sequence is basically the same. The purpose of the technical review, to ensure the software does what the documentation says it does, is also basically the same regard-

See **TECHNICAL** page 26

Robins is a senior product information analyst at the Burroughs Corp. in Radnor, Pa.

Computervision tools debut

Source code documentation and consultation offered

By Rosemary Hamilton

BEDFORD, Mass. — Computervision Corp. has informed customers that it will introduce conversion tools to help automate the porting of its older computer-aided design and manufacturing systems to its recently introduced 32-bit workstation.

It will also offer source code documentation along with programming consultation for writing programs on the new system.

The Bedford firm's announcement last week to its users group, User Software Coalition, comes on the heels of the massive two-year conversion project in which Computervision ported its Cadds software from proprietary minicomputers to an industry standard workstation. The system, called Caddstation, was introduced in April. It is based on Sun Microsystems, Inc. hardware and runs under University of California at Berkeley's 4.2 Unix.

Although the company hasn't "sorted through the packaging" of these offerings, it expects to release them in the fourth quarter, according to James Price, director of third-party marketing.

Computervision's as-yet-unnamed conversion tool kit is an enhanced version of the tool kit it used for its own conversion project. The tools were developed by Massachusetts Computer Associates, Inc., an Applied Data Research, Inc. subsidiary based in Wakefield, Mass. The two companies signed a letter of intent last week enabling Computervision to remarket the tools.

Price said the tool kit will range in price from $10,000 to $50,000, depending on the amount of code a user wants to translate. He said the tool kit will be offered in four packages: for conversion of 10,000 lines of code, 30,000 lines of code, 100,000 lines of code or an unlimited amount.

The documentation and consultation will allow users to write programs for the new Cadds. With the older systems, Computervision provided portions of source

See **COMPUTERVISION** page 20

SOFTWARE NOTES

Cobol compiler certified by GSA

The first Cobol compiler to be certified as meeting the standards of **ANSI's Cobol 85** has been produced by **Micro Focus, Inc.** The Palo Alto, Calif., supplier of compilers and productivity tools, said that its compiler was validated "without errors."

A few Cobol 85 compilers that are not yet validated are already on the market, including one from **Tandem Computers, Inc.**, with more entries expected. Vendors must have compilers validated by the General Services Administration by Oct. 1, 1987, in order to bid on government contracts.

See **NOTES** page 23

Cobol options aid productivity

By Eddy Goldberg

SALEM, Mass. — Language Technology, Inc. recently made available Release 4.1 of Recoder, a Cobol restructuring product with 26 new report and formatting options.

Release 4.1 is intended to boost programmer productivity by providing more flexibility and customization features. The Control Flow Report, for example, makes it possible to split unwieldy programs into more manageable units.

In addition, Recoder users may now specify the paragraph size and number of new paragraphs created in order to tailor the restructured program to their needs, said Eric Bush, chairman of Language

See **COBOL** page 20

INSIDE

Sterling Software's Dylakor Division announces a spreadsheet for mainframes/**20**

NEW THIS WEEK

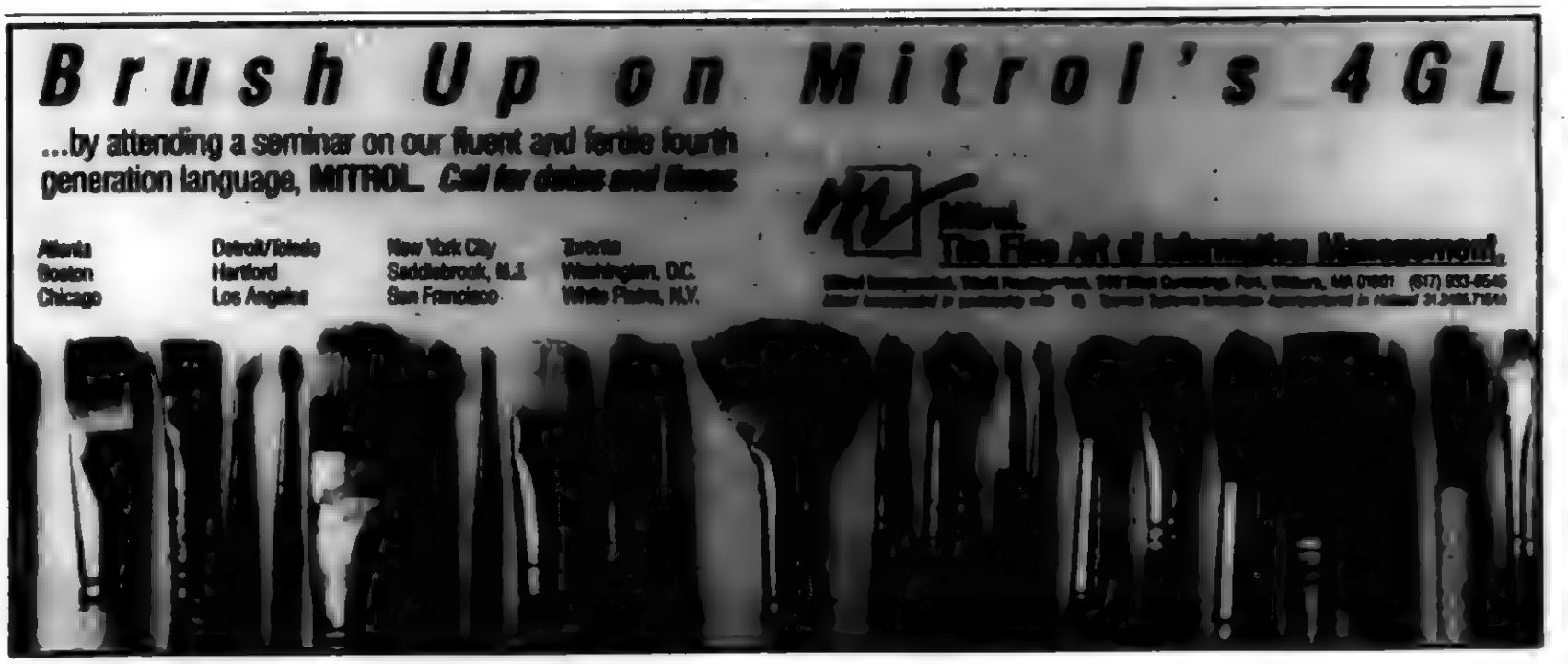
- TRT offers telex interfaces for IBM, DEC minis
- Apollo Computer releases the Domain/Performance analysis kit

For more on these and other new products, see pp. 91-102.

INSTANT ANALYSIS

"The spirit of the addendum process was to allow you to add new features to Cobol 85 without going through a 10 to 15 year cycle. But the implementation has not been clearly thought out."

— **Lawrence K. Madison, DP director, Travelers Insurance Co.**



Sterling unveils spreadsheet

GRANADA HILLS, Calif. — Sterling Software, Inc.'s Dylakor Division announced its first application product, a spreadsheet for mainframes.

Named Dyl-Calc, it was designed to mimic the operations of a personal computer spreadsheet but be available to many users at the same time and offer users the option of viewing several spreadsheets on the same screen.

Information from any mainframe data base can be loaded into the spreadsheets, and information from one may be edited and integrated into another, Dylakor President Carole Morton said.

The spreadsheet can also make use of mainframe security, as three-level password protection can be invoked and individual cells containing constants can be protected, allowing alteration of variables only, Morton claimed.

Dyl-Calc is available now for $6,000 to operate under DOS/CICS, OS/CICS and MVS/TSO.

In addition, Sterling announced Shrink/MVS, a data compression and encryption system able to provide 60% to 80% file compression for VSAM and non-data-base files under MVS.

The compression software was previously available for Cullinet Software, Inc. IDMS and IBM IMS, DOS and DOS/DL1 systems, Sterling spokesmen said.

Computervision turns believer after Compass helps convert software

By Rosemary Hamilton

WAKEFIELD, Mass. — When David Loveman, president of Massachusetts Computer Associates, Inc. (Compass), went to Computervision Corp. in 1984 to pitch his firm's software conversion tools, he found a willing listener.

Computervision, at that time, was still the leader in the computer-aided design and manufacturing (CAD/CAM) market and was preparing to convert its popular Cadds software — about six million lines of code — from its proprietary minicomputer platform to industry-standard hardware. The day after Loveman's pitch, Compass and Computervision were negotiating a contract.

Computervision had evaluated a number of different vendors' conversion tools but settled on the Compass line for several reasons, according to Massood Zarrabian, a Computervision vice-president who served as project leader.

In part, it liked the geographical proximity of the Wakefield, Mass., firm. But more important, Zarrabian said, was the quick rapport between representatives of the two companies. "There was a lot of comfort. We hit it off at our first meeting," he said.

In addition, Compass had a track record of handling large-scale conversions, albeit smaller than the Computervision task.

On Sept. 4, 1984, Compass signed a contract with Computervision and began developing the conversion tools. Compass is a 25-year-old company that was acquired in the late 1960s by Applied Data Research, Inc.

The bulk of the Cadds software had been written in Fortran S, a Computervision version of Fortran, and a small portion of the software had been written in a proprietary language called TPL. Compass' assignment was to develop tools that would convert Fortran S to Fortran 77 and TPL to C.

Zarrabian said that without the Compass tools, "we probably would have needed 15% to 20% more people." At various times, the project involved up to 200 people. On average, 40 to 100 people worked on the project, he said.

The heart of the conversion tools is a data base that contains "global information" on the software, including such information as relationships among data, how file names are used and what routines call other routines, Loveman said.

The data base contains instructions for the tools that actually convert the software. During the conversion, the code must be rewritten in a new language while keeping the function intact. When translating a

See COMPASS page 22

Computervision tools debut

From page 19

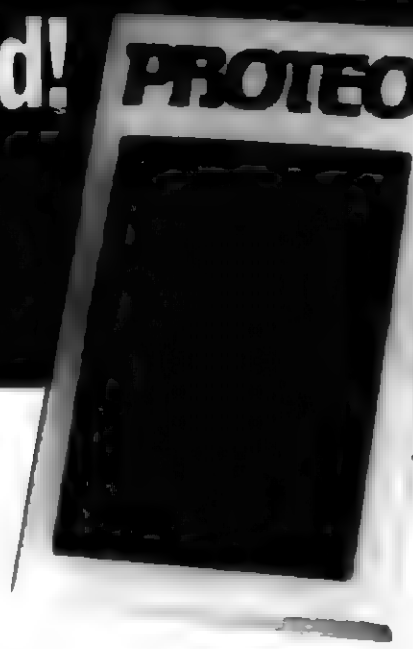
code on a special license basis.

"It wasn't a clean programming shell," Price said. "We used to send source code so they could muck around with the system. Now we will be documenting the ins and outs so they can program effectively."

At this stage, the consultation service is planned as a special hot line number for programming problems and training courses, Price said.

He said Computervision may offer the conversion tool kit bundled with the programming documentation. "Switching the programs is only the first 15% to 20% of the game," he said. "Then comes hooking it up with Cadds. The documentation will provide clean entry points to relink the software routines with Cadds."

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Compass aids conversion

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particular module of code, the conversion tools refer to the data base to see what the purpose of the module is, he said.

The conversion tools are made up of three main components. The front end reads the code and converts it to an internal, symbolic form. Then the transformer makes the necessary changes to the symbolic representation. Finally, the unparcer rewrites the internal form as the new code.

The tools were used primarily to convert the more routine portions of Cadds that would have been monotonous work for a programmer.

Other portions of the code that were more complex had to be converted manually. "Things that were hardware specific, like graphics-related things, couldn't be converted automatically because they had to be re-engineered," Loveman said.

In the spring of 1985, it became clear that Computervision was losing market share to competitors IBM and Intergraph Corp. "By March 1985, the conversion project went into panic mode," Loveman said.

In March, Compass delivered tools to be alpha-tested at Computervision; it followed up with a revised tool set in June for beta testing. At that point, the "serious conversion" began, Loveman said. Computervision stayed on schedule, converting code and then sending it out to customer sites for testing in late 1985 and early this year.

In April, with the conversion process completed, the company introduced its Caddstation CAD/CAM 32-bit workstation, as it had planned.

DBMS bows, converts workstations

By Eddy Goldberg

BERKELEY, Calif. — Sybase, Inc. recently announced a software-based relational data base management system that it says will convert a general-purpose 32-bit workstation into a high-performance data base server.

Sybase will begin beta-testing the product at 10 sites next month, with general availability set for October on the Sun-3 workstation running University of California at Berkeley's Unix 4.2. The company plans to beta-test a Sybase version for the Digital Equipment Corp. VAX environment in October, with availability set for near year's end, spokesmen said.

The product consists of the Dataserver, which converts a 32-bit workstation into a data base server, and the Data Workbench, a separate front end. The Data Workbench is an icon-based user interface that consists of an extended version of SQL, a report-writer and application development tools.

TRW, Inc., an investor in Sybase, will host three beta-test sites. "It's much faster than the competing data base management systems, is extremely user friendly and is evolving into something that will meet the data security needs of government contractors," said Stan Stahl, senior software engineer for TRW's Defense Systems Group.

Robert S. Epstein, executive vice-president of Sybase, offered two examples of the product's performance on the Sun-3. In a query that asked to fetch one row out of a million-row table using SQL, response time was 50 msec. In a 10-table join with 10 million-row tables, response time was 360 msec., he said.

Prices for the Dataserver and Data Workbench vary depending on CPU size. The Dataserver for the Sun-3 and Microvax II is $18,000, and the Data Workbench is $7,500. For the VAX 11/780, the Data Server costs $40,000, and the Workbench, $15,000.

SCIENCE/SCOPE®

A U.S. spacecraft orbiting Venus made the first close-up views of Halley's Comet, giving scientists valuable insights into the comet at a time when it was on the far side of the sun and direct observations from Earth were impossible. NASA's Pioneer Venus Orbiter, built by Hughes Aircraft Company and circling Venus since 1978, conducted its investigation a month before five other spacecraft flew by the comet. The Orbiter was delicately repositioned with precise commands from Earth to observe Halley's at its closest point to the sun, a distance of about 55 million miles. The spacecraft measured changes in the comet caused by intense solar heating. It also provided an ultraviolet image of Halley's and its large surrounding hydrogen cloud. Data gathered by the Orbiter helped scientists determine the gas composition of the comet, the rate at which water vaporized, and the ratio of gas to dust in the comet.

A new-generation mapping radar has two advanced features to help it spot military targets and create maps with resolution equal to that of infrared sensors. The Advanced Synthetic Aperture Radar System (ASARS-2), designed to complement electro-optic sensors, is flown on a U.S. Air Force TR-1 reconnaissance aircraft and provides real-time radar imagery to a ground station in all weather. ASARS-2 has a "squintable" antenna, which allows it to look around obstructions to make maps and classifications of targets on a single pass. The system also has a spotlight mode, which allows the antenna to look back or forward to focus on a suspected target and glean more detail. Hughes is producing the system for the Air Force under a development and production contract.

The AMRAAM missile may become the next-generation weapon for protecting U.S. Navy surface ships against threats that have slipped through the outer defense shields. Sea AMRAAM, under study for ship self-defense, would be essentially the same as the Advanced Medium-Range Air-to-Air Missile in full-scale development by Hughes for the U.S. Air Force and Navy. However, compared with existing missiles, Sea AMRAAM would increase a ship's firepower because the missile's guidance system is much less dependent on the ship's radars. Many missiles could be fired at different targets simultaneously, and they could home in even if the targets were outside the field of the ship's radar systems. Sea AMRAAM is also faster, more maneuverable, and can fly farther than current ship self-defense systems.

Acting as a kind of design and manufacturing prompter, a new artificial intelligence network increases productivity by automatically generating instructions for assembling complex electro-optical devices. The Hughes Integrated Classification System (HICLASS™) analyzes product design information to determine the best assembly techniques. It then selects the most efficient manufacturing processes available. Operators, on demand, are able to call up appropriate graphical and text instructions in color as they interact step by step with the system. As a result, workmanship improves substantially and products are made better.

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Notes: Sterling supports DB2

From page 19

Sterling Software, Inc. has climbed aboard the DB2 bandwagon. It has announced its **DMS/OS data storage management system** for MVS will support IBM's relational data base management system. Support includes archive, backup and restore processing of DB2 data sets. DMS/OS currently supports IMS files, and with the DB2 announcement will also support archive/restore processing of VSAM files, Sterling officials said.

■

Applied Data Research, Inc.'s Datacom/DB DBMS will be used with **Pallm, Inc.'s** software to provide relational capabilities for mainframe applications in the insurance industry. Pallm, based in Indianapolis, uses the DBMS in connection with its **Pallmvector** and **Pallmpac** systems, used in the life and property/casualty insurance business.

■

On-Line Software International, Inc. of Ft. Lee, N.J., is the first mainframe vendor to provide site licenses for its micro-to-mainframe link, **Free-Link**. An annual fee of $3,000 for DOS/VSE users and $5,000 for MVS users entitles a site-license holder to unlimited copies of the micro piece of the link and a copy per CPU of the mainframe piece. President Jack Berdy says 700 copies of Free-Link's mainframe software have been given away as part of a promotional program since fall 1985. The firm sells the micro piece for $495 per copy to non-site license holders.

■

The popular statistical analysis package **SPSS/PC Plus** is also available on a site license basis, said John Grillos, president of **SPSS, Inc.** A university may license up to 2,000 copies of the $795 package for $2.50 each or $5,000 for a first-year fee. Business users face the stiffer fee of $6,000 for 100 copies or $60 a copy.

■

The expert system building software **Automated Reasoning Tool** is finding employment in a variety of places as interest in commercial systems grows. The **Inference Corp.** product was recently adopted by **Lotus Development Corp.** for use in its development of products that incorporate expert systems, and **Sun Microsystems, Inc.** will offer it on its 32-bit Sun-3 workstation.

■

Also in the artificial intelligence realm, **Hewlett-Packard Co.** is offering Knowledge Craft, from **Carnegie Group, Inc.**, on the HP 9000 Model 320 workstation.

■

BBN Software Products Corp. of Cambridge, Mass., is reportedly developing manufacturing and factory automation software for introduction later this year. It is the developer of the RS/1 scientific data analysis package.

■

Nomad2, the fourth-generation language and data base management system from **D&B Computing Services, Inc.**, has been adopted by **Holland Systems Corp.** for use in development of its Information Resource Management product line. For example, Holland will offer its Strategic Systems Planning to customers with Nomad2 for developing business models.

■

Bentley College in Waltham, Mass., may be at the forefront of a trend. Its continuing education center is offering a six-month program for career changes into hot line software support and microcomputer software consulting.

■

Peat, Marwick, Mitchell & Co.'s Catalyst Group has entered into a licensing agreement with **Joseph and Cogan Associates, Inc.**, a Burroughs Corp. subsidiary, to provide Burroughs users with Catalyst's **Pathvu** and **Structured Retrofit**. Pathvu measures program logic against structure programming principles, while Structured Retrofit rewrites Cobol into structure programs.

Computer Associates unwraps data security tool for MVS, MVS/XA

By Charles Babcock

NEW YORK — Computer Associates International, Inc. announced a release of a data access security package it acquired in December.

CA-Top Secret, formerly the Top Secret product from CGA Software Products Group of Holmdel, N.J., is now available in Release 4.1 for IBM's MVS and MVS/XA operating systems.

In addition to protecting data from accidental or intentional destruction, modification or disclosure, CA-Top Secret is now compatible with recent releases of IBM data base and interactive environments, including CICS 1.7 and IMS 2.1.

The release contains security enhancements in the areas of integrated storage control and IMS/VS Multiple Systems Coupling feature, company officials said.

The transaction level protection in CICS, IMS and Cullinet Software, Inc.'s IDMS is improved with increased administrative and reporting flexibility, company spokesmen said.

CA-Top Secret, first introduced in 1981, costs $25,000 for a three-year license. CA-Top Secret reportedly requires no initial program loads, exits, macro coding or modification to the operating system for installation.



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SAS





Technical edit cause of delay

From page 19

less of the environment.

Why does the process invariably cause delays? In most companies, controls or written procedures for the process are nonexistent. Compliance with nonexistent controls, as one may expect, is casual at best. For example, the writer will request the corrected drafts be returned by a fixed date so the documentation can be completed according to a fixed schedule. Programmers, however, can usually be counted on to spend their time writing code or fixing bugs, especially at the end of a project. After all, they get paid for programming, not for editing documentation. The review of the documentation usually gets put at the bottom of the programmer's priority list. Many weeks past the requested date, the writer will finally receive the corrected drafts.

When there are several reviewers of the same draft, as there usually are, the problem is compounded. Since the reviewers individually make corrections to a sentence, paragraph or page, it is inefficient for a writer to start incorporating corrections until all the corrected drafts are returned. In this way, the writer does not have to rewrite sections that have already been corrected. The writer usually must wait until the last draft is returned.

The most egregious cause for delay occurs when management has budgeted no time for the review of documentation. Even though management knew up front that there would be several hundred pages of documentation, no time was allotted for reviewing the material.

The second most flagrant cause of delay occurs when management has budgeted the time for reviewing documentation, but uses the time for programming because the project is behind schedule. Both cases prove to be false economies because the project will be delayed by the time it takes to review the documents.

Even when the technical review process is planned and executed according to schedule, there still are problems that cause delays. Many technical editors lose sight of the purpose of the technical edit, wanting to discharge themselves of the task as quickly and easily as possible. The brevity of the results can be laughable. These are my three favorite editorial comments:

- This is not correct.
- I don't think it works like this.
- This report has changed.

Ask any technical writer if these editorial comments are not commonplace in the industry. Other than being amusing, these edits needlessly cost the writer extra time. For example, examine the first comment. The writer now knows that something is incorrect and needs to research the answer. Usually, the writer has to track down the author of the comment to find out exactly why the documentation is incorrect and what the correction should be. This can be a time-consuming process, especially if there are several editors and each is equally vague. The point is, however, that this extra work can be avoided when the editors provide an explanation with their comments.

Editorial comment No. 2 is very revealing. The first interpretations are either that the editor is too lazy to test the code or the editor's code is too sloppy to provide a definitive answer. Another interpretation is that the draft was taken home to be edited (which is often the case) and the editor didn't have the opportunity to test the application. In either case, the burden of the work is shifted to the writer. The writer is going to have to take the time to find the answers that should have been provided by the technical expert in the first place.

The third comment is similar to the others. The writer has to scrounge up a copy of the new report when a copy could have been provided by the editor.

The technical review process is just one facet of a development project. Since it often comes at the end of the project, any delays it causes are felt immediately. Here are some recommendations to avoid delays:

- Establish a standard that can be used to budget time for technical edits; for example, 10 pages an hour. Realize that a six hundred page manual will take more than two days to edit properly.
- Incorporate the time needed to review documents in the project plan.
- Establish written procedures for deadline compliance to control the technical review process.

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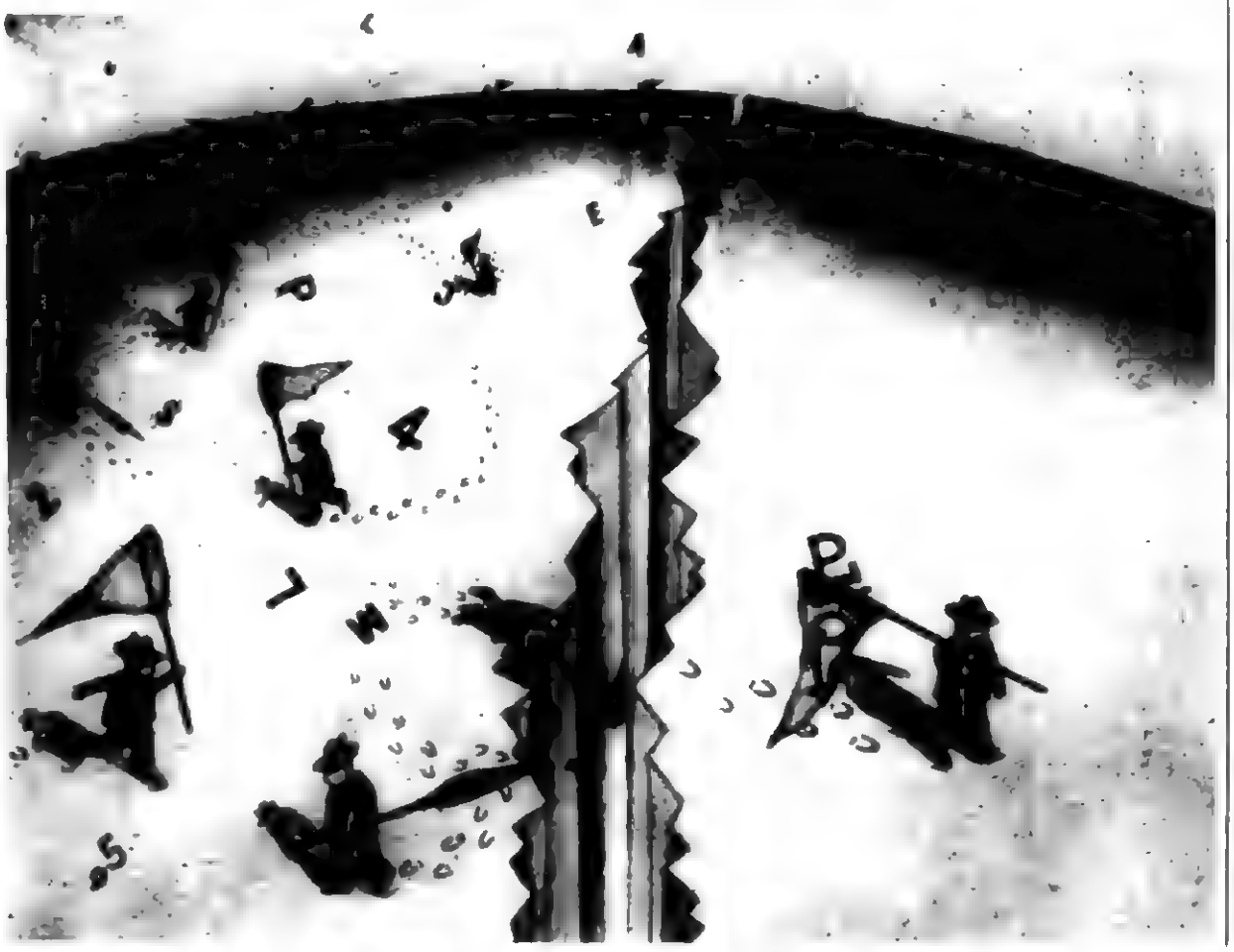
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Cobol options aid productivity

From page 19

Technology.

Bush said the options enable programmers looking at a program for the first time to simplify complex expressions, making the program easier to understand. "Old programs have lots of conditionals added over the years, lots of 'ands,' 'ors' or 'nots,' " he said. One way the new options may be used is to eliminate one, some or all of the conditionals during restructuring.

The large number of parameters included in the release will allow users to tailor the restructuring operation to their needs by site, program or organization, according to Bush..

A $150,000 perpetual license option replaces the three-year term previously offered at that price.

MICROCOMPUTERS

SMALL TALK
Will Zachmann

Compatibles: Telecat scores

It is amazing that just a little more than a year ago, most Wall Street analysts were writing off vendors of IBM Personal Computer-compatible systems as sure victims of IBM's market clout. Early in 1985, the conventional view in the financial community was writing the obituaries of all the other vendors.

Of course, that wasn't how it happened at all.

Users, being typically less well paid than the Wall Street pooh-bahs and technically a lot smarter, had little difficulty recognizing a good deal when they saw one. Not only did the compatible vendors offer IBM PC-, XT- and AT-compatible systems that did everything the IBM-labeled product did, but many actually did it better. Compaq Computer Corp.'s Deskpro 286, for example, might not have been any cheaper than an IBM PC AT, but at least the disk drives could be counted on.

Perhaps most important of all, compatible vendors began to offer not only more features on quality products but sharply lower prices as well. Tandy Corp., recovering from its not-invented-here syndrome, began offering aggressively priced systems in 1985. Leading Edge Products, Inc. became both a price and a market leader at the low end, and Zenith Data Systems Corp. began taking big government contracts, largely by knocking the socks off IBM's pricing.

But for really aggressive prices, it was initially the then-unknown mail-

See **COMPATIBLES** page 31

Zachmann is corporate vice-president for research at International Data Corp. in Framingham, Mass.

Board ups PC speed, aims to open door for Windows

By Peggy Watt and Douglas Barney

REDMOND, Wash. — Microsoft Corp. is paving more paths for its Windows graphical interface with the introduction last week of Mach 10, an add-on board that more than doubles the speed of IBM Personal Computers, PC XTs and compatibles, along with a new mouse and graphics input interface.

Mach 10 is aimed at quelling users' complaints that Intel Corp. 8088 microprocessor-based machines were not fast enough to run Windows effectively and required the faster processing speed of Intel 80286-based machines. "We think Mach 10 will allow corporations to move to Windows without having to upgrade their machines," said Michael S. Cooper, manager of Microsoft's hardware group.

The Mach 10 has a dual-speed mode and can run at nearly 10 MHz or can switch to 4.77 MHz, the standard speed of 8088-based machines. The slower speed is necessary to accommodate the copy-protection schemes of some older versions of software packages. "We don't anticipate too many compatibility problems there," Cooper said. Mach 10 also supports an optional Intel 8087 math coprocessor.

The Mach 10 replaces the 8088 processor and runs on the IBM PC, PC XT and Portable PC, along with many compatibles, including the original Compaq Computer Corp. Portable, the Ericsson Information Systems, Inc. PC and the Leading Edge Products, Inc. Model D.

In related news, Microsoft earlier this month announced Inport, a device interface that is being promoted as a prospective standard for both hardware and soft-

See **BOARD** page 28

Autodesk to rethink users group policy

Exposition melee may force firm to OK dealer sponsors

By Rosemary Hamilton

Bowing to user pressure, Autodesk, Inc. recently said it will reconsider its policy of not acknowledging users groups with dealer affiliations. Autodesk's decision came after what one user characterized as a "brouhaha" at the international users group meeting held at the Autocad Exposition in Chicago late last month.

"We would welcome a change in their policy," said Robert Hartman, a member of the Hawaii Autocad User Group. "Dealers are a good asset to a user group. We have one excellent dealer in Hawaii that's a member, but he's prohibited by Autodesk from sponsoring or organizing the group."

See **AUTODESK** page 30

Starbase takes laptop to office

By David Bright

NEW YORK — Last week at the PC Expo, Alloy Computer Products, Inc. introduced a storage subsystem for exchanging data between the IBM PC Convertible and desktop IBM Personal Computers. Alloy also unveiled Clusternet, an Intel Corp. 80286-based engine for multiuser personal computer clusters.

Framingham, Mass.-based Alloy Computer introduced the Starbase subsystem line with the belief that the PC Convertible is destined to see a great deal of use as a desktop system, not just as a portable computer.

"The PC Convertible's function is more than just carrying it with you on a trip," said Alloy President Dick Gorgens. "In order to use it effectively, you need some way of using it in the office. I like to think

See **STARBASE** page 28

NEW THIS WEEK

- Compuscan introduces PC-compatible page reader
- Mighty Computers offers 32-bit workstation

For more on these and other new products see pp. 91-102

INSTANT ANALYSIS

"Philippe Kahn is selling software to himself. He is his typical customer, and that's how he's deciding what to market. But, so did Adam Osborne."

— George Morrow, chairman of Morrow Designs, Inc., commenting on the sales techniques of Kahn's Borland International, Inc.

Oracle's SQL★Calc makes a relational DBMS as easy as 1-2-3.

Oracle Corporation has developed a Lotus 1-2-3 compatible spreadsheet and integrated it with its ORACLE® relational database management system (DBMS). The new product, SQL★Calc,® is the first to combine a mainframe-class relational DBMS with an easy-to-learn and familiar PC spreadsheet user interface.



SQL★Calc is designed for 1-2-3 users who've run out of memory, flexibility and patience. SQL★Calc allows you to put SQL database commands into spreadsheet cells . . . just like formulas. This permits you to access large amounts of data directly from your spreadsheet.

Like all Oracle Corporation products, SQL★Calc runs identically on mainframes, minicomputers and PCs.

SQL★Calc's foundation is the ORACLE relational DBMS, which provides users with a complete set of SQL commands through which they can create, retrieve, modify and otherwise control their data. SQL is the industry standard database command language for large computers. The SQL commands available in ORACLE are identical to the SQL commands in IBM's premier mainframe relational DBMS products, SQL/DS and DB2.

Built on this powerful DBMS foundation is a Lotus 1-2-3 compatible spreadsheet that allows users to put SQL commands into spreadsheet cells in the same way as they enter formulas. When a SQL command for data retrieval is entered into a spreadsheet cell, information is automatically retrieved from the database and placed into the spreadsheet. SQL★Calc also permits users to modify the database - and even create new database tables - directly from the spreadsheet.

SQL★Calc is easy to learn because its menu and command structure are compatible with those of Lotus 1-2-3. And SQL★Calc's ORACLE DBMS requires no supplement: It is vastly more powerful than the database components of 1-2-3, Symphony, Framework, dBase II, dBase III, or any other PC DBMS.

SQL★Calc is available immediately for IBM PC/XTs and ATs for $995.* SQL★Calc will soon be available on a wide variety of systems, including IBM mainframes, DEC, DG, and other superminis, and most UNIX systems.

For further information, or to order your copy of SQL★Calc, call 1-800-345-DBMS. Or write Oracle Corporation, Dept. CS, 20 Davis Drive, Belmont, CA 94002.

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Board speeds PC to run Windows

From page 27

ware developers seeking to integrate graphics input devices such as a mouse, Cooper said.

The mouse is also a handy, but not essential, part of Microsoft Windows, the graphical operating environment that is Microsoft's vision of the future for PC interfaces. Microsoft will bundle its bus mouse, the Inport interface, Windows and the Mach 10 board for $549.

The Inport interface includes a new 40-pin custom integrated circuit and small, 9-pin connector. The board with the new chip will be marketed with the current Microsoft Mouse replacing the logic circuits on the board.

The mouse chip supports not only the bus mouse but also digitizer pads, joy sticks and up to 50K bit/sec. two-way data transfer, Cooper said.

Microsoft will also continue to sell its serial mouse, which is more expensive because of its on-board intelligence, but which also enables a system with no free serial ports to use a mouse.

Though Microsoft is naturally regarded as a software company, sales of the Microsoft mouse have actually accounted for half of the firm's total product unit sales since its introduction three years ago, Cooper said.

"We're not in the hardware business per se, but with Windows and its graphical environment, we want to make sure there is a standard input for a graphical interface," he said.

Paradise Systems, Inc., Verticom, Inc. and Summagraphics Corp. announced they will support the interface in future products, and a Microsoft spokesman said several hardware vendors have indicated they will also support the interface.

In other news, Atari Corp. announced that it reached an agreement with Microsoft to market Microsoft Write for the Atari 520ST and 1040ST computers. Microsoft Write is based on the version of Microsoft Word written for Apple Computer, Inc.'s Macintosh personal computer.

Microsoft also announced Quickbasic, a Basic compiler, and a new C compiler. Both are easier to use and offer faster compilation speeds than previous products, said Robert Dickerson, group product marketing manager for Microsoft's language division.

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Starbase takes laptop to office

From page 27

that Starbase provides people with that ability."

According to Gorgens, the Starbase subsystem line, which starts in price at $1,995, essentially allows the PC Convertible laptop computer to function as a desktop personal computer by exchanging data with desktops and by providing 20M bytes of hard disk storage.

While the PC Convertible contains a 3½-in. floppy disk drive, the desktop IBM PC uses the industry standard 5¼-in. floppy drive. Starbase includes a 5¼-in. floppy that functions as an additional drive for the PC Convertible.

Using standard IBM PC-DOS commands, users can reportedly copy files back and forth between the two drives. This conversion capability will be important for PC Convertible users who do not have a desktop PC, as will the increased storage capacity afforded by the 20M-byte hard disk drive, Gorgens said.

Available next month, the Starbase-II and Starbase-III are each packaged in a box connected to the PC Convertible's expansion port by a 36-in. cable. The $1,995 Starbase-II includes a 5¼-in., 360K-byte floppy drive, a 20M-byte hard disk drive and a parallel printer port. The $2,495 Starbase-III also includes a 40M-byte, ¼-in. cartridge tape drive for backups.

A repackaged version of Starbase-II, called Starbase-I, has no connecting cable and, hence, must fit underneath the PC Convertible. Scheduled to be produced offshore beginning in October, Starbase-I will cost $1,495.

Alloy targets Clusternet

Alloy is targeting its Clusternet multiuser engine at value-added resellers that want to provide high-performance network hardware inexpensively in a small footprint. Because Clusternet can host up to 16 users and several Clusternet units can be linked together, a Clusternet configuration can serve as a cost-effective multiuser alternative to Unix-based supermicrocomputers, Gorgens claimed.

Clusternet runs applications software designed for the IBM PC, Personal Computer XT and Novell, Inc. networks. Novell-compatible file and record locking capabilities are included. Gorgens added that Clusternet's 16-slot, 16-bit bus provides plenty of expansion room for vertical applications such as computer-aided design and manufacturing.

The electronics for Clusternet are all contained in a floor cabinet. Each user is allocated a board containing an 8-MHz Intel 8088-compatible NEC Information Systems, Inc. V20 processor and up to 1M byte of random-access memory (RAM).

A four-user unit, priced at $14,995, includes the central 10-MHz Intel 80286 processor, 4M bytes of RAM, a 190M-byte hard disk drive, a floppy disk drive, a 120M-byte tape drive, two serial and two parallel ports and four terminals. The cost for each additional user is $1,600.

Alloy, which analysts say is strongest in the tape backup business, late last month filed for its first public offering.

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SOFTWARE INTERNATIONAL

masterpiece

Autodesk to rethink policy

From page 27

Autodesk is the maker of highly acclaimed microcomputer-based computer-aided design and manufacturing software. Since introducing Autocad in 1982, the company's installed base has swelled to approximately 50,000.

The company has maintained a policy of recognizing and supporting only those users groups formed and managed by users.

It has also said that dealers are welcome as group members, as long as they do not play an influential role in the group.

Early this month, a company spokeswoman said the policy, which has been evolving over the last few years, is under review.

> ***'I think the Autodesk attitude is self-serving. We're 56 Autocad users who aren't recognized by Autodesk.'***
>
> — Robert Sprowls users group founder

Currently, those groups authorized by Autodesk are placed on a referral list for new users.

The vendor helps new user-organized groups get started by alerting registered users in the group's geographical area.

"I think the Autodesk attitude is self-serving. We're 56 Autocad users who aren't recognized by Autodesk," said Robert Sprowls to Autodesk officials attending the Chicago meeting, regarding the Pittsburgh-based group he founded with a dealer.

Sprowls' comments were supported by many attendees at the users group meeting, who claimed that they have the right to include whomever they want in their groups.

Swell of opposition

As the Autodesk policy was reiterated at the meeting by Sandra Boulton, an Autodesk marketing manager, the swell of opposition rose.

Finally, company President John Walker, who had been quietly sitting in the back of the meeting room, said, "For God's sake, what does it matter if a dealer is in a user group? I would say of the annoying people I've met, only a small percentage have been dealers."

In a series of interviews following the users group meeting, Autocad users said they believe dealer participation in their group is helpful because dealers are often more knowledgeable of the software and also have access to product information before users.

However, Autodesk has said dealer-organized groups can give those dealers an unfair advantage over other dealers.

Sales leads

As a users group contact person, a dealer is, in effect, receiving sales leads when Autodesk refers new users to that group.

David Cohn, an architect with Thorn, Howe, Stratton & Strong, a design firm in Memphis, and a member of the Memphis Autocad User Group, said his group decided to hold meetings on neutral territory after an experience with a dealer that left "bad feelings all around."

According to Cohn, the Memphis group, which is authorized by Autodesk, originally held meetings at various dealerships in that city.

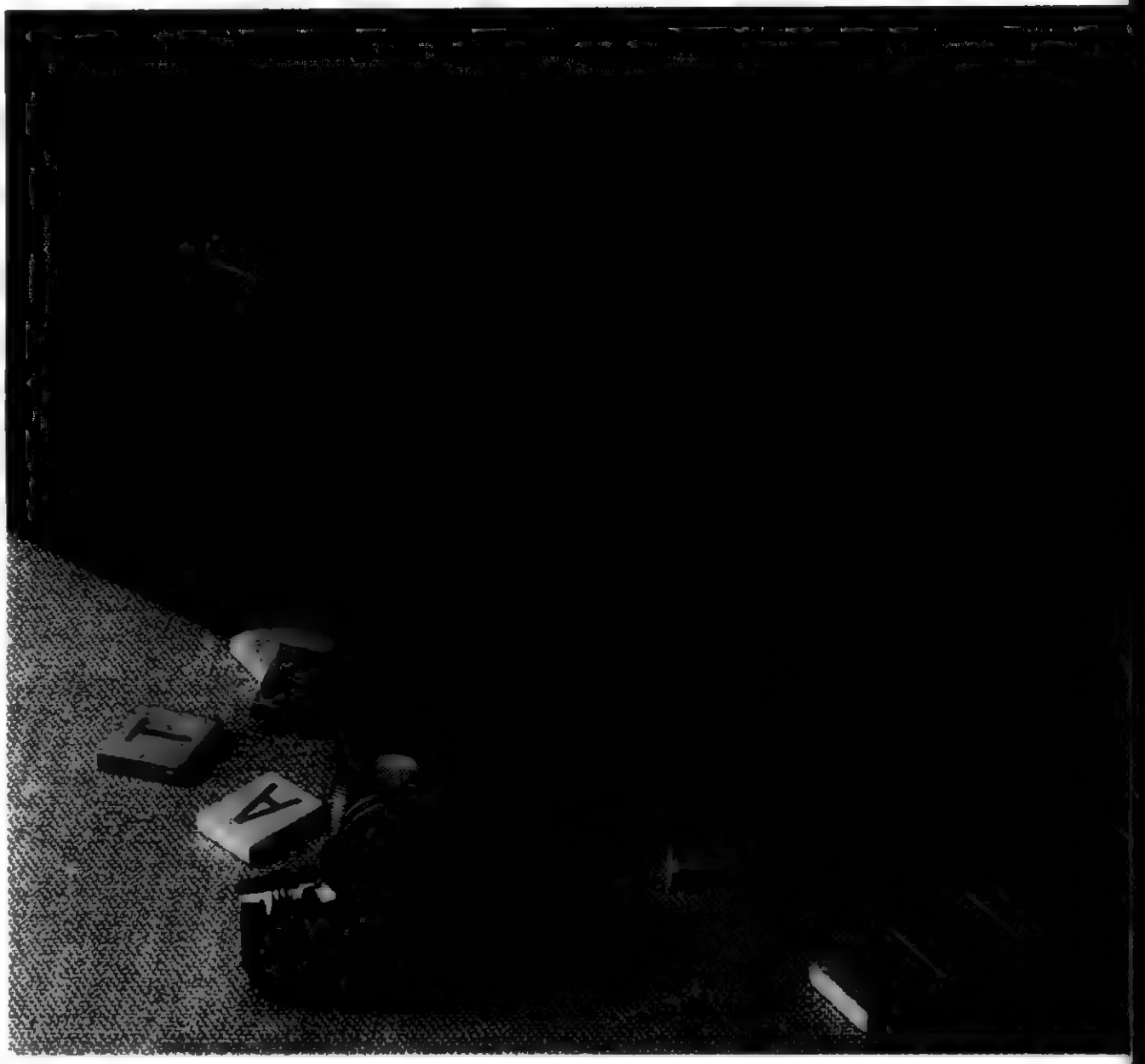
At one meeting, a user presented the idea of the group buying peripheral equipment in bulk by mail order to save money.

"The dealer really took offense, as if we were advocating mail order over dealers. He told us we were not welcome in his store again," Cohn said.

His group does not have any dealers on its board, but Cohn said dealer participation is essential and his group has many dealers as members.

Sprowls' Pittsburgh group is not authorized by the vendor because a local dealer is a cofounder and serves as technical director of the group. In addition, meetings are held at this dealer's site.

"I think it is up to the users how to run the group," Sprowls said. "We want to be recognized and be on their list. We can't get Autodesk people to speak at our group."



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AST-5250/ Async Dialup featuring multiple sessions

Compatibles: Telecat scores

From page 27

order brands like PC's Limited that pioneered low price points. True, they quoted bare-bones system prices without hard disks, monitors and, often, key adapter cards. But they still began driving home to users the evident fact that only bozos would pay IBM's list prices for personal computers.

Even 18 months ago buying a Compaq system was considered risky by many corporate buyers, but things are radically different today. Only the most die-hard believers among the Big Blue faithful are still willing to shuck out up to twice as much as necessary to often get not quite as much.

Buying less-expensive compatibles, adventuresome in early 1985, became acceptable late in that year and is getting downright fashionable today.

My personal computer hardware pick for July is an exciting new IBM PC AT-compatible entry: the Televideo Systems, Inc. Telecat 286. Not only is it from a vendor whose name is familiar to many larger users because of its terminal line, but the machine is priced quite aggressively.

Listing for $2,995 with a 20M-byte hard disk and $3,495 with a 30M-byte disk, the Telecat 286 offers an AT-compatible system for about the price of a PC XT.

These prices, although low compared with IBM or Compaq, may not seem all that aggressive compared with those of the mail-order vendors who now list AT-compatible systems as low as $1,495. The mail-order vendors quoting these prices, however, are listing a configuration without a hard disk, display adapter or monitor.

The Telecat 286 configurations include the hard disk, a Televideo monochrome monitor with a 640- by 400-pixel high-resolution graphics capability and a display adapter that supports standard IBM color and monochrome graphics, the high-resolution monochrome capabilities of the system monitor (including a 16-value gray-scale mode) and an extended 16-color mode for standard color monitors.

With these capabilities, the Telecat 286 at list price looks quite competitive even with the mail-order systems from lesser known brand names, which are priced only slightly lower for comparable configurations.

Unfortunately, the extended graphics modes are compatible with neither IBM Enhanced Graphics Adapter (for color) nor Hercules Computer Technology, Inc. (for monochrome). This rather limits their utility since they are unlikely to be supported by most software vendors.

However, users with special applications willing to write their own software may find the enhanced graphics modes a plus.

For the rest of us, the Telecat 286's standard display card's compatibility with the IBM monochrome and GCA Corp. adapters will be sufficient.

Comfortable keyboard

The keyboard is comfortable and is laid out like the original AT keyboard but with LED indicator lights on the Caps Lock, Num Lock, and Scroll Lock keys.

Not surprisingly, given Televideo's long experience in the terminals business, the display is comfortable, easy to read and quite impressive when the high-resolution monochrome capabilities are utilized.

Documentation is solid, although sometimes less clear than a beginner would like, especially as far as system setup goes.

The Telecat 286 achieves a relatively small footprint (compared with the PC AT) partly by mounting the system board in a removable tray at the bottom of the system. This, while an advantage should the system board need replacement, is rather an inconvenience in ordinary use.

All things considered, however, the Telecat 286 definitely gets my recommendation as an alternative to the IBM PC AT worthy of serious consideration by corporate users.

It is not only much less expensive and supported by a well-known vendor, but like many other compatibles capable of running at 8 MHz, it easily outperforms the standard AT as well. I suspect we will be seeing quite a few of them on the desks of corporate America.





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COMMUNICATIONS

DATA STREAM
Walter Ulrich

Networks for crisis coping

Many companies' communications facilities are inadequately equipped to handle the sudden increase in demand that often happens during a crisis. A business crisis, such as unwelcome attention from T. Boone Pickens, greatly increases the level of executive communication. A physical disaster, such as a flood or fire, can destroy vital records and interrupt operations to the point where a company is forced to go out of business.

Corporate communications networks are designed to support business activity at its normal rate. Insufficient communications setups can frustrate the company's attempts to deal with a crisis. No computer or communications manager wants his department to add to the chaos instead of improving the situation.

In today's on-line environment, restoring processing power and peripherals alone is not enough. Communications facilities must be restored in the computer room *and* the user community.

In the same way the MIS director prepares a disaster recovery plan, the communications manager must prepare a crisis control program that will enable him to respond effectively to crises. This program has three essential elements:

Introduce new communications technologies. They will then be available in an emergency. Once these technologies have been installed, a plan

See NETWORKS page 37

Ulrich is president of Houston-based management and technology consulting firm Walter Ulrich Consulting.

Broadband networks unite

Ethernet-MAP coexistence offered by Bridge, Chipcom

By Elizabeth Horwitt

Products recently unveiled by Bridge Communications, Inc. and Chipcom Corp. enable an Ethernet local-area network (LAN) to be implemented concurrently with other LANs on broadband cable, company spokesmen claimed.

The offerings will be attractive to medium and large companies — "people who have recognized that one network solution will not fit all their needs," said Harvey Freeman, vice-president of Minneapolis network consulting company Architecture Technology Corp. "I look for broadband to become the favored medium to tie everything together."

The Ethermodem Remodulator from Chipcom eliminates signal interference problems that sometimes occur when users implement a 10M bit/sec. Ethernet system, such as Chipcom's own Ethermodem, on a broadband cable that already supports other networks, Chipcom President Daniel Presser said.

Many of Chipcom's customers initially installed broadband to support a video surveillance system, a Sytek, Inc. terminal-to-host network or a factory network conforming to the Manufacturing Automation Protocol (MAP), he added.

MAP, from General Motors Corp., defines a token bus network that "takes up three channels, which are prime real estate on the broadband cable," Presser said. Chipcom's 8023HE Ethermodem Remodulator enables MAP and 10M bit/sec. Ethernet to coexist in adjacent channels without generating interference, he added.

See BROADBAND page 38

Software vendors see light in Sun system

Recent offerings facilitate multivendor file exchange

By Rosemary Hamilton

Two communications software vendors recently jumped on the bandwagon of Sun Microsystems, Inc.'s Network File System (NFS), which, until now, has been licensed primarily by hardware vendors.

NFS software allows users on multivendor systems to exchange files transparently across a local-area network.

Multiplex/NFS, recently released software from Network Innovations Corp. of Cupertino, Calif., allows IBM Personal Computer users to pull data from Unix data bases on a Sun host and incorporate it into files generated by popular PC software such as Lotus Development Corp.'s 1-2-3.

Residing on a Sun Microsystems host, Multiplex/NFS works in conjunction with

See VENDORS page 39

Vitalink speeds up LAN bridge

By Stanley Gibson

MOUNTAIN VIEW, Calif. — Vitalink Communications Corp. recently announced Translan III, a bridge product that enables users to connect two Ethernet local-area networks (LANs) over terrestrial or satellite-based lines at rates of up to 2M bit/sec. Like Vitalink's earlier Translan II , Translan III operates at the data-link layer of the seven-layer International Standards Organization (ISO) model, enabling it to support a range of higher-level ISO protocols such as Decnet, Transmission Control Protocol/Internet Protocol (TCP/IP) and XNS.

"We're trying to take the geography out of the context of local-area networks," said Vitalink spokesman Paul Schaller. Translan III enables users on one Ethernet or IEEE 802.3-compatible LAN to communicate with users on a remote LAN as if all were located on the same local-area network, he explained.

See FASTER page 39

NEW THIS WEEK

- Votan offers voice mail system with recognition capability
- For more on this and other new products, see pp. 91-102.

INSTANT ANALYSIS

"Centrex users are currently wondering how long they can put their telecommunications facilities in limbo. Telephone companies are offering a Band-Aid solution to their networking needs in the form of analog Centrex enhancements, and they don't know what the future holds in terms of digital services."

— John Powers, vice-president, strategic services, Telecom Management Corp.

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Networks for crisis control

From page 33

should be prepared for using them effectively during a crisis.

Speeding communications

Several existing communications technologies speed communications during an emergency. Paging systems make it possible to reach people quickly, even when they are away from both home and office. Mobile radio helps people communicate while traveling to crisis management meetings.

Electronic mail greatly enhances an executive's ability to obtain vital information, and voice mail enables managers on the road to call in for information using a Touch-Tone telephone.

Videoconferencing can bring people together over long distances on short notice.

Here is one case of how

> ***Several existing communications technologies — paging systems, mobile radio, electronic and voice mail, videoconferencing — speed communications during an emergency.***

the right communications technology helped out during a crisis. When the space shuttle *Challenger* exploded, millions of schoolchildren were watching, including students in the Houston Independent School District (HISD).

The HISD is one of the largest school districts in the country, with 233 schools covering 312 square miles and educating 193,000 pupils.

The shuttle disaster created an immediate need to deal with the children's anxiety. HISD school officials and psychologists went into a quick huddle and prepared detailed instructions for all the Houston school district principals.

Thanks to an innovative electronic mail system in place at HISD, those instructions were in the principals' hands two hours after the shuttle disaster occurred.

Increase capacity of communications facilities. Arrangements to secure communications services for peak periods must be made in advance. Network hardware must have the capacity to handle additional communications ports. Sources of immediate supply for additional modems must be kept current.

Planning is simplified by the availability of on-demand network services available from value-added network suppliers, telephone companies and other carriers.

Subscriber agreements should be negotiated and plans made to bring services on-line during an emergency.

Set up alternative facilities. The configuration and backup of the network control center is of primary importance, as alternate routing across the network can provide needed redundancy. Standby public network agreements add further flexibility. Contingency plans for communications setups must be prepared and put in writing.

Revenue losses

A major U.S. company that is heavily dependent on voice communications sustained heavy revenue losses a few years ago. The common-carrier-supplied main trunk to its headquarters ran across a stream on a vehicular bridge.

When the bridge was washed out, the company was out of business for a day. Alternate communications would have meant rapid recovery.

Backup facilities would have protected the revenue base for the company and maintained vital services for its customers.

The communications crisis control program is the key to preparing for future problems. Preparations and expenditures must be made carefully and conservatively. Investments in equipment must be minimized.

The program is one more job for the already overburdened communications manager. It is also a critical priority — the company's survival may one day depend on it.



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Concord Data Systems

Broadband nets unite

From page 33

"The need for high-speed, peer-to-peer communications is what usually drives users to install Ethernet," Presser noted.

Approximately 70% of Chipcom's customers are firms that have Digital Equipment Corp. installations and want to implement the vendor's Ethernet-compatible communications system, Decnet, he said.

Du Pont Co.'s Sabine River Works facility in Texas is in the process of installing the remodulator in order to solve interference problems generated by a Chipcom Ethernet network and a variety of other networks sharing the same broadband cable.

In the last eight years, the site has implemented a video surveillance network, several dedicated links between computers and Sytek's Localnet 20 on the cable.

Localnet 20 links a variety of computers and terminals from Hewlett-Packard Co., IBM and DEC, according to Du Pont senior engineer Randolph Knipp.

High-speed LAN needed

Approximately one year ago, the Sabine River facility decided it needed a high-speed LAN to link process monitoring and control machines to a technical center where computers perform statistical analysis and optimization.

Because the equipment is predominantly DEC's, Knipp's group chose to implement Decnet communications software on top of Chipcom's Ethermodem.

The initial test implementation worked well, but as soon as a Sytek System 2000 was implemented on the cable, interference problems surfaced.

"It was like two broadcasting stations trying to use the same channel," Knipp said. "We are convinced the remodulator will solve this problem."

Because Bridge's broadband Ethernet runs at 5M bit/sec. rather than 10M bit/sec., users should have no problem implementing it on the same cable as a MAP network, Bridge President William Carrico said.

The Bridge family of broad band Ethernet products supports multiple communications protocols, including the Transmission Control Protocol/Internet Protocol (TCP/IP), the company claimed. The products include the following:

- The communications server CS/1B links eight to 32 hosts, terminals and other devices to a 5M bit/sec. broadband Ethernet network that supports TCP/IP.

The 32-port version is priced at $15,600.

- The multiport bridge MB/1 is an eight-port bridge that enables Bridge and non-Bridge Ethernet products supporting TCP/IP to communicate with devices on the broadband Ethernet. For example, VAX minicomputers can communicate with devices on the network via a Unibus TCP/IP Ethernet controller from Excelan, Inc. The MB/1 enables multiple Ethernet LANs running on other media to be connected via a broadband backbone. The bridge is priced at $10,500.
- The channel remodulator CR/5 resides at the cable head end and performs packet regeneration, frequency translation and collision detection. The product is priced at $5,000.
- The radio frequency modem RFM/5 interfaces Bridge LAN servers with broadband cable. Its price is $795.

"What we're announcing is a complete broadband product line," Carrico said. The broadband interface supports the company's full line of Ethernet products, he added.

"We also bring to the party intelligent head ends and modems that automatically compensate for temperature changes, adding or subtracting of workstations and other changes that broadband cable is susceptible to. We're aiming at Ungermann-Bass, Inc., which also offers a 5M bit/sec. broadband Ethernet," Carrico said.

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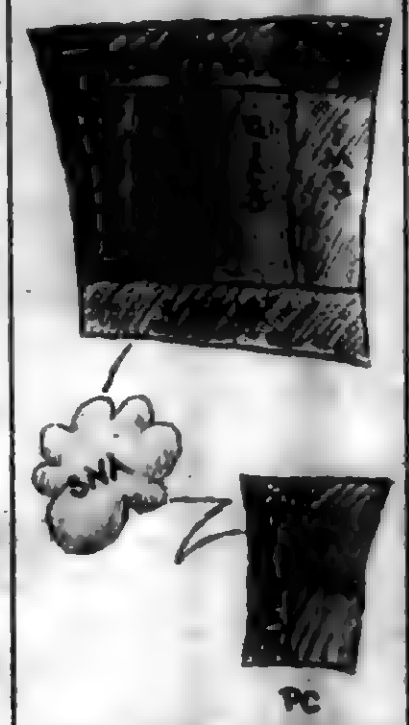
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As a subsystem, Arbiter is fully compatible with RACF and other popular security software. It also feeds data into IBM's SMF—data you can use to tune Arbiter. Or use for network capacity planning, usage accounting and auditing.

Faster LAN bridge out

From page 33

Translan III complies with the European T1 2.048M bit/sec. transmission rate and can also support the U.S. 1.54M bit/sec. rate, Schaller said. Translan II sends at 448K bit/sec.

Translan III operates independently of higher level communications software, because it functions on the data-link layer of the Open Systems Interconnect model, Schaller pointed out.

Vitalink's Translan products were codeveloped with Digital Equipment Corp. and are similar to DEC's Lanbridge 100. While Lanbridge consists of one box that connects two Ethernets at one point, Translan installs an interface on each cable, and it connects the interfaces over a long-distance, high-speed medium.

In satellite-based networks, the frame-address properties of Ethernet dictate that only the earth station to which the communication is addressed will actually receive that data. In this way, the network performs as a "distributed switch," Schaller said.

nect LANs via several parallel circuits. This feature is valuable because of the redundancy offered in case of line failure, Schaller said.

The parallel-line feature can also provide load leveling or routing of calls to the line with the greatest available capacity, he added.

The product consists of a rack-mounted box with several ports: one for an Ethernet connection; four V.35 ports for digital circuits; one console port; and a printer port.

Vitalink also announced new software that will permit Translan II to communicate with Translan III.

Vendors use Sun system

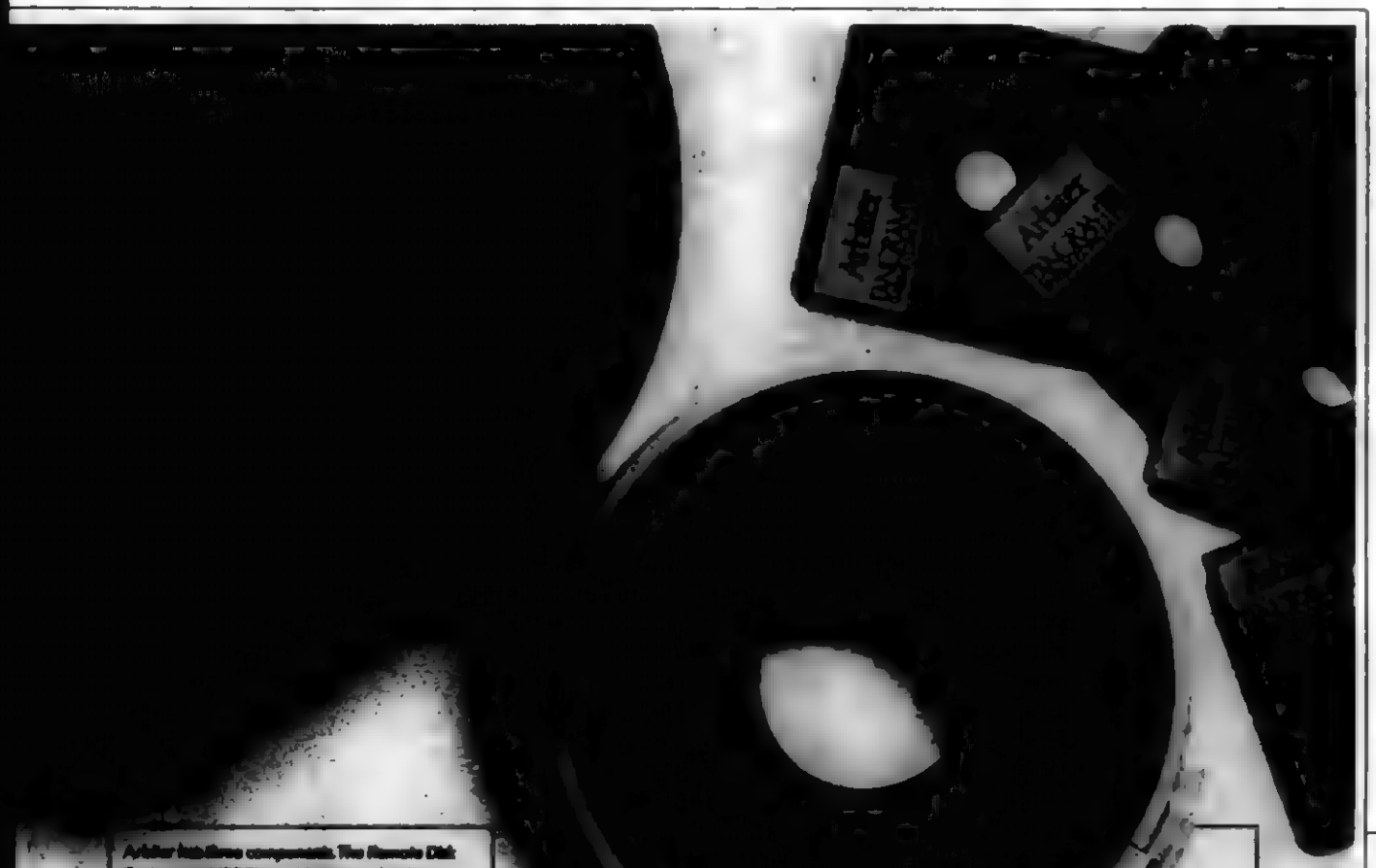
From page 33

PC-NFS, Sun's recently introduced version of NFS for the IBM Personal Computer and compatibles.

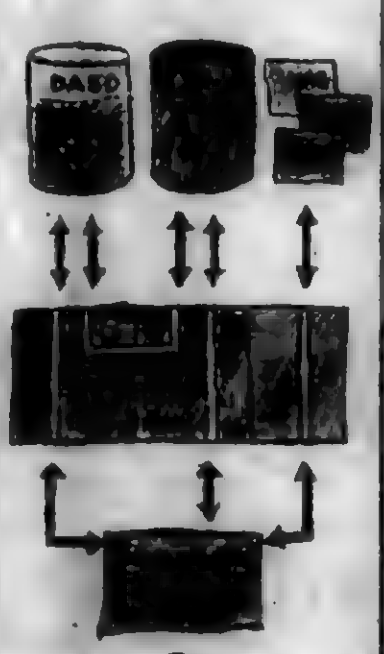
The Multiplex portion of the product provides the data extraction and automatic reformatting capability. The NFS portion provides the communications link and allows for the transparent sharing of these files, Multiplex President James Groff said. The company has been marketing Multiplex to run on a variety of local-area networks. The NFS version, priced at $1,195 for a single copy, will be available within 60 days of order.

The Wollongong Group of Palo Alto, Calif., will market an NFS option for its Wollongong Integrated Networking/VAX (WIN/VX) software. WIN/VX is an implementation of the Transmission Control Protocol/Internet Protocol communications software running under Digital Equipment Corp.'s VMS operating system. The NFS option will enable users of VAX/VMS systems to communicate with any other system supporting NFS.

The NFS option for WIN/VX is scheduled for shipment in October. It will sell for $5,000 in single quantity for the VAX version and $2,500 in single quantity for the Microvax version.



Arbiter has three components. The Remote Disk Environment (RDE) provides a seamless interface to remote disks on the host, which may be accessed by PC users or host application programs. The External File Interface (EFI) transfers data to and from files on the host and the remote disks. The Interactive Session Relay (ISR) allows "power users" to connect a PC to another mainframe subsystem—for example, TSO or CICS—without disconnecting from Arbiter.



Arbiter not only gives the data center more control over the micro/mainframe environment, it increases the ease with which PC users can access mainframe data. Instead of time-consuming file transfers and data reformatting, Arbiter allows the PC user to access corporate data via remote disks—already formatted for Lotus 1-2-3,* dBase II or III,* or other popular software. Remote disks are accessed exactly like the A, B or C disks attached to the PC.

Arbiter enables your information center to extract data from any host-formatted file structure (e.g., IMS or VSAM) using its existing tools—whether they're COBOL, Pascal, PL/I, SAS* or FOCUS.* That data is delivered onto the remote disks in standard PC formats like DIF, WKS and CSV.

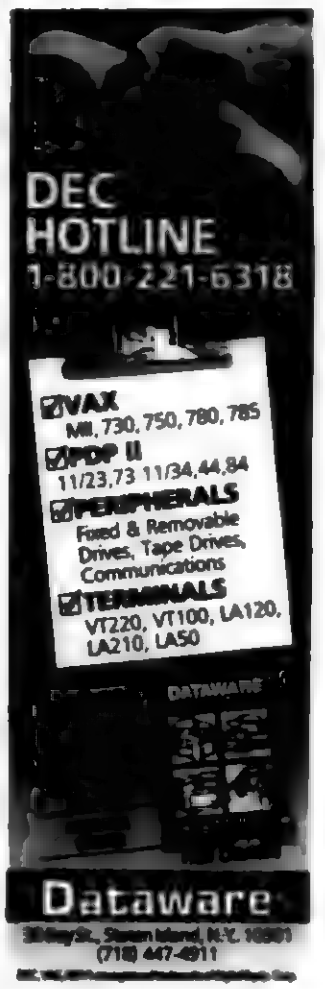
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SYSTEMS & PERIPHERALS

HARD TALK
Donna Raimondi

The great tape debate rages

Allegations that chromium dioxide cartridge data tapes may not be suitable for archival storage are drawing heated reactions from chromium dioxide's developer and from IBM, one of its major users.

Last month in this column, *Computerworld* aired the opinions of physicist William Manly, a consultant to the magnetic recording industry [CW, June 9]. Manly claimed that chromium dioxide-based tapes — such as the ones used by IBM in its 3480 cartridge tape system — are potentially toxic and short-lived.

Du Pont Co., the inventor and major marketer of the chromium dioxide magnetic particles used on the tapes, and IBM, which uses its own formulation of the material in its 3480 magnetic tape subsystems, take strong exception to Manly's views.

Manly, of HMI Consulting in Arlington, Texas, based his claims on his more than 20 years of experience with tape technology, including research work at tape manufacturer Ampex Corp. He stated that chromium dioxide degrades in the presence of moisture and oxygen to form chromium hexavelent compounds that are highly poisonous.

He further said that the tapes based on chromium dioxide have not been sufficiently tested to determine if they will last long enough to be useful for archival storage.

"Long-term testing has verified that our formulation of materials and manufacturing processes has produced a data processing tape product

See GREAT page 46

Raimondi is a Computerworld senior writer.

GE offers data base system

Office package combines GEscan and Microvax II

By James Connolly

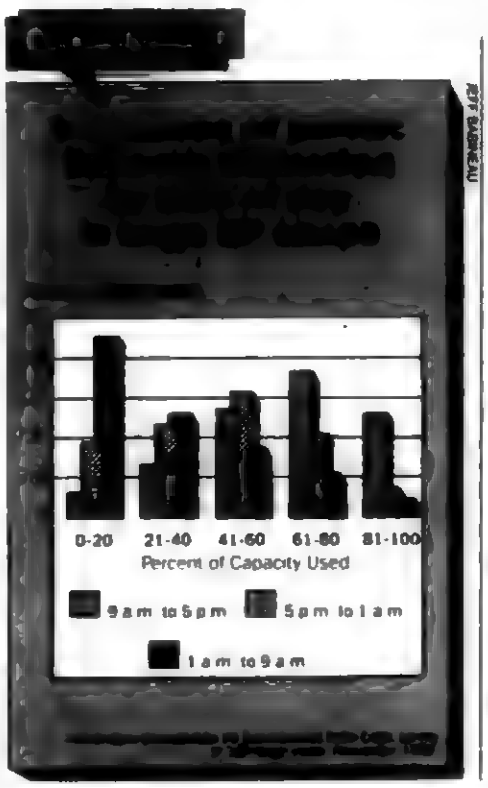
RALEIGH, N.C. — Seeking to expand its market from the federal government arena into the corporate world, General Electric Co.'s Silicon Systems Technology Department has announced a turnkey data base system.

GEfile includes GE's GEscan hardware and software sequential search and retrieval data base system as well as a Digital Equipment Corp. Microvax II minicomputer. The GEscan elements have been available previously through GE's Aerospace Division, which had sold 35 of the systems to the federal government. The earlier GEscan systems were integrated by the customers with larger DEC VAX superminicomputers.

"What we have recognized is that over the past couple of years in the government applications, the application there is not unique to government . . . but has broad commercial application. So in transferring the GEscan group down into the semiconductor business division, there is a commitment to take the GEscan product to commercial markets, as well as introduce specially configured products that meet specific applications and commercial markets," said Bill Geiger, manager of GEscan marketing.

While GEscan has been used by the government primarily in defense and intelligence applications, GE says it is useful for maintaining text data bases in fields such as the legal profession, sales and engineering, according to David Morris, manager of GEscan products. Target customers include organizations that have no access to mainframe data base management systems

See GE page 44



Priam unveils RT PC drives

By James Connolly

SAN JOSE, Calif. — With claims of price advantages over comparable IBM products, Priam Corp. has introduced a series of 5¼-in. Winchester disk drives designed for use with the IBM RT Personal Computer workstation.

Priam officials claimed its Innerspace family of add-in disk drives and Storagespace ED series of external drives provide capacities comparable to IBM disk drives, which cost up to twice as much. Each model is available with a controller that allows addition of a third disk drive to the RT PC.

The Innerspace 43M-byte and 62M-byte drives were designed for use with the floor-standing RT PC Models 20 and 25. The add-in kits cost $1,398 and $1,798 for the 43M- and 62M-byte versions.

The Storagespace ED drives were designed to fit beside the desktop RT PC Model 10. Prices range from $1,995 to $2,395.

INSIDE

CIE Systems offers an IBM-compatible color terminal/43

Tandem Computers unveils a 1,600 line/min printer designed for high reliability/43

Integrated Solutions adds Motorola 68020 and Unix-based nodes for heavy computational loads/44

NEW THIS WEEK

- Seikosha offers monocolor-to-color printer
- Laserlink announces add-on board for Canon laser printer

For more on these and other new products, see pp. 91-102.

INSTANT ANALYSIS

"If iron oxide tapes will last 30 years, so will chromium dioxide tapes."

— Robert Baer, Du Pont Co., on questions about the durability and safety of chromium dioxide tapes

Manufacturer pushes system to capacity and beyond

Upgrade not always preferable way to grow

By Rosemary Hamilton

PINE HILL, Ala. — Instead of trying something new, Jim Bonner, director of information services at MacMillan Bloedel, Inc., says he believes in maximizing the potential of what he has.

A Hewlett-Packard Co. user for five years, Bonner has tentative plans to upgrade his system later this year. However, he says he will not consider a move to the vendor's highly touted reduced instruction set computer (RISC) systems because his conventional HP 3000 minicomputer has adequately served his company's information needs.

Bonner says there is a 70% to 80% chance that by year's end his company will purchase a traditional architecture HP 3000 Series 70, a system announced earlier this year with the debut of the RISC systems, formally known as the HP Precision Architecture computers.

The Series 70 was offered as an upgrade to the HP 3000 Series 68. It is said to offer 30% more performance than the Series 68 and costs $30,000 as a field upgrade.

"We're very interested in the RISC systems and have enough confidence in HP to believe that what it's selling will work," says Bonner, whose firm is the U.S. subsidiary of MacMillan Bloedel, Ltd., a Canadian producer of lumber and paper. "But our business is in a constant state of generating information. I don't have an adequate plan should we get behind. So I wouldn't bring in a solution until it's proved itself in the marketplace."

Furthermore, Bonner says, his department has been able to expand the capabilities of the HP 3000 beyond its traditional use as a business computer by adding proprietary applications for the production processes, the heart of MacMillan Bloedel's business.

The U.S. operation is made up of the Pine Hill headquarters, a sales office in Atlanta and 15 plants along the East Coast. Bonner estimates that the company produces 65 million feet of structural grade lumber, 135 million square feet of plywood, 430,000 tons of liner board and 210,000 of corrugating board each year.

MacMillan Bloedel now uses two HP 3000s. A Series 68 with 5M bytes of main memory is used for office applications, and a smaller Series 40 with 1M byte of memory is used to manage the company's production processes.

Approximately 40 HP Touchscreen Personal Computers and 68 HP terminals are located throughout the U.S. offices and linked to the minicomputers via the HP Distributed Systems Network link.

The centerpiece of this system is the HP Image data base management system, Bonner says. MacMillan Bloedel uses in-house applications to interface with Image for both the administrative and production sides of the business. As a result, production data on such items as raw material are immediately available to sales personnel.

See MANUFACTURER page 44

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CIE Systems terminal out

Said to offer color, improved resolution

By James Connolly

IRVINE, Calif. — CIE Systems, Inc. has introduced a color terminal that reportedly is plug compatible with IBM's 3179 and 3279 terminals and that provides a 25% improvement in screen resolution.

CIE Systems, a subsidiary of C. Itoh Electronics, Inc., claimed that the CIE 7900 Executive Color Terminal improves text readability through use of a .28-mm dot pitch.

It also uses a 122-key keyboard for 3179 compatibility or an 87-key keyboard for 3279 compatibility.

Function as monochrome terminal

In addition, the company claimed the terminal can function as an IBM 3178 or 3278 monochrome terminal in a coaxial environment or as a Digital Equipment Corp. VT100 in an RS-232 asynchronous environment.

The terminal, which was announced at the 1986 National Computer Conference, costs $1,695.

CIE Systems also has announced that its Laser Optical Filing System (LOFS) will now be distributed through vertical market resellers, as well as through existing private-label channels in the general office industry.

LOFS, introduced in the U.S. in November 1985, is an optical filing system that the company claims will replace paper-based filing systems that require repeated access to information.

Officials of CIE Systems said that more than 25 of the LOFS systems manufactured by Hitachi, Ltd. are now installed in the U.S., and several hundred systems have been installed in Japan.

The system reportedly relies on data and image compression techniques to store digital images of up to 60,000 letter-size documents on a single 12-in. optical disk.

The single-unit, end-user price is $125,000.

Tandem Computers line matrix printer targets high throughput environments

By James Connolly

CUPERTINO, Calif.— Tandem Computers, Inc. last week added to its line matrix printer family with a printer designed for use in environments requiring high throughput and high reliability.

The 5518 line matrix printer reportedly prints at 1,200 line/min using standard fonts and at 1,600 line/min using an optional high-speed font.

The company said that the printer's reliability is improved because of the mechanism's small number of moving parts. The printer reportedly requires no scheduled maintenance. Microprocessor controls are said to isolate most failures at the board level, according to Tandem officials.

"Through the use of advanced line matrix technology, we are offering our users a high-performance printer that combines versatility with high speed and high throughput. This technology provides a degree of reliability that complements Tandem's Nonstop computer systems," said Lawrence A. Laurich, vice-president of engineering for Tandem.

Existing members of the line matrix printer family are the 300 line/min 5515 and the 600 line/min 5515.

The 5518 costs $32,000.

Portable terminal ties to IBM minis

By James Connolly

LAGUNA HILLS, Calif. — Informer Computer Terminals, Inc. recently introduced a 14-lb portable terminal and a controller for use with IBM System/34, 36 and 38 minicomputers.

The System 300 Subsystem includes the Informer 251 terminal and the Informer 291 twinaxial remote terminal controller. The products provide all IBM 5251 and 5291 functions, including status line, field separation and keyboard emulation.

"The unique advantage offered by the Informer System 300 is its ability to connect remote users via standard public phone lines," company President Lars Persson said. He said the terminal is particularly suited for users who travel and need access to their company's central data base.

According to the vendor, users can support up to seven Informer 251 terminals to the Informer 291 through RS-232 lines or through an integral modem contained within the Informer 251.

The terminal costs $2,190, and the controller costs $2,545.

CORRECTIONS

The Tandem Computers, Inc. Nonstop VLX system [CW, April 21] can grow from a four-processor base in single-processor increments up to a maximum of 16 processors in a system.



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Unix-based nodes unveiled

By James Connolly

SAN JOSE, Calif. — Integrated Solutions, Inc., a subsidiary of NBI, Inc., has introduced two Unix-based nodes designed for users who run heavy computational loads without graphics.

The cluster compute node and the diskless compute node are based on the Motorola, Inc. 68020 microprocessor and VMEbus and the Integrated Solutions TRFS extension of University of California at Berkeley Unix 4.2.

According to an Integrated Solutions official, the cluster compute node was designed to overcome the limited peripheral access of Ethernet.

The cluster compute node utilizes a 20M bit/sec. backplane for internetwork communications as well as private buses for accessing 4M bytes of memory.

It is priced at $5,900.

Field-installable

The company spokesman said the clusters are field-installable into existing Integrated Solutions Optimum V systems.

The diskless compute node is reportedly priced at $6,900 and is packaged in an eight-slot desktop enclosure.

It is said to feature four VME-expansion slots, 4M bytes of memory and an Ethernet controller.

GE releases office data base system

From page 41

and want data base systems that can be installed in an office.

Morris said GEfile is available in three configurations, each being built around GEscan and the Microvax. The GEscan system reportedly handles searches in a background manner, freeing the Microvax to handle other queries or general data processing. The GEscan connects to the Microvax's Q-bus via a direct-memory access interface card.

GEfile 1200 is the base system and includes a Microvax with 2M bytes of memory, a 120M-byte disk drive and a T3 version of GEscan. The T3 version includes a backplane and a T3 board with three text array processors. The GEfile 1200 was designed to store up to 50,000 pages of text and costs $64,900.

GEfile 3300 includes a Microvax with 5M bytes of memory, a 330M-byte disk drive and two three-processor boards. It costs $79,000.

GEfile 6600 was designed to handle 500,000 pages of text and includes 9M bytes of memory in a Microvax, 660M bytes of disk storage and a T12 version of GEscan with four three-processor boards. It costs $98,000.

Morris said GE provides users with the object code for GEscan, which includes the ability to build a data base. It also includes features such as query, audit trail, print, a thesaurus and what Morris called "current answer." The current answer feature, he said, allows a user to be notified when files are updated with data relevant to an earlier query.

Query options include a menu, a command-driven language and a single-time find, in which a user types in descriptions of the needed data. Morris said GEfile can handle queries of up to 3,000 characters, whether in a single query or multiple queries. Multiple queries are processed in parallel, he added.

Morris claimed that the system will search as fast as it takes to get information off the disk and that the system will display the first answers it gets from the data base even while searching for more query matches.

Manufacturer pushes capacity

From page 41

Bonner says the company has developed its own software for two reasons. On the administrative side, some of the software has come from the parent company, where Bonner said there is a policy that their business is unique enough to warrant customized applications.

On the production side, Bonner says he could not find off-the-shelf applications for less than what it would cost to develop them in-house.

Originally leased IBM systems

The company originally chose HP in 1980 after using a number of different IBM systems on a lease basis, including the 360 Model 20 and the Series/1. At that time, the company operated in a batch environment. The same raw material data that can now be transmitted to the sales office immediately once took anywhere from 24 to 48 hours to process.

When MacMillan Bloedel decided to move from a batch environment, it wanted to purchase an IBM system. It chose the System/38 but then discovered it would have to wait a year for delivery, Bonner says. "We just didn't feel we could wait 12 months for IBM," he adds.

In addition to offering "terminal orientation and a good data management system," HP was one of the few vendors that could offer an adequate service contract, Bonner says. "We're about 100 miles from the closest city, and we found many companies couldn't fulfill our service requirements."

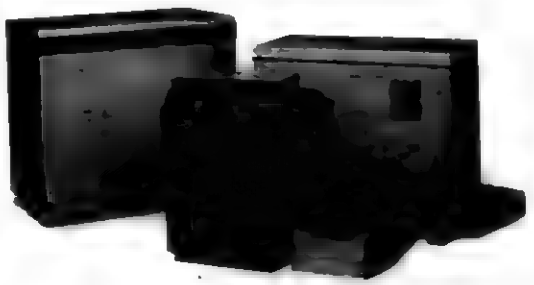
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The great tape debate rages

From page 41

that is highly reliable," IBM responded in a formal statement. "The chromium dioxide tapes are suitable for archival storage and safe for handling and use by our customers," the statement continues.

Du Pont's Dr. Bruce Karrh, vice-president of safety, health and environmental affairs, says, "About the only way you could be exposed to an unacceptable amount of chromium dioxide is in the manufacturing process."

Tapes that use chromium dioxide can be disposed of in the same manner as any other tape, he says about Manly's assertion that chromium dioxide tapes would have to be disposed of as a toxic waste, in a government-approved fashion.



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Allegations unfounded

Manly's allegations are misleading and unfounded, the IBM statement says. "The magnetic particles in chromium dioxide-based tapes are fully encapsulated in an inert, nontoxic polymeric binder system."

IBM says that there is little likelihood of any dangerous degradation of the tapes in normal handling, and that both Du Pont and IBM tests show that the material meets U.S. Environmental Protection Agency requirements.

As for the longevity of the tape, Du Pont's Robert Baer, marketing manager for chromium dioxide, says there is no reason to believe that the tapes will last fewer years than the competing iron oxide-based reel tapes.

Du Pont performed aging studies with chromium dioxide-based tapes that indicate long life spans. "We believe that if the data center follows the tape manufacturer's recommendations, the chromium dioxide tapes will be absolutely functional for a long time. If iron oxide tapes will last 30 years, so will chromium dioxide tapes."

Temperature, humidity tests

The Du Pont aging studies consist of placing pieces of magnetic tape in a magnetometer and subjecting the tape to 65°C temperature and 50% humidity conditions for various periods of time.

Seven days in the magnetometer correlates well with real-life conditions to the tape's magnetic flux over a one-year period, Baer says.

It is the tape's magnetic flux that is being measured.

> ***'About the only way you could be exposed to an unacceptable amount of chromium dioxide is in the manufacturing process.'***
>
> — Dr. Bruce Karrh
> Du Pont Co.

First-year loss

"Most of the magnetic flux loss that you will encounter occurs in the first year, and then to a much more limited extent in the second and third years. Beyond that, there is little change in magnetic flux character in all the chromium dioxide tapes we have ever examined — both tapes that we made and other people's," Baer says.

Typically, 10% to 20% of the magnetic flux demagnetizes over the first two years, but this does not mean that 10% to 20% of the data written to the tape degrades.

It means that 10% to 20% of the surface of each of the many billions of magnetic bars on a section of tape converts from magnetic to nonmagnetic types of chromium.

Baer says that tape product designers build their hardware around the minimum flux that remains after the 10% to 20% degradation.

'Long-term stability'

"Results of tests clearly prove the long-term stability of the recorded signal," IBM says.

"As a matter of fact, IBM has provided a five-year product warranty on all 3480 chromium dioxide cartridges ever since we introduced the product," the IBM statement continues.

IBM started shipping the product early in 1985, but the company has been buying the chromium dioxide particles from Du Pont for at least six years, according to Du Pont's Baer.

Performance requests

Manly urged readers to ask their tape manufacturers for iron oxide-based tapes with performance equivalent to the chromium dioxide. He stated that manufacturers could supply the tape if customers asked for it.

But Baer says he doubts that one can get chromium dioxide performance out of iron oxide tapes. Iron oxide particles, used in reel tapes for many years, are not suitable for IBM 3480 cartridge tape, because they do not fit the system's high density requirements.

"The old iron oxide just will not work," he says.

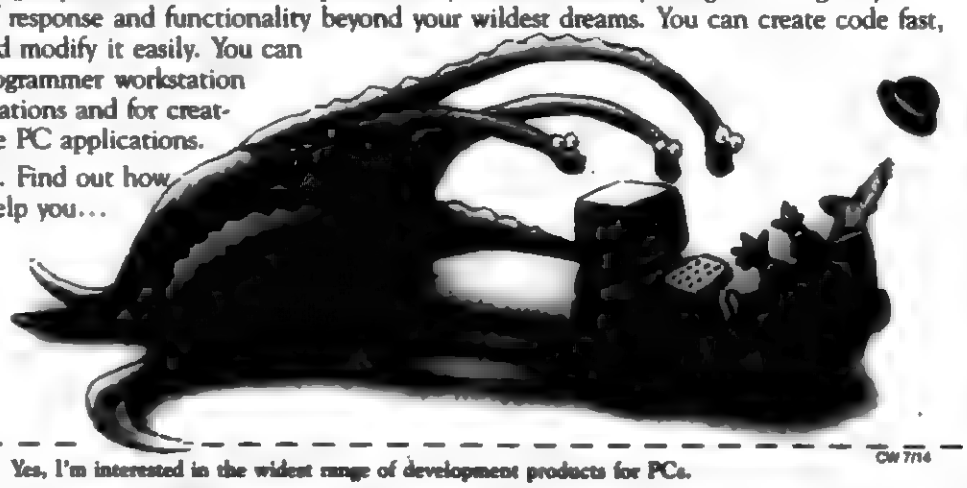
There is a new iron oxide formula, but it has not been on the market long enough to determine if it is useful for cartridge tapes, according to Baer.

"The difference between the old iron oxide and the new one, that could possibly work with 3480 technology, is that the new one is doped with cobalt," he says. "We have tested cobalt tapes, but we don't know yet if they would work satisfactorily in a 3480-type environment."

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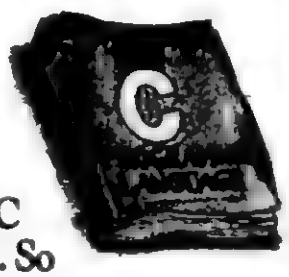


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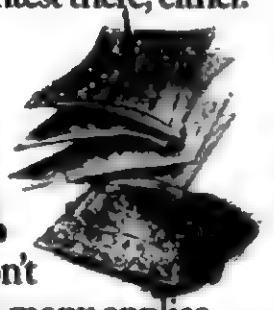
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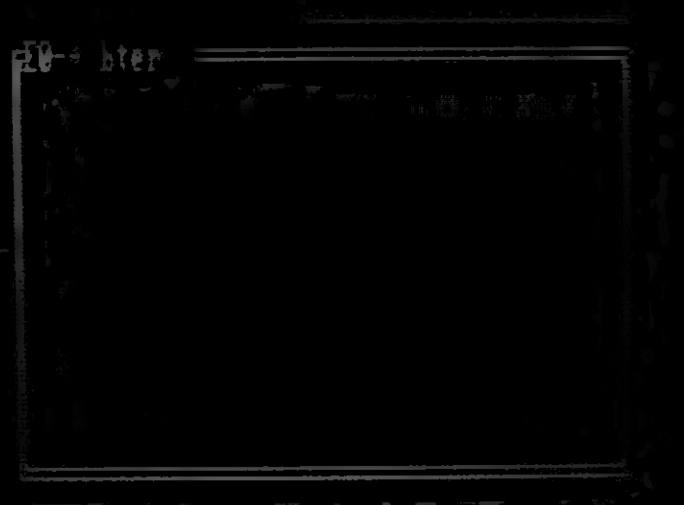


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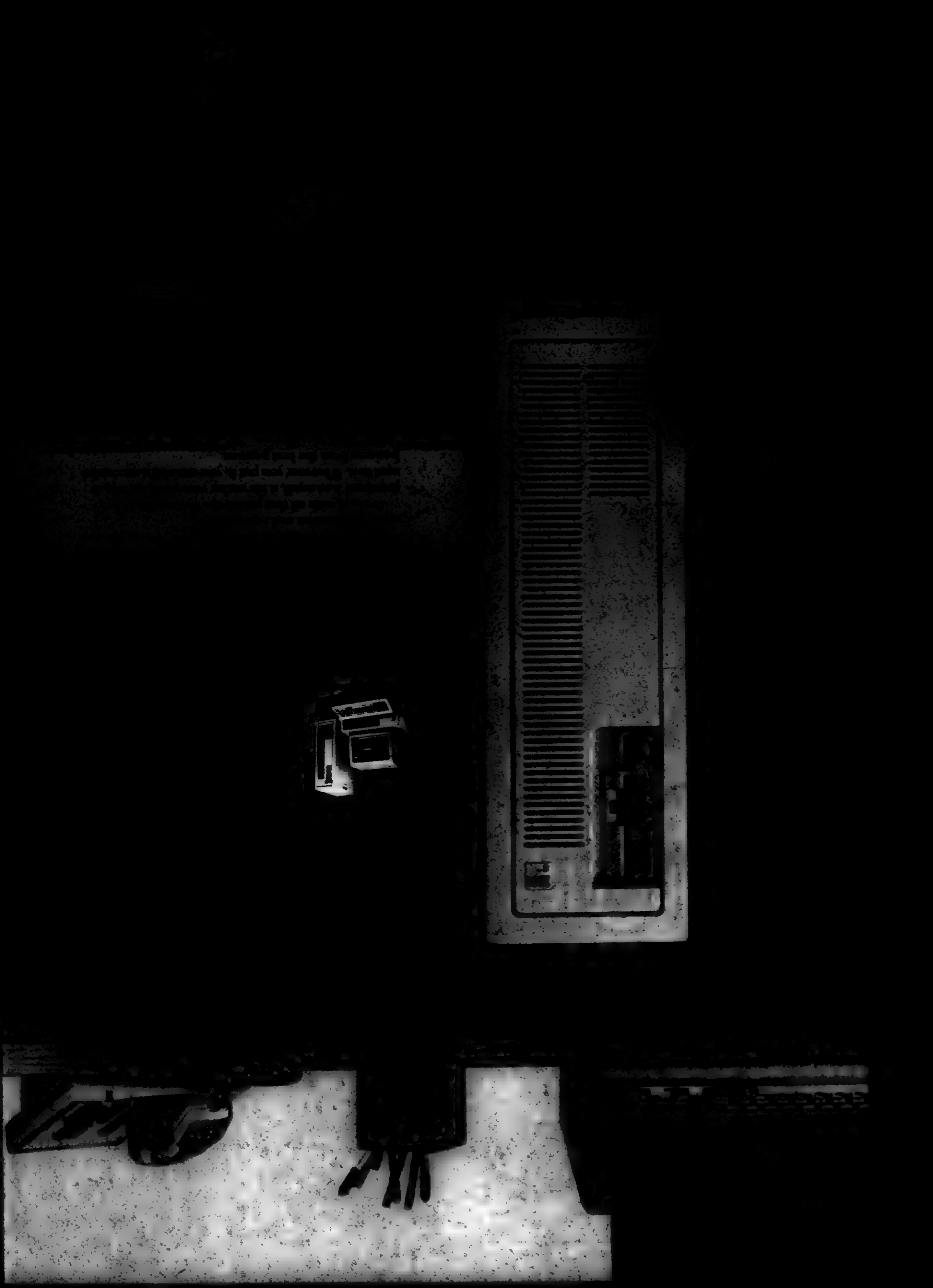
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Product Spotlight

Edited by Barbara Wierzbicki

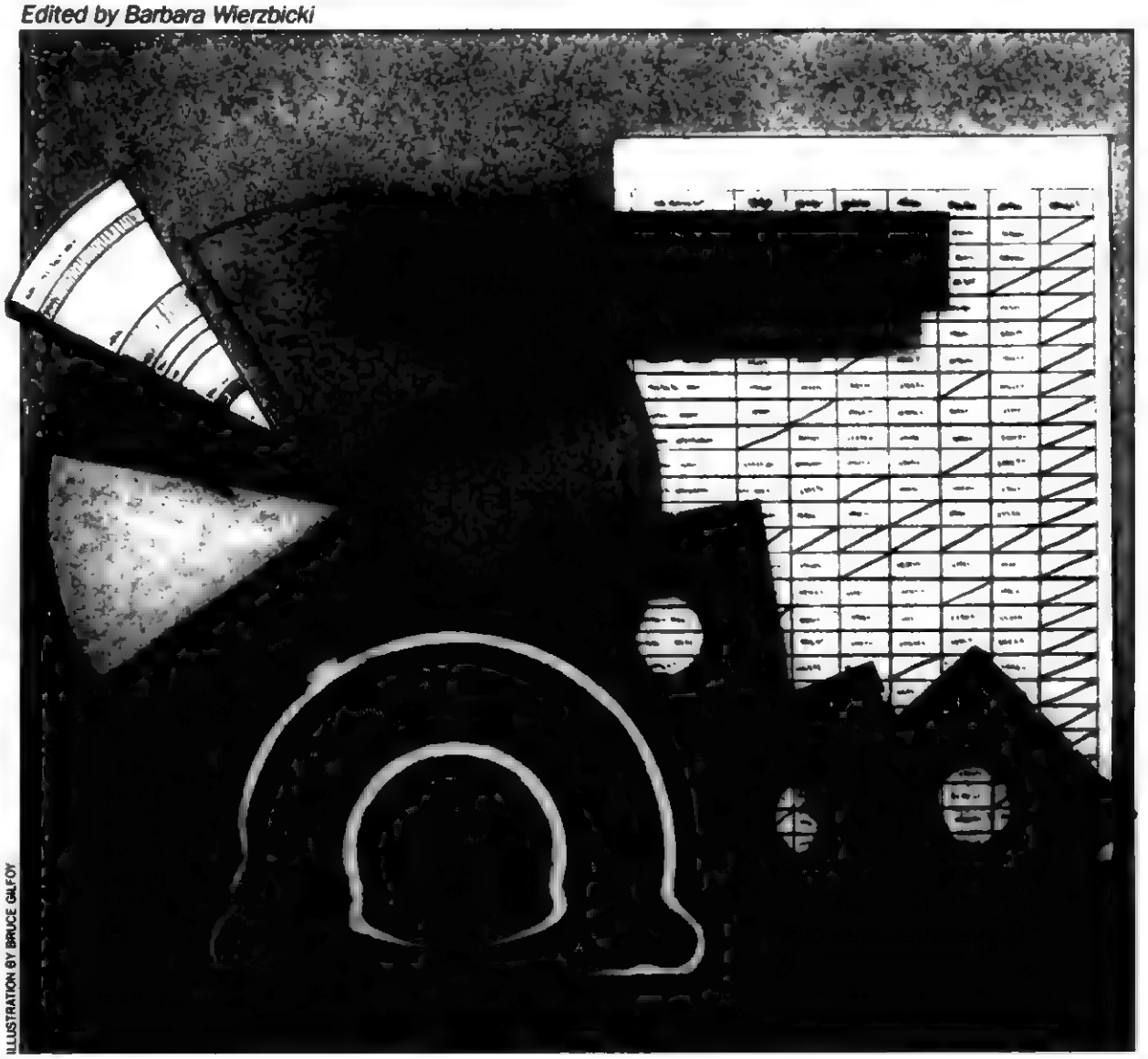


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Comprehensive chart of expert system development shells/59-60

Expert system shells

Design tools help MIS answer management's call

By MICKEY WILLIAMSON

Exaggerated claims for their effectiveness abound and so do skeptics' retorts. But the fact remains that within virtually every company in the Fortune 1,000, key management is deciding what repetitive or complex decisions could profitably be turned over to a computer endowed with a bit of intelligence.

Developing, or even advising on the development of, an expert system can be a daunting prospect to the MIS manager — particularly because the problems that expert systems attack differ fundamentally from those with which the DP manager is most familiar.

In the traditional data processing paradigm, problems are well defined. You can draw a flowchart and enumerate the control structure at every possible branch point. Logic finds data and decides what to do next.

The kinds of problems that management — and expert systems — attack are less well structured. Data may be incomplete or of uncertain accuracy. The MIS manager, whose training did not include ways of conducting heuristic searches through mountains of imprecise and possibly conflicting data, may find himself lost in a world where educated guesses and rules of thumb come into play. Control must be implicit: Data finds the rules that apply and decides what to do next.

Think of an expert system as a three-legged milking stool. One leg consists of the system's knowledge base: rules, static data, good guesses — anything an expert puts to use in solving a problem. (Anything except intuition, that is. Intuitive reasoning is still beyond the capability of any hardware and software combination.) An expert system's knowledge base may come from one or a number of human experts, from written materials or both.

The second leg is the expert system's inference engine: the way it applies information in the knowledge base to the problem at hand, the route it takes in applying data to the rules of the case.

The third leg — without which the system cannot stand — consists of information about a specific problem that the user wants solved. This information is supplied at runtime, either by the

Expert systems will soon be a given in software technology. Their developers — whether within DP or elsewhere in the company — will look to MIS for technical aid and comfort.

Williamson, a technical journalist based in Warwick, Mass., is the author of Artificial Intelligence for Microcomputers *(Simon & Schuster, Inc., 1986). She is currently writing a book on building expert systems.*

Design tools help MIS answer call

Continued from previous page

user or by routines in the expert system that look for data from external sources.

In the data processing shop, expert systems could solve some vexing problems. "There is the whole question of training and staffing, having the old hands leave the environment and bringing in new people," says Michael Stock, vice-president of advanced systems development at Composition Systems, Inc., an Elmsford, N.Y., company developing expert systems for newspaper production (see story page 50). A system incorporating the expertise of a programmer who is due to retire could train his replacement not only in the ways of data processing tools but also specifically in the ways they are used at a particular site, Stock explains.

Then there is the area of configuration analysis, performance monitoring and tuning. Probably the most successful expert systems in use today are Digital Equipment Corp.'s Xcon and related systems, which advise on the configuration and siting of every VAX computer that DEC sells. An inventive MIS manager could do worse than to consign his department's expertise in identifying bottlenecks and expert capacity to an expert system, according to Stock.

Building systems such as these requires capturing expert knowledge, encoding it in computer-readable form and giving the computer some means of reasoning and some kind of I/O system for rendering its advice.

Fortunately, a variety of tools exist that solve many of the design problems and let the developer concentrate on the user interface and on acquiring and expressing the expert knowledge on which the system will be based.

Expert system development tools, or shells, as they are often called — although some vendors object to the latter term because of the fragility it implies — come in a wide variety of sizes and shapes. These range from $50 personal computer-based packages — useful for exploring the possibilities that inference engines offer — through serious PC systems with far-ranging capabilities, to mini and mainframe development systems with price tags in the tens of thousands of dollars. Some of these run on dedicated symbolic processing machines that boost entry costs into the six-figure range.

Joseph Carter, senior manager in the consulting division of Arthur Andersen & Co., based in Chicago, categorizes expert systems and the characteristics of shells best suited to them in the following way:

Advisor systems represent the category most commonly associated with general expert system use. While these shells are typically rule-based, the more complex knowledge

Continued on next page



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Market for expert system shells breaking new ground

By SUSAN MESSENHEIMER

Since its modest beginnings in 1984, the commercial market for expert system tools has gained strength — and vendors. With the arrival of personal computer-based expert system tools, the market divides into two distinct sectors based on the kind of hardware upon which expert system tool software operates.

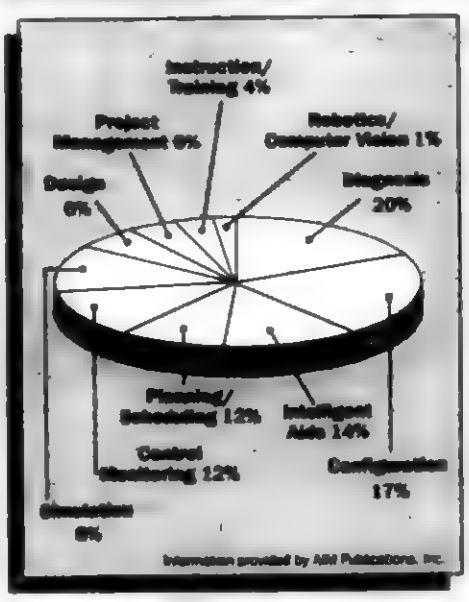
By the end of 1985, some 15 vendors of high-end tools had shipped products; add another 22 vendors of PC-based tools that were delivered to customers, and the expert system tools market includes over 35 vendors — with more on the way.

At present, these two sectors do not compete with each other, although there are indications that this may change, as tools developed on large symbolic processors are ported to smaller but increasingly powerful machines, such as Apple Computer, Inc.'s Macintosh and the impending generation of PCs based on 32-bit microprocessor chips.

Buyers of expert system tools tend to be large corporations and government agencies that use them to build expert systems for proprietary, in-house purposes.

According to our recent market research, the heaviest nonacademic users of expert system tools are manufacturing firms and those doing work in defense or other government contracts. Together, these users account for 60% of expert system tool usage. But interest in expert system tools has been increasing in such realms as banking, insurance and finance as newly competitive companies in these industries look for ways to develop a strategic edge over their rivals.

HIGH-END TOOL USAGE BY APPLICATION



JEFF BARNARD

The problem domains in which expert systems have been put to work include the following:

- Diagnosis in computing, telecommunications, electronics, engineering, medicine, resource exploration and military applications.
- Configuration of computer systems, insurance policies and so on.
- Intelligent aids — in tuning systems, cost determinations.
- Control monitoring — accepting data from sensory inputs — as in process control of manufacturing plants and nuclear power plants.
- Planning/scheduling — in factories, military, finance and so on.
- Simulation — in manufacturing, design, decision support.
- Design — in manufacturing, software development, very large-scale integration and so on.
- Project management.
- Instruction and training.
- Robotics and computer vision.

Because they have a history of usage among defense contractors and in manufacturing, most tools are used in engineering applications. The MIS departments account for less than 5% of expert system tool purchases, but that, too, is starting to change as the profound potential of expert system tools becomes better understood. Examples of MIS use of these tools include the following:

- Travelers Insurance Co. of Hartford, Conn., is using Teknowledge, Inc.'s S.1 expert system tool to diagnose faults in DP equipment.
- Level Five Research, Inc. has built an expert system using its own product, Insight 2+, which aids in the planning and scheduling of software development projects.
- In a significant new development in expert system tool architecture, Software Architecture & Engineering, Inc. will soon announce its next-generation project, a specialized expert system tool geared for software development that combines knowledge base and software engineering. ■

> ***MIS accounts for less than 5% of expert system tool purchases, but that is starting to change as their profound potential becomes better understood.***

Messenheimer is president of AIM Publications, Inc., a Natick, Mass.-based market research firm specializing in artificial intelligences commercialization that publishes the monthly "AI Markets" newsletter.

Continued from previous page

bases as well as those with a great number of rules will probably be best developed using a hybrid system — which includes both rules and frames — such as the Knowledge Engineering Environment (KEE) from Intellicorp or the Automated Reasoning Tool (ART) from Inference Corp. "The hybrid shells let you manage rules better. Including frames allows you to write more into the data structure and less into the rules," Carter says.

Decision support systems integrate data from diverse sources into a form that top executives can use to make business decisions. Complex data structures, the ability to express relationships and a good user interface are prime considerations. There may also need to be some rule processing ability, allowing the user to handle statements such as, "If this ratio is X, then inventories are too high." Programs such as Exsys from Exsys, Inc. and Guru from Micro Data Base Systems, Inc. fall into this category.

Decision analysis systems deal in planning and scheduling. They typically arrange and rearrange large numbers of variables and parameters to come up with a recommended plan or schedule: The shell in which a decision analysis system is built must not limit the number of variables and intermediate variables. A feature known as blackboard architecture, which allows the inference engine to consider a variety of possibilities at once, is useful here. A shell such as ART is especially well suited to decision analysis problems.

Systems that deal in soft and unstructured input, such as the Securities and Exchange Commission system (built by Arthur Andersen using the KEE shell) for analyzing corporate annual reports, need some type of natural language processing capabilities as well as the ability to manipulate complex data structures.

Flexible and maintainable systems, such as those used by insurance agents to generate client proposals, deal with domains where the rules are changed frequently and the knowledge base must be updated to take every change into account. "Most shells can be applied to this type of problem," Carter says. "Its complexity will determine whether it should be rule-based or hybrid." Teknowledge, Inc.'s S.1 and Aion Corp.'s Aion Development System/PC are among the most suitable shells for this type of application.

There probably is no shell in existence that does not require compromise at some point in the development process. Still, Carter advises, "You'll get a long way into your work before you're smart enough to realize what the limitations of these systems are, and until then you won't be qualified to write your own. . . . With a shell, you can be productive in a matter of days." Then he adds, "But it's like playing chess. You can learn all the moves in a couple of hours, but you don't master it for a long time because it's so rich. It helps to have someone around who knows how to put the moves to use."

Picking the right development shell

The way they reason, and the fact that they reason at all, make expert systems highly memory intensive. Where personal computers will be either the development or the delivery vehicle, 640K bytes of random-access memory (RAM) and a hard disk should be considered minimum requirements. If budget constraints preclude upgrading memory in existing machines, then considerations other than a package's RAM requirements may be irrelevant.

> ***An inventive MIS manager could do worse than to consign his department's expertise in identifying bottlenecks and expert capacity to an expert system.***

There are PC-based shells that require as little as 256K bytes of RAM, using additional available memory to conduct rule searches. They can hardly be expected to do serious work in minimally equipped computers.

Budget and memory constraints aside, there are several important considerations that must be weighed when picking any expert system development shell:

- The type of knowledge that is involved.
- The type of reasoning that is used.
- I/O requirements at runtime.
- Rule editing and debugging facilities provided.
- Vendor support.

Expertise in a subject area — a domain, in expert system terminology — usually comprises a variety of elements: vocabulary definitions, objects and the relationships between them, constraints, hypotheses, rules, heuristics and descriptions of processes and experience based on situations previously encountered.

Continued on next page

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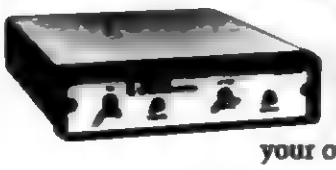
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This knowledge can be expressed in a variety of ways. Say, for example, that an applicant must show combined costs for housing and installment debt to be less than 32% of total income in order to qualify for a mortgage loan. That rule might be written: If the sum of applicant's housing costs and installment debt payments is less than 32% of total income, then applicant is eligible for a mortgage loan.

This IF-THEN format represents the most common way of expressing knowledge in an expert system. Given the necessary data for a specific applicant, the expert system can look in its rule base and determine the applicant's eligibility.

With sufficient effort, a developer can code a great deal of expert knowledge using shells based on IF-THEN rules, such as M.1 from Teknowledge, Exsys, Insight 2+ from Level Five Research, Inc. and ES/P Advisor from Expert Systems International. Some types of knowledge, however, lend themselves more readily to other representation schemes.

Where examples of successful decisions abound, but the rules behind them remain unclear even to the experts, an inductive system that generates its own rules from examples may be preferable. One method of expressing knowledge in an inductive system is called a decision matrix. It permits a series of attributes to be arranged in spreadsheet form with the right-hand column of the spreadsheet containing the conclusion. For example, attributes contributing to a weather forecast might include temperature, relative humidity, barometric pressure, direction of pressure change, wind direction and wind speed. Each row of the matrix would contain the instances of each attribute that would lead to a specific forecast.

A program such as 1st-Class from Programs in Motion, Inc. uses the decision matrix format. Other rule-by-example systems include Radian Corp.'s Rulemaster and General Research Corp.'s Timm PC. They use the same kind of algorithm for inducing rules but do not hold their knowledge in a matrix.

The most obvious way to express expert knowledge is to state facts and describe how they are related to each other, usually in a complex data structure called a frame. Shells with this capacity are the most effective method for describing complicated relationships, but systems built around frames are typically more difficult to program and debug.

Frame-based representation schemes are found exclusively in minicomputer-based shells so far, because of the large chunks of memory they require. Some shells, however, known as hybrid systems, accept both rules and frames in the same knowledge base. Wizdom PX from Software Intelligence Laboratory, Inc., for example, solves the problem of describing complex relationships by linking factual statements in a relational network.

Related to the issue of knowledge representation is the question of how and by whom the expert system will

Continued on next page

Expert system shells at work in commercial environments

SHELL: Insight 2+.

BUILT BY: Lummus Crest, Inc., Bloomfield, N.J. (subsidiary of Combustion Engineering, Inc., Stamford, Conn.).

PURPOSE: Intelligent computer-aided design for in-house use.

DESCRIPTION: Lummus Crest uses Planned Design Management System (PDMS), an engineering modeling software system from Great Britain, to design process plants and oil and gas production facilities. The company added complex enhancements to PDMS. One of the added systems, built by design engineer Andre Maziarzewski, makes PDMS easy to use.

The Insight 2+ portion of Maziarzewski's expert system runs on IBM Personal Computer XTs and ATs and a Compaq Computer Corp. 286. The PCs use Microstuf, Inc. Crosstalk communications software to talk to a Prime Computer, Inc. 9955 minicomputer and Westward Technology, Inc. 2015 graphics terminals. Operators at the terminals fill in on-screen forms with about 40 variables taken from sketches done in the process department.

The expert system prompts the user for inputs and checks them for validity, commenting in a conversational manner when inputs are outside expected limits. Then it submits the resulting file to a drafting program, analyzing input data to select the drawing scale that will best display design details.

If there is too much demand on the system's resources, slowing response times to unacceptable levels, the system flashes a warning: "Too many users working; getting shorter on memory. I will be slower. Sorry."

SHELL: Knowledge Engineering Environment (KEE).

BUILT BY: Arthur Andersen & Co., Chicago.

PURPOSE: Analysis of corporate financial information, for use by the Securities and Exchange Commission (SEC), Washington, D.C.

DESCRIPTION: Federal law requires that all publicly held companies submit reams of financial data to the SEC, which investigates possible violations of the securities laws. An expert system reads corporate proxy statements with a sophistication unmatched by the average human investor.

Asked to identify companies that have taken action in the past year to dodge a leveraged buy-out attempt, for example, it searches for concepts rather than specific words, the way an investor who knew what to look for would do.

The system runs on Symbolics, Inc. 3600 and Xerox Corp. 1108 machines.

SHELL: KEE.

BUILT BY: Babcock and Wilcox Co., Lynchburg, Va.

PURPOSE: Welding advisory system for use by a construction subsidiary.

DESCRIPTION: The Weld Scheduler specifies welding procedures and inspection requirements to be used in on-site construction of coal- and oil-fired boilers.

The system combines the expertise of design and welding engineers. Its output is a set of instructions to welding technicians at the construction site.

Written in KEE on a Symbolics 3670 minicomputer, the Weld Scheduler's user interface is implemented on an IBM Personal Computer located in the Babcock and Wilcox Construction Co.'s office in Copley, Ohio. There users fill out on-line work sheets, providing data for about 30 welds at a time, then submit these sheets by telephone line for batch processing on the parent company's host Symbolics 3670 in Lynchburg.

SHELL: Automated Reasoning Tool.

BUILT BY: Composition Systems, Inc., Elmsford, N.Y.

PURPOSE: Newspaper management, for use by client newspaper companies.

DESCRIPTION: Slated to go into beta testing this summer, Composition Systems' Expert Publishing System is designed to take the crisis atmosphere out of daily newspaper operations. The system is composed initially of three separate systems that tie together the functions of advertising, page design and production.

The Expert Space Reservations System manages newspaper space allocations for ads and news, keeping a running inventory for every edition.

In the ad sales office, it also handles order processing functions, gives sales personnel intelligent advice about contract rules and sales opportunities and contains comprehensive MIS reporting capabilities.

The Expert Paper Layout System performs continuous real-time page design, determining the placement of ads so as not to conflict with news stories, adjusting layouts to handle late-breaking news and last-minute ad cancellations and making complex financial decisions centering on when to increase or decrease the number of pages in an edition. It also configures the presses and mediates between the often conflicting demands of the editorial, advertising and production departments.

The Expert Production Control System tracks the flow of editorial and advertising copy, allocates resources and schedules their use and predicts major demands for people, equipment and supplies to avoid bottlenecks and shortages.

Composition Systems' product runs on any Digital Equipment Corp. VAX/VMS processor. Configurations vary according to newspaper circulation size.

SHELL: Insight 2+.

BUILT BY: Bruce Olsen, vice-president, Seafirst Bank, Seattle.

PURPOSE: For Olsen's own use as a bank credit examiner.

DESCRIPTION: Olsen's job involves overseeing the credit quality of the people to whom Seafirst makes loans.

Three separate knowledge bases incorporate bank rules and policies concerning consumer auto leasing installment loans, purchase of new car loans from automobile dealers and the bank's personal revolving line of credit, which may be either unsecured or secured by a homeowner's equity.

Since most consumer credit is granted according to a technique called credit scoring, Olsen incorporated into his system about 10 pages of scoring rules taken from a manual that accompanied the bank's computer software system. The dealer auto loan system also contains internal bank policies and collection code rules, which determine how quickly the bank will respond if an account seems to be falling behind in payments.

The systems run on a Compaq Deskpro 5, a Microsoft Corp. MS-DOS machine compatible with the IBM PC XT.

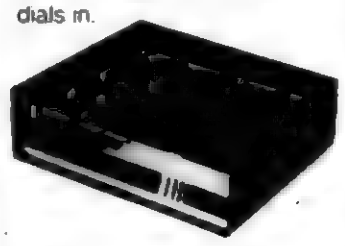
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be developed. Often the task is a team effort, with the person possessing the expert knowledge teaching a programmer about how decisions are made. The programmer assumes the role of knowledge engineer — collecting and coding information and then working with the expert to validate the system by giving it additional problems to solve.

To make both coding and validating easier, the ideal expert system development shell reasons the way the expert does. Reasoning is the job of the inference engine; it is built into the shell.

Some inference engines, termed "forward chaining," look at the left-hand (IF) side of the first rule in the knowledge base and try to determine whether the fact it asserts is true. If the fact is false, the system moves to the next rule and tries to prove the truth of its assertion. When a rule whose left-hand side is true is located, the forward-chaining inference engine declares its right-hand (THEN) side true as well. The rule is said to have been fired, and the inference engine goes on to find another rule whose IF side matches the THEN side of the rule just fired, continuing in this way until no more rules can be fired. The system then reports its conclusion, if one has been found, or announces that it cannot draw any conclusions from the information at hand.

By contrast, the "backward-chaining" inference engine starts with a goal or hypothesis and works backward through the rules in its knowledge base, considering only those that are relevant to the goal. If X is the goal, a backward-chaining system looks for a rule whose THEN part contains X. Having found one, it inspects the IF part of that rule and looks for another rule that has the same terms in its THEN part, continuing until it fires all the rules necessary to prove X true. If it cannot satisfy the requirements for X, it picks another hypothesis and tries again or reports to the user that no conclusion can be reached.

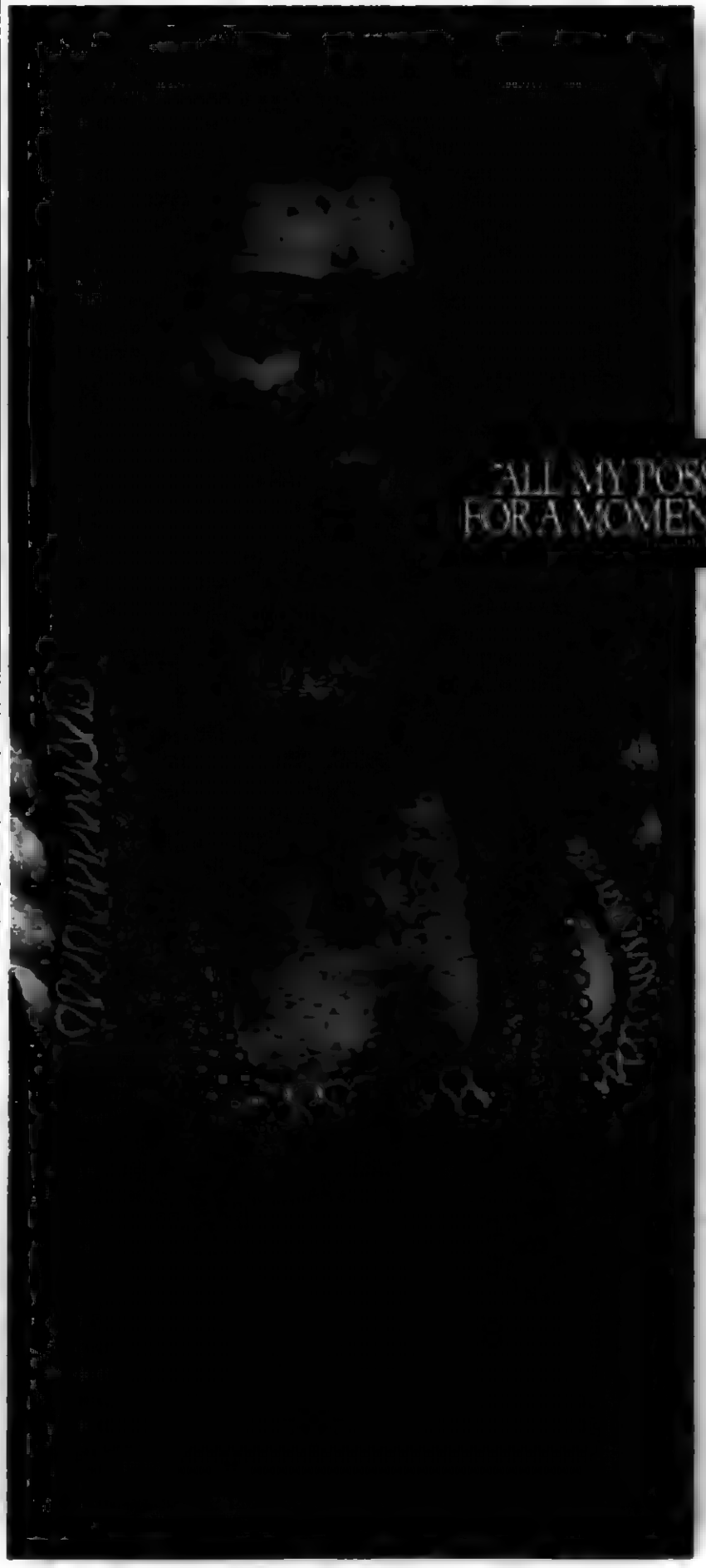
Often a forward-chaining inference engine will have to pass over a rule, because it has not yet been proven true, only to return to it later when its IF clause becomes true. A similar process can occur with backward-chaining engines. This does not mean they chain in both directions; which side of the rule is considered first determines the direction of chaining.

Generally, a backward-chaining system runs faster for problems where the user seeks to select from a list of possible outcomes — as in diagnosing an illness or mechanical fault given both a set of symptoms and an educated guess as to where the fault lies. Forward-chaining systems perform more efficiently where a body of data must first be assembled to perform a task — as in configuring a computer system or selecting the best candidate to fill a hiring requisition given a set of performance or qualification criteria.

> ***'With a shell, you can be productive in a matter of days. It's like playing chess. You can learn all the moves in a couple of hours, but you don't master it for a long time because it's so rich.'***
>
> — Joseph Carter
> Arthur Andersen & Co.

If an inference engine considers its job done when it finds a single valid conclusion, then the order of chaining may have a significant

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Continued from previous page

effect on the expert system's advice. The direction of chaining is not always important, however. Richard Currie, systems development specialist in the research and development division of Babcock and Wilcox Co., an operating unit of McDermott International, Inc. located in Lynchburg, Va., found that the expert system he built using KEE performed identically when it chained in either direction.

"We chose KEE because it had both forward and backward chaining," Currie says. "We tried it both ways and didn't see any difference in performance, so we went with forward chaining, which seemed more natural to the operators."

Some shells allow either the developer or the user to determine the direction of the search. Moreover, some also permit the developer to determine the order in which rules will be considered by assigning priorities to them or by putting them into categories whose consideration is triggered by specific events. Certainty factors can be associated with rules that are in the knowledge base. Where statistical probabilities enter into an expert's decision making, a shell's certainty factor capabilities become important. For example, if Premise A leads to Conclusion B 75% of the time and to Conclusion C 60% of the time, then the shell should be able to contain that information.

It may also be necessary to allow the user to express confidence in the variables input at runtime. The user may be only 60% sure that Condition A exists. Numerous ways exist to combine the certainty factor of the knowledge base with the certainty factor of the user. Some methods yield more conservative results than others, but few shells offer more than one system for calculating certainties. One of the most sophisticated systems in this respect is Guru, a personal computer-based shell that runs under Unix and Microsoft Corp. MS-DOS.

Some expert reasoning involves pieces of data which, in expert system terminology, are called "fuzzy variables." It may be necessary to allow a user to answer a question at runtime with a list of possibilities, perhaps associating a different certainty factor with each. An inference engine that can handle fuzzy variables combines each of these variables with the applicable rules and comes up with a list of possible outcomes, each with its associated indication of probability.

The ability to select a threshold of certainty — to tell the inference engine, in effect, not to consider any outcome that has less than a certain percentage of certainty — is another desirable characteristic for many applications. Setting a high threshold can speed processing where only the most likely outcomes are useful. Some systems arbitrarily set the confidence threshold at 20%, causing rules to be considered and results to be reported that are too uncertain to be of any use.

Expert systems vary widely in their I/O requirements. Input needs may be as simple as plucking data from a Lotus Development Corp. 1-2-3 spreadsheet or as complex as reading data from a bank of process monitoring instruments. Advice may be required in real time or not; printing results on a terminal screen may be good enough, or written reports — with or without graphics — may be required. It may be necessary to store user inputs in a disk file along with the system's recommendations. Matching a system's requirements to a shell's abilities may mean setting priorities — or it may mean insisting on a shell that can reach out to the operating system to run programs written in other languages.

"Despite all the hype, you're not going to do a useful application without actually writing some code outside the shell," says Currie of Babcock and Wilcox. "So you'd better have a shell that permits you to get in and out easily."

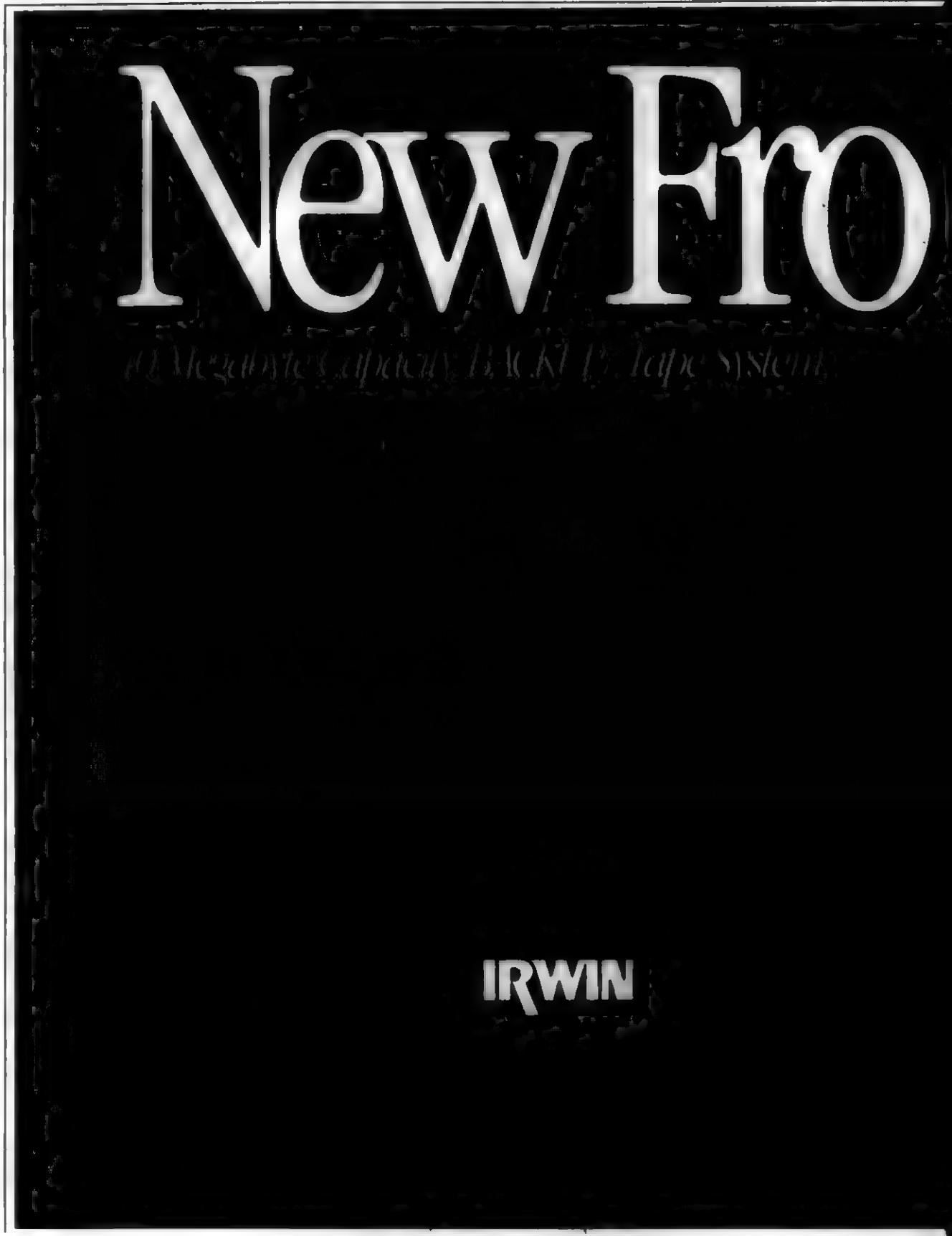
Programming the user interface can be especially important when the end users are not the same people as the experts whose knowledge the system contains. People can resist the introduction of expert systems for a variety of reasons. Some, such as fears about job security, are issues for management to handle. Others, such as ease of use and confidence in the system's abilities, must be dealt with during development.

John Kruse, senior software engineer at 3M Corp.'s software and electronic resource center in St. Paul, Minn., developed an expert system that helps chemists predict the physical properties of polymers they have synthesized.

Kruse says user patience can be strained if the expert system has to search a huge space to find its answers, but even slow processing speeds need not present a barrier to user acceptance.

"A human factors tactic is to make the system helpful enough so that the user knows when there's going to be a long wait," he says. "Nobody minds going for a cup of coffee while some work is being done for him." Users, Kruse adds, want "predictability and controllability of the system. If you do your human factors correctly, it should not be a problem."

Rule editing and debugging facilities are important considerations both for user acceptance and for ease of development. During the validation process, the experts whose knowledge is built into an



expert system need to look at the rules to trace their logic. If the rules are impossible for a nonprogrammer to read, debugging and validating the system are more difficult than they should be.

In Seattle, Seafirst Bank Vice-President Bruce Olsen — whose bank-credit expert system incorporates knowledge from books, manuals and bank policy statements — says the ability to ask a system how it reached its conclusion is a real asset. Usually, he notes, when an expert system exhibits faulty logic, it does so because it is lacking some key piece of information. To illustrate, he tells this story:

"I tried to plug our chairman of the board into my personal lines of credit evaluator. Since he leases a condominium — he doesn't own a house up here — the thing blew up and denied him any credit. I had to reason backward to find out where the problem occurred. It turned out I was missing a key rule."

Olsen says he would have spotted the problem faster if he had been more experienced in building expert systems and adds, "It sure was frustrating at the time. Asking how the system got there would have been darn nice."

> ***'Make the system helpful enough so that the user knows when there's going to be a long wait. Nobody minds going for a cup of coffee while some work is being done for him.'***
>
> — John Kruse, 3M Corp.

In some cases, a development shell's features can be less important than the nature of the company that supplies it. According to Thomas Freund, project leader in the manufacturing analysis group at Pratt and Whitney — a division of United Technologies Corp. — based in East Hartford, Conn., "If you are looking strictly at the kind of knowledge representation and so forth, you are going along a blind alley," he says. "It's important also to look at the company — at the direction in which they are heading, what kind of market they are targeting, what kind of applications."

Freund says his organization chose Carnegie Group, Inc.'s Knowledge Craft for its intelligent computer-aided design system because Carnegie is "heavily into manufacturing and engineering. People should look more at what a company is doing in their own area, rather than the fact that they sell this wonderful shell."

It is also important to Freund that the Carnegie Group maintains a consulting practice. "There has to be a value to having that consulting capability when you need it and to the fact that they are coming up with products geared to the kind of application you have in mind," he adds.

Some form of knowledge base security may be important in an expert system to protect the knowledge base from inadvertent corruption. Shells that offer a runtime version provide one form of security. In instances where it is desirable to keep users from inspecting the knowledge base at all — where proprietary information is incorporated into a novice training program, for example — tokenization or compilation is required. And compilation is a necessity where execution speeds are to be considered. "Running a shell interpretively and expecting to get any performance out of it is ludicrous," says Composition Systems' Stock.

It would be reasonable to wonder why a computer shop staffed with competent programmers should use an expert system shell instead of writing code from scratch. The answer comes in two parts. First, programmers tend to think in terms of procedures rather than in terms of problems, which is the way expert system development demands. Second, with their built-in knowledge representation schemes and inference engines, shells have done the less creative part of the work, leaving the developer free to concentrate on finding the best way to express the expert knowledge and develop the best possible user interface.

"An expert system shell works in much the same way as a problem-oriented fourth-generation language," Olsen observes. "A person who cut his eyeteeth on procedure-oriented programming can find making the transition a bit of a hurdle, but the training in logical thought is definitely a help."

The inferencing and knowledge representation techniques of expert system development had their origins in the artificial intelligence laboratories of the major universities, but the day is at hand when they will be taken for granted as a basic part of computer software technology — as unexceptional as a spreadsheet. When that day comes, if the expert system developers are not housed in the DP shop, then they will be spread throughout the corporation — and they will surely be looking to the computer room for access to data bases and for technical aid and comfort. ■

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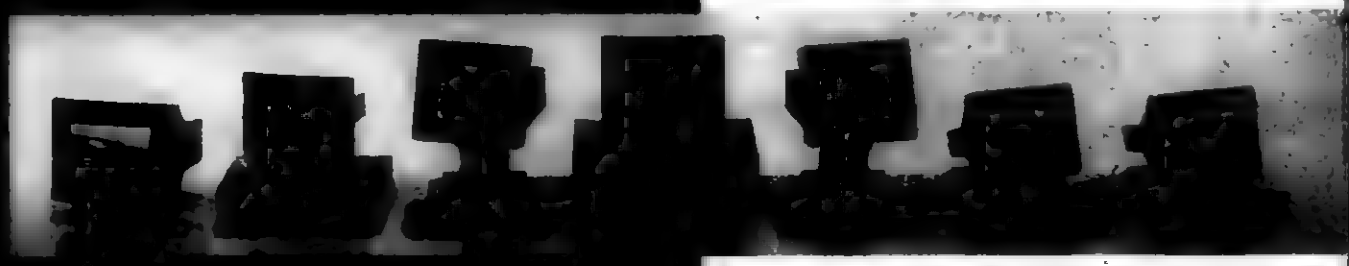
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EXPERT SYSTEM DEVELOPMENT SHELLS

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Vendor	Product	Minimum Memory Required (in bytes)	Requires Hard Disk	Rule-Based	Frame-Based	Example-Based	Forward Chaining	Backward Chaining	Runtime Version Available	Runs in Compiled Form	Performs Higher Math Computations	Runs External Programs	Text Editor	Data Import	Price
Aion Corp. 101 University Ave. Palo Alto, Calif. 94303	*ADS/PC*	512K	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Lotus 1-2-3, Ashton-Tate Dbase II, Dbase III, Micropro P-Stat	$7,500
Ashy Corp. 358 Baker Ave. Concord, Mass. 01742	*Ashy/Expert*	512K	No	Yes	Yes	No	No	Yes	No	Yes	Yes	Yes	No	ASCII, Dbase II, 1-2-3, Lotus Symphony	$295
Artelligence, Inc. Suites 212-253 14902 Preston Road Dallas, Texas 75240	*Prodigy*	256K	No	Yes	No	No	No	Yes	Yes	No	No	Yes	No	ASCII	$450
Automated Reasoning Corp. Suite 1D 290 W. 12th St. New York, N.Y. 10014	*ln-Ate*	512K	No	Yes	Yes	Yes	Not applicable	Not applicable	Yes	Yes	Yes	Yes	No	LISP, ASCII	$8,000
Automated Reasoning	*ln-Ate**	Not applicable	Not applicable	Yes	Yes	Yes	Not applicable	Not applicable	Yes	Yes	Yes	Yes	No	LISP, ASCII	$15,000
California Intelligence #8, 912 Powell St. San Francisco, Calif. 94108	*Xsys*	640K	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	ASCII, IBM Data Interchange Format (DIF), Microsoft Sylk, 1-2-3, Dbase II, Dbase III	$995
Carnegie Group, Inc. Suite 650 Commerce Court Station Sq. Pittsburgh, Pa. 15219	*Knowledge Craft**	Not applicable	Not applicable	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	ASCII	$50,000
Expert Systems International 1150 First Ave. King of Prussia, Pa. 19406	*ES/P Advisor*	384K	No	Yes	No	No	No	Yes	Yes	Yes	No	No	No	ASCII	$895
Exsys, Inc. P.O. Box 75158 Contract Station 14 Albuquerque, N.M. 87194	*Exsys*	256K	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	ASCII	$900
General Research Corp. 7655 Old Springhouse Road McLean, Va. 22102	*Timm-PC*	640K	Yes	No	Yes	Yes	No	No	Yes	Yes	No	Yes	Yes	Can be imbedded in other programs	$5,000
Human Edge Software 1875 S. Grant St. San Mateo, Calif. 94402	*Expert Edge*	256K	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	No	Yes	ASCII, DIF, 1-2-3, Dbase II, Dbase III	$795
Inference Corp. #501 5300 W. Century Blvd. Los Angeles, Calif. 90045	*Automated Reasoning Tool**	Not applicable	Not applicable	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	LISP	$65,000
Intellicorp 707 Laurel St. Menlo Park, Calif. 94025	*Knowledge Engineering Environment**	Not applicable	Not applicable	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	LISP	$55,000
Intelligenceware, Inc. Suite 730 9600 S. Sepulveda Blvd. Los Angeles, Calif. 90045	*Expertech*	256K	No	Yes	No	No	Yes	Yes	Yes	No	No	Yes	No	ASCII, Dbase II, Dbase III	$475
Intelligenceware	*Intelligence/ Compiler*	300K	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	ASCII	$990
IBM Corp. 934 Hunter Road Wilmette, Ill. 60091	*ADS Development System*	512K	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	ASCII, DIF, Sylk, 1-2-3, Dbase II, Dbase III	$945 to $970
Level Five Research, Inc. 503 5th Ave. Indialantic, Fla. 32903	*Insight 2+*	192K	No, but recommended	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	ASCII, DIF, 1-2-3, Dbase II, Dbase III	$485

The companies included in this chart responded to a recent telephone survey conducted by Computerworld. Vendor list supplied by the Query Group of Norwich, Mass. Further product information is available from the vendors.
*These shells are for use in minicomputer environments.

Old chart compiled by Michael Gilbert-Turner and Christie Sears

Product Spotlight / Expert System Shells

		System Requirements		Knowledge Reasoning											
Vendor	Product	Minimum Memory Required (in bytes)	Requires Hard Disk	Rule-Based	Frame-Based	Example-Based	Forward Chaining	Backward Chaining	Runtime Version Available	Runs in Compiled Form	Performs Higher Math Computations	Runs External Programs	Text Editor	Data Import	Price
Micro Data Base Systems P.O. Box 248 Lafayette, Ind. 47902	*Guru*	512K	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	ASCII, DIF, Sylk, 1-2-3, Dbase II, Dbase III	$2,995
Mountain View Press P.O. Box 4656 Mountain View, Calif. 94040	*Expert-2*	64K	No	Yes	No	Yes	Yes	No	Yes	Yes	Yes, with addition	Yes	Yes	DIF	$100
Portable Software, Inc. 650 Bair Island Road Redwood City, Calif. 94063	*XI*	512K	No	Yes	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes	1-2-3, Dbase II	$1,250
Programs in Motion, Inc. 10 Sycamore Road Wayland, Mass. 01778	*1st-Class*	256K	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	ASCII, 1-2-3, Dbase II, Dbase III	$495
Radian Corp. P.O. Box 9948 8501 Mo-Pac Blvd. Austin, Texas 78766	*Rulemaster*	500K	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	ASCII	$995
Software Architecture and Engineering, Inc. 1600 Wilson Blvd. Arlington, Va. 22209	*ABE*	640K	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	C	$4,000
Software Architecture and Engineering	*ABE/**	Not applicable	Not applicable	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	C	$7,000 to $25,000
Software Intelligence Laboratory, Inc. 1593 Locust Ave. Bohemia, N.Y. 11716	*Wisdom PX*	512K	No, but recommended	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	1-2-3, ASCII	$13,000
Systems Designers Software Suite 407 444 Washington St. Woburn, Mass. 01801	*Sage*	256K	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	No	Pascal	$499
Systems Designers Software	*Javasgit**	Not applicable	Not applicable	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	1-2-3, ASCII	$15,000 to $25,000
Teknowledge, Inc. 525 University Ave. Palo Alto, Calif. 94301	*M.1*	384K	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	C	$5,000
Teknowledge	*S.1**	Not applicable	Not applicable	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	C	$40,000
Texas Instruments, Inc. P.O. Box 809063 Dallas, Texas 75380	*Personal Consultant*	640K	Yes	Yes	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes	LISP, Dbase II, Dbase III, 1-2-3	$950
Texas Instruments	*Personal Consultant Plus*	640K	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	LISP, DOS, Fortran	$2,950
Tarpart Systems, Inc. 12607 Astee Houston, Texas 77066	*Class*	192K	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	C	$395
Tarpart Systems	*Class**	Not applicable	Not applicable	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	C	$2,500


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80. Manufacturer of Computers Computer-Related Systems or Peripherals
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95 Vendor Other _____

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22. Director/Manager of Operations Planning/Admin/Serv
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31. Manager/Supervisor Programming
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D. Communications Systems
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In Depth

Review your annual reviews

How objectively do you evaluate your personnel?

Many DP managers look forward to personnel evaluations about as much as visits to the dentist. The author offers a painless cure: a matrix of performance standards for fair, well-structured reviews.

By JOHN CLARKE

Not too long ago, the senior management of a growing, service-oriented data processing department faced a dilemma. The department staff had recently grown, and the established methods of managing human resources clearly were no longer effective.

For the past several years, as the number of users and the size of the department grew, true seat-of-the-pants management worked, as it had since the days of the earliest mainframe. However, a sense of formal structure had recently started to evolve. Many functional groups within DP were becoming internally organized along product lines, with programming and analyst staff permanently assigned to certain users or systems.

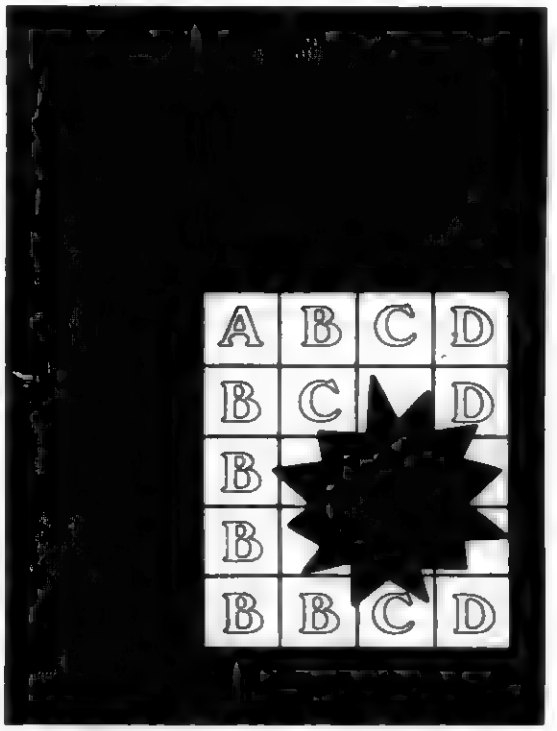
As these groups grew, it became impossible for one manager to administer all department activities adequately. The result was the creation of a new layer of management at the functional group level, charged not only with total responsibility for a user's systems but also with supervisory responsibilities for the group.

The senior managers understandably were concerned that with more people performing supervisory tasks, personnel managers needed to be as objective and uniform as possible. In the past, all personnel performance evaluations were made by one senior manager. But that was to change; in the future more managers would conduct employee reviews. A method was needed to make sure that reviews were evenhanded and meaningful, regardless of the author.

However, the complexity of the task of implementing such a program soon became apparent. Developing an evaluation review form for one work group — in this case, the analysts — led to questions about what was appropriate to measure and how to express the measurements.

Next came questions on what was expected of different groups of analysts who performed different types of tasks and thus required different levels of skill in doing those tasks. When checking the files for specific job descriptions, the discovery was made that no such descriptions existed — previously there had never been time, much less the need, to write them.

Consequently, a potentially dangerous situation existed. Jobs were performed but never formally defined. Tasks were accomplished by a range of employees, but the level of competence at which each individual was expected to perform them was never determined. And out of this environment, objective personnel evaluations affecting promotions and salary increases were to take place.



Establishing the levels of skill required, with A designating the most skillful, for each job function can help standardize performance expectations for a specific job title.

What solved the organization's dilemma was the use of a structured process for specifying what was required of each job position and the levels of competence needed to fulfill the requirements. Once that process was implemented, a uniform system for evaluating actual performance — based upon the attainment of those standards — was put into effect. The result was an environment in which people knew what was expected of them, what it would take to advance up the organizational ladder and how each person's job performance ultimately would be evaluated.

Performance evaluation then and now

Many organizations fall into an all-too-familiar trap — rewarding or promoting an employee from one position to another solely because that person has been in a position for a predefined period of time. Rather than promoting or granting salary increases based strictly on longevity, it is better to reward the employee who can successfully perform specific job functions at a required level and demonstrates the necessary skills.

For this to take place, definite standards of required job function ability and skill

About the author

Clarke is a senior consultant with Positive Support Review, Inc., a management consulting firm based in Los Angeles.

> ***Rather than promoting or granting salary increases based strictly on longevity, it is better to reward the employee who can successfully perform specific job functions at a required level and demonstrates the necessary skills.***

must be developed and directly related to each job position. Following this, a process to formally evaluate employee performance can be implemented.

However, developing a description of what is needed to perform a given job adequately — along with a vehicle to determine if an individual demonstrates the ability to be successful at the job — usually gets deferred until it is too late to avoid confusion and problems. Too often the perceived complexity of the tasks needed to develop these tools makes it preferable to avoid doing them at all.

The easy solution historically has been to take a short-term perspective. This usually calls for dealing with personnel matters as rapidly and simply as possible and hoping there won't be any complaints. That approach works for a while. But as organizations grow, the short-term view quickly outlives its usefulness.

Obviously, time and resources must be devoted to developing a structured system of performance evaluation based upon job and skill requirements. Ultimately, however, the benefits of such a system far outweigh the costs of time and effort that go into the task. The key is in approaching the task one step at a time and in properly identifying and addressing what is necessary to do a job successfully.

The elements of performance

Three elements define a job and the performance of that job: functions, skills and objectives. The first two elements are indispensable to defining job requirements and evaluating performance, because they describe what is done and the level of ability needed to do it successfully.

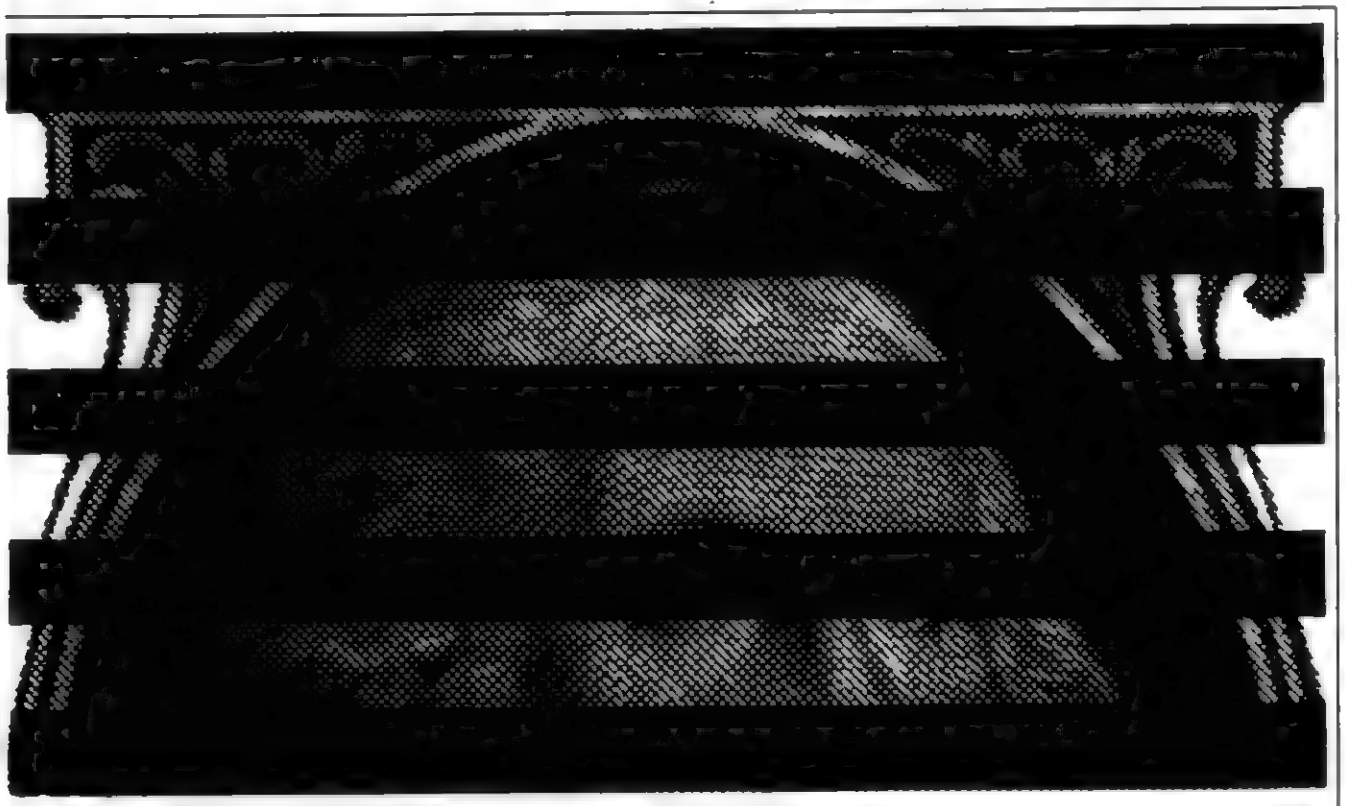
The third element — operational objectives — is an optional part of the process. Operational objectives usually involve managing the activities of others and thus are not appropriate for all employees. However, even when organizations do not establish formal operational objectives, the attainment of objectives is inherent in any measurement system where the employee being evaluated knows the areas in which the measures will be taken. Nevertheless, the use of specific operational objectives forms a valuable third measurement for those organizations that choose to use it.

The process described hereafter focuses on using the major elements — job functions and job skills — to develop individual performance standards and to assess the attainment of those standards in DP organizations.

Evaluation tools

Taking the two major elements and transforming them into sets of job descriptions, functional and skill requirement definitions and performance evaluations is a straightforward process — but one that is potentially time consuming for the uninitiated. Fortunately, one can take advantage of several tools for identifying and organizing the information needed to implement meaningful human resource management in a DP organization. These tools are job matrices, narratives that explain the different levels of job functions or skills and a common scale for use in evaluating actual performance.

Job matrices show the performance and skill levels that must be maintained across various jobs in a department. In terms of performance evaluation, job matrices allow employees to know what is expected of them in the categories under which they will be evaluated. As a



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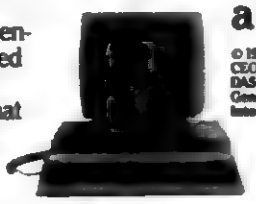
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> ***Developing a description of what is needed to perform a given job adequately usually gets deferred until it is too late to avoid confusion and problems. Too often the perceived complexity of the tasks needed to develop these tools makes it preferable to avoid doing them at all.***

tool for planning career development, matrices show how performance and skills must be increased in order to permit progression from one job to another.

Narratives explain what the different levels of performance mean, using quantifiable terms that are relevant to a particular organization.

A **common rating scale** is used to evaluate actual performance. Such a common scale establishes uniformity in the evaluation process. Performance is rated relative to whether the standards for the position have been met and thus eliminates much of the subjectivity found in many rating systems.

How these tools fit into the step-by-step development of requirements definitions, job descriptions and performance evaluations is discussed below (see chart page 66).

Step 1: Identify what is done. The first step of the process is to list the job functions performed as a normal part of business by a given group of personnel. Taking applications analysts as an example, the tasks that are part of the system development life cycle form the core of these functions. In most organizations, however, analysts perform functions beyond purely development-related tasks. Obviously, maintenance of ongoing systems is also a major responsibility, but what other functions do members of the group perform?

Lead analysts may get involved in management tasks, and most certainly all analysts perform at least some administrative tasks. What is important at this point is to identify the whole spectrum of functions performed by anyone or everyone in the group. It is not necessary that every individual perform every function on the list, but every major job function should be identified.

Step 2: Identify the skills needed to do the job. Most job skills in a DP organization fall into two broad categories: technical skills and people skills.

Identifying the technical skills is a relatively straightforward process, since the list is primarily an inventory of the technologies in use. Again, as with the inventory of job functions, it is not necessary that all individuals be involved in activities that utilize all the technologies.

For example, many firms use both batch and on-line applications as a part of business. More often than not, batch Cobol analysts focus exclusively on maintaining and enhancing these systems, while analysts working with CICS or other on-line technology applications concentrate on their areas of expertise.

Other areas not to overlook when compiling this inventory, even though they may just be coming into the organization, include fourth-generation tools, such as Information Builders, Inc.'s Focus, and microcomputer technologies.

People skills are necessary in any environment other than one in which the only contact employees have with one another is via notes shoved under closed office doors. (Even that requires a certain degree of written communication skill.)

As more and more DP organizations become actively involved in helping users implement information systems technology for competitive advantage, rather than merely for payroll and the general ledger, interpersonal and communication skills become increasingly important. Consequently, the people skills — and business skills — that the organization needs to get the job done

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should be identified and inventoried.

The lists of job functions and skills developed in Steps 1 and 2 will ultimately form the vertical axes of the job matrices. These axes depict the standards required for the various jobs in the department; the horizontal axes are the list of job positions themselves. However, there are still two more steps to perform before the matrices can be completed.

Step 3: Identify what is relevant to becoming successful. Once job functions and necessary skills have been identified, the next step is to identify the components of the skills that are relevant to the performance of specific functional tasks.

For technical skill areas in a DP organization where analysts analyze and programmers program, programmers need to be adept at certain aspects of the language in use that are not necessarily part of the realm of the analysts. For example, the components of technical skill that a programmer working with Lotus Development Corp.'s 1-2-3 should be expected to have mastered would include writing macros and using other automated tools for manipulating very large spreadsheets.

On the other hand, an analyst would not necessarily be expected to write the specific macro but instead would need to know the capabilities and limits of using macros and be able to integrate their use into a well-structured application.

The components of people skills tend to be relatively universal. The classic example is the definition of management, the components of which include, at the least, planning, organizing, directing, monitoring and reviewing. The components of interpersonal skills may be more nebulous to define, but it is possible to accomplish the development of identifying labels for these components with a reasonable investment in time.

Step 4: Define progressive levels of performance and skill. The next step is to define what constitutes distinct plateaus of performance and skill. Using measures in terms that are appropriate to the organization, sets of progressive levels of performance and ability — from entry level to expert — are identified. For job functions, in many cases it is appropriate to express performance levels in terms of the relative independence with which the function can successfully be performed — under close supervision, under minimal supervision, given general direction and so on.

While for job functions it is often possible to use a single scale for all elements, skill areas almost invariably resist the use of such a tool. The components of technical skills just cannot be easily expressed in the same terms as communication skills or management skills. Consequently, distinct scales for technical skills and each of the people skill areas will need to be developed.

> ***The narrative serves as a valuable tool for career development because it helps answer the questions employees always have about what it would take to be considered for advancement to another job level.***

At the same time, the narratives associated with the individual levels are developed. Each narrative spells out, in plain English, what a certain level of ability is. In certain job functions and technical skill areas, quantifiable terms can be used: "Averages 95% of error-free code."

For areas that are not easily quantified, the different levels can be distinguished through other means. For example, the application of written communication skills can be assessed by identifying the nature of the written documents produced and to whom they are addressed. In

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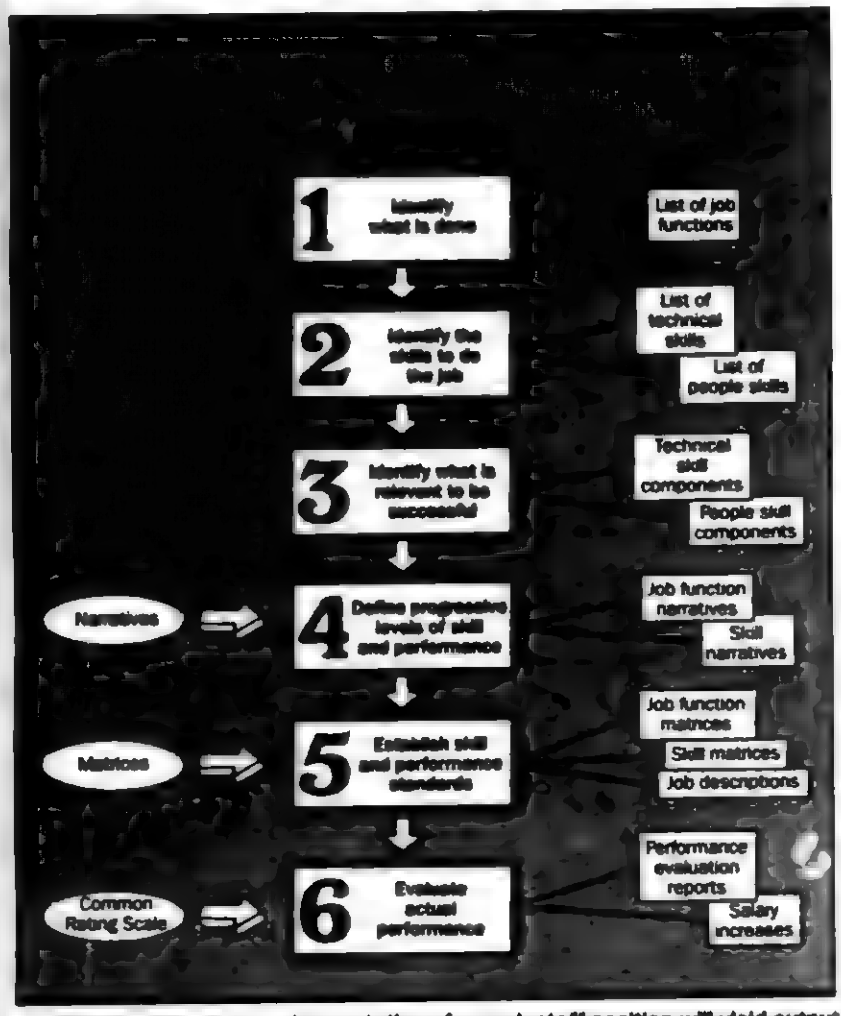
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Defining requirements and expectations for each staff position will yield output in the form of lists, narratives and matrices that help eliminate ambiguity and establish clear yardsticks for performance.

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a second example, progressive levels of microcomputer skills can be narrated as follows:

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B. Proficient in use of PC, infrequently needs support in use of complex DOS commands, efficiently operates five major software packages, strong working knowledge of network and communications functions.

C. Competent in use of PC, efficiently uses major DOS commands, efficiently operates at least three major packages, working knowledge of network and communications functions.

D. Familiar with use of PC, can use some DOS commands, knowledge of one major software package.

E. Limited experience with PC, requires basic or review training.

Once the standards have been defined, detailed descriptions can also be developed for each job position. Using the narrative associated with each function or skill standard, job descriptions become very relevant. This is because they specify not only what is to be done by the incumbent of a job but also at what level of competence it is to be accomplished. The narrative also serves as a valuable tool for career development because it helps answer the questions employees always have about what it would take to be considered for advancement.

> ***Without a structure to set standards and rate achievements, the process consists of the manager forming an opinion of an employee's work and then struggling for the best way to express that in writing.***

Step 5: Establish standards. The next step is to establish performance standards. Following the definition of the applicable scale(s) to be used, the level of performance or skill that is to be expected from personnel in any given job is determined for a specific function. The skill narratives listed above are based on a standard structure of progression through four or five levels. Levels A through E can be used to represent various standards for each job function or skill for each job level.

Depicted in matrix form, a single picture of departmental standards is produced for typical job functions (see chart page 61). A matrix for job skills would be identical in style; the list of skills would replace the list of functions forming the vertical axis of the matrix.

The definition part of the process is now complete. Specific job functions have been identified for each job position, as have the skills that are necessary to fulfill assignments. The results can be distributed to the work force, laying the groundwork for the next step — formally evaluating individual performance.

Step 6: Evaluate actual performance. In rating individual performance, a third tool is used to make the evaluation meaningful and reduce the influence of subjectivity. This tool is a common scale that expresses the degree to which established standards have been met over the course of the evaluation period.

Such a scale retains uniformity regardless of how standards are expressed for each area, focusing attention on the question, "Did you do what you were expected to do?" It also takes into account the fact that different levels of performance are expected of different job positions. The following is an example of such a rating scale:

5 — Always exceeds standard.
4 — Frequently exceeds standard.
3 — Always meets standard.
2 — Usually meets standard but needs improvement in one or more areas.
1 — Occasionally meets standard.
0 — Never meets standard.

Each individual is evaluated according to the functions and skills specific to the position. Using this scale as an example, a rating of 3 denotes that the individual is performing at the expected level. Individual strengths and weaknesses as well as potentially underused skills can be monitored to provide information for needed training or controls.

If desired, weights can be applied to any or all of the rating areas to reflect the relative importance of the area. This is also useful in computing a weighted average to determine an individual's overall score. Since scores are all based upon a common scale of achievement, it is then possible to develop a forced ranking of all individuals in a given group or set of groups. This forced ranking highlights the overachievers as well as the underachievers and can be a factor in determining the distribution of annual salary increases.

Regular performance evaluation reviews benefit both employees and management by structuring and thus enhancing performance management. Many DP organizations seem to approach performance evaluations with all the enthusiasm of impending root canal work. This is understandable, since in many cases evaluation takes a backseat to keeping operations functioning and users happy. Without a meaningful structure to set standards and rate accomplishments, the process consists of the rating manager forming an opinion of an employee's work and then struggling to find the best way to express those feelings in writing.

By basing evaluations on published, quantified standards that express expectations for job function and skill abilities, a solid foundation is established for effective long-term human resource management in DP departments. The steps outlined earlier make it feasible to do so. First, specific job functions are identified, as are the skills necessary for successful performance of those functions. Next, progressive levels of ability and skill are defined, followed by the setting of performance standards for each position. When it comes time to evaluate actual performance, the measure is the degree to which those standards have been met. The process works, and it can work for you. ■

In Depth

Automating Glitter Gulch

Las Vegas DP managers must play it safe

Profiles of DP managers in five major Vegas hotels show familiar concerns: disaster recovery, inventory control and near-zero downtime. Yet their data bases track jackpots, high rollers and last-minute Superbowl betting.

By COLIN McKINLAY

Data processing managers in the desert resort of Las Vegas, with its half-million permanent residents, operate their departments around the clock, the same as the facilities they serve operate, but little of the glamour of their business rubs off on their jobs.

Take, for example, Bill Watson, manager of the data processing operation at Bally's Grand Hotel, formerly MGM Grand. Watson calls himself "basically a systems man. I solve problems by devising a system that can be partially or completely computerized, depending on the need. We don't computerize for the sake of computerizing."

A 25-year veteran of the computer industry, Watson started out doing customer servicing at Bache & Co. of New York, moved on to Pan American Airlines, where he pioneered an on-line worldwide petroleum inventory system, and then took on inventory control at pharmaceutical maker Geigy Chemical Corp. From there, Watson moved to ABC, where he managed the processing of election returns, and then to Montefiore Hospital & Medical Center, where he developed an on-line customer billing system. He landed in Las Vegas via a job opportunity advertisement placed by MGM.

Watson manages an IBM 4341, an Electronic Engineering Co. Hotel Management System, an on-line race and sports book system using Data General Corp. equipment, a Datapoint Corp. telephone management system, an AT&T private branch exchange (PBX) running Integrated Hospital Network, Inc. software, and an IBM Series/1 that ties into the IBM 4341 to provide management with payroll and employee meal information.



PHOTO COURTESY OF LAS VEGAS NEWS BUREAU

Front office functions — including reservations, registration, city ledger accounts and files maintained on regular customers — are handled by the Electronic Engineering Hotel Management System. In the back office, the IBM 4341 is the workhorse, Watson says. It is there that all casino revenue accounting is done, along with the hotel and corporate general ledger and accounting functions.

Optical scanners for badges

The system also handles personnel functions: Bally's employees are issued badges that are inserted into an optical scanner as they report to work, and their attendance is automatically recorded on the Series/1. The badge is used similarly when eating at the employee cafeteria, since many employees, under the terms of union contracts, are entitled to one or two meals a day. When employees leave for the day, the badges go back into the machine for checkout.

The 4341 also maintains about 20 different kinds of mailing lists for the sales staff to use for soliciting new business for the hotel. Sales offices around the country are tied into the computer so that information about groups and conventions, as well as contracts and future commitments, can be kept current.

The DG hardware is used for the race and sports book system. It does accounting, prints betting tickets, manages payoffs and provides a daily summary.

The PBX Inquiry System, manufactured by AT&T, is tied into the Electronic Engineering system and provides a display board for telephone operators. An operator punches in as many letters as are necessary to get a display and room number for each guest. The system also is used to keep track of key employees when they are away from their desks.

In the way of change, Watson reports that a new payroll system is in the works; the payroll department currently does not have on-line access to the computer. Watson is also actively pursuing the development of an on-line purchasing and inventory control system to enhance his department's capability. "We are always looking to stay up to the minute in our

About the author
McKinlay is editor of the Las Vegas Business Press.

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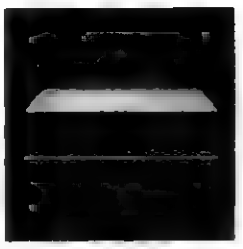
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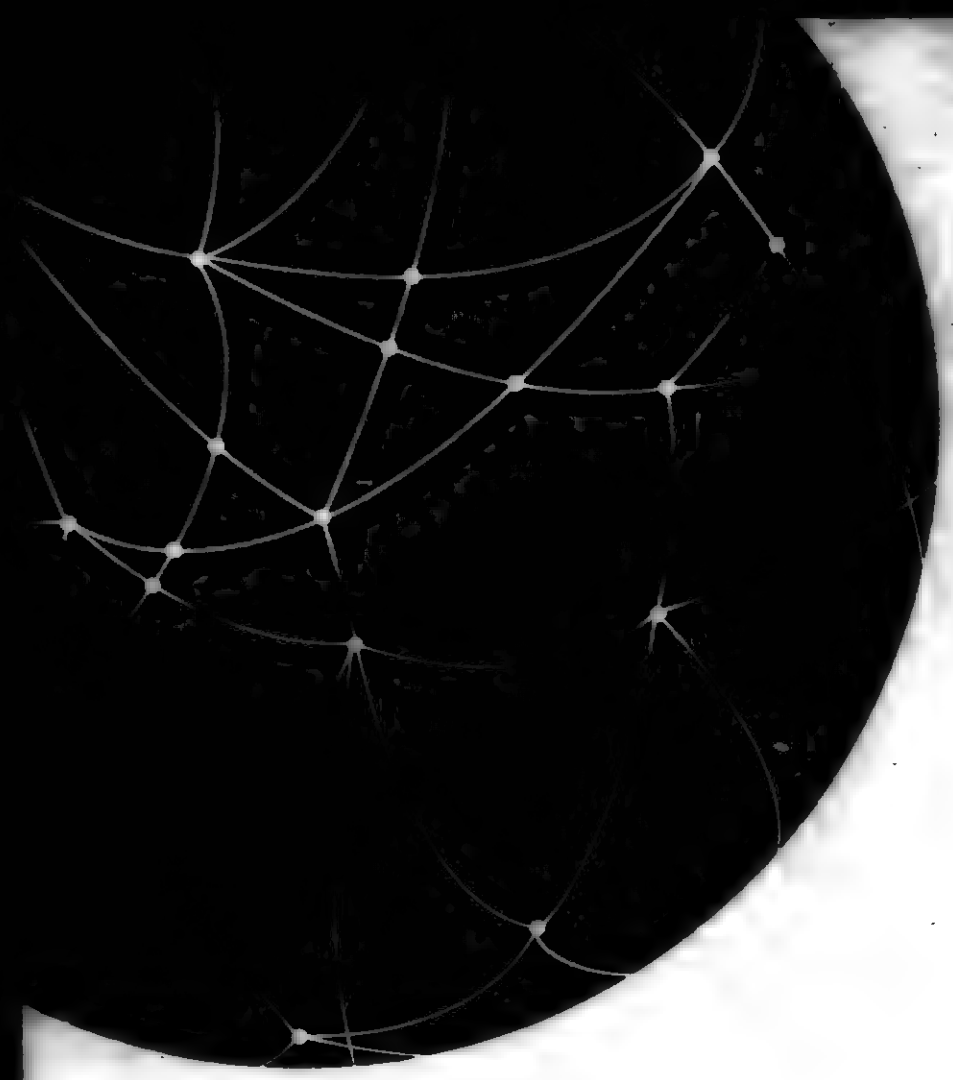
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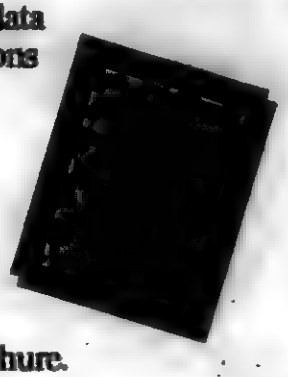
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In Depth/Las Vegas DP Managers

hardware. The state-of-the-art equipment is always under review," Watson says.

Also state of the art is a Johnson Controls JT80 fire control system with speakers in every guest room, a reaction to MGM Grand's tragic 1980



PHOTO COURTESY OF BALLY'S GRAND HOTEL

Bill Watson of Bally's Grand Hotel: "I'm basically a systems man."

fire that took scores of lives. Fire is one of Watson's major fears, although he says fire control procedures were drastically improved with the reconstruction of the hotel.

"You set your procedures to prevent a fire loss. You are always reviewing. You have dry runs to make sure that you can recover, but you never really know if it's going to work until it happens," he says.

The 1980 fire destroyed the hotel's computers, but the records sat in fireproof lockboxes and were undamaged. "We didn't miss a payroll after the fire," he reports.

There is one aspect of the business that is not discussed freely because of its sensitivity, but it is extremely important to the people who run the casinos. It is the "folio" kept on high-betting customers, and it determines how they will be rewarded when they check out of the host hotel.



PHOTO COURTESY OF CAESARS PALACE

Lyle Bell of Caesars Palace: "Our business never stops."

Their reward could be any combination of free room, food and beverages — identified in the industry as RF&B — depending on the amount of money spent at the tables. At many casinos using data processing equipment, financial transactions made during the stay of the guest are entered into a folio as they occur.

A casino executive then makes a determination as to the liability of the guest for charges incurred, which are usually assigned to the room. The decision by the casino executive often determines if the guest will come back or go somewhere else.

The folio contains personal information about the guest, such as his occupation, banker and established credit line. This information is carefully guarded by the casinos. The system was devised by the corporations when they took over the many casinos owned by partners — who carried folio information in their heads 20 years ago.

At Bally's Grand, Watson says, computers maintain two kinds of files on guests. The A file is for the regular guest, and the B file is for the preferred guest. "We even keep track of the birthdays or anniversaries of our better guests," Watson says.

□

At the 1,600-room Caesars Palace hotel, "the systems run 24 hours a day, because our business never stops," says Lyle Bell, director of data processing. "It is rare for us to have a system go down for more than 10 minutes. Our progamming and operations staff is committed to keeping these systems up."

Bell joined Caesars Palace in 1984, after four years as director of data processing for a manufacturing firm and eight years as a management information consultant with the accounting firm of Arthur Andersen & Co. in San Francisco.

Bell runs his department with two NCR Corp. 8550 mainframes, which are used for the front-desk system and for most of the accounting systems. This equipment, in use since 1976, is on the way out.

'Need to move ahead'

"It has served us well," Bell says, "but we need to move ahead with new technology. We need to transfer information on preferred guests into the casino information system on a more timely basis."

The department has used an IBM 4361 Model 4 since mid-1985, and that machine is now being used to bring up a new payroll/personnel system. New accounting software is destined for this machine in the future.

Caesars uses a Tandem Computers, Inc. Nonstop system for the race and sports book and for the casino information system.

"We need to replace our front-desk system, and we are looking at other possibilities. We have found that most front-desk systems are geared for hotels smaller than Caesars, so it will be a challenge to find something that will work for our size resort and can be integrated with our casino information system," he says.

Player incentive programs

Another system on the horizon would connect slot machines to a data collection and information processing base. This would give the hotel accounting and internal control information and provide an opportunity to market slot machine play through player incentive programs.

"For example," Bell says, "it is possible to issue a slot player a card to insert into the machine and accumulate points based on coins in and handle pulls. The bonus points could be used to award the player prizes or other complimentaries."

Bell says another major application under construction is a casino accounting system that will be integrated with the casino information system. This system will automate fill and credit accounting at the tables and more efficiently prepare the "stiff sheet," which reports casino wins and related information by various areas in the casino.

Bell says there have not been any computer disasters at Caesars while he has been there, but that there were some anxious moments when the race and sports book system went down for a few minutes prior to a major football game — a critical time because of last-minute bets.

His secret nightmare would be a problem with the Tandem system on New Year's Eve or before the playing of the Super Bowl. This year, both events went off without a hitch.

Although it is a year or two away, Bell wants to provide the front-desk cashiers with point-of-sale information from the cash registers, "which most other places have."

□

"The whole idea is to keep the guest happy," says Jack L. Braman, director of management information systems for Hilton Nevada Corp., which includes the Las Vegas, Flamingo and Reno, Nev., Hiltons.

That process begins at Compass Computer Systems, a Hilton subsidiary, which maintains two IBM 3083s in Dallas to track Hilton



PHOTO COURTESY OF BALLY'S GRAND HOTEL

A 1980 fire destroyed the former MGM Grand's computers, but its records were safe in fireproof lock boxes. Says Watson: "We didn't miss a payroll."



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reservations on a worldwide basis. Braman takes over once the guest arrives with the help of an Ontel Corp. system consisting of 58 terminals and 29 printers located throughout the hotel.

The Hilton staff uses the system to take care of guests' needs while they are in the hotel, from check in to checkout. The system interfaces with point-of-sale devices — cash registers — and automatically tallies transactions charged to guest rooms, tacking them onto the customer's bill.

A Northern Telecom, Inc. telephone system automatically prices all phone calls and adds them to the guest's folio. The housekeeping department keeps track of the condition of the guest rooms through this system.

When a maid finishes cleaning a room, she picks up the phone, dials a number and reports that the room is ready for occupancy. This information goes to the computer and is available to the staff at the front desk for use in assigning the rooms.

> ***Bell says there have not been any computer disasters at Caesars while he has been there, but there were some anxious moments when the race and sports book system went down for a few minutes prior to a major football game — a critical time because of last-minute bets. His secret nightmare would be a problem with the Tandem system on New Year's Eve or before the playing of the Super Bowl.***

An IBM Series/1 Model 4956 handles the accounting system, the general ledger, accounts receivable, casino accounts, accounts payable and hotel and casino payroll using 12 terminals and five printers.

Soon Braman will provide hotel executives with daily profit-and-loss statements, an improvement over the current monthly statements produced by the system. "This system also talks to the corporate office in Beverly Hills, Calif.," Braman explains.

Slot machines are monitored by a Digital Equipment Corp. PDP-11/24, which tells the slot manager in hard-copy form how many coins were dropped in each machine, the number of coins paid out and how many times the handle was pulled. It also detects any mechanical failures and notifies the surveillance department monitoring the casino of any big jackpot.

Casino player history is maintained by an IBM System/38, which keeps track of receivables, accounting in the casino cage, the casino back-office accounting, disputes and all casino systems. It can display a guest signature on a screen to be viewed by hotel employees processing checks or markers. There are 55 terminals and 27 printers connected to the System/38.



PHOTO COURTESY OF HILTON NEVADA

Jack Braman of Hilton Nevada: "Keep the guest happy."

"This also helps us analyze a special event or the success of a junket," Braman says.

In April, the Hilton started to computerize its function book, which keeps track of special events such as conventions. IBM Personal Computers, of which the hotel already has bought 24 and expects to buy another 20 this year, represent part of an effort to increase department productivity.

First of many steps

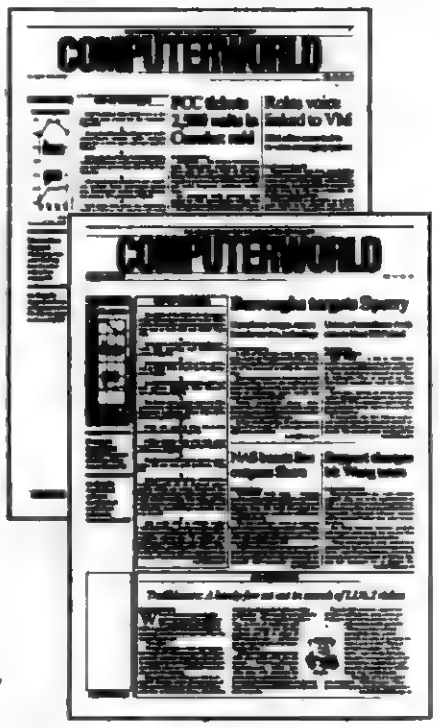
The function book is the first step in an attempt to give departments access to all function information, Braman says. Computerization of the engineering department functions is scheduled for this summer. The computer will keep track of trip tickets — work orders to make repairs — and will document time and costs for repair jobs.

According to Braman, the computers provide a cost forecast, establish preventive maintenance scheduled according to the manufacturer's recommendations and determine when something should be replaced rather than repaired. He adds that voice recognition is being studied as a possible replacement for keyboards and that inventory control is another area of interest.

Braman says he has no great fears about the system and can recall only one serious problem in the past 14 months. Three power surges blew out diodes late one evening, and the

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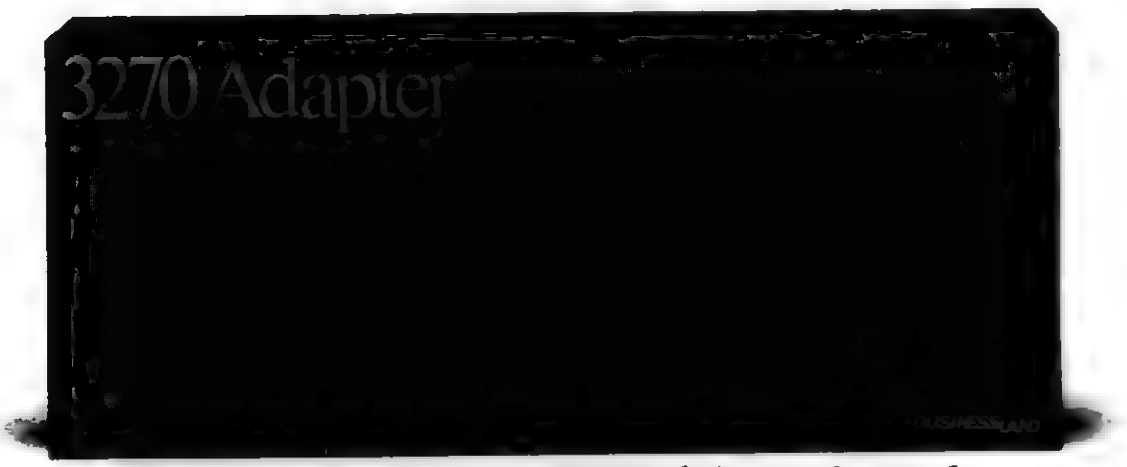
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front-desk system was out of commission for an hour, but there were no guest complaints.

□

The data processing manager for the Union Plaza in downtown Las Vegas is Alan Dattge, who has held the position since October 1979.

A native of Las Vegas, Dattge worked for eight years in the accounting department at the El Cortez Hotel before joining the Union Plaza. The El Cortez management sent him to programming courses, and he picked up the rest of his expertise "piecemeal."

His equipment includes two IBM System/34s, one IBM System/36, a Tandem Nonstop II, a Remanco Systems, Inc. point-of-sale system for the hotel's Center Stage restaurant, about 70 CRTs around the hotel and 25 printers of various models.

The Remanco system provides a keyboard for a food server to enter a code number for a food order. For example, 525 might be a roast beef sandwich.

The order is printed out for the cook, and when the guest is finished eating, the system prints out the bill, breaking down the amount spent on food items, the bar and taxes.

"I am fighting for an inventory control system that will allow us to keep a better handle on our costs. As prices fluctuate, the system will automatically update the cost of menu items and let management decide how to structure its food. There is an IBM inventory and purchase order control system that does this automatically," Dattge says.

The System/36 "runs the hotel," with software from Pleasant Hill, Calif.-based Hotel Information Systems. Dattge says the software is used by more than 200 businesses around the world. The system handles reservations, check ins and checkouts, room availability, accounts receivable and commissions for travel agents.

Tracking gambling activity

The System/34 handles the gambling part of the hotel operation. It provides a game analysis and slot machine input. The daily drop is counted, as is the number of jackpots paid during a 24-hour period. Every seven days, a reading is taken of the slot activity. There is a meter reading of the number of coins put in the machine to produce a hold percentage.

For the table games, the machine keeps track of the drop for 21, craps and roulette on the basis of three shifts per day and calculates a drop-and-win percentage. There are daily totals, monthly totals and yearly totals — standard operating requirements of the Nevada Gaming Control Board, which polices the industry.

The Tandem Nonstop appears to be almost the standard of the race and sports betting industry. The Union Plaza's version gives each ticket writer his own computer terminal and allows information on eight tracks in the U.S. to be sorted out simultaneously for the players.

"All major sporting events can be handled," Dattge says. Every 24 hours, there is a series of management and auditing printouts. The computer prints the betting tickets, stores one copy and computes the winning prices, which are put on a display board manually.

The Union Plaza also has an automated attendance system, with the employee identification badge being used to check in and out of the time office. Dattge says

> ***Dattge has had no problems with the equipment, but half a dozen yearly power outages — usually when the wind blows — cause a few gray hairs, because "we don't have backup power here."***

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this gives management a daily labor cost for the profit-and-loss statement.

More than push buttons

Dattge says that the biggest problem is trying to get management to understand the capabilities of the computer. "They seem to think that all you have to do is push a button and out comes any kind of information. They don't realize that input is required. Too often, they think this is already done," Dattge says.

> ***"Management seems to think all you have to do is push a button and out comes information. They don't realize input is required. Too often they think this is already done."***
>
> — Alan Dattge
> Lyon Plaza

The computer provides the labels for mail-out literature on eight yearly pan tournaments, six gin tournaments and, now, four slot machine tournaments. The hotel will have its own slot club, with the members being treated to parties, overnight stays and prizes.

Dattge operates his 24-hour department in a room with a 71° F controlled temperature — standard operating procedure — with a staff of six. Two people work days, one works a swing shift, one works the graveyard shift and two are scheduled for relief shifts.

He has had no equipment problems, but half a dozen yearly power outages — usually when the wind blows — cause a few gray hairs, because "we don't have backup power here." His backup system, begun in 1985, consists of microfiche files of everything that is computer generated.

□

Carole A. Carter, managing director of corporate computer services for Summa Corp., refers to the departments she works with as her "customers," because she feels that it is just as important for her to keep them happy as it is for them to keep the tourists happy.

At Summa, a company that was formed to manage the Las Vegas acquisitions of

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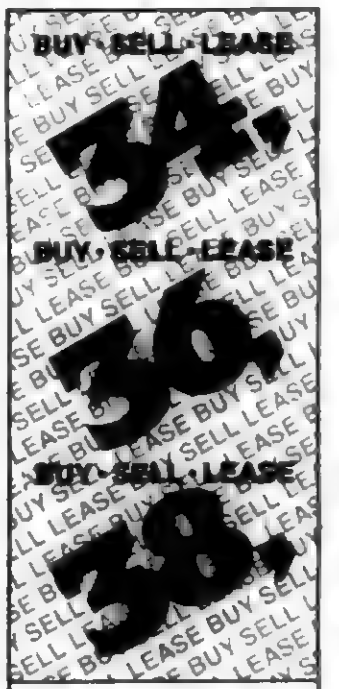
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PHOTO COURTESY OF CLIENT/PLAYA

Union Plaza's Alan Dettge: Fighting for better inventory control.

the late Howard Hughes, Carter's customers include the Desert Inn, the Frontier, Sands, Castaways and Silver Slipper, all located in Las Vegas, and occasionally Harold's Club in Reno, Nev.

In addition, Carter's 75-member staff provides services for Summa's real estate division, which includes offices in Los Angeles, and Hughes Aviation Services, a fixed-base operation at McCarran International Airport that is the destination of many major airlines' charter flights to Las Vegas.

Carter worked her way up to her present position through seven years of service with Summa as an assistant controller at the Sands Hotel, as a member of the corporate computer services staff and as director of account control.

"We are a total IBM system," she says, and this system, like others in Las Vegas, operates 24 hours a day, seven days a week. The one exception comes when they shut it down for 90 minutes every Tuesday for maintenance.

The data processing department, which handles four million transactions a month, is located in its own building a block west of the Las Vegas Strip.

IBM shop

The system includes two IBM 4381 Model Group 2 CPUs; one IBM 4341 Model Group 2; 325 remote printers and terminals throughout the Summa empire; 105 local terminals in the data processing department; and seven IBM Series/1 minicomputers.

"We support our own casinos. In-house development and design for the hotel application was done by the department," she says.

The machines perform standard functions such as general ledger, with McCormack & Dodge Corp.'s general ledger accounts payable package, as well as capital projects, payroll, personnel and insurance for employees.

Carter's group created the software for the aircraft operation that keeps track of aircraft maintenance, parts inventory and accounts receivable, and it provides the same services for charter planes that major scheduled carriers provide — passenger seating, check in, a manifest and a video display screen that displays arrivals and departures throughout the Hughes terminal.

"We also have a business systems information center support group that is responsible for the acquisition and installation of microcomputers and subsequent training of all users," Carter says.

On the drawing board now are plans for a shift from a centralized to a distributed environment. When completed — within a few months — the system will include a mainframe connected to a minicomputer system that is specifically designed for a given department, as well as the addition of microcomputers to departments, Carter explains.

"With microcomputers connected to the mainframe, our customers can download selected information to their microcomputers. They can rearrange their data in the format they want to see printed out or add information for a whole new report," she says.

Cash register connection

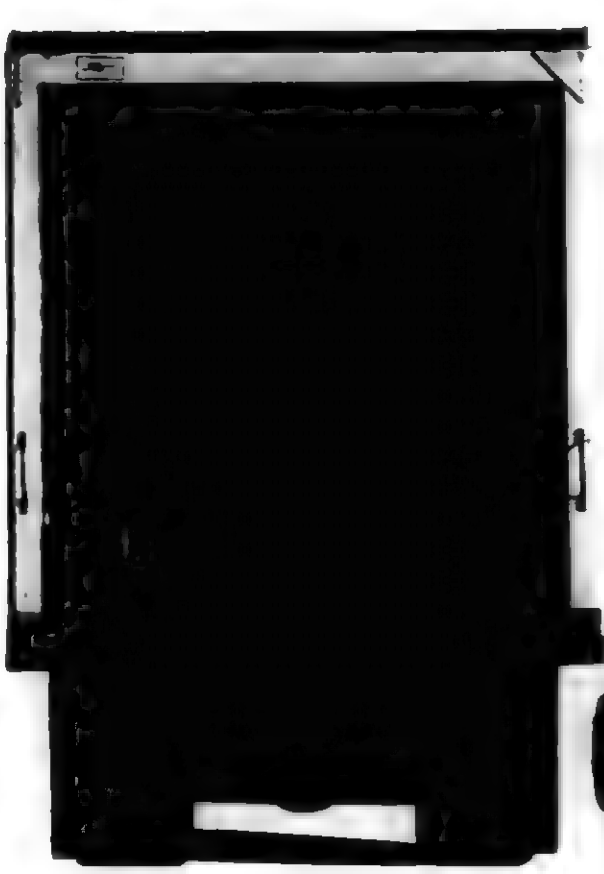
A recent addition to the system is the connection of cash registers at the Frontier to provide instant point-of-sale data on guest purchases by hooking the NCR Corp. cash registers into the IBM mainframes.

"We are looking at another system for the Desert Inn," she says. "All we have to do is provide a communications link."

The only complaints registered come from guests who say the computer is too slow, particularly when they are standing in line waiting to be checked into rooms. "It's critical to have our computer work as fast as possible," Carter says.

Carter's overall philosophy, based on the fact that data processing work is charged back to users, is clear: "The customer is always right. I'm always available for their complaints, and I take their phone calls. We must provide the best service we can." ■

Without the right connections, you could pay a lot to deliver a little raster data.



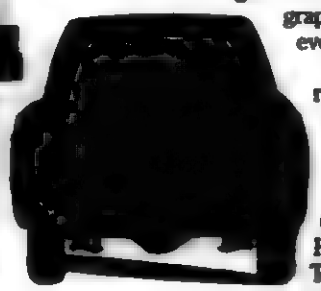
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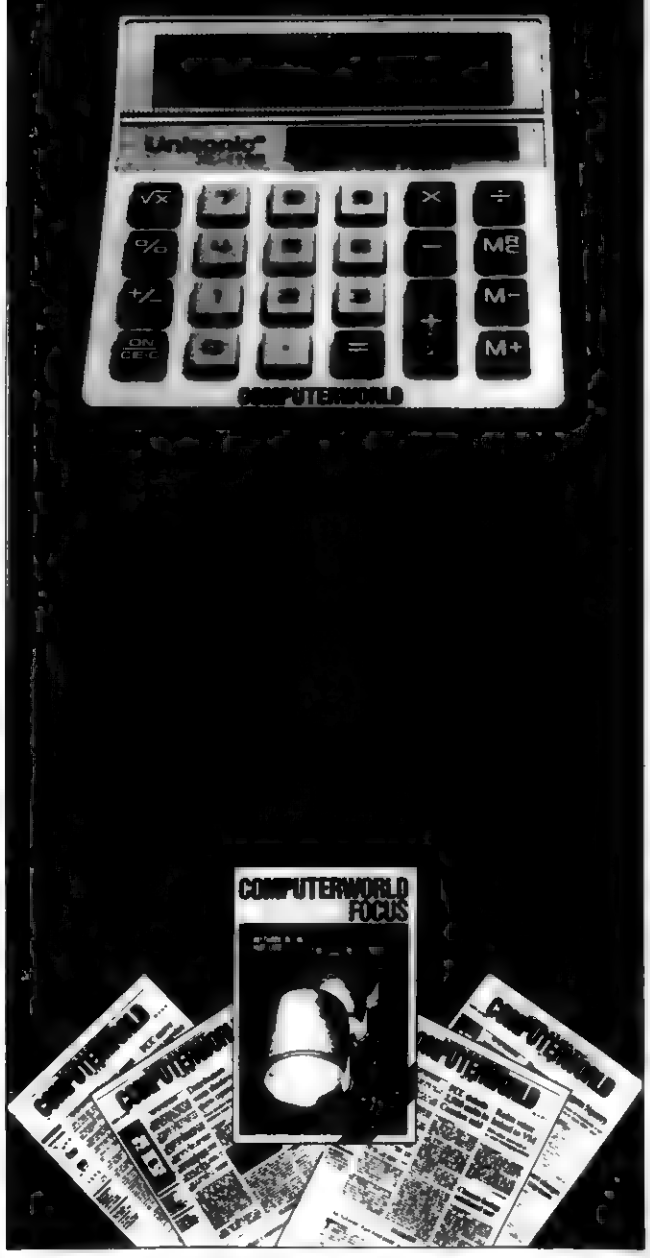


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MANAGEMENT

TAKING CHARGE
David R. Vincent

Making MIS a profit center

The profit motive is fundamental to our economy. It has been demonstrated over and over that when an activity cannot be related to profit, its management becomes vague and lacks clear business direction.

At its recent executive roundtables, The Information Group, Inc. found that most MIS executives operate as a nonprofit function and lack a cohesive framework in which to direct their department.

This situation can affect the careers of MIS managers. Their contributions are not always recognized because they are difficult to measure. Furthermore, the manager of a nonprofit function in a profit-oriented company is an enigma. Senior executives are reluctant to accept someone who plays by special and very hard-to-understand rules.

MIS must find a way to demonstrate its value or continue to be perceived as a noncritical factor in the business. There are many ways to demonstrate value, but the most convincing is return on investment.

Take, for example, the case of an MIS group at a utility company faced with the problem of measuring return on investment. The group was constantly under-funded. Its strategic importance was not clear and the perception of its value was minimal.

To begin correcting this situation, the group's head decided to let his department's end users directly bear the cost of information services.

See MAKING page 89

Vincent is president of The Information Group, Inc., a facility for research, executive education and consulting.

Data as competitive edge

Big Eight partner looks at shift in consultant approach

By Eddy Goldberg

The focus of MIS consulting has changed in recent years from applications development to the use of information technology to give businesses a competitive advantage, according to Joel Friedman, a partner in the Management Information Consulting Division of Arthur Andersen & Co.


Friedman

In a recent interview, Friedman discussed issues raised by the use of information for competitive advantage, a term that his firm has dubbed IFCA.

CW: Is the concept of IFCA appropriate for every company?

FRIEDMAN: I think it's probably [appropriate] for every organization. How formally you try to adopt the concept is going to vary with management style. I'll start with the premise that every organization would like to achieve a competitive advantage. Therefore, every organization has at least some opportunity to use information as a competitive weapon.

Some industries are far more amenable to the concept than others, and it depends on something we'll call information intensity. Every organization has some opportunity to use information as a competitive tool, but based on the nature of the industry and the markets they're in, you'll find varying degrees of success.

CW: Should executives be wary of competitive strategy hype?

FRIEDMAN Sure. Every five years or so, whether it's in the information systems arena or the business strategy arena, there is a new buzzword or matrix or technique. None of these things taken by themselves represent a panacea. There is

See DATA page 86

Information carries legal liabilities

By Donna Raimondi

In an increasingly litigious society, companies that sell computer-generated information or design are finding themselves in a vulnerable position. But, according to Peter Marx, a Boston lawyer who specializes in computer law, information managers can take steps to protect themselves.


Marx

Courts are starting to raise questions about who is responsible when incorrect information ultimately damages someone. The following examples are some of the cases in which judgment has already been reached:

- Families of the victims of a World Airways crash in Alaska collected $12 million in a lawsuit against Jeppesen and Co., a chartmaker, and the Federal Aviation Administration. The pilot of the ill-fated plane had relied on Jeppeson's allegedly inaccurate charts that portrayed instrument approach procedures — graphical drawings based on faulty government data.
- A federal appeals court in Boston ruled in May of this year that the U.S. Weather Service was not liable for an erroneous forecast that led to the deaths of four lobstermen.
- A researcher for Dun & Bradstreet Corp.'s on-line credit data base entered incorrect information about Greenmoss Builders, Inc., a contractor, that claimed the company had filed for bankruptcy.

Greenmoss sued Dun & Bradstreet for libel and sought damages for financial loss after the information was passed on to interested parties. Greenmoss won.

Answers to the question of who is legally responsible begin with principles of

See INFORMATION'S page 88

INSIDE

Calendar: Shows, conferences, seminars/82

INSTANT ANALYSIS

"With the trend toward the distributing and downsizing of computing, mini MIS groups will be established in each department. Central MIS will take on more of a consultative role."

— George Colony, president of Forrester Research, Inc.

Rise of end-user computing brings new challenge to MIS/DP

Data centers effective management tools

By Eddy Goldberg

The fact that end-user computing has arrived is irrefutable. Estimates show that by 1990, 80% of all computing will be conducted on end-user technology, according to the MIS Research Center at the University of Minnesota. But what end-user computing is and how its rapid growth should be managed are not as clear-cut.

"End-user computing is the unstructured use of computers by someone who is not a professional in data processing," according to Naomi Lee Bloom, a senior principal at American Management Systems, Inc. in Arlington, Va. "Management of end-user computing is the management of people doing unstructured things," Bloom adds.

This is not an easy mandate for MIS and DP departments accustomed to more centralized control. However, as microcomputer use in corporations continues to grow, it is a challenge with which MIS and DP managers must deal.

Implementing controls while still serving the needs of both the end-user community and the corporatewide information systems function can be tricky.

"Management has to be more or less formal and rigorous, depending on what's going on," Bloom says. "We equip everybody with micros and encourage their use. For some users there are no controls. But as end-user computing begins to take on the same role and authority traditionally handled by DP computing, it will need to have that same level of control," she asserts.

The Bank of New England in Boston has already installed seven personal computer local-area networks to serve its microcomputer users and is planning more.

"You walk a really fine line in managing end-user computing," says Danielle Barr, vice-president of corporate systems. "You have to have some control, but without stifling innovation absolutely. We institute only those controls that will help us keep moving forward." Barr cites standardizing software as one example.

She says end users are encouraged to work with the Information Center or the PC Coordination Center to develop new applications, but questions the need for users to become skilled programmers. Instead, she emphasizes the technical support and resources of the centers available to end users. "They get the idea, we develop it. They want the solution," Barr said.

This partnership is contributing to the greater scope of activities for information centers in general. "The PC management function is evolving, becoming more mature, a more ingrained part of the corporate environment," Barr says.

As a result, information centers that are only corporate "PC stores" are no longer viable, she says. Applications development tied into the needs of the corporation represents

See RISE page 84



TURNAROUND TIME

Larry Long

***Q** Last year I chaired a committee that conducted an exhaustive search for a new computer system. Our recommendation, which appeared to offer the greatest price/performance, was accepted. The superminicomputer selected offered close to 10 times the performance of our previous system.*

A year later we are still waiting for delivery of some peripherals, mainframe features and systems software that was promised five months ago. The local sales and technical support people are no help. The sales people can't fill out an order form properly and the technical field staff know less about the hardware and software than we do. We've gotten the runaround so many times that we now try to solve the problems ourselves.

It is apparent that we made the wrong decision, but now we are committed. What can we do?

Given that you're committed to this vendor, you must begin to work with the vendor to resolve current problems and avoid future problems. No computer vendor wants this kind of customer dissatisfaction.

If the right person were to learn of your problems, the firm might very well take action to rectify the situation.

If you are convinced that you will not get satisfaction from the local office, write a letter to the national sales manager. Document every instance in which you feel the vendor has acted unprofessionally or failed to live up to stated, written or implied agreements.

Such a letter will probably strain your relationship with the staff at the local office, but so be it. You will either be serviced properly by the existing staff members or by their replacements.

***Q** The phrase "by the book" was coined to describe the man I work for: Be at your desk by 8:30 in the morning; take no more than one hour for lunch; and above all, don't make waves. I've worked as a programmer-analyst for the last four years and until recently I have enjoyed plenty of creative license. Now the differences in the way I work and the way my new supervisor wants me to work have resulted in a major personality clash. We don't like each other.*

I continue to work hard and I get a steady stream of positive feedback — except from him. During a recent performance review, he rated me "poor" in five of the six performance categories. His supporting statements were laughable.

I would like to stay with this company for a while, but this review may have destroyed my future with the company. Should I contest his evaluation of my performance?

If you feel that you have been wronged and that you can build a solid case for a stronger performance review, by all means use the formal grievance channels to contest the results of your review.

No performance evaluation system can factor out a rating supervisor's personal bias against a subordinate. That is why most systems have checks and balances, one of which is that your supervisor's manager has to sign off on your evaluation. Typically this signature is a rubber stamp, except when the evaluation is contested.

If your current evaluation is grossly out of line with previous evaluations and you can document the quality and quantity of your recent work, you stand a good chance of having your ratings adjusted.

Over the long term, if you expect to stay with the company, the two of you will need to negotiate a working arrangement. This will involve some compromise on both parts.

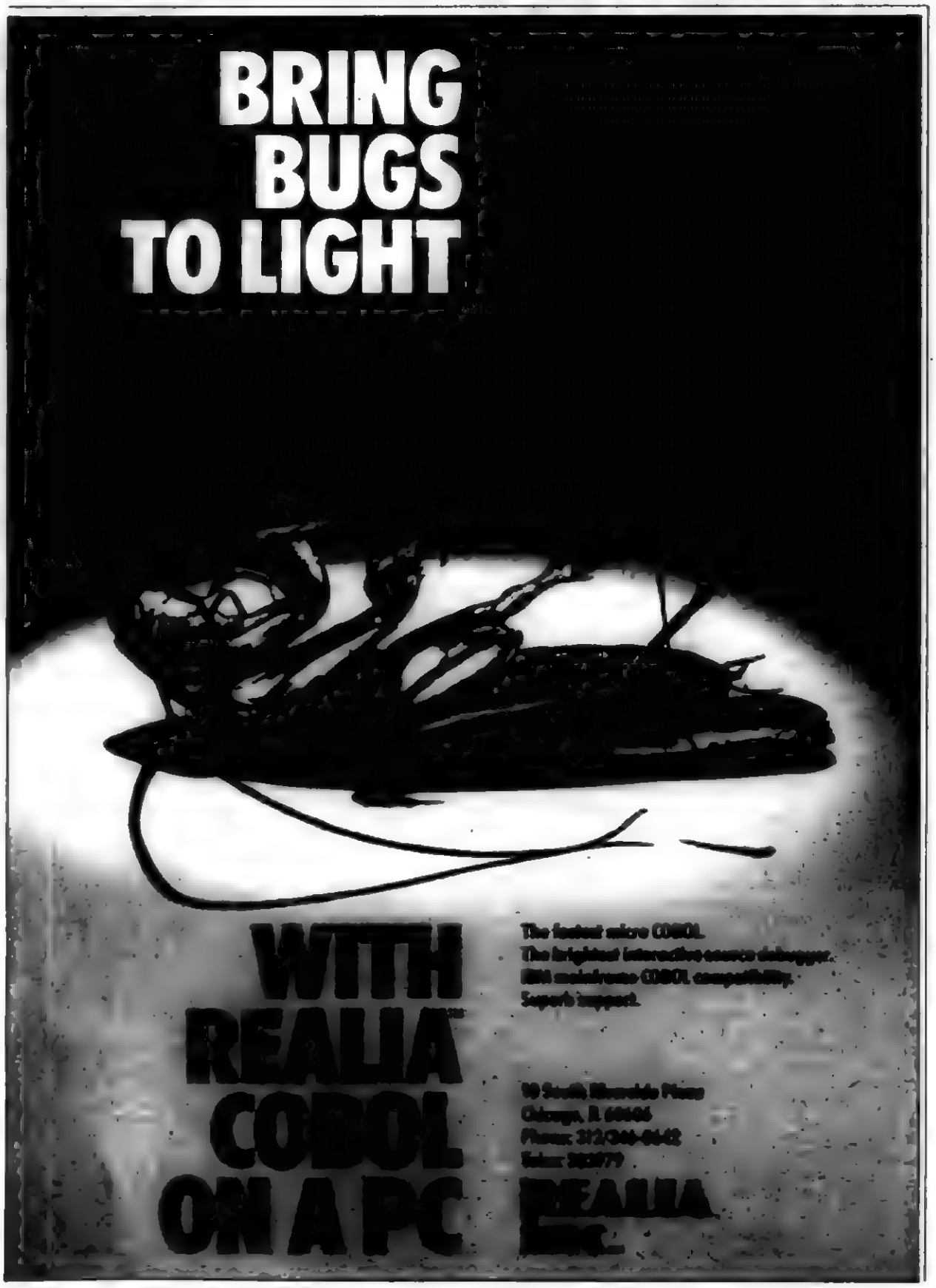
***Q** We have eight personal computers in our public relations office, all of which are IBM Personal Computers or compatibles. Two of us set up the PCs, then trained ourselves and the others to use word processing, data base and spreadsheet software. We make good use of our personal computers, but we're certainly not sophisticated users.*

We would like to network our personal computers so that we can share files, programs, data and a laser printer. Our data processing people are mainframe-oriented and have no experience in micro networking. Moreover, they show very little interest in helping us, even if we pay their internal fee of $25 an hour. Do you think networking these PCs together would be too difficult a task for us to undertake?

"Difficult" is a relative term. More than one seasoned MIS professional has taken up primal scream while installing a PC network. If your knowledge is limited to a few DOS commands, then you may be in for a hard time. I don't mean to imply that you can't learn, but learning the specifics of PC networking poses a greater challenge than learning to use micro productivity software.

Before undertaking this task, I would suggest that you find a resource person to help you over the rough spots. Don't depend on any "free" help from the people who sell you the hardware and software.

Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, P.O. Box 9171, Framingham, Mass. 01701-9171.



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CORPORATION



Someday, our children will be able to share information, anywhere, anytime and in any form as easily as we use the phone today. At Northern Telecom, we call this vision the Intelligent Universe,* and we're already building telecommunications products to make it a reality.

Recently, the global telecommunications industry established a set of standards called Integrated Services Digital Network, to help guide the future of telecommunications.

In concert with you our customer, we're fully committed to applying the principles of ISDN. After all, these principles are but another step on the way to our vision.

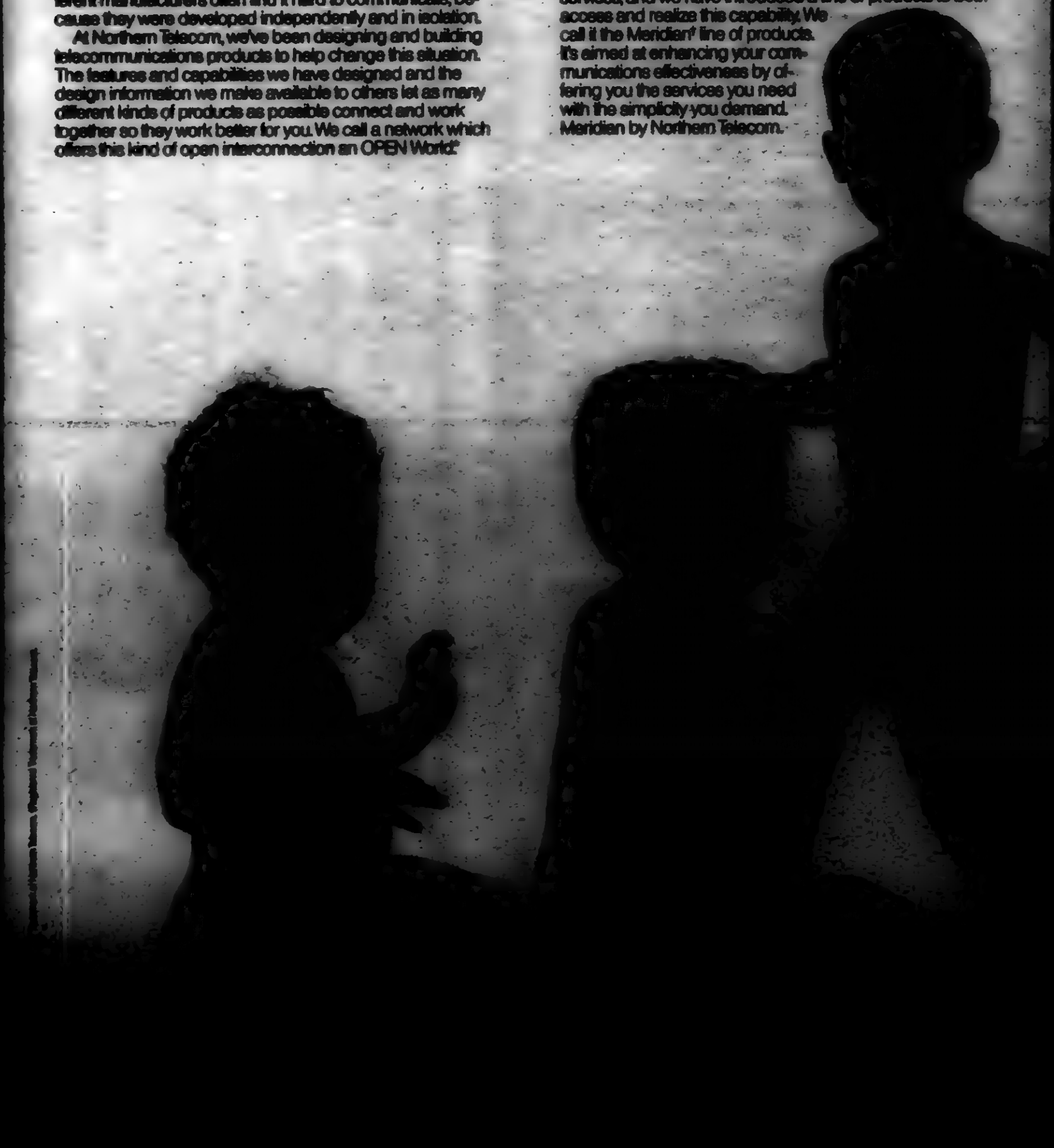
INTEGRATED—People in different parts of the world have different customs and speak different languages. That's because they were relatively isolated, and their cultures developed independently before the days of radio, television, telephones and fast, easy transportation. Sometimes, it's hard to communicate.

Similarly, computers and other equipment made by different manufacturers often find it hard to communicate, because they were developed independently and in isolation.

At Northern Telecom, we've been designing and building telecommunications products to help change this situation. The features and capabilities we have designed and the design information we make available to others let as many different kinds of products as possible connect and work together so they work better for you. We call a network which offers this kind of open interconnection an OPEN World.*

SERVICES—You don't need to understand what makes a telecommunications network tick to use it. For you, the network is just the communications services you need. And of course, the actual telephone or terminal you use is one means of accessing such services.

At Northern Telecom, we have defined and are building into the network a tremendous capability for the provision of services, and we have introduced a line of products to both access and realize this capability. We call it the Meridian* line of products. It's aimed at enhancing your communications effectiveness by offering you the services you need with the simplicity you demand. Meridian by Northern Telecom.



DIGITAL—Most people find that the best approach to solving a problem is the simplest approach. In telecommunications, the simplest way of carrying information is to convert it to a series of 1's and 0's—a digital bit stream.

A digital bit stream can mean anything—it can be your voice, a letter, a television picture, or the manufacturing diagrams for a new car.

At Northern Telecom, we've been designing and building telecommunications products based on the simple digital bit stream for two decades. We call a network that handles all information in digital form a Digital World.®

NETWORKS—In sports, a winning team starts with a good game plan, and adapts it in real time based on the changing flow of the game.

Up to now, telecommunications networks have followed a very static game plan. They were built mostly of separate elements to handle predictable changes in needs on a long-term basis. There was almost no way of controlling them in real time, so they provided little current information about overloads or breakdowns or anything.

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We call it Dynamic Network Architecture.®

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CALENDAR

JULY 20-26

JULY 20-23, TORONTO — **Directions at Toronto.** Contact: Cincom Systems, Inc., 2300 Montana Ave., Cincinnati, Ohio 45211.

JULY 21-22, SAN JOSE, CALIF. — **Computer-Aided Logistics Support.** Contact: Education Foundation of the Data Processing Management Association Seminars, Dept. CALS, P.O. Box 3608, 3420 Kashiwa St., Torrance, Calif. 90510. Also being held July 24-25 in Los Angeles.

JULY 23-25, BOSTON — **Microtrends '86, Education: Redirecting the Revolution.** Contact: Bobbi Hunt, International Communications Industries Association, 3150 Spring St., Fairfax, Va. 22031.

JULY 23-25, MORRISTOWN, N.J. — **Data Communications: Fundamentals and Beyond.** Contact: The American Institute, Carnegie Building, 55 Main St., Madison, N.J. 07940. Also being held July 30 to August 1 in Los Angeles; August 6-8 in Anchorage, Alaska; August 13-15 in Boston; and August 20-22 in Indianapolis.

JULY 24-25, ATLANTIC CITY — **Integrated Logistics Support.** Contact: TTS Seminars,, c/o Technology Training Corp., Dept. ILS/LSA, P.O. Box 3608, 3420 Kashiwa St., Torrance, Calif. 90510. Also being held July 28-29 in Orlando, Fla., and July 31 to August 1 in Washington, D.C.

JULY 24-25, SAN FRANCISCO — **Advanced Communications Architectures Seminar.** Contact: Communications Solutions, Inc., 992 S. Saratoga-Sunnyvale Road, San Jose, Calif. 95129. Also being held August 19-20 in Washington, D.C.

JULY 24-25, WASHINGTON, D.C. — **EDI Training Session.** Contact: TDCC, 1101 17th St. N.W., Washington, D.C. 20036. Also being held August 21-22 and September 25-26 in Arlington, Va.

JULY 27 TO AUG. 2

JULY 27-30, BOSTON — **Recognition Technologies Users Association Forum '86 Summer Session.** Contact: Recognition Technologies Users Association, P.O. Box 2016, Manchester Center, Vt. 05255.

JULY 27-31, ANAHEIM, CALIF. — **Third Annual Information Center Conference & Exposition.** Contact: Information Center Conference & Exposition, Weingarten Publications, Inc., 38 Chauncy St., Boston, Mass. 02111.

JULY 28-29, AVON, COLO. — **How to Manage Data and Information as a Resource.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

JULY 28-29, BOSTON — **Fast Algorithms Seminar.** Contact: Technology Training Corp. Seminars, Dept. FA, P.O. Box 3608, 3420 Kashiwa St., Torrance, Calif. 90510. Also being held July 31 to August 1 in Orlando, Fla., and August 4-5 in Washington, D.C.

JULY 28-30, RENO, NEV. — **1986 Summer Computer Simulation Conference.** Contact: The Society for Computer Simulation, P.O. Box 17900, San Diego, Calif. 92117.

JULY 28-AUGUST 1, SAN DIEGO — **Mapper Installation, Coordination and Support.** Contact: Compumetrics Training Institute, P.O. Box 58383, Houston, Texas 77258.

JULY 28-AUGUST 1, SEATTLE — **Omnicom Week.** Contact: The Omnicom Institute, Omnicom, Inc., Suite 304, 501 Church St. N.E., Vienna, Va. 22180.

JULY 30-AUGUST 1, AVON, COLO. — **How to Build and Use a Data and Information Resource Directory.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

AUG. 3-9

AUGUST 4-8, ANN ARBOR, MICH. — **Contemporary Data Communication Networks: Planning, Management and Computer-Based Design.** Contact: Engineering Summer Conferences, 300 Chrysler Center/N. Campus, Ann Arbor, Mich. 48109.

AUGUST 4-8, FORT COLLINS, COLO. — **Topics in Manufacturing Systems Engineering.** Contact: National Technological University, P.O. Box 700, 601 S. Howes St., Fort Collins, Colo. 80522.

AUG. 10-16

AUGUST 11-14, SNOWMASS, COLO. — **AM/FM International Ninth Annual Conference.** Contact: AM/FM International, Suite 820, 8775 E. Orchard Road, Englewood, Colo. 80111.

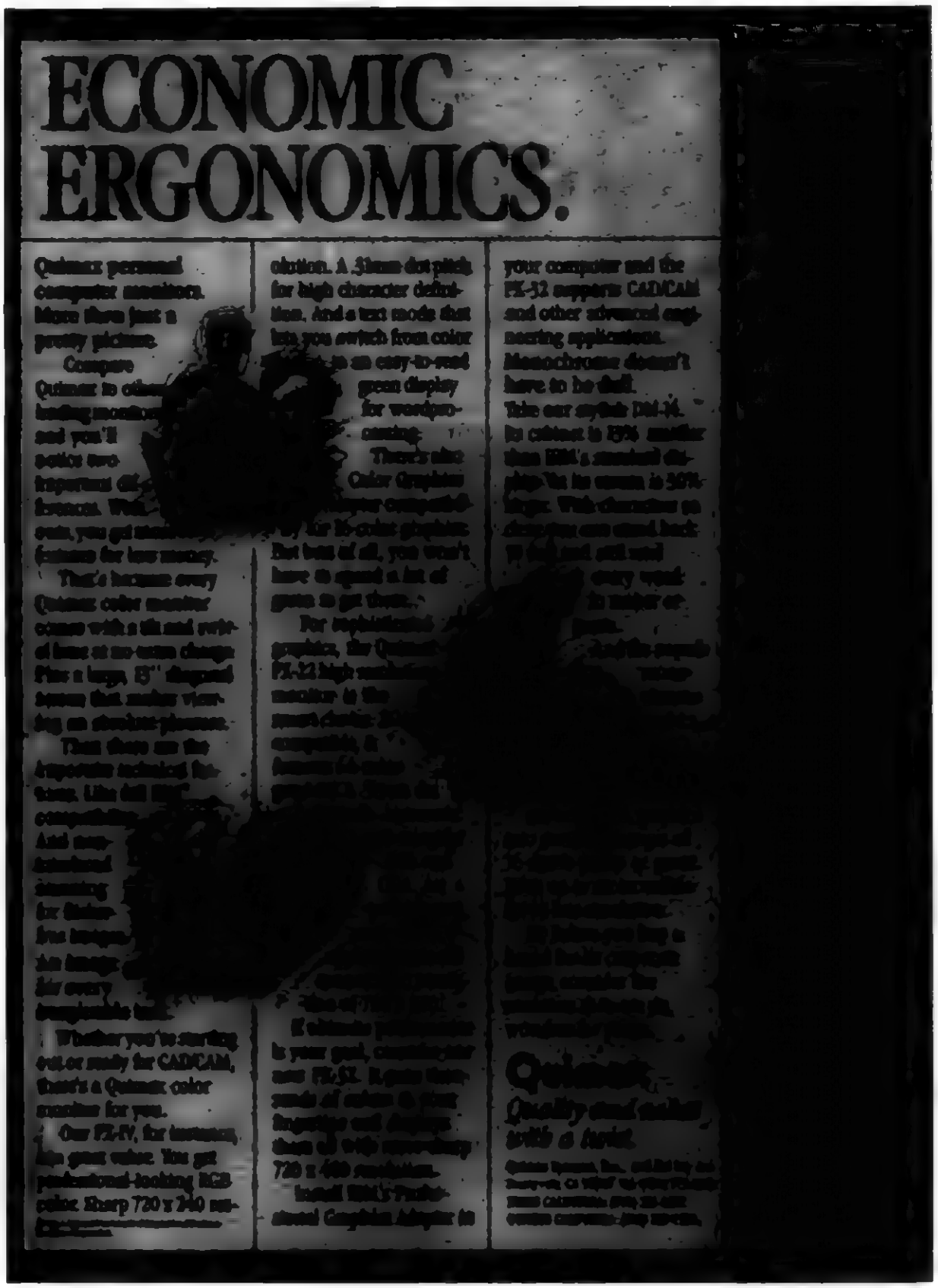
AUGUST 11-15, PHILADELPHIA — **AAAI-86 Fifth National Conference on Artificial Intelligence.** Contact: AAAI-86, The American Association for Artificial Intelligence, 445 Burgess Drive, Menlo Park, Calif. 94025.

AUGUST 14, ATLANTA — **Buying and Selling Rights to Software, Hardware and Services.** Contact: Data-Tech Institute, Lakeview Plaza, P.O. Box 2429, Clifton, N.J. 07015. Also being held August 15 in Philadelphia, August 18 in Boston and August 19 in Chicago.

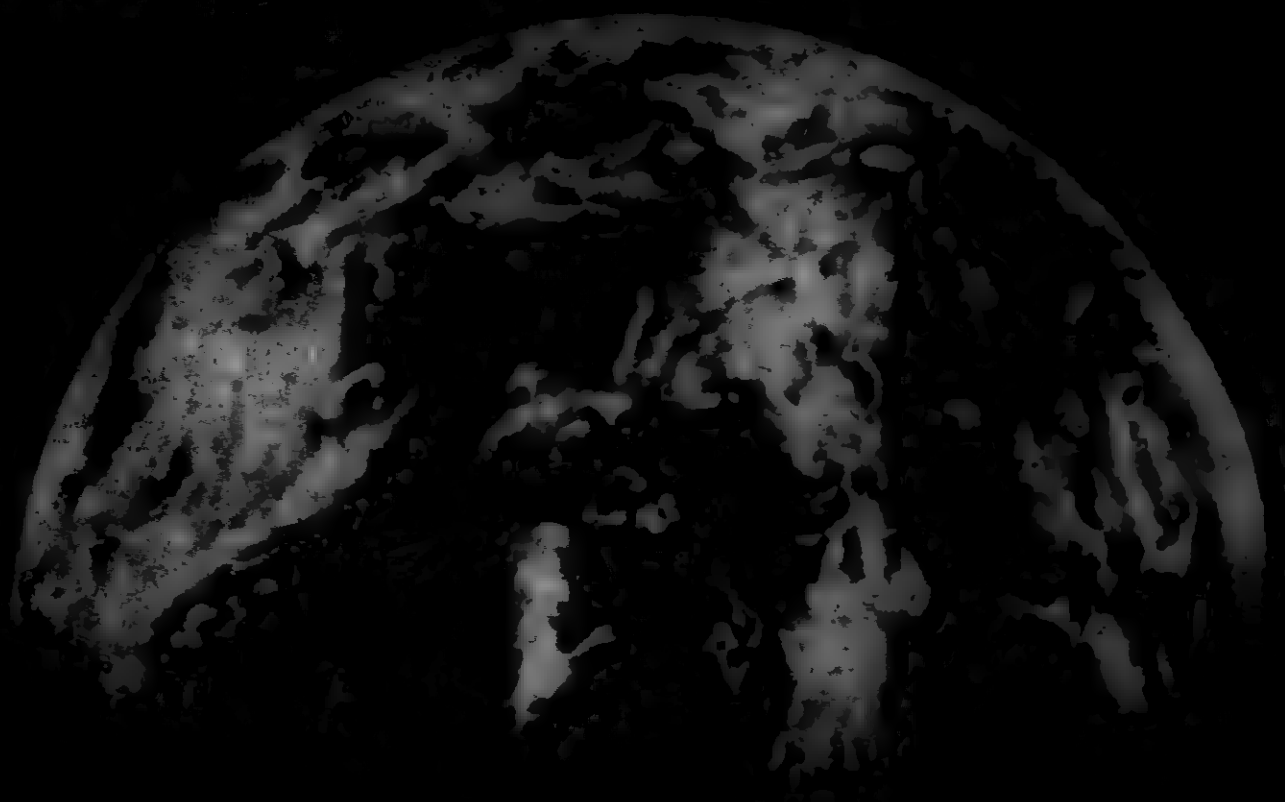
AUG. 17-23

AUGUST 18-22, DALLAS — **Thirteenth Annual Conference on Computer Graphics and Interactive Techniques.** Contact: SIGGRAPH '86, Conference Management, Smith,

See CALENDAR page 84



If the space program had advanced as fast as the computer industry, this might be the view from your office.



And space stations, Martian colonies, and interstellar probes might already be commonplace. Does that sound outlandish? Then bear these facts in mind:

In 1946 ENIAC was the world's first electronic computer. It computed weighed 30 tons, stood two stories high, covered 15,000 square feet, and cost $486,840.22 in 1946 dollars. Today

We also offer seven personal computer publications. *InfoWorld*, the weekly newspaper for people managing and purchasing personal computers for American business. The other six concentrate on specific personal computers: *PC World*, the comprehensive guide to IBM personal computers and compatibles; *inCider*, the Apple II journal; *Macworld*, the Macintosh magazine; *80 Micro*, the magazine for TRS-80 users; *RUN*, the Commodore 64 & VIC-20 magazine; and *AmigaWorld*, the magazine for the Commodore Amiga.

from our readers.

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number

Rise of end users brings challenge

From page 77

the future.

W. H. Groetzinger, director of Information Systems and Management Services at Rohm and Haas Co. in Philadelphia, says, "We're enthusiastic about end-user computing and doing what we can to support it. Employees are provided with a pretty full set of end-user tools at the mainframe, System/36 and PC levels."

Groetzinger uses the four classic stages of growth — initiation, proliferation, control and maturity — to describe the growth of end-user computing at his firm. Rohm and Haas, he says, is now in the control phase.

"We don't think you can put requirements on what you permit people to do," he claims.

However, he is instituting a level of control by restricting the types of personal computers and software his group is willing to support.

Doug Norwood, manager of the Information Center for the City of Los Angeles, sees three trends from his end-users: increased demand for micro-to-mainframe links, with the host used as a library; higher demand for graphics and associated printers; and more use of host-based products such as SAS, from SAS Institute, Inc., and Focus from Information Builders, Inc., which have risen fourfold in the past year.

> ***'Six to nine months ago, everyone was happy with stand-alone Lotus 1-2-3 on PCs. Now they want data from the mainframe, to download, to transfer to other PCs and to other sites,'***
>
> — Kathy Kilduff, Honeywell, Inc.

Norwood's staff of seven serves a user community of about 1,500, of whom 1,000 have user IDs, and he receives many requests for new packages. However, he says caution is the key word when dealing with enthusiastic users hot for a new product. He suggests sticking with a basic set of PC software products: word processor, spreadsheet, data base and graphics.

"Unless you have a quantum leap in the technology, if it has a little more whiz-bang, it won't be substantially better. There are a lot of look-alike products," he warns. "There's so much software out there to keep up with."

Yet he finds most of it is for micros. "We're not finding a great deal of advanced technology for data bases or spreadsheets on the host."

Each organization's end users have their own individual and collective life cycles. As their needs continue to evolve, end users become more sophisticated and demand more from the information center.

"Six to nine months ago, everyone was happy with stand-alone Lotus 1-2-3 on PCs. Now they want data from the mainframe, to download, to transfer to other PCs and to other sites," says Kathy Kilduff, manager of Honeywell, Inc.'s Information Technology Center in Waltham, Mass.

After installation and initial education, Kilduff's biggest problem is communications, linking the stand-alones.

One part of her solution is to write her own communications course for the end users. Education is a large part of what she does in the information center, but she says staying abreast of changing user needs is critical.

"What worked last year won't necessarily work this year. We're refining our courses every quarter," Kilduff says. She finds users requesting increasingly advanced courses.

In order to sort out the plethora of microcomputer products, Kilduff is part of Honeywell's PC Council, which has an internal, nationwide software data base. She said the group has corporately licensed training tutorials for the most popular packages.

She also uses the services of Corporate Software, Inc. of Canton, Mass., which researches thousands of software packages each year and puts the top 400 in a reference book that information center managers can use to assist them in choosing the software most appropriate to their needs.

Information centers

Information centers appear to be an effective method for MIS departments to manage end-user computing.

"A good responsive information center is the logical response to end-user computing," says James C. Wetherbe, a professor of MIS at the University of Minnesota and director of its MIS Research Center.

"Our research shows that a well-focused, competent information center staff can make all the difference in the world in enhancing the image of the MIS staff and supporting the user."



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AUGUST 19-20, NEW YORK — **DEC: The Next Five Years. Contact:** The Yankee Group, Seminar Division, 14th Floor, 89 Broad St., Boston, Mass. 02110.

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AUGUST 26-28, SAN MATEO, CALIF. — Interconnect '86. Contact: Agnes M. Pavel, Program Director, U.S. Telecommunications Suppliers Association, Suite 1618, 333 N. Michigan Ave., Chicago, Ill. 60601.

AUGUST 27-29, NOORDWIJKERHOUT, THE NETHERLANDS — Information Systems Assessment. Contact: Stichting Informatica Congressen, Paulus Potterstraat 40, 1071 DB Amsterdam, The Netherlands.

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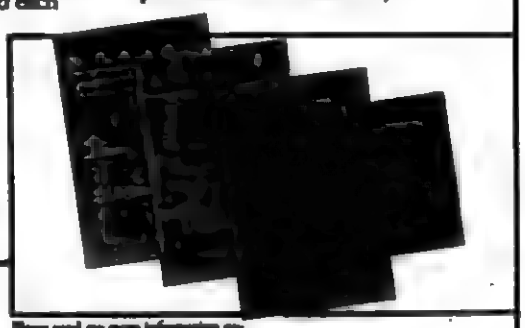
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Data use gives competitive edge

From page 77

no magic inherent in any of these techniques that will assure success. They are basically one more means by which an organization can refine its planning process, refine its operations and try to beat the competition.

IFCA shouldn't be overblown in terms of its importance. It's just one more tool in the bag of tricks that any information systems manager has to better discharge his responsibilities.

CW: Who might initiate IFCA, and how should it be justified?
FRIEDMAN: There are really several starting points. Again, it varies with organizational style. Where it has been most successful is where it has been driven by the executive office in conjunction with the business strategy or the equivalent of the chief information officer in conjunction with long-range information planning.

Those two starting points tend to take a fairly broad view of the company, its markets and its competition. Rather than starting with the notion that we have some neat technology and how should we use it, it's the other way around: We've got a business problem to solve, and what can we do with the technology to better enhance our position?

CW: What are the major obstacles that crop up in the implementation of these programs and projects?
FRIEDMAN: There are several. Just as all business strategies are not going to be successful, not all information technology strategies are going to be successful. You have to overcome the unrealistic expectations of management that technology is somehow magical and that everything is going to be dramatically successful.

The second issue is technology, particularly when building competitive intelligence systems, for example. The success of those depends on the availability and accuracy of the information you're going to obtain. There are limitations on the data itself, the retrieval and the data base capabilities within the organization.

The third problem, particularly with the internal use of information for competitive advantage . . . is that once you build those [competitive intelligence systems] and make information available to the executive suite on a timely basis, you have now dramatically shifted the balance of power within the organization. Once you provide information on-line to the executive suite, you've shifted power. The middle management ranks in the organization can find that extremely threatening if it isn't managed properly.

CW: What can the MIS manager do to bridge the gap to the executive office?
FRIEDMAN: It's all driven by the ability to use information to solve business problems. If the approach from the information systems manager to the executive suite is to say, "Gee, I have this really neat hardware, and here's what we can do with it," and you happen to have an executive who's not attuned to hardware, it will fall on deaf ears.

If the information systems manager takes the perspective, "We're using this resource to help with our business goals and strategies, and we're focusing on the needs of all of your users in the organization," you may or may not get the CEO to buy into the system, but you can typically find a number of user sponsors for more advanced uses in technology.

> ***'If a competitor is able to use technology as a competitive weapon and you don't respond . . . you'll be held accountable to your shareholders sooner or later.'***
>
> — Joel Friedman
> Arthur Andersen & Co.

CW: What about MIS managers today, some of whom may not want to get involved in the strategic aspects of information technology?
FRIEDMAN: The trauma of change. That's true with any kind of change, whether it's technology, product or marketplace. Yet if an organization doesn't respond to change, it's not going to survive. I think organizations will find themselves with very little choice.

If a competitor is able to use technology as a competitive weapon and you don't respond . . . you'll be held accountable to your shareholders sooner or later. If you're the individual who doesn't respond and you have a whole level of management beneath you that does understand better how to use technology, you'll become superfluous.

You've got to face up to change. There really is no choice. It's a question of how rapidly you do it, how rapidly your industry is changing, how rapidly your competitors are changing. But you have no choice.

So for the information systems manager who's finding himself frustrated today, there are a couple of messages. One is to keep the faith, because change is inevitable. Two is to find a coalition of supporters within the organization because there are going to be individuals in the organization who really see the use of technology and information and the competitive potential. I'm very optimistic about this change.

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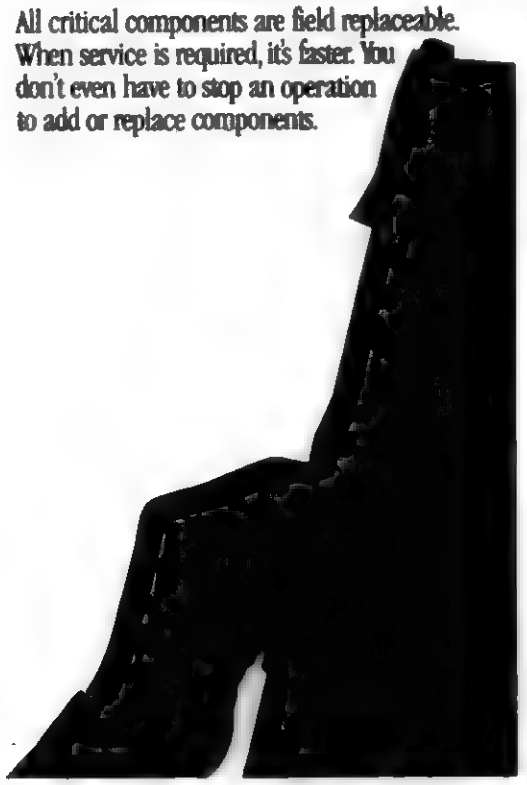


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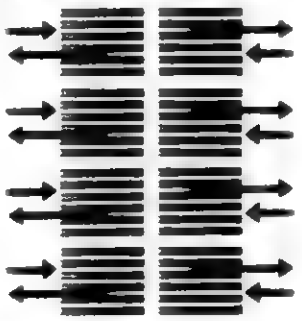
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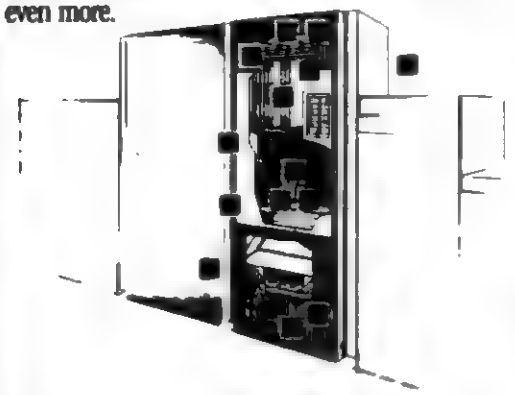


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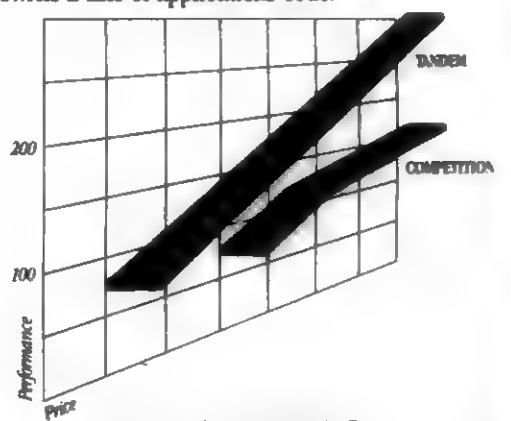


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Information's liabilities

From page 77

common law, according to Marx, a partner in the Goulston & Storrs law firm in Boston. "You start from a basic premise of Anglo-American law that people are responsible for their wrongs to others if they have some kind of a 'duty of care' toward them," Marx says. But what constitutes duty of care is not clear-cut.

For example, a company that claims to sell a word processing program has a duty of care to provide that product. If the program actually is not a word processor but only a text editor, the customers who bought the package expecting word processing services could win a lawsuit, because they clearly ended up with something other than what they expected.

The vendor is under legal obligation to provide what it says it provides — in this case, word processing software.

On the other hand, nobody can hold the U.S. Weather Service responsible for ruining their picnic if the service said it would be a sunny day and it rains, Marx says.

"If I was going to be a guest at your picnic, which you planned on the weather service forecast, and it rained, and I sued, I would not win," he explains. "That is clearly so removed there is no duty of care."

Shades of gray

But between those two extremes are many gray areas, Marx says. Often, informational services are mislabeled as products, a legal technicality that can make a world of difference, Marx says.

"Traditionally with services, you had to have been negligent in order to be held liable," he says. With products, there is strict liability, whether or not the provider was negligent.

However, marketing departments often package services as a product so that the customer thinks he is getting something tangible, he adds.

Steps that smart managers can take to reduce chances of being held responsible start with an awareness of how the service they provide is being marketed, Marx says. Managers should ensure that the capabilities of the service or product are not being exaggerated.

In addition, managers should think about the effects of their service or product on third parties as well as on the direct customer. This is particularly true when lives or large sums of money are involved, Marx says.

Quality control is important, Marx says. "If the data you are dealing with may have serious consequences — such as the data used in disease control or aircraft control — there should be redundancies."

Two clerks could separately enter critical information and if discrepancies result, a supervisor should check the data to see why it is different.

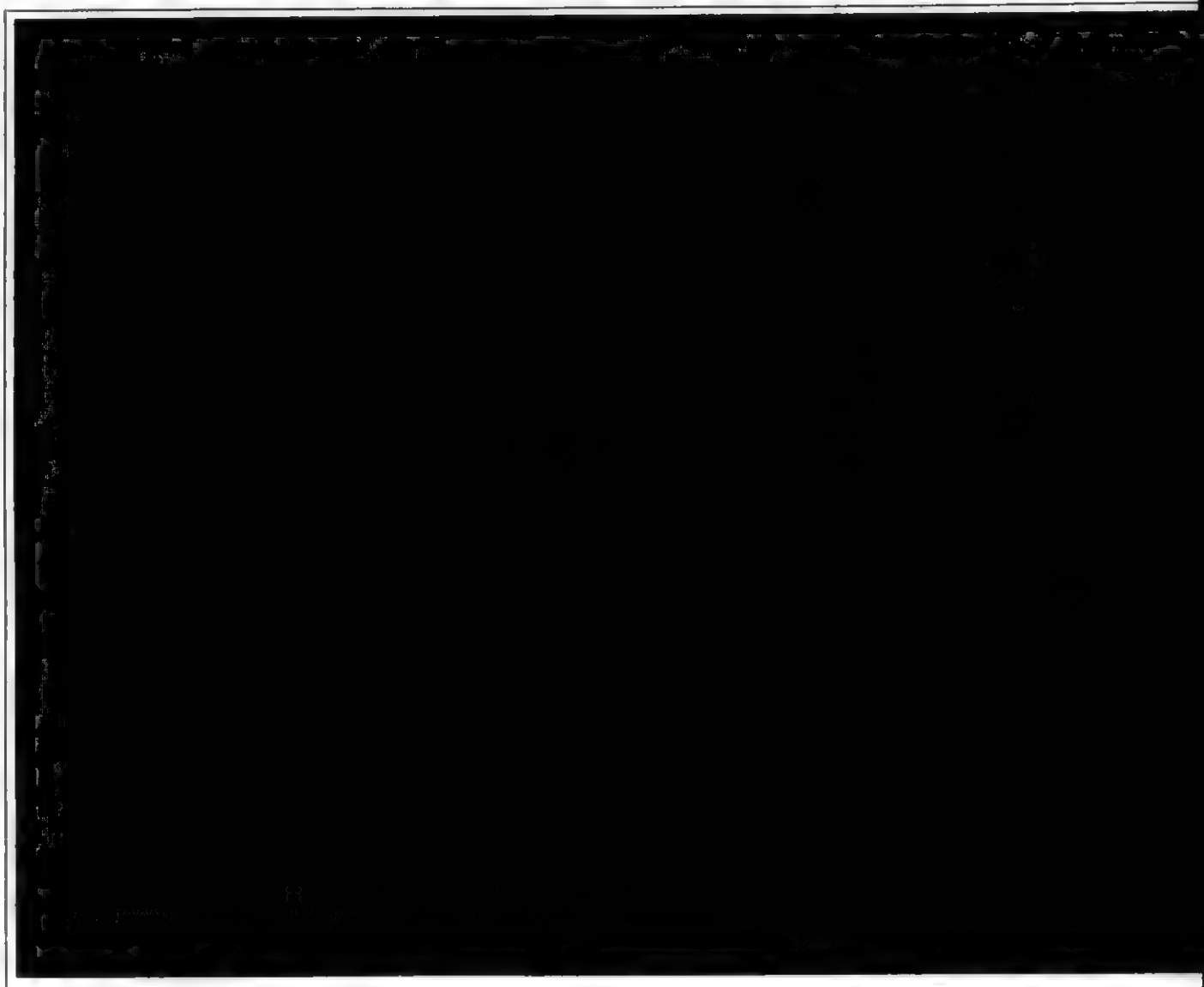
Companies should sign contracts with suppliers and customers to shift responsibility wherever possible, Marx continues. "Jeppeson could have had a contract with the aircraft owner saying the owner was responsible for whatever happened to the plane."

At the time of the World Airways disaster, it was not possible for a company to sign such a contract with government agencies. But Jeppeson later helped push legislation through Congress so that now a company can contract to shift responsibility for mistakes that are solely the government's fault.

"When important decisions are made, they should be recorded," Marx says. Internal records should be complete, documenting all the considerations that went into deciding whether a product or service was safe.

Records should cite all efforts that were made to ensure safety and to improve the service or product, so that if there is a lawsuit, there is a formal record of company responsibility and not a lot of "smoking guns" — informal memos that work against the company.

The information manager should know how the company's insurance policies protect himself and his staff. "How much do the insurance companies cover MIS activities? Do they cover MIS executives personally?," Marx asks. If there is a duty of care that extends to individual employee's responsibility, it might be wise to have that employee well covered.



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Making MIS a profit center

From page 77

The group first researched prevailing market rates of outside service bureaus. They then consolidated the quotes and averaged them. From the averaged rates, they subtracted 25% to arrive at a rate far below market value.

The new rates were proposed to management for use in evaluating the distribution and effectiveness of MIS resources. When management agreed the proposed rates were more than fair and should be used, the MIS group created a competitive revenue stream for funding its operations.

The group then had to determine how much of the revenue should be invested in MIS. It also had to determine how much should be returned to the corporation.

It created a profit-and-loss plan and statement of assets. Management agreed to achieve the same return on its MIS assets as on others. The target return, when subtracted from the revenue, yielded the MIS budget.

The user departments thus absorbed charges from MIS as expenses in their operations. Each user matched his portion of MIS expenses to his ability to generate revenue or to control costs. Essentially, investment judgments in MIS were passed on to users.

This process is analogous to transfer price mechanisms used in large manufacturing organizations, which measure performance at each plant contributing to the end product. Likewise, data processing and information services are two of many corporate resources used to produce an end product.

At the utility company, top management changed its perception of the MIS department. Rather than a drag on overhead, it was seen as a vital contributor to the company's earnings. The MIS executive gained stature and became more involved in business decisions.

Nevertheless, there are pitfalls in establishing MIS as a profit center. If objectives are not well defined, the concept might lead to disastrous results. Profit-oriented MIS and user managers might squeeze out vital services such as security and disaster recovery as a result of short-term profit maximizing. The corporation might have to fund any MIS activity that doesn't have short-term benefits to users.

Profit centers favor high-volume, complex applications such as on-line systems. These are used by a limited number of business groups and generate very profitable revenue. On the other hand, applications such as time-sharing are less complex, use fewer resources, and are far less profitable.

Time-sharing may use large amounts of MIS resources, but this is spread over many users. When a profit-oriented MIS group favors more profitable transactions, service may suffer for others, even though that is at odds with business objectives.

The solution to matching service to business objectives lies in changing the way MIS professionals are paid and rewarded.

Motivation obstacles

At an Information Group executive roundtable, MIS managers complained about personnel departments and restrictive salary systems, such as the odious Hay Point program, because these systems create obstacles to motivation.

When MIS professionals are paid and rewarded under obsolete and bureaucratic systems, there is little hope for aligning them with business objectives. Executives at the roundtable felt that in addition to changing the method of assessing MIS performance, jobs and reward systems should be restructured.

That is easier when they can be based on an identifiable MIS contribution such as return on investment.

Finally, MIS executives in charge of a profit center need to be involved in the business of the organization more than ever to optimize the results of the new MIS business unit.

If the profit center views itself as an independent business, it might turn away from day-to-day involvement with the organization it serves. Running an MIS unit as a profit center should enhance its stature in the organization, not alienate it.

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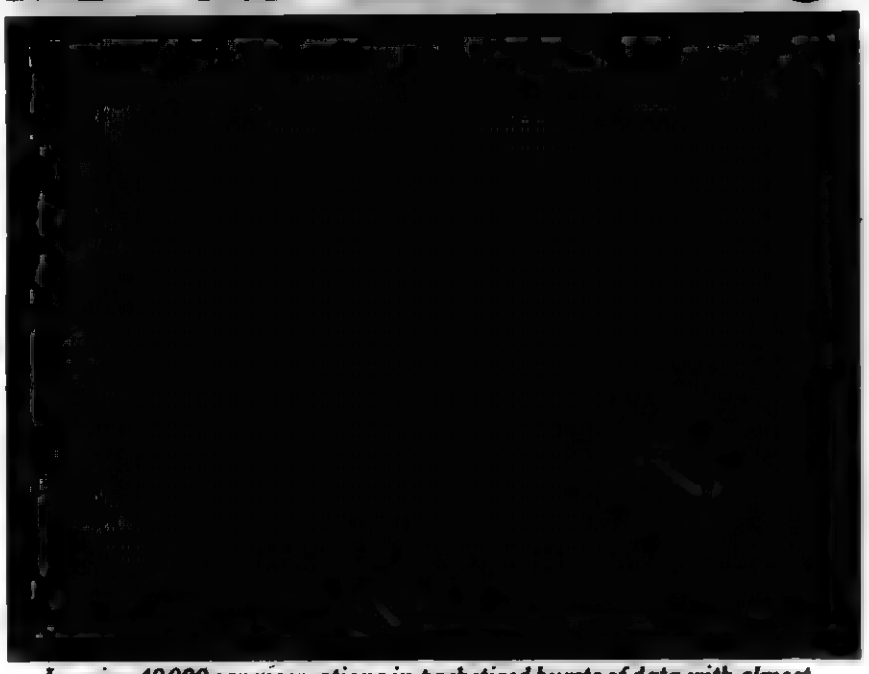
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NEW PRODUCTS

Page reader eliminates rekey need

Compuscan, Inc., of Fairfield, N.J., has introduced the PCS Model 235 personal computer-compatible page reader.

According to the vendor, the PCS Model 235 eliminates the need to rekey information contained in correspondence, reports and files.

It is said to be able to scan a typewritten page of text or data and input the information, properly formatted, into IBM Personal Computers and compatibles in 30 sec. or less.

Automatic features

Priced at $3,150, the page reader is said to automatically stack-feed up to 50 pages while unattended, read popular office type styles and automatically add proper formatting codes.

It also comes with an interface for most word processing software packages such as Micropro International Corp.'s Wordstar and Wordstar 2000, Ashton-Tate's Multimate, IBM Displaywrite, Samna Corp.'s Samna Word and Volkswriter Deluxe and Wordperfect Corp.'s Wordperfect.

According to a company spokesman, the PCS Model 235 supports word processing, data communications, document distribution, electronic mail, data base creation and electronic filing applications.

He added that the scanners were designed to solve the problem of bottlenecks caused by an increasing amount of paper-based information that, without the scanners, would need to be manually keyed into personal computers, word processors and other office systems.

The PCS Model 235 is Compuscan's second personal computer-compatible page reader.

The company's PCS Model 230, introduced last fall, costs $5,695. It has the same features as the PCS Model 235 with the added capability of being upgradeable to connect with dedicated word, communications and data processors.

The company also offers the Model 220 PCS Scanner that was designed to operate specifically with dedicated word processors such as those offered by Wang Laboratories, Inc. and IBM.

Desktop 9-track streaming drive boasts small footprint

A desktop 9-track streaming tape drive with a small computer systems interface (SCSI) has been released by the Qualstar Corp. of Canoga Park, Calif.

Called Ministreamer Model 1054, the tape transport is said to be IBM and American National Standards Institute (ANSI) compatible, using standard ½-in. tape on a 10½-in. reel. The Ministreamer is priced at $3,995.

With Ministreamer Model 1054, users can select densities of 1,600 and 3,200 bit/in. Tape streaming speeds are 50 and 25 in./sec., respectively.

According to Qualstar, one of the major advantages of the system is its small size. The drive measures 12¼ in. by 21½ in. by 8¼ in. It weighs 31 lb. and does not require a separate equipment rack for mounting.

The surface area required for the drive is said to be about the same as for an 8½-by 11-in. piece of paper.

The SCSI interface is said to simplify the software integration of various peripherals on a common bus.

The SCSI controller in each of the Ministreamer drives provides the system with the drive's parameters and makes it possible for one software driver to control a number of different peripherals.

Features microprocessor technology

According to a company spokesman, the Ministreamer features microprocessor technology designed to control tape motion and eliminate tension arms.

Qualstar manufactures and markets a family of ANSI- and IBM-compatible 9-track, streaming tape drives, including 7-in. and 10½-in. drives with Pertec Peripherals Corp./Cipher Data Products, Inc., IBM Personal Computer and SCSI interfaces.

The company also supplies a tape subsystem for the IBM Personal Computer XT and AT that allows the user to interchange data files with virtually any mainframe computer, the vendor said.

Tool enables RM/Fortran users to develop graphics applications

Ryan-McFarland Corp. of Rolling Hills, Calif., has announced that RM/Fortran IBM PC- DOS users can now develop graphics applications using Graphics Software Systems, Inc.'s GSS-CGI-based Graphics Development Toolkit.

According to the vendor, RM/Fortran programmers using the Graphics Development Toolkits's GSS-GCI raster technology can now develop applications featuring pop-up menus, windowing and high-quality text fonts.

GSS-GCI is said to be the first true device-independent computer graphics interface for raster and vector graphics.

RM/Fortran applications

It enables RM/Fortran applications to be decoupled from hardware dependencies and eliminates the need for applications developers to create device drivers of graphics algorithms.

The GSS Toolkit is said to support a wide range of I/O devices, such as the IBM Enhanced Graphics Adapter and other IBM peripherals, as well as devices from Hewlett-Packard Co., Epson America, Inc., Okidata Corp., Ricoh of America, Toshiba America, Inc., Hercules Computer Technology, Inc. and Mouse Systems Corp. systems.

Designed to support the migration of high-end Fortran applications, RM/Fortran is a complete implementation of the Fortran-77 standard, certified error-free by the General Services Administration at the highest possible level.

IBM markets RM/Fortran Version 1.0 as IBM PC Professional Fortran for its engineering and scientific series of machines, the vendor said.

The price of RM/Fortran is $595, and the price of the GSS Graphics Development Toolkit is $395

TRT interface lets VAX, IBM minis access telex network

Offers accountability, internal message ID

TRT Telecommunications Corp. of Washington, D.C., is offering telex interfaces for users of IBM System/34, 36 and 38 computers and Digital Equipment Corp. VAX minicomputers.

The telex interfaces for IBM System/34, 36 and 38 and VAX provide menu-driven access to the worldwide telex network and enable users to send messages to other private or public networks, using TRT as the gateway.

Access to TRT is available via a 1,200 bit/sec., 2,400 bit/sec. or 4.8K bit/sec. dial-up connection. The procedure of message processing on the interfaces consists of the user creating or revising his message with the telex editor, placing the message on the transmission file and letting the system automatically transmit the message.

According to TRT, full message accountability is ensured, either via a message log that is continually updated on the IBM System, or — with both the DEC VAX and the IBM System/34, 36, 38 — through a TRT acknowledgement number, delivery notice and message text at the sender's workstation or printer.

In addition, both systems are said to allow for the assignment of an internal message identifier, enabling users to keep separate files on messages by project name or by department.

Both TRT interfaces provide for outgoing message control and routing through a supervisor. Messages leaving the system are created and delivered to TRT for telex transmission from the user's workstation.

Messages coming into the system from domestic and international points are automatically distributed directly to the correct end user on the system.

The fully paid license for the interface, including system software and autodialer hardware and software, costs $4,500 for the IBM System/34 and 36 and $5,500 for the System/38. A maintenance option is available for $40 per month. For the DEC VAX, the permanent license costs $2,700.

A one-year license with option to convert is available on the IBM System/34 and 36 for $228 per month and on the System/38 for $269 per month, maintenance included.

According to a company spokesman, if the user wishes to convert from a one-year license, he can use 65% of payments already made as payment toward the new license.

INSIDE

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SOFTWARE & SERVICES

Systems software

Cosmic has announced **Expert System Executive**, a computer program for use in automated real-time monitoring.

When provided with a set of rules and real-time data, the Executive continuously compares the current status to the rule conditions, determines which rules are applicable and performs the required action. It has three major data principles: an array containing the rules, an array containing the conditions and the queues containing the conflict set.

The program is written in C for use on a Hewlett-Packard Co. 9000 series computer.

Expert System Executive costs $500.

Cosmic, Computer Services Annex, The University of Georgia, Athens, Ga. 30602.

■

Genesys Software Systems, Inc. has enhanced its **Human Resource Managers and Staff** (HRMS) system software by including an English/French language capability.

The HRMS program includes Payroll Accounting, Personnel Administration and Benefits Management. Either French or English may be selected at logon, and all menus, data entry, data inquiry and system screens appear in that language. A user can switch between languages without having to sign on again.

HRMS runs on IBM mainframes under OS or DOS.

The enhancement costs from $32,000 to $65,000 for individual modules. The complete system costs from $111,000 to $355,000.

Genesys Software Systems, 20 Ballard Way, Lawrence, Mass. 01843.

■

Hewlett-Packard Co. has introduced its **HP 64000-UX** microprocessor development environment.

The product is said to provide connectivity and compatibility with host computer environments. It offers such capabilities as an open system with versatile networking to microprocessor software development environments such as Digital Equipment Corp. VAX and IBM Personal Computers, in-circuit emulators, and analysis tools for 8-, 16- and 32-bit microprocessors and HP computer-aided software engineering tools that address the entire microprocessor software design cycle.

HP 64000-UX costs $6,500.

HP, Inquiries Manager, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

■

Convex Computer Corp. has announced that Quantitative Technology Corp.'s **Math Advantage Software** is now available for use with Convex's C-1 supercomputer system.

The Convex Math Advantage consists of 176 engineering and scientific subroutines. The subroutines are said to provide functions used in signal and seismic processing, mechanical design and scientific computing.

Convex Math Advantage costs $10,000 in executable form. The source code costs $15,000.

Convex Computer, 701 N. Plano Road, Richardson, Texas 75081.

■

IMSL has released the **IMSL Library** for Pyramid Series 900 systems using the Fortran 77 compiler, under the OS operating system.

The IMSL Library is said to provide over 500 mathematical and statistical Fortran subprograms for the professional problem solver. The IMSL library subroutines are divided into three categories: mathematical, statistical and general applications.

The IMSL Library's annual license fee on the Pyramid 900 systems is $2,500 for the first year and $2,000 for a renewal.

IMSL, 2500 City W. Blvd., Houston, Texas 77042.

■

Apollo Computer, Inc. has introduced its **Domain/Performance Analysis Kit** (PAK), a set of computer-aided software engineering tools.

Domain/Pak consists of the The Domain Performance Analysis Tool, said to refine performance data down to the procedure level; the Display Process Status, used to learn how an application as a whole shares system level resources; and the Histogram Program Counter, used to obtain a detailed look at execution time within a given procedure.

Domain/PAK costs $250 per node and $980 per site.

Apollo Computer, 330 Billerica Road, Chelmsford, Mass. 01824.

Applications packages

Manufacturing and Consulting Services, Inc. has announced the availability of its **Anvil-5000** computer-aided design and drafting and computer-aided manufacturing software to run on the IBM RT Personal Computer.

Anvil-5000 is said to integrate wire frame, surface and solid modeling, finite element mesh, drafting and numerical control into a single package using the same data structure and the same interactive interfaces.

Anvil-5000 workstation licenses range from $5,000 per workstation to $19,000 per workstation for 12 workstations.

Manufacturing and Consulting Services, 9500 Toledo Way, Irvine, Calif. 92718.

Languages

Whitesmiths, Ltd. has announced **Version 2.3** of **C/370**, its C compiler for the IBM mainframe environment.

C/370 enables the development of C programs in the IBM mainframe environment and allows software developers to port existing applications to the IBM 370.

The major enhancement in Version

Continued on page 94



How to give them complete hands-on training without them getting their hands on your mainframe.

Introducing MENTOR/IMS the unique, fully-featured IMS/VS master terminal simulator that runs on an IBM PC or compatible.

Mentor/IMS is the first and only software package to provide full IMS/VS operator training, operational recovery procedure, rehearsal and error situation simulation, without interfering with your mainframe systems. Completely flexible, it customises to your own transaction codes, database names, logical terminal names, etc, to create a uniquely cost-effective and safe training and diagnosis tool.

Mentor/IMS supports all operands of all IMS/VS master terminal commands and behaves and responds exactly like a normal IMS/VS MTO terminal. All types of IMS/VS restart are simulated and full support is also provided for unsolicited and random events, such as system checkpoints, transaction abends, execution of BMPs, etc.

Created by Span Software Consultants, who have an impressive, 10-year record of mainframe software success all over the world, Mentor/IMS is developed and supported to the highest standards, with maintenance and upgrades for new IMS/VS releases and features assured.

Quite simply, it means that now, with just a personal computer, you can totally separate training from your mainframe system, provide self-study and revision facilities, and give genuine experience and disaster recovery training without risk or inconvenience.

To find out just how easily and effectively you can do it, call us now for our FREE Mentor/IMS demonstration diskette or mail us your business card or letterhead to the address below.

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(Don't worry about time zones we'll be waiting on your call!)

Span Software Consultants Limited,

The Genesis Centre, Birchwood Science Park, Warrington, Cheshire, England. Telephone: U.K. 0925-814444. Telex: 627142 SPNSOF G.

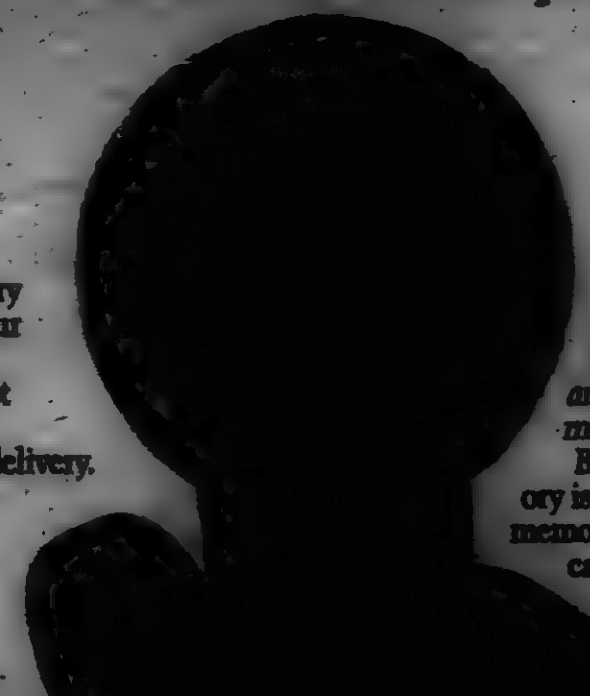
AUSTRALASIA: *Software Developments Pty Ltd.*, 845 Pacific Highway, Chatswood, N.S.W. 2067, Australia. Telephone: (02) 411-7200. Telex: AA 73649.

MENTOR/IMS

THE WORLD'S FIRST PC IMS/VS SIMULATOR

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If you want 512Kb or 256Kb memory cards for your IBM™ System/36, your choice is simple.

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Or call EMC and get immediate delivery.

Why you need more main storage in the first place.

Insufficient main storage is the single biggest limitation on the performance of your System/36.

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What makes EMC add-in memory better.

To start with, EMC's new 512Kb and 256Kb memory cards utilize 256K RAM technology. Our 256Kb card, for example, has almost 50% fewer components and interconnections than IBM's. So it's inherently more reliable and consumes less power.

What's more, every single EMC memory board undergoes a rigorous 100-hour test and burn-in procedure in one of our own System/36's.

Our quality control pays off, too. For thousands of IBM users who rely on our memory for even their most critical applications.

We've installed more memory in IBMs outside than any other independent supplier.

Our customers include leading Fortune 500 companies, such as A[illegible] Bankers Life, Connecticut [illegible] GTE and Bank of New York, to name a few.

And EMC memory boards are 100% compatible with your System/36. They fully support all IBM memory and memory diagnostic routines—*and do not affect your IBM maintenance agreement in any way.*

Better yet, EMC's new 512Kb and 256Kb memory is priced a full 25% less than IBM's comparable memory. Our volume discounts and trade-up credits can make your savings even greater.

100% money-back guarantee.

If you're not 100% satisfied with your EMC memory for any reason, simply return the board within 30 days and we'll *refund 100% of your money.* No questions. No hassles. And of course, no waiting.

To place your order for immediate delivery—or for more information—just call the toll-free number below today. Or mail the coupon to: EMC Corporation, 12 Mercer Road, Natick, MA 01760.

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[illegible] Corporation, 12 Mercer Road, Natick, MA 01760.

EMC²

[illegible] communicate!

Continued from page 92

2.3 is MVS/XA support, which allows C programs to reside anywhere in the 2G-byte address space available under MVS/XA.

It supports arrays larger than 16M bytes. Other new features include improved command line parsing and the ability to use 8-char. external names.

C/370 costs $5,000.

Whitesmiths, 97 Lowell Road, Concord, Mass. 01742.

Utilities

Teradyne, Inc. has announced its **Automated Remote Control** (ARC) software.

ARC is said to permit the setup, monitoring and troubleshooting of A300-Series Analog Large-Scale Integration Test Systems anywhere in the world from a terminal of the Test System Director (TSD), the host computer of Teradyne's Teranet automatic test equipment networking system.

From a TSD terminal working with the ARC software, users can load, set up and run test programs; debug test programs; calibrate a tester; and send test data to a line printer or to the host computer for storage.

ARC costs $30,000.

Teradyne, 321 Harrison Ave., Boston, Mass. 02118.

■

Eurosoft International, Inc. has announced **Macnix**, a software package said to provide Unix users with an interface to Apple Computer, Inc.'s Macintosh.

Macnix takes advantage of the Macintosh terminal to perform graphics operations. The host mainframe provides storage and multiuser support.

Macnix is said to be a unified virtual file system defined by the Unix files plus the Macintosh's diskette. The mainframes supported include Digital Equipment Corp.'s VAX, Sperry Corp.'s Personal Computer IT, NCR Corp.'s Tower and AT&T's 3B2 and 3B5.

Macnix costs from $1,000 to $7,500.

Eurosoft International, 14082 Loma Rio Drive, Saratoga, Calif. 95070.

■

Talaris Systems, Inc. has released **Version 2.1** of its **Laserplot** graphics support software.

Laserplot Version 2.1 is said to provide users with easy access to Talaris' 2400, 1200 and 800 laser printers' plotting capabilities. It offers a user-callable subroutine library written in Fortran 77 for developing graphics, filters that permit users to convert graphics from device or software-dependent formats to the Talaris laser printer format and interfaces to other graphics packages.

Laserplot Version 2.1 is priced at $1,700.

Talaris Systems, P.O. Box 261580, 5160 Carroll Canyon Road, San Diego, Calif. 92126.

■

Maersk Data, Inc. has introduced **MD-Slide**, said to allow direct connection of Hewlett-Packard Co.'s 7510 Color Film Recorder to IBM mainframes using IBM's Graphical Data Display Manager (GDDM) graphics.

MD-Slide is a resident system program that converts GDDM/Admprint files to HP's graphics language commands and replaces the existing file with the new file. The Maersk Data spool system then sends the graph to the HP 7510 connected to the controller with a protocol converter. If the user wants to change the font, palette or background, entry into a full-screen program allows the manipulation of backgrounds and palettes.

MD-Slide costs $7,500.

Maersk Data, 25 Vreeland Road, Florham, N.J. 07932.

Training software

Comprehensive Software has added the **Introduction to Electronic Spreadsheets** to its Intro series of training software for IBM Personal Computers and compatibles.

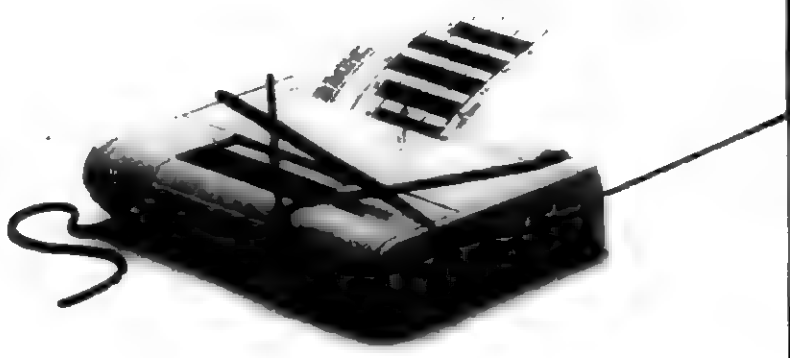
The program is said to explain what spreadsheets are as well as providing background for determining their needs. It features Lotus Development Corp.'s 1-2-3.

Topics include creating work sheets, functions, formulas, ranges, macros, data bases, graphics, cross-checking, combining work sheets and design principles.

Each of the five products in the series costs $59.95.

Comprehensive Software, Suite G, 2316 Artesia Blvd., Redondo Beach, Calif. 90278.

The new Diconix 150. At under four pounds,
It's the one PC printer you can



NEW PRODUCTS/SOFTWARE & SERVICES

Software Express has released its **Operator Training Tutorial** software package for training end users on Appgen applications.

The Operator Training Tutorial is said to take novice end users through such procedures as system logon and logoff, menu selection, data entry procedures and editing shortcuts.

The Operator Training Tutorial program is available on machines that are running AT&T's Unix and Microsoft Corp.'s Xenix.

The program costs $95 for both the software and manual.

The manual is available separately at a cost of $50.

Software Express, 7th Floor, 2925 Briarpark Drive, Houston, Texas 77042.

Services

IBM has announced **additional maintenance service** for third-party add-ons for its Personal Computer.

Ten of the products added to the list are configurations of AST Research, Inc.'s Advantage multifunction boards.

The other products include the Hewlett-Packard Co. Thinkjet printer, the Emulex Corp. DCP 88VM board and the Forte Data Systems Co. Graph Card and Forte PJ.

Other added products include the Hercules Computer Technology, Inc. Color Card and Hercules Graph Card and Digital Communications Associates, Inc. Irma 1.42 board.

A customer with an IBM PC including third-party cards serviced by IBM can add the cards to the maintenance agreement or withdraw the entire machine from the agreement.

Annual carry-in minimum maintenance fees range from $35 to $270.

On-site repair costs $10 more.

IBM, Old Orchard Road, Armonk, N.Y. 10504.

■

Dow Jones Information Services has announced **Quicksearch**, a service to aid an on-line search for company information.

A complete Quicksearch report is said to include a current quote, the latest news current to 90 seconds and a financial and market overview.

The report also includes earnings estimates, company vs. industry performance, quarterly income statements and balance sheets and company profiles.

Users can search for information using the company name or stock symbol.

Quicksearch costs $39 for a complete company report.

Dow Jones, P.O. Box 300, Princeton, N.J. 08540.

■

Tectran Corp. has introduced a national **For Sale By Owner** electronic listing service for used computer equipment.

The service allows sellers to establish a listing of their equipment.

Buyers are provided with the names and telephone numbers of sellers free of charge.

Listings access is available on the vendor's 1,200 bit/sec. Digital Equipment Corp. VT100 emulation data line.

A one-time listing fee is paid to activate the listing. The size of the fee depends upon the asking price of the equipment, starting at $29.95 for equipment worth less than $2,000.

Tectran, 780 Wellington Ave., Cranston, R.I. 02910.

MICROS

Systems

Mighty Computers Co. has introduced **MC-32 Personal Supermini**, a 32-bit personal computer workstation.

MC-32 runs under the host personal computer's Microsoft Corp. MS-DOS operating system. It is said to feature a coprocessor board powered by the National Semiconductor Corp. 32032 32-bit CPU with up to 8M bytes of onboard memory.

The MC-32 can also run AT&T's Unix System V, Version 5.2 to become a multitasking, multiuser system with file and record locking capabilities, according to the vendor.

The MC-32 Personal Supermini system with 1.5M bytes of random-access memory, a 10-MHz coprocessor and a 20M-byte hard disk costs $3,500.

Mighty Computers, Suite 207, 4529 Angeles Crest Highway, La Canada, Calif. 91011.

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Dayton, Ohio 45420
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NEW PRODUCTS/MICROCOMPUTERS

Acctex Information Systems has announced a **turnkey optical disk-based document storage and retrieval system.**

The system is composed of the vendor's indexing and search software with a write-once, 5¼-in. optical disk.

It includes an IBM Personal Computer AT, a document digitizer-scanner and an optical disk drive.

According to the vendor, the system also includes customized application software and a full-page bit-mapped display. It also includes a laser printer.

The modular system is said to be able to be expanded to multiple image workstations by adding a local-area network and utilizing multiple optical disks as image servers.

The document storage and retrieval system is priced at $49,900.

Acctex, Suite 600, 131 Steuart St., San Francisco, Calif. 94105.

■

Philips Information Systems, Inc. has announced the **Philips P3102** and **P3200** personal computers.

Both systems were designed to act as intelligent workstations and also to act as stand-alone tools, according to the vendor.

The P3102 features color graphics emulation and IBM Personal Computer compatibility, the vendor said.

The machine reportedly offers 512K bytes of memory, expandable to 640K bytes.

It runs under Microsoft Corp.'s MS-DOS 3.1.

The P3200 is an IBM PC AT compatible.

It is available with one 1.2M-byte floppy drive or one 1.2M-byte drive and a 25M-byte hard disk drive.

The computer has eight expansion slots and a 12-in. monochrome monitor. In addition, it runs under MS-DOS 3.1.

The P3102 is priced from $1,752, and the P3200 is priced from $3,795.

Philips Information Systems, Suite 300, LB 35, 15301 Dallas Pkwy., Dallas, Texas, 75248.

Software applications packages

Baker & Rabinowitz, Inc. has introduced the **Personal Applications Executive** (PAX) operating system for IBM Personal Computers.

PAX is said to give software developers multitasking advantages.

The operating system includes features such as high-speed device drivers and a completely functional demonstration system, the vendor said.

The drivers include optimized assembly-language procedures for video display, printer output and interrupt management.

The complete PAX system costs $149.95.

Baker & Rabinowitz, 3869 Kilbourne Ave., Cincinnati, Ohio 45209.

■

American Teledata Corp. has announced **Amtel Credit Reporting**, a software package that is said to automate inquiries made to credit bureaus.

Amtel Credit Reporting is able to minimize credit bureau access charges.

The system reportedly selects the best bureau for a specific geographic area and then calls up the bureau using a preconfigured ZIP code table.

The credit information is saved on disk and may be printed or reprinted at any time. This procedure provides complete archive capabilities.

Amtel Credit Reporting simultaneously processes up to 200 applicants, according to the vendor.

Amtel Credit Reporting works on IBM Personal Computers and compatible machines.

The software package is priced at $295.

American Teledata, Building 320, 8100 S. Akron, Englewood, Colo. 80112.

■

Intex Software Systems International, Ltd. has introduced a multilingual word processing program called **Intext** for IBM Personal Computers.

According to the vendor, Intext can change from one language to another in midtext. It automatically reconfigures the computer keyboard to the national standard of any of 41 foreign languages, including non-Roman alphabets and those written from right to left.

The Preventive Medicine that Reduces System Outages by 90%.

STABILIZE/CICS

Detects and Repairs Most CICS System Abends Instantly



The Best Medicine Cures the Problem Before It Occurs

STABILIZE/CICS is the "preventive medicine" MIS/DP installations have been waiting for. STABILIZE diagnoses critical CICS systems problems and then *automatically* supplies real-time corrections. Now you can get a powerful mainframe software product that will reduce your systems outages by 90 percent!

Keep Your System Up and Running

STABILIZE combines two powerful systems working in unison. The System Repair Component automatically repairs corrupt system components, while the Diagnostic Component provides on-line diagnostic information.

When problems occur, the Repair component immediately goes into action. Functionality is restored within seconds, preventing typical 30-minute outages. At the same time, the diagnostic component displays the cause of the problem, helping your staff to prevent future occurrences of the same error.

The results—STABILIZE delivers enormous productivity improvements for the people who use your CICS systems.

Key Benefits of STABILIZE:

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Two Executive Drive, Fort Lee, NJ 07024

1-800-526-0272

Or in New Jersey call 201-592-0009.

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Output can reportedly be printed on dot matrix, laser or letter-quality printers.

Graphics capability is needed for languages with non-Roman alphabets.

Intext is priced at $495 for two languages.

Intex Software, 488 Madison Ave., New York, N.Y. 10022.

■

The Crosby Co. has announced a statistical process control software package called **X & R Master**.

The package is said to perform X-bar and R-type statistical process control calculations.

It produces control charts and process capability reports.

It prints average, range, tolerance, standard error, moving mean and distribution charts.

The process capability studies are controlled by a menu and calculations and tests for control are automatic.

X & R Master is priced at $59.95.

Crosby, P.O. Box 2433, Glen Ellyn, Ill. 60137.

■

Syntactics Corp. has announced the availability of its **Crystalwriter Plus** object-based word processing software for the IBM Personal Computer AT and compatibles running under Microsoft Corp.'s Xenix-based systems.

According to the vendor, Crystalwriter Plus features object-based design for text handling, a spelling checker and corrector, automatic footnoting, text merge and an integrated forms editor and records manager.

Crystalwriter Plus is also used on systems running under Bell Laboratories' Unix System V, System III and the University of California at Berkeley System 4.2.

Crystalwriter Plus costs $695.

Syntactics, Suite 145, 3333 Bowers Ave., Santa Clara, Calif. 95054.

■

Gordon Group has announced its **Before You Leap** knowledge-based software project estimation and scheduling package.

Before You Leap is said to provide schedule estimates for financial, military-standard, scientific or any other type of software written on microcomputers, minicomputers and mainframes.

Before You Leap can also reportedly forecast detailed manloading requirements by task across the major time phases of the software project.

In addition, the program can be used as a macro estimation tool, making a single estimate for each software project, according to a company spokesman.

Before You Leap is priced at $495.

Gordon Group, Suite 321, 2530 Berryessa Road, San Jose, Calif. 95132.

Software languages

Online/Database Software, Inc. has introduced a Cullinet Software, Inc. **IDMS compatible/Cobol workstation** for use with The Application Builder (TAB).

With the inclusion of the IDMS compatible/Cobol workstation, TAB users can create, edit, develop and run an IDMS/R Batch Cobol program.

TAB operates on an IBM Personal Computer XT, Personal Computer AT or compatible with 640K bytes of memory and a minimum of 6M bytes on hard disk.

TAB and its various components are priced at $6,100. Current users can upgrade for $1,000.

Online/Database Software, One Blue Hill Plaza, Pearl River, N.Y. 10965.

Software utilities

American Programmers Guild, Ltd. has announced **Xpack**, a file transfer and security software package.

Xpack is said to allow users to encrypt any file to be sent through standard seven-bit electronic mail such as MCI Communications Corp.'s MCI Mail or ITT's Dialcom.

Features include the ability to use menus or to run directly from Microsoft Corp.'s MS-DOS, to encrypt all documents and to run communications software directly from the Xpack menu in order to send files immediately after they are encrypted.

Xpack runs on IBM Personal Computers or compatibles and costs $49.95 per copy.

American Programmers Guild, 12 Mill Plain Road, Danbury, Conn. 06811.

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For the first time, you can make as many copies of our FREE-LINK micro software as your organization needs. It's no longer necessary to pay for each individual copy or to ask your vendor to authorize additional copies. We've already taken care of that for you. A renewable yearly license for our mainframe software lets you link as many users to the mainframe as you want, at no additional cost. We've even included free maintenance as well as continuous software updates.

The Leader in Link Software from the Beginning

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NEW PRODUCTS/MICROCOMPUTERS

Microsolutions, Inc. has introduced **Unidos**, a software program said to allow IBM Personal Computer and compatible users to run 8-bit Digital Research, Inc. CP/M programs directly on the PC without additional hardware.

Unidos is said to emulate a Zilog, Inc. Z80 microprocessor and create a complete CP/M Version 2.2-compatible environment for running 8-bit CP/M software. Unidos executes Z80 instructions and does not require any changes to CP/M programs. Unidos features a built-in support if the PC has a NEC Corp. V-Series microprocessor installed.

Unidos is priced at $69.95, according to the vendor.

Microsolutions, 125 S. Fourth St., DeKalb, Ill. 60115.

■

Softcorp has introduced **Toolkit II**, a histogram printing program for its Advanced Pro-Path 6 project management package.

Toolkit is a utility program said to produce cost and resource allocation histograms from Advanced Pro-Path 6 project files. According to the vendor, it works without modification to existing project files.

Toolkit II can send histograms to a variety of devices, such as the computer screen or disk file. Printers do not require graphics capabilities.

Toolkit runs on IBM Personal Computers. It costs $49. Advanced Pro-Path 6 costs $199.

Softcorp, Suite 244, 2340 State Road 580, Clearwater, Fla. 33575.

■

Microport Systems, Inc. has introduced **System V/AT**, a version of AT&T's Unix System V Release 2 IAPX286 Version 1 designed for the IBM Personal Computer AT.

System V/AT is said to feature a virtual screen windowing system, dynamic disk buffer allocation for random-access memory disk performance, file system hardening and a symbolic debugger.

The runtime system costs $159. The software development system and the text processing system cost $169 each. Together, they cost $439.

Microport Systems, 10096 Soquel Drive, Aptos, Calif. 95003.

■

Structured Software Systems, Inc. has announced **SDF200**, a language enhancement said to add a hierarchic disk directory format to the Basic and Pascal operating systems for Hewlett-Packard Co. Series 200 and 300 desktop computers.

SDF200 provides single-workstation users with the structured directory format for the operating systems without requiring a shared resource manager controller.

Features include multiple-tree-structured directories, logical file groupings, 16-char. file names, extendable files and directories and selective backup and compatibility with shared resource manager and Series 500 disks.

SDF200 costs $600, the vendor said.

Structured Software Systems, 1072 Irick Road, Mount Holly, N.J. 08060.

■

Microsolutions, Inc. has announced **Matchpoint-PC**, said to allow IBM Personal Computer users to read from and write to Apple Computer, Inc.'s DOS, Prodos, SOS and Apple CP/M disks.

The Matchpoint-PC package consists of the Matchpoint-PC card and software disk and a copy of Uniform-PC Version 2, designed to work with the Matchpoint-PC card.

Uniform-PC is said to make the computer see CP/M disks as IBM PC-DOS disks. Matchpoint-PC also allows the use of Apple Softcard and Northstar CP/M disks as though they were DOS disks.

Matchpoint-PC is priced at $195.

Microsolutions, 125 S. Fourth St., DeKalb, Ill. 60115.

Solutions, Inc. has introduced **Glue** for Apple Computer, Inc.'s Macintosh.

Glue is said to add a print-to-disk capability to most Macintosh applications, enabling desktop publications to include graphics from almost any Macintosh applications in a newsletter. Glue is also said to facilitate the electronic distribution of newsletters, because once a newsletter has been printed to disk it can be routed through a network or an elec-



tronic mail system.

According to the vendor, the images copied by Glue are not limited by the size of the Macintosh screen.

Glue is priced at $49.

Solutions, P.O. Box 989, Montpelier, Vt. 05602.

Software data base management systems

Dynamic Graphics, Inc. has introduced **Desktop Art** for use with Apple Computer, Inc.'s Macintosh.

The software is composed of volumes of digitized graphics selected from the company's library of illustrations and photos. Each volume contains at least 300 illustrations stored on two diskettes as Macpaint documents.

The first two volumes are Graphics & Symbols 1, a collection of pictograms and symbols, and Artfolio 1, a compilation of people, objects and animals.

Graphics & Symbols 1 costs $66.95, and Artfolio 1 costs $74.95.

Dynamic Graphics, P.O. Box 1901, 6000 N. Forest Park Drive, Peoria, Ill. 61656.

■

Intermec Corp. has announced **PCLM**, its multipurpose personal computer label manager.

PCLM is said to give users the ability to create and store an infinite number of label formats on floppy or hard disks. It offers a label audit feature that tells how many labels have been produced. It also includes a library of preformatted labels.

PCLM is said to be written around the Revelation data base management program and allows users access to other DOS files downloaded from the mainframe.

PCLM is priced at $695.

Intermec, P.O. Box 360602, 4405 Russell Road, Lynwood, Wash. 98046.

Software enhancements

Software Directions, Inc. has announced **Printq Version 3.0**, its print spooling software for the IBM Personal Computer.

Version 3.0 is said to provide the ability to begin printing a report while that report is still being spooled. Changes have also been made in the Printq Status Display.

According to the vendor, Printq was designed after the print spooler used in the IBM System/38.

Software Directions, 1572 Sussex Tnpk., Randolph, N.J. 07869.

COMMUNICATIONS

Controllers

Netronix has announced the **MNA100** Multibus network adapter designed to provide Intel Corp. Multibus-based systems with access to the IBM PC Network.

The adapter is said to be completely IBM PC Network-compatible at both the hardware and protocol levels. It features an Intel 80188 CPU that provides protocol processing through the session level. The host system communicates with the adapter via dual-ported memory.

The adapter operates on a CATV-type broadband system. It costs $1,595.

Netronix, 1372 N. McDowell Blvd., Petaluma, Calif. 94952.

Voice/data communications

Votan has introduced its **Votan Telecenter** IBM Personal Computer-based voice mail system with voice recognition capabilities.

Votan Telecenter records, plays back and distributes individualized messages. The system's voice recognition capability is said to enable users to utilize functions by using voice commands.

The Votan Telecenter ranges in price from $10,950 to $19,450.

Votan, 4487 Technology Drive, Fremont, Calif. 94538.

Software

LaSalle Micro, Inc. has released **Version 1.2** of **Backcomm**, its communications software program that operates in the background of IBM Personal Computers and compatibles.

Backcomm 2.1 includes such features as the ability to encrypt and decrypt files and to squeeze and unsqueeze files without leaving the program. It also offers password protection and automatic call scheduling by day, date and time.

Backcomm also features a built-in command language, Backtalk, which allows for communication as well as

Continued on page 100

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NEW PRODUCTS/COMMUNICATIONS

Continued from page 99

disk file read and write; and interfacing to other programs executing simultaneously on the computer.

Backcomm costs $95.

LaSalle Micro, 1350 Remington Road, Schaumburg, Ill. 60195.

Multiplexers/Modems

Astrocom Corp. has enhanced its **E299 Squeeziplexer**.

The E299 Squeeziplexer is now rack-mountable so that up to four units can be contained in one rack. According to the vendor, the E299 supports up to 32 IBM Category A or compatible terminals or printers at distances of up to 10,000 ft through the use of four RG62A/U coaxial cables. The E299 demultiplexes data from any IBM 3274 Model 41 or 3274 Model 61 series controller equipped with the optional 9901 extended time-out interface.

The E299 is available in 8-, 16-, 24- and 32-port configurations. The 32-port configuration costs $2,930.

Astrocom, 120 W. Plato Blvd., St. Paul, Minn. 55419.

■

Scitec Corp. USA has announced the **Scitec Saturn D4** advanced T carrier modem.

The modem is said to operate between NRZ data equipment and the North American terrestial DS1 service.

It features standard primary rate speeds of 1.536M bit/sec. and 1.344M bit/sec., as well as subrate speeds that are multiples of 56K bit/sec. and 64K bit/sec. Scitec D4 provides both D4 and extended superframe framing on the network side.

Scitec Saturn D4 costs $3,500.

Scitec, 850 Aquidneck Ave., Middletown, R.I. 02840.

■

Creative Digital, Inc. has introduced the **Mercury Fastmodem 1200B** internal modem for IBM Personal Computers and compatibles.

The modem is said to feature autoanswer, tone- and pulse-dial capabilities and connection to most time-sharing systems as well as to other personal computers.

The modem operates asynchronously at 1,200 bit/sec. with a fallback to 300 bit/sec.

In autoanswer mode, the modem automatically detects and responds to the transmission speed of the calling modem.

Mercury Fastmodem 1200B costs $259.

Creative Digital, Suite D207, 1620 Old Oakland Road, San Jose, Calif. 95131.

Test equipment

Electrodata, Inc. has enhanced its **CTS 3** communications test set.

The data and capture buffers of the CTS 3 have each been doubled to 4,000 characters, and built-in routines have been added to perform bisynchronous and Synchronous Data Link Control spooling tests, VDT and printer tests and terminal simulation routines and echo tests.

Eighteen preprogrammed setup menus for monitoring and trapping applications have also been added, according to the vendor.

The CTS 3 costs $1,995.

Electrodata, 23020 Miles Road, Bradford Heights, Ohio 44128.

■

TITN, Inc. has introduced its **Experdata E20 Ethernet Tester.**

The E20 allows users to test Ethernet local-area network components to see if they conform to Ethernet Version 1.0, 2.0 or 802.3 standards.

According to the vendor, the test also measures traffic on the network and simulates different types of traffic for capacity planning and troubleshooting.

Experdata E20 can be used to check transceiver functions such as the transmit and heartbeat before installation on a network as well as to perform echo and collision tests and line-quality test work.

The Experdata E20 Ethernet Tester costs $4,500.

TITN, 5591 W. 78th St., Edina, Minn. 55435.

SYSTEMS & PERIPHERALS

Data storage

Southern Data Systems, Inc. has introduced the **SDS 2290V** family of disk drives for Wang Laboratories, Inc. VS computer systems.

The SDS 2290V disk drives range in capacity from 76M bytes to 576M bytes. Each drive is either a 76M-byte removable drive or a 288M-byte fixed drive.

The 288M-byte fixed drive supports a 30,000-hour mean time between errors. Both drives utilize standard cables and are plug-compatible with Wang 2265V-2 and Control Data Corp. 9766 disk drives.

The SDS 2290V disk drives cost from $8,395 for the 76M-byte model to $19,290 for the 576M-byte model.

Southern Data Systems, P.O. Box 31192, Raleigh, N.C. 27622.

■

Emulex Corp. has introduced the **UC14** Unibus host adapter designed to connect a Digital Equipment Corp. PDP-11 or VAX-11 series computer to the small computer systems interface (SCSI) while implementing DEC's Mass Storage Control protocol.

The host adapter combines with Emulex S2/SCSI, enhanced small disk interface and ST506 disk and tape controllers. The user can choose from a variety of 5¼-in. Winchester disk drives and ¼-in. cartridge tape

Continued on page 102

With MULTSESS system support software, handling multiple VTAM applications isn't an amazingly difficult feat. MULTSESS is easy to install, easy to maintain and easy to use, giving you the capability to access multiple VTAM applications—or even two or more connections to one application—from any number of 3270 type terminals in your system!

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NEW PRODUCTS/SYSTEMS & PERIPHERALS

Continued from page 100

drives. Features include direct memory access, optical disk drive support, an SCSI-protocol controller and 18-bit addressing.

The UC14 is priced at $2,200.

Emulex, P.O. Box 6725, 3545 Harbor Blvd., Costa Mesa, Calif. 92626.

Terminals

Codonics, Inc. has introduced the **I-300** graphics enhancement package designed to provide Wyse Technology, Inc. 50 and 75 terminals with Tektronix, Inc. 4010 and 4014 emulation.

Features provided include 1,024- by 800-pixel graphics display and a 1,024- by 1,024-pixel physical memory area.

The vector drawing rate is said to be more than 1,000,000 pixel/sec., and the data transfer rate is 38.4K bit/sec.

The complete I-300 graphics enhancement package costs $1,095.

Codonics, 18001 Englewood Drive, Middleburg Heights, Ohio 44130.

■

HOB Electronic has announced the **Series 80** family of IBM 3270-compatible terminals.

The terminals connect to IBM's 3274 and 3276 cluster controllers and use a two-component architecture combining a 16-bit terminal microprocessor with the firm's mainframe terminal control program, Codis.

Models include the HOB 88R 3178-compatible with 15-in. screen; the HOB 88S 3178-compatible with 15-in. screen, user-specific functions, programmability and an RS-232C port; the HOB 89S; the HOB 88S with a 14-in., seven-color screen; the HOB 88E 3270-compatible featuring multiple sessions, electronic notebook and data compression and selection; and the HOB 89E, with the same features as the 14-in. color screen HOB 88E.

Prices are $1,590, $1,990, $2,390, $2,390 and $2,790, respectively.

HOB Electronic, Bldg. D, 7 Kimball Lane, Lynnfield, Mass. 01940.

Printers/Plotters

Laserlink Systems, Inc. has announced its **Laserlink Expansion Card** for the Canon, Inc. LBP-8 A1 desktop laser printer.

According to the vendor, the Laserlink Expansion Card gives the Canon A1 laser printer full bit-map raster graphics, vector graphics and forms and multiple font capabilities.

The card is also said to provide the Canon A1 laser printer with 1.125M bytes of random-access memory. With the expansion card, the Canon A1 can be upgraded to match the full-page, 300 dot/in. graphics capacity of the Canon LBP-8 A2.

The Laserlink Expansion card costs $995.

Laserlink Systems, 161 Knollwood Drive, San Rafael, Calif. 94901.

■

CIE Terminals has announced that its **Lips 10 Laser Printer** is compatible with Hewlett-Packard Co.'s Laserjet printer.

Lips 10 is said to provide a 10 page/min. print speed compared with Laserjet's 8 page/min. The printer also has an additional 11 Laserjet-compatible font cartridges. One feature is the printer's two simultaneous on-line font cartridges that are operator-controlled either at the printer's panel or by the software.

The Lips 10 printer costs $3,495. An upgrade compatibility kit costs $200. The fonts are priced from $195 to $345 each.

CIE Terminals, 2505 McCabe Way, Irvine, Calif. 92714.

■

Seikosha Co. has introduced the **MP-1300** convertible monochrome-to-color printer.

The MP-1300 is said to be capable of producing draft-quality printing at 300 char./sec. and letter quality at 75 char./sec.

It features 185 IBM and ASCII software-generated character sets and eight international fonts, as well as graphics. Other features include rear and bottom paper loading and parallel and serial interfaces.

There is an optional snap-in, seven-color printing kit to add full-color alphanumerics and graphics printing.

The MP-1300 costs $799, and the optional color printing kit costs $155.

Seikosha, Suite SW3/249, 10080 N. Wolfe Road, Cupertino, Calif. 95014.

PRICE REDUCTIONS

Micro-Term, Inc. has announced price reductions for its **400 series** of terminal products.

Specific reductions are as follows: Model 420 from $695 to $595; Model 425 from $895 to $695; Model 440 from $1,695 to $1,495; and Model 450 from $595 to $545.

Micro-Term, 512 Rudder Road, Fenton, Mo. 63026.

■

Algor Interactive Systems, Inc. has reduced the price of **Supersap**, a finite element for stress, dynamic and heat transfer analysis for the IBM Personal Computer AT and compatibles.

Said to offer unlimited problem size, Supersap comes on 20 360K-byte diskettes. It contains two- and three-dimensional mesh generators, an interactive model editing system, preprocessing and 3-D graphics display on the front end. On the back end, it has postprocessing for stresses, displacements and heat flux.

Supersap now costs $1,500.

Algor Interactive Systems, Essex House L1, Essex Sq., Pittsburgh, Pa. 15206.

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COMPUTER INDUSTRY

Section begins on page 134

SRC stumbles over start-up hurdles in connectivity mart

Late product arrivals, layoffs trouble firm

By Stanley Gibson

NATICK, Mass. — Despite targeting one of the most important areas in the computer industry today — multivendor connectivity — Software Research Corp. (SRC) finds itself in a perilous situation due to many woes characteristic of start-up companies.

In the last six months, SRC has seen almost half of its 125-member work force depart, either voluntarily or through layoffs. Company officials point to delays in getting SRC's ambitious products to market as the reason for the layoffs.

SRC's major product is Strategic Network Exchange (SNE), which is intended to connect a number of different computers from vendors such as Wang Laboratories, Inc., Digital Equipment Corp. and IBM. But SRC's problems came about because of the difficulty of marrying a software engineer's dream with the right kind of management expertise.

"They tried to do too much too fast. They were trying to do something that was unparalleled," says George Colony, president of Forrester Research, Inc. of Cambridge, Mass. "They had problems from the beginning because they couldn't explain the product to anyone. I don't think the management or venture capitalists ever understood what the product was."

Founded as a consulting firm in 1978, SRC began product development in 1984 with the first round of what would reportedly total $11 million in venture capital over the following two years. Investors include the venture capital firms Eastech Management Co. and Welsh, Carson, Anderson & Stowe, neither of which would comment on the present status of SRC.

The company required additional funds of an unspecified amount in May of this year, according to several sources.

"The layoffs were a result of not being able to have the product on time — to get the revenues up to the level we needed," says Eduardo Stecher, SRC's marketing vice-president. Stecher cofounded SRC with Alan Vecchio to provide network consulting services to vendors developing IBM-compatible equipment.

"It was a lot more complex than we ever thought," Stecher says of the company's efforts to develop multivendor connectivity software.

Bernie Wess, an independent consultant based in Needham, Mass., voices a similar view. "How can a small company solve the problems that IBM has to solve?" he asks. "It's an extraordinary undertaking."

Stecher says SNE has been shipped to 16 companies, some of which are using it on a trial basis.

One user from a large financial services company says his company decided to use SRC's software, rather than DEC or Wang IBM connectivity software, because it wanted a single-user interface for data transfer and electronic mail.

"We're very pleased with how it has gone. Our concern is that they missed target dates," the user says. "Perhaps they tried to be too co-operative with early customers."

He adds that the young company concentrated on customizing early releases of the software at the expense of developing a strong generic product. The user claims that SRC did not provide timely product documentation.

"If they go out of business, it'll be something of a disaster," the user adds.

On May 22, Martin Waters was named SRC president and chief operating officer, taking over control of day-to-day operations from Paul Tucker, who had been president and CEO. Tucker then became chairman and retained his CEO position.

Tucker, a 23-year Honeywell, Inc. veteran, was brought in to run SRC in 1984. Several sources say the sales-oriented approach Tucker brought from Honeywell was not ideally suited to an entrepreneurial company such as SRC, in which product development was the first priority.

"I understand how to get a product from concept to market," Waters says. He previously worked as CEO of Ordain, Inc., a now-defunct Los Angeles-based maker of a relational data base machine. Prior to that, Waters was general manager of the business systems division of Perkin-Elmer Corp.

He says SRC will not need additional cash before year's end, by which time the company's business plan calls for profitability to be achieved through the sale of its software products.

Waters does not rule out the possibility of SRC being acquired to ensure its long-term survival, but he says no negotiations are in progress.

Stecher says a sale could improve the company's prospects. "The investors are pursuing making money. As a company, we would be better off if we could work with a big company — to find a financial sponsor in someone who is closer to our goals than the investors," he says.

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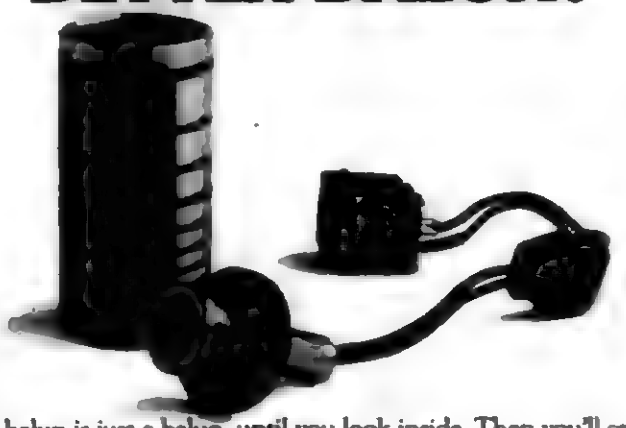


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Hogan-IBM wedding bells may sound hollow to bank MIS



OUTSIDE LINES
M. Arthur Gillis

When Hogan Systems, Inc. and IBM announced their marketing agreement in May, the bank MIS community did not end up with a stronger single-vendor-supported turnkey system. Instead, it got a software package developed and maintained by Hogan and a computer built by IBM. But now the difference is that IBM sells them both.

What ever happened to the idea that when two complementary organizations pool their resources, the result is not just the sum of the parts, but something more?

Who will benefit from this new arrangement? Clearly, it is good for Hogan. The stock market proved that. There is no better way to beat the competition than to have IBM affix its seal of approval on a product. Psychologically, this marriage gives the impression that the leading hardware company has just identified Hogan as the leading bank software company.

What is in it for IBM? Surprisingly, there is just as much psychological impact for IBM as for Hogan. IBM knows that it is not as easy to win anymore as it was in the old days. Its weaker earnings performance last year was the first sign.

IBM cannot just sell iron today, because others can do that even without the polish. Also, IBM's biggest competitor in the banking industry, Burroughs Corp., will get even bigger with the addition of Sperry Corp.

IBM always claimed it was in the solutions business. Now it can demonstrate it with software because, in terms of complexity and work load, 90% of a solution comes from software.

It takes two days to install, test and run diagnostics on an IBM 3090. Add two weeks for systems software testing, and the hardware environment is ready. By comparison, it takes about five years to fully install the Hogan system.

In dollars, that 3090 may have cost the user $3 million to $4 million. Total cost to a financial institution for the Hogan system, including implementation, is more than $6 million.

In the bowels of the MIS shop

Although IBM can theoretically offer the total solution, it may only be able to sell that idea in the executive suite. Will IBM be able to perform in the bowels of the MIS shop where the implementation is conducted?

It is doubtful. After 28 years' worth of systems implementation projects and conversions, I have learned to side with the team that learned from actual experience. It takes computer technicians, as well as bank operations professionals, to do a complete job. Where is IBM going to get those people?

Typical IBM systems engineers are great when it comes to MVS/XA, CICS, IMS and generic systems knowledge. But they will be hard-pressed to provide implementation support for one of the most complex applications packages ever developed.

If IBM's contribution is marketing, then one would have to ask why it needs thousands of generic sales reps to sell to fewer than 500 financial institutions. Hogan does not need IBM's sales clout unless it is to rebuild Hogan's credibility.

Every large financial institution knows about Hogan's reputation, based on both its success as well as its failure when it could not de-

See HOGAN-IBM page 106

Gillis is an Atlanta-based software consultant to large banks and financial institutions. He is a former senior vice-president of Fleet National Bank in Providence, R.I., and the author of several books, including Microcomputers in Financial Institutions.



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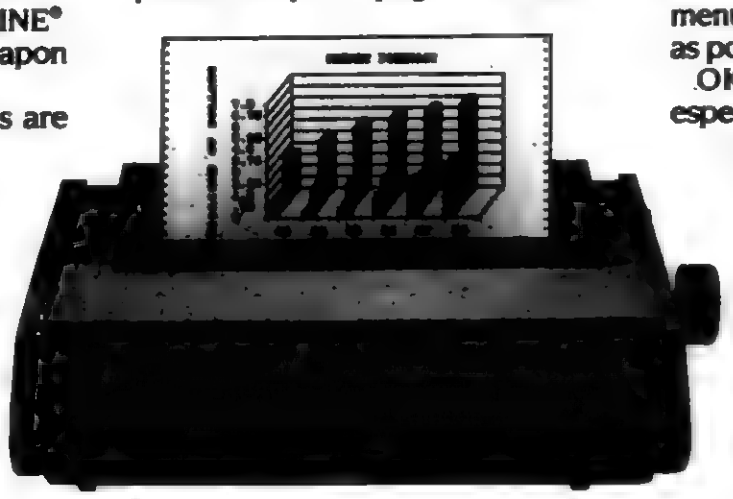
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U.S. Sprint revs campaign to ward off heavy competition

Emphasizes low rates, high fiber-optic quality

By Mitch Betts

U.S. Sprint Communications Co., which combines the communications units of GTE Corp. and United Telecommunications, Inc., has begun operations with an aggressive marketing campaign that stresses the transmission quality of the company's fiber-optic network.

U.S. Sprint debuted as the No. 3 carrier, behind AT&T and MCI Communications Corp., facing a very competitive and challenging marketplace that its parent companies found unprofitable.

The partnership merged the GTE Sprint and U.S. Telecom long-distance companies as well as GTE Telenet and United Telecom's data communications units.

"The merger was a smart move, but whether it's a profitable one remains to be seen," said Edward Goldstein, an analyst with the MAC Group, a consulting firm in Cambridge, Mass. "It's very tough to go up against AT&T and MCI in this business."

U.S. Sprint executives said they hope the appeal of low rates and the largest continuous fiber-optic network will help them take customers away from MCI and AT&T permanently. Charles M. Skibo, a member of the office of the president at U.S. Sprint, said the firm aims to increase its 4% share of the long-distance market to 7% by 1988 and better than 10% in the early 1990s.

Edward W. Carter, senior vice-president for sales and marketing, said U.S. Sprint will offer business customers a WATS Plus service with T1 access, virtual banded WATS and Dial-1 WATS. U.S. Sprint also offers the Telenet data network, a virtual private network, electronic mail and other data communications services.

Prices and other details about the services have not been disclosed, but Carter said those details will be announced sometime this month, with reduced rates effective Aug. 1.

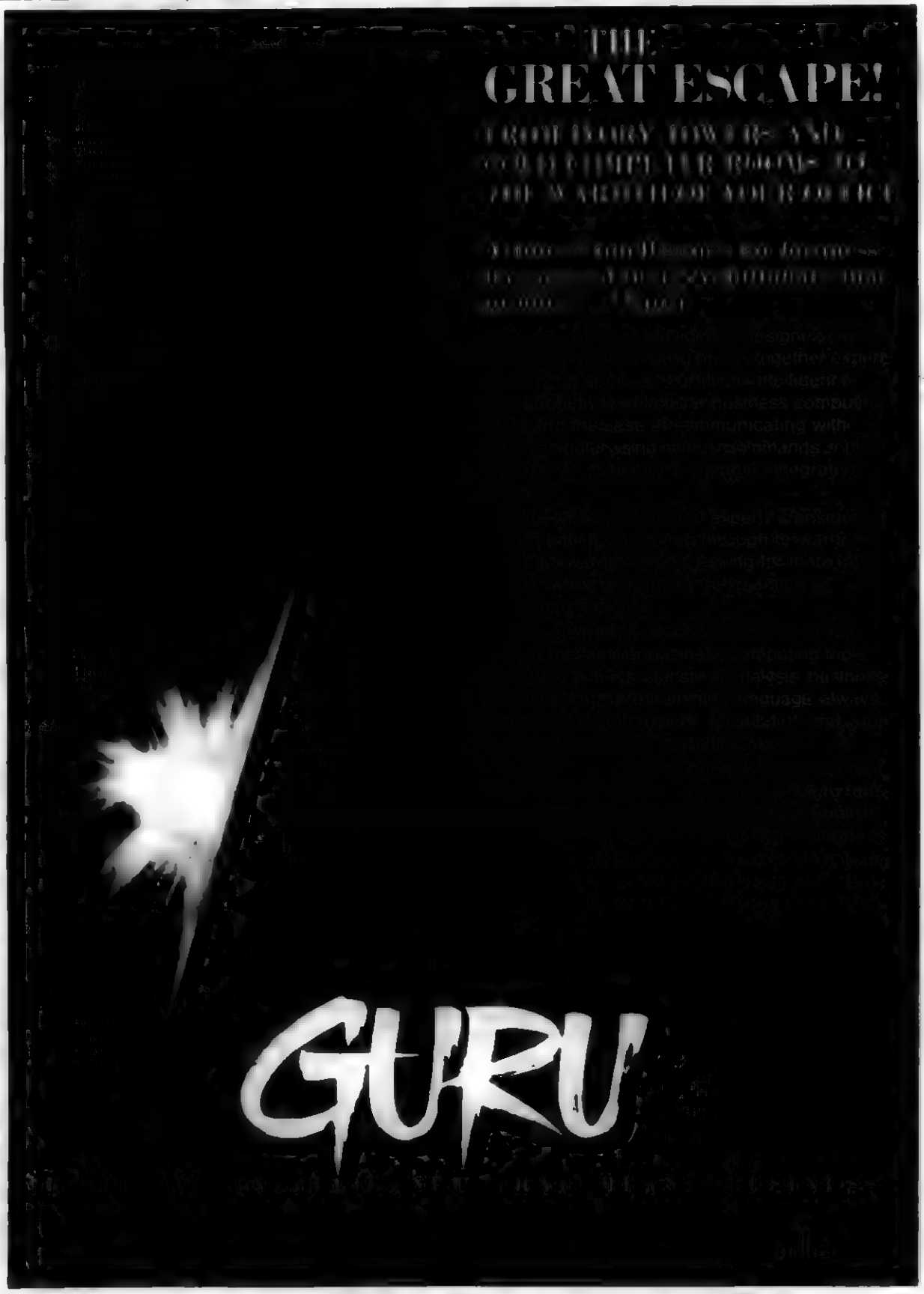
Carter claimed that U.S. Sprint will not only undercut the prices of MCI and AT&T, but will also offer superior quality in voice and data transmissions because of its fiber-optic network. "Price is only half a strategy," Carter said.

Carter said fiber-optic technology reduces static and background noise in long-distance telecommunications and provides security and redundancy features.

U.S. Sprint has in place 5,500 miles of continuous all-digital, fiber-optic cable, the largest continuous fiber network in the U.S. By the end of 1987, the network is scheduled to reach 22,000 miles, according to company officials.

The top executives of U.S. Sprint are J. David Hann, responsible for data communications, and Skibo, responsible for marketing, operations and administration. Prior to the formation of U.S. Sprint, Hann was president of GTE Telenet and Skibo served as president of U.S. Telecom.

Last week, former GTE Sprint President Donald Prigmore voluntarily left U.S. Sprint management for a position with GTE's diversified products group. His departure is expected to strengthen United Telecommunications' role in the management of U.S. Sprint.



Hogan-IBM bells have hollow ring

From page 104

liver a loan system and an international banking system. But the failures were only relative.

What I believe prospects want to see from Hogan today is not a new marketing representative, but a commitment to applications development, implementation support, ongoing enhancements, customer service and some assurance that its financial integrity will ensure a long, healthy future. Is IBM going to provide these things?

One wonders how these marriages are put together and how long they will last. What kind of a marriage is this? Why didn't IBM just buy the company? Is it because the two want to live together for a while to be sure they are compatible?

Hogan and IBM stated a 20-year agreement between the two firms. Perhaps there was a typographical error in expressing the unit of time. My opinion is that the honeymoon will last for perhaps 20 months.

When vendors begin to focus on user benefits as the basis for their strategies, they may in fact find the key to success. Self-serving positioning to enhance one's image may work for micro software, but it will not impress the sophisticated (defined as previously burned) MIS directors of large financial institutions.

When IBM and Hogan return from their honeymoon, I hope they will live a long, happy life together and have lots of kids. But if Hogan stays in Dallas and IBM stays in Armonk and each continues to do its own thing, I am afraid the second chapter will take place in the divorce court.

On September 24 we're covering DEC and you can be part of it.

Announcing the Computerworld Extra on Digital Equipment Corporation.

For several decades, no one has posed a serious threat to IBM's stronghold as the number-one computer manufacturer. But, in the last few years, the company from Maynard, MA, has been quietly consolidating and revamping its product lines, its strategies, its entire organization. And they've set their sights on some very big targets.

In the September 24 Computerworld Extra, we'll take a thorough look at what Digital's got to offer. And why many of the world's large and mid-sized companies are now seriously evaluating DEC.

We'll discuss Digital's strengths. Its top-to-bottom architecture. Its networking and distributed processing philosophies. And the products that connect to IBM — including products that may work better in the IBM environment than IBM's own solutions.

And we'll round out the issue by interviewing Ken Olsen, the man behind the $7 billion corporation.

The Digital story is fascinating. Must reading for our 128,000 paid subscribers. Plus all are the people who will read our Computerworld Extra as it's passed on down the hall. Including large numbers of readers at more than 95% of Digital's installed base of large and mid-sized companies. Plus a major share of the IBM installed base.

Extra copies will also be distributed at DEXPO West '86, Oct. 7-10, in San Francisco.

So, if you've got a product or service that's DEC compatible — or an alternative — our Extra gives you a tailor-made audience. But hurry, closing is August 15.

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IBM, Cybernex dispute settled

From page 134

est in Xerox Corp.'s disk drive subsidiary, Century Data Systems Co. of Anaheim, Calif.

The pending deals, while not mandated by the IBM settlement, will enable Cybernex to remain in business as a disk drive vendor after divesting its thin-film head operation.

A Cybernex spokesman said the firm agreed to the IBM settlement to end what has been a costly and lengthy litigation process. "It was the best option available, and we're not admitting to the allegations," he said.

Disk drive industry analyst James Porter of Disk/Trend, Inc. in Santa Clara, Calif., called Cybernex's moves "a marvelous save" despite the firm's forced departure from the thin-film head business.

"The firm took a broadside from IBM, and suddenly it has a profitable operation in Century Data," Porter noted.

IBM trade secrets

In its 3-year-old suit, IBM claimed that when Cybernex Chief Executive Officer William Klein and four other founders left Big Blue, they took trade secrets relating to thin-film recording head technology used in the high-capacity hard disk drives.

IBM contended that Cybernex, six months after the firm's inception, possessed a production process "virtually identical" to its own, a process that had taken IBM 14 years and $200 million to develop.

Cybernex agreed to stop manufacturing and marketing thin-film recording heads that use or rely on IBM trade secrets. Cybernex must also reimburse salaries paid to Cybernex' founders for the period of time before they left IBM.

Spokesmen for IBM and Cybernex declined to elaborate on the payment terms, citing a confidentiality agreement.

Combining units

Cybernex said it would combine Xerox's 8- and 14-in. disk drive unit, Century Data, long rumored to be on the block, with its affiliate Cybernex Advanced Storage Technology, a maker of high-capacity 5¼-in. hard disk drives.

A Xerox spokesman said Xerox would retain a small interest in the combined company but declined to quantify the amount.

The spokesman added Xerox was selling control of Century Data as part of its 2-year-old strategy to reduce its involvement in the OEM peripherals business.

The firm recently sold a 90% stake in its Optimum optical disk drive subsidiary to Cipher Data Corp. and has divested pieces of its Shugart disk drive operation to two separate Asian concerns during the past two years.

Under terms of the Read-Rite merger, production of Cybernex products will be converted to Read-Rite's process in a 12-month phase-in period. IBM has signed a covenant not to sue Read-Rite after determining Read-Rite's manufacturing process does not infringe on IBM patents.

Old countries, new markets

From page 134

firms. European capital spending, Altman notes, has yet to reflect the worldwide decline in oil prices and will not do so until near year's end.

Well positioned to cash in on European market growth, DeMarcillac says, are West Germany's Nixdorf Computer AG and Siemens AG, Italy's Ing. C. Olivetti & Co. and two U.S. vendors, IBM and DEC.

At DEC, Mark Steinkrauss, director of investor relations, says the international sector contributed

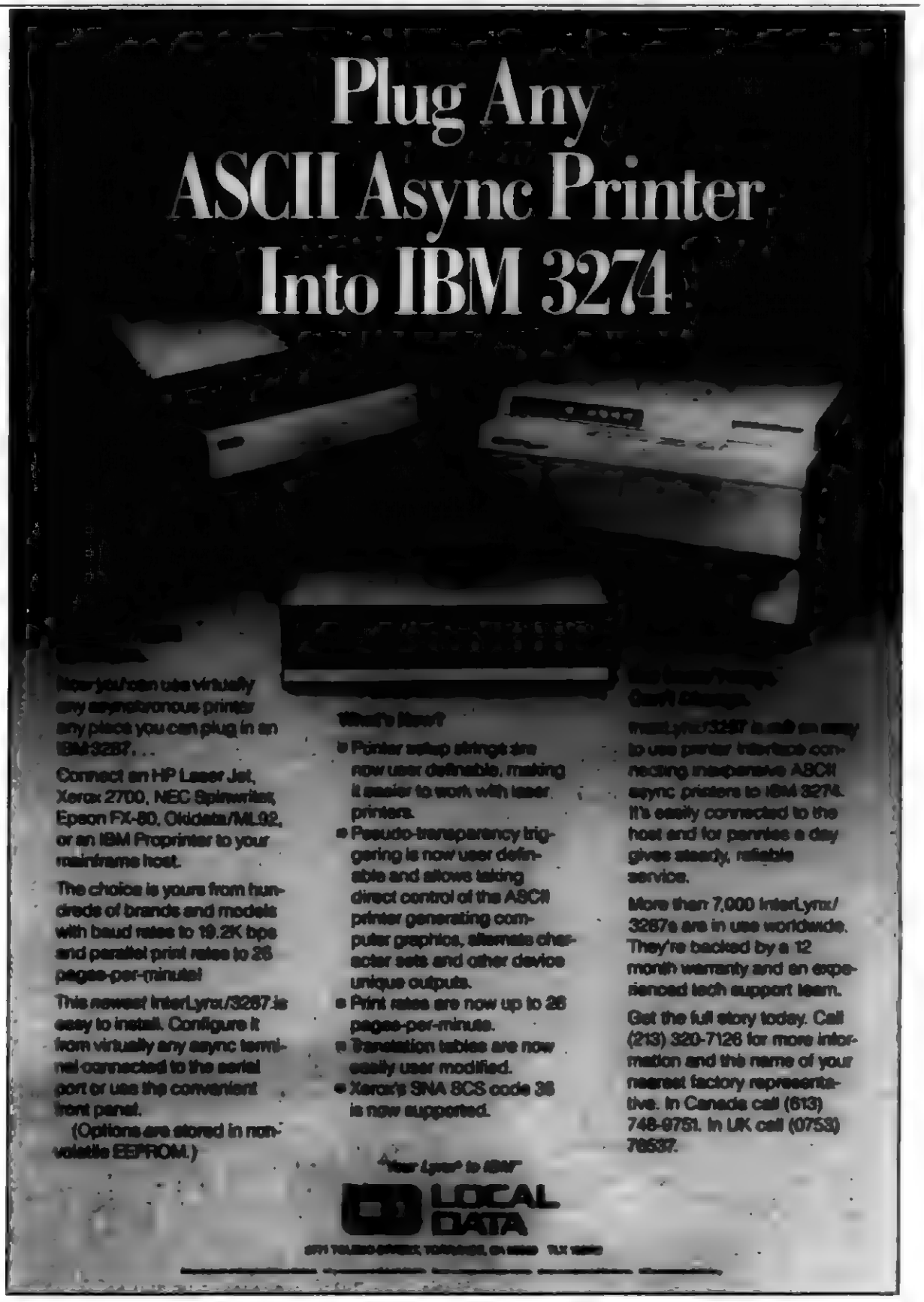
> ***"The international sector's contribution to Digital Equipment Corp. revenue at the end of the third quarter was 40.4%. For the same period in the last two fiscal years, it was only 35%."***

42.7% of DEC's $82.7 million revenue in the third quarter ended March 31. Steinkrauss notes international sales make up a greater proportion of DEC revenue in the third quarter than in any quarter he can recall in his eight years with the company.

For the nine-month period ending with that quarter, the international sector's contribution to DEC revenue was 40.4%. For the same period in the last two fiscal years, it was only 35%.

While Steinkrauss is not able to break out European sales from overall international revenue, he notes that Europe is a strong market in which DEC has seen particular success making sales to the banking and financial services sector.

European sales are often an overlooked part of the DEC success story that has been the talk of the industry for the last nine months. For other firms still adrift in the doldrums of the U.S. computer market, it is a lesson well worth learning.



"The machine-specific books were not enough, so we decided to try Computerworld. The result was immediate."

David W. Smith
Marketing Services Manager
EMC Corporation
Natick, MA







EMC Corporation manufactures add-in memory and peripheral controllers for IBM, DEC, Hewlett-Packard, Prime and Wang minicomputers and sells them directly to computer users. So the company decided to spread the word to MIS/DP directors by advertising in vendor/machine-specific publications and in Computerworld.

Says David W. Smith, Marketing Services Manager for EMC, Computerworld was chosen for two reasons.

First, EMC selected Computerworld to reinforce the company's message in the minds of readers of machine-specific books and to get to the readers who didn't see the ads in other publications. *"One of our product managers pleaded for greater visibility and recognition for his products — the machine-specific books were not enough,"* recalls David. *"So we decided to try Computerworld, and the result was immediate."*

The second reason is that David has seen Computerworld ranked as the best MIS/DP multivendor book in machine-specific readership studies.

"So many DP shops use more than one machine," he adds. *"Computerworld addresses all markets, and we're getting responses in all five of our vendor categories."*

Since EMC started advertising in Computerworld, the number of phone inquiries actually doubled, David revealed. *"When an ad appears in Computerworld, business picks up tremendously. In fact, Computerworld is responsible for some of our more spectacular success stories,"* he adds. *"Business is coming directly from those ads; people are calling and ordering, and that's something you don't find very often in this business. One caller actually ordered three boards after reading our ad in Computerworld."*

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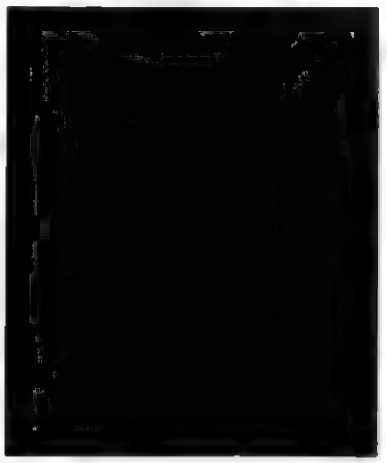
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✓Volkswriter 3 1.0 ... 147.
Living Videotext
✓ThinkTank 2.1 *(copy-protected)* ... 105.
✓Ready 1.0 *(not copy-protected)* ... 49.
Micro Education (MECA) *(copy-protected)*
✓Managing Your Money 2.0 ... 115.
Micropro *(not copy-protected)*
✓WordStar 3.31 ... 179.
✓WordStar 2000 Plus Release 2 ... 285.
Microsoft *(not copy-protected)*
✓Extended Report Writer 1.3 ... 85.
✓Clout 2.0 ... 135.
✓R:base 5000 1.01 ... 359.
✓R:base 5000 Multi-user 1.0 ... 719.
Microsoft *(not copy-protected)*
✓Multiplan 2.0 ... 119
✓Microsoft Word 3.0 ... 247.
✓Windows 1.01 ... 65.
✓Quick Basic 1.02 ... 69.
✓Project 2.0 ... 239.
Microsmtl *(not copy-protected)*
✓Crosstalk XVI 3.61 ... 95.
✓Remote 1.3 ... 95.
Migent Software *(not copy-protected)*
✓Ability 1.0A ... 365.
MultiMate International *(not copy-protected)*
✓MultiMate 3.31 ... call
✓MultiMate Advantage 3.6 ... 269.
Nantucket Software *(copy-protected)*
✓Clipper *(Winter '85 version)* ... 349.
Paperback Software *(copy-protected)*
✓VP-Planner 1.0 ... 57.
Peter Norton *(not copy-protected)*
✓Norton Commander 1.0 ... 36.
✓Norton Utilities 3.1 ... 59.
Quarterdeck *(not copy-protected)*
✓DESQView 1.2 ... 65.
Satellite Software *(not copy-protected)*
✓WordPerfect 4.1 ... 239.
Software Group *(not copy-protected)*
✓Enable 1.1 ... call
Software Publishing *(copy-protected)*
✓PFS:File B:01 ... 84.
✓PFS:Write C:01 ... 84.
✓Harvard Total Project Manager 1.1 ... 269.
Not copy-protected versions due to be released soon—call.

TRAINING

ATI *(copy-protected)*
✓*SKILL BUILDER PROGRAMS*
Intro and How to Use:

Data Bases	MS-DOS	
Compaq	PC-DOS	
IBM-PC	BASIC ...	each 33.

✓*TRAINING POWER PROGRAMS*
How to Use:

dBase II	dBase III	Lotus 1-2-3
Multimate	Framework	Displaywrite 3
Multiplan	Wordstar	
WordPerfect	Symphony	... each 43.

Individual Software *(copy-protected)*
✓The Instructor II ... 26.
✓Professor DOS ... 33.
✓Tutorial Set *(both items above)* ... 49.
✓Typing Instructor ... 26.
✓Training for Lotus 1-2-3 *(for vers. 1A & 2)* ... 37.
✓Training for dBase III ... 37.

HARDWARE

Manufacturer's minimum limited warranty period is listed after each company name. Some products in their line may have longer warranty periods.

AST Research *(1 to 2 years)*
SixPakPlus 64k *(includes Sidekick vers. 1.5 not copy-protected & DESQView* ... 169.
SixPakPlus 384k *(fully populated)* ... 219.
✓AST-5251-11 ... 579.
✓AST-3780 ... 579.
✓Advantage 128k ... 369.
RAMpage! *upgrades to 2Mb* ... call
✓RAMpage! AT *upgrades to 2Mb* ... call
Both RAMpage boards support EMS and fully support EEMS.
Amdek *(2 years)*
✓Video 310A mono monitor *(amber)* ... 159.
✓Color 722 - RGB *(EGA compatible)* ... 519.
Curtis *(Micima)*
ACCESSORIES
✓Low Profile Tilt and Swivel Pedestal ... 25.
✓PC Pedestal *(for IBM Mono or Color)* ... 27.
Portable Pedestal *(for portable computers)* 36.
✓Printer Stand ... 18.
System Stand *(for IBM-PC & XT)* ... 19.
✓Universal System Stand ... 25.
CABLES
Smartmodem to IBM Cable ... 17.
✓Keyboard Extension Cable *(3 to 9 feet)* ... 27.
✓Extension Cables for IBM Mono Display ... 33.
SURGE SUPPRESSORS
✓Diamond *(6 outlets)* ... 29.
✓Emerald *(6 outlets; 6 ft cord)* ... 36.
✓Sapphire *(3 outlets; EMI/RFI filtered)* ... $47.
✓Ruby *(6 outlets; EMI/RFI filtered; 6 ft cord)* 55.
✓Command Center ... SPECIAL ... 79.
DCA *(1 year)*
✓Smart Alec ... 639.
✓Irma ... 769.
Epson *(1 year)*
We are an authorized Epson service center.
✓LX-80 printer *(80 column)* ... call
✓FX-85 printer *(80 column)* ... call
✓FX-286 printer *(136 column)* ... call
✓LQ-800 printer *(80 column)* ... call
✓LQ-1000 printer *(136 column)* ... call
Hayes *(2 years)*
✓Smartmodem 300 ... 139.
✓Smartmodem 1200 ... 369.
✓Smartmodem 1200B *(w/Smartcom II)* ... 349.
✓Smartmodem 2400 ... 579.
✓Smartmodem 2400B *(w/Smartcom II)* ... 539.
✓Smartcom II 2.1 *(software)* ... 69.
Hercules *(2 years)*
✓Hercules Color Card *(parallel port)* ... 159.
✓Hercules Graphics Card *(parallel port)* ... 299.
Intel *(chips: 1 year; boards: 5 years)*
Above Board PC 64k *(upgrades to 2 Meg)* call
✓Above Board AT 128k *(upgrades to 2 Meg)* call
Above Board PS 64k C/S/P *(upgrades to 1.5 Meg)* ... call
8087 *(for IBM-PC & XT)* ... 129.
8087-2 *(works on 8 Mhz computers)* ... 177.
✓80287 *(for 6 MHz IBM-PC AT)* ... 225.
✓80287-8 *(for 8 MHz IBM-PC AT)* ... 269.
Kensington Microware *(1 year)*
✓Masterpiece ... 94.
Key Tronic *(90 days)*
5151 keyboard *(deluxe)* ... 169.
✓5153 keyboard *(with touch pad)* ... 279.
Mouse Systems *(3 years)*
✓PC Mouse with PC Paint+ ... 139.
✓PC Mouse with Ready and PC Paint+ ... 149.
NEC *(90 days)*
✓Multisync monitor *(EGA compatible)* ... 549.
Orchid Technologies *(1 to 2 years)*
Conquest Multifunction Board *(2k upgrades to 2Mb, fully supports LOTUS/INTEL expanded memory specification (EMS)* ... 264.
Tiny Turbo 286 ... 459.
PC Turbo 286e w/1 Meg ... 749.
✓Eccell Multifunction Board for the AT *(2k upgrades to 1 Meg, fully supports LOTUS/INTEL expanded memory specification (EMS) and Error Correction Code (ECC), serial and parallel ports optional* ... 399.
Paradise Systems *(1 year)*
✓Color/Mono Card ... 149.
✓Modular Graphics Card ... 275.
Princeton Graphics *(1 year)*
✓MAX-12E Amber monochrome monitor ... 179.
✓HX-12 RGB monitor *(680 x 240)* ... 449.
Quadram *(1 to 2 years)*
Expanded Quadboard *(2k upgrades to 384k)* ... 169.
384k *(fully populated)* ... 219.
Silver QuadboardQk *(upgrades to 576k)* 249.
✓Microlazer Printer buffer *(parallel) w/copy MP 64 (64k) upgrades to 512k* ... 159.
✓QuadEGA+ *(half-card)* ... 369.
SMA *(20-day money-back guarantee)*
PC-Documate Keyboard Templates *available for:*

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✓DOS/Basic 3.0-3.1	WordStar
✓Lotus 1-2-3	✓WordStar 2000
✓Symphony	Turbo Pascal
Framework	✓WordPerfect
dBase II	✓dBase III

✓MultiMate ... each 12.
Toshiba *(90 days)*
All Toshiba printers listed are 24 pin dot matrix.
✓P321 serial/parallel printer *(80 col.)* ... 519.
✓P351 serial/parallel printer *(136 col.)* ... 1089.
Video 7 *(2 years)*
✓VEGA *(half-card)* ... 369.

DRIVES

IOMEGA *(90 days)*
✓Bernoulli Box 20 Meg w/PC2 card ... $1999.
✓10 Meg cartridge ... 51.
✓Bernoulli Box 40 Meg w/PC2 card ... 2499.
✓20 Meg cartridge ... 69.
Mountain Computer *(1 year)*
Drive Card 20 Meg ... call
PC Connection *(1 year)*
20 Meg Hard Drive Card ... 499.
Seagate *(1 year)*
20 Meg Internal Hard Drive *(w/controller and cables)* ... 449.
Toshiba *(90 days)*
PC, XT 360k Drive *(5¼" half-height)* ... 109.
✓AT 360k Drive *(5¼" half-height)* ... 117.

MEMORY

64k Memory Upgrade Set for IBM-PC or XT system board or any memory board
150 nanosecond *(set of 9)* ... 15.
200 nanosecond *(set of 9)* ... 12.
✓128k Memory Upgrade Set for IBM-AT System Board *(9 chips piggybacked)* ... 39.
✓256k Memory Upgrade Set for any IBM-AT memory board *(9 chips)* ... 39.

DISKS

All disks have a lifetime warranty.
DS/DD Disks for the PC & XT (40 TPI). *10 disks per box.*
✓Verbatim Datalife ... 17.
✓Maxell MD-2 ... 19.
DS/High Density Disks for the AT (96 TPI). *10 disks per box.*
✓Fuji ... 27.
✓Maxell ... 34.
✓Verbatim ... 34.

✓Flip Sort *(holds 75 disks)* ... 15.
✓Floppiclone Disk Drive Cleaner *(5¼")* ... 18.

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Word-a-holics unite!

Trying to decide which word processor to buy is like trying to decide which college to go to. The decision will change your life forever, but you may never know if it was the best one. Here are five tried and proven professional packages. They all have spell checkers. None are copy-protected. And hard drives are recommended for all. See PC Magazine 1/28.



MultiMate Advantage 3.6 with Graphlink and On-File $299
Originally designed to emulate the WANG word processor, MultiMate is often referred to as the corporate word processor. It offers sophisticated networking capabilities, and, with two free-for-a-limited-time software programs (Graphlink and On-File), also has built in graphics and database.

MicroSoft Word 3.0 with Outline $347
With a mouse and a graphics card, MicroSoft Word lets you move words around without touching the keyboard, and see what you got without squinting. Without a mouse or a graphics card it's still a powerful word-processor, with "Style Sheets" that simplify formatting, and a built-in outline program.

WordPerfect 4.1 ..... $229
We have a friend who writes for computer magazines. At one time or another he has used and reviewed virtually every major word processor. He now swears by WordPerfect and swears at all the others. Use this program for a while and you'll be able to touch type most of your commands with your eyes closed and your right hand tied behind your back.

WordStar 2000 Plus Release 2 ..... $285
WordStar has had some trouble shedding its image as the lumbering dinosaur of the microcomputer age. But hundreds of thousands of people use it. There are a lot of programs out there to back it up. And this new version gives it the same advanced features as any top-quality word processor. Even the control keys are starting to make some sense.

Volkswriter 3.0 ..... $147
Solid performance with a reasonable price continues to be Volkswriter's claim to fame. It's fast, and boasts one of the original what-you-see-is-what-you-get screens. With the new version's spell checker and more sophisticated print formatting, it is now able to compete functionally with the other high-end word processors. (Our new low price is pretty persuasive too).

Buy one. Get two.



Hey, got a friend? Don't know? Check your database! What? No database? Have we got a deal for you (and your friend). Until June 30, Microrim will send you a complete second copy of Rbase 5000 free when you send in your warranty card and a copy of our sales invoice. So you can get together with your friend, split the cost for one and get two! Or, you can keep the extra copy at home, at a branch office, or down the hall. Rbase 5000 is easy to learn and operate, and has the custom reporting features most users need. Remember, the two for one offer is only good from April 15 till June 30.

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(Additional Rbase 5000 from Microrim) ..... $Free

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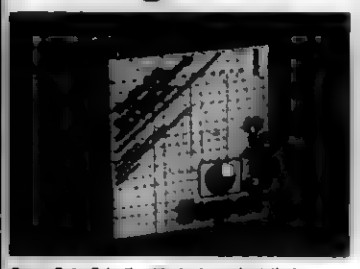
64K (200Ns)	$12 ea. set
64K (150Ns)	$15 ea. set
128k or 256k (150Ns)	$39 ea. set

Bernoulli Berserk!

We've got a problem. The prices we're able to offer on Bernoulli boxes are changing about 10 times faster than we can change this ad. Probably because the machines are selling about 10 times faster than anyone ever dreamed they would. The 20 Meg and 40 Meg versions feature two ½ height drives with removable cartridges. There's a 90 day warranty, and we're an authorized Bernoulli service center—turn around on repairs is usually 24 hours. Here are our latest up-to-date-but-probably-obsolete-by-now prices!

Bernoulli Box 40 Meg **$2499**
Additional 20 Meg Cartridges $89
Bernoulli Box 20 Meg $1999
Additional 10 Meg cartridges $51
Bernoulli Care Kit $79

Supercalc ifragilistic!



SuperCalc 3 is the kind of product that you'd be proud to bring home to your mother. Like Lotus 1-2-3 it offers spreadsheet, information management and presentation graphics. But it only needs 128k of RAM, and is not copy-protected. It also is compatible with the Hercules Monochrome Card, as well as the Enhanced Memory (EMS) and Enhanced Graphics (EGA) standards. And you get a free copy of Sideways, the program that lets your printer think horizontal is vertical.

SuperCalc 3 2.1 (with Sideways) .....
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SixPakPlus Minus$!



AST is so wrapped up in Enhanced Memory and other arcane subjects that they've been letting the price slip on their original claim to fame—the AST SixPakPlus, one of the original and best multifunction cards. So if you're just starting in computing, or outfitting a second unit for home, now's a great time to buy this basic piece of hardware. You get a clock calendar, serial port, parallel port, up to 384k of memory, and copies of two classic unprotected programs—Sidekick 1.5 and DESQView. A genuine deal.

SixPakPlus 64k **$169**
SixPakPlus 384k (fully populated) $219

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(and get $50 rebate from Hercules)
Hercules Color Card (1/2 slot) $159
(and get $50 rebate from Hercules)

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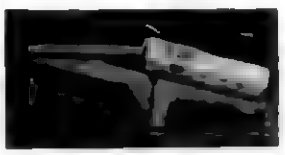
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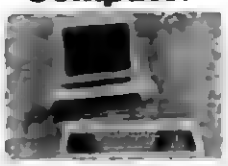
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* Source: A Profile of Computerworld Readers and Their Organizations, STAT Resources, August 1984

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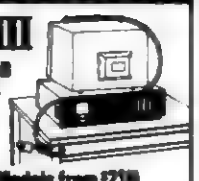
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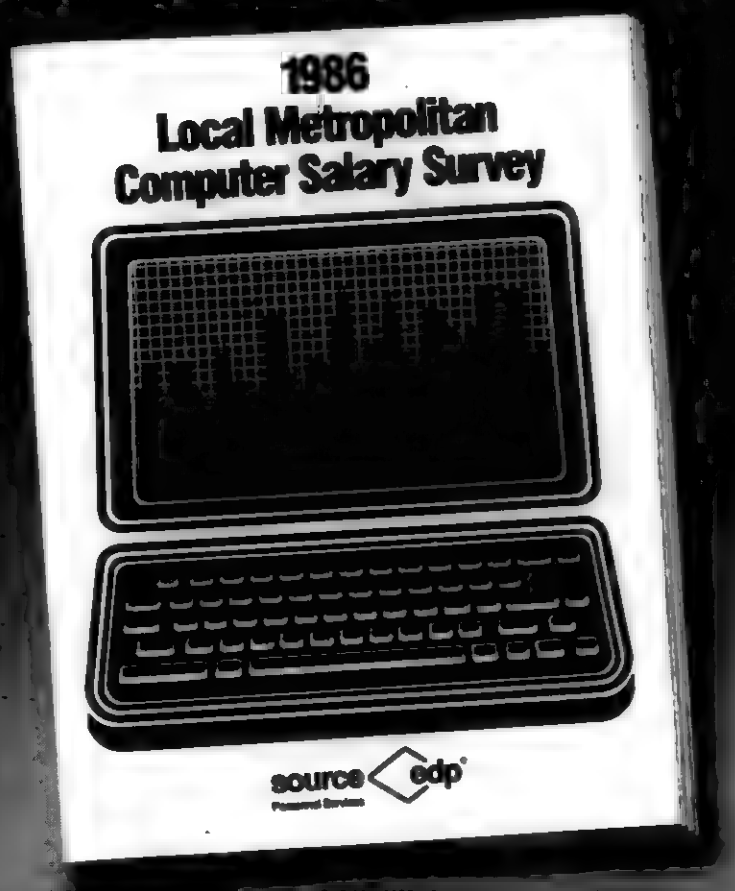
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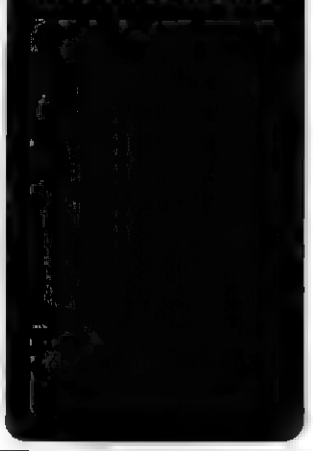
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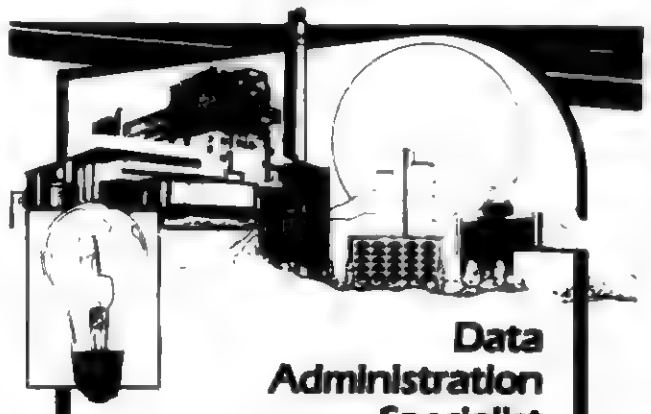
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ADS/O	●	●	●		●	●	●	●	●	●	●			●
HP-3000	●		●	●									●	●
PL1			●			●							●	●
APL		●												●
DEC VAX	●	●	●		●		●			●	●			
ADR (DATA COM)	●	●			●		●							
IDEAL	●	●			●									
RPG III S/38		●	●								●	●		●
CICS	●	●	●		●		●	●	●	●	●			●
IMS DB/DC	●	●			●		●	●	●		●	●	●	●
ADABAS	●	●			●				●				●	
NATURAL	●	●	●		●			●		●			●	
FOCUS	●	●			●	●		●		●				
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SQL	●	●				●							●	
DB II	●				●	●	●	●	●				●	
RPG II S/36		●		●		●						●		●
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Computerworld Headquarters: 375 Cochituate Road, P.O. Box 9171, Framingham, MA 01701-9171
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Foreign Editorial/ Sales Offices

Argentina: Ruben Argento, Computerworld Argentina, Av. Belgrano 406-Piso 9, CP 1092 Buenos Aires. Phone: 34-5583/5584. Telex: 22644.

Asia: Euan Barty, Asia Computerworld Communications Ltd., 701-4 Kam Chung Bldg., 54 Jaffe Road, Wanchai, Hong Kong. Phone: (05) 8L63236. Telex: 72827 (COMWR HX).

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (02) 4395133. Telex: AA74752 COMWOR.

Austria: Dr. Manfred Weiss, CW Publikationen, Verlagsgesellschaft m.b.H., Josefstaedter Strasse 74, A-1080 Wien, Austria. Telex: 115 542 (sch/a).

Brazil: Eric Hippeau, Computerworld do Brazil, Rua Pedroso de Morais 1553, 05419 Sao Paulo, SP Brazil. Phone: 814-9658-212-8750. Telex: 11 32017 (WORD).

Denmark: Preben Engell, Computerworld/Danmark A/S, Torvegade 52, 1400 Copenhagen K, Denmark. Phone: (01) 955 695. Telex: 31566.

France: Axel LeBlois, Computerworld Communications S.A., 185 Avenue Charles De Gaulle, 92200 Neuilly Sur Seine, France. Phone: 747 1272. Telex: 613234 F.

Hungary: Dezso Futasz, SZT Computerworld, P.O. Box 386, Budapest, 1536, Hungary.

Italy: Daniele Comboni, Computer Publishing Group S.R.L., Viale Restelli 5, 20124 Milano. Phone: (2) 688 9773. Telex: 333436 (GEJIT).

Japan: Mr. Shuji Mizuguchi, Computerworld Japan, 7-4 Shintomi 1-Chome, Chuo-ku, Tokyo 104. Phone: (03) 551-3882, Telex: 252-4217 (Computerworld Japan only).

Steven Yamada, Tokyo Representative Corp., Sanshin Kogyo Bldg., 2-10 Kando Jimbocho 3F, Chiyoda-ku, Tokyo 101, Japan. Phone: 230-4117, Telex: J26860 (reps for all CWCI publications except Computerworld Japan).

Mexico: Henry Morales, Computerworld Mexico S.A. de C.V., Oaxaca 21-2, Mexico City 7 D.F. Colonia Roma, 06700 Mexico. Phone: (05) 514-4218. Telex: 177 1300 (ACHAME).

The Netherlands: Wout Berends, CW Communications B.V., van Eeghenstraat 84, 1071 GK Amsterdam, The Netherlands. Phone: (020) 64 6651. Telex: 18242 (CWCOM NL).

Norway: Mr. Morton Hansen, CW Norge A/S, Hovnveien 43, P.O. Box 2862, Toyen, 0608 Oslo 6, Norway. Phone: (20) 64 77 25. Telex: 76476 9 (CW NOR N).

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Spain: Neil Kelley, Computerworld/Espana, Barquillo 21-3 izda, Madrid-4, Spain. Phone: 231 23 85; 231 23 86; 231 23 88. Telex: 47894 (CW E).

Sweden: CW Communications AB, Sodra Hamnvagen 22, S-115 41 Stockholm, Sweden. Phone: 46 8 67 91 80. Telex: 14904 9 (NOVACW).

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Taiwan: Grace Tang, ACE Media Agency Ltd., Room 503, 1, Fu Hsin S. Road, Sec. 1, Taipei, 10587, Taiwan, R.O.C. Phone: 751 3636. Telex: 14142 (ACE GROUP). (Representative for all CWCI publications).

United Kingdom: Martin Durham, CW Communications Ltd., 99 Grays Inn Rd., London, WC 8UT, United Kingdom. Phone: (01) 831-9252, Telex: 263345.

Euan Rose, Bill Dunlop, Barbara Levy, Christine Taylor, Beere Hobson Assoc., 345 Goswell Rd., Islington, London EC1, United Kingdom. Phone: (01) 278 3415. Telex: 311951. (Representatives for CWCI publications).

Venezuela: Kalman von Vajna Nagy, CW Comunicaciones, C.R.L. Torre Maracaibo, Piso 10, Oficina H, Av. Libertador, Caracas, Venezuela. Phone: 72-76-30.

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STC creditors get 80% equity

Deal settles debts owed before Chapter 11 filing

LOUISVILLE, Colo. — Storage Technology Corp. (STC) took the first step out from under the veil of bankruptcy last week, announcing an agreement in principle with its creditors' committee that would give creditors 80% equity in STC.

The agreement was unanimously approved by STC's board of directors and effectively settles all of the company's debts before it filed for protection under Chapter 11 of the Federal Bankruptcy Code 21 months ago.

STC now plans to file a reorganization plan in U.S. Bankruptcy Court in Denver. The company said it hopes to have the plan approved by year's end, in line with STC Chairman Ryal Poppa's earlier projections of emerging from bankruptcy [CW, May 26].

The deal appears to be a compromise over earlier proposals presented to the creditors' committee. In May, Poppa said the committee was considering a proposal to give creditors $100 million in cash and $300 million in eight- to 12-year notes, with the balance in equity.

Under the terms of the agreement announced last week, creditors will receive $140 million in cash, $285 million in 10-year notes with a 13.25% annual yield and 80% of STC's postbankruptcy common stock.

— Maura McEnaney

Wang to slash work force

From page 134

Devin said the job cuts will occur in manufacturing, administrative and support positions at most of Wang's U.S. facilities. Positions in sales, marketing, and software and hardware support will not be affected. Devin said the company hopes to increase employment in those areas by roughly 200 people after the reduction of 1,600 is completed.

Wang will encourage employees age 45 and older with five or more years' experience to retire with at least three months' salary and other benefits. In the areas targeted for reduction, other less senior employees will be offered similar incentives. To encourage a fast reduction, Wang is offering an extra four weeks' salary to workers leaving by the end of this week and an extra two weeks' pay for those leaving by Aug. 1.

"Every company has normal attrition on a monthly basis, and we're trying to speed that up," Devin said. "The employees have been very supportive so far and I am sure we will achieve our goals."

"They want to avoid the mistakes of a year ago, such as the doubt and uncertainty among employees and the demoralization that set in," one Wang worker said, contrasting last week's announcement with the 1985 layoffs. Devin said Wang studied the work force reduction methods of industry leaders that do not lay off workers, such as IBM, Digital Equipment Corp. and Hewlett-Packard Co.

Wang's financial struggles result from its inability to translate its word processing prestige into sales of its current product line, according to analyst George Colony of Cambridge, Mass.-based Forrester Research, Inc. Colony said Forrester's April survey of Fortune 1,000 users rated Wang "on a par with DEC and AT&T" and trailing only IBM in quality and customer satisfaction, but that has not been reflected in Wang's bottom line.

"Wang word processing is still the industry standard, but the business is evaporating," Colony said. "If Wang can't compete in office automation and the mid range, the growth curve will stop. It's a marketing problem. There's no clear Wang identity anymore."

AST reduces staff by 7%

From page 134

65 jobs were cut for better productivity, Ashbrook said.

"This is a planned business move, not a reaction to the market," he said. AST employs more than 900 people in its Southern California research and development facilities and five international manufacturing and sales sites.

The revenue of the microcomputer add-on board vendor has declined steadily from $43.6 million to $41 million in the last three quarters. Although still well ahead of results recorded last year, net income fell sequentially from $8.5 million to $6.4 million in the third quarter.

The figures are attributed, both by AST and financial analysts, to a flat personal computer market and tight profit margins. Fourth-quarter 1986 results are not expected for several weeks, but analysts say they expect the downward trend to continue.

Analyst Jon Gruber of Montgomery Securities in San Francisco called the job cut "a very positive move on AST's part" and an appropriate reaction to lower sales volume. He predicted AST revenue will drop to $38 million in the first fiscal quarter of 1987 but added that desktop publishing ventures could pick up sales in the second quarter.

Bret Maxwell of First Analysis Group in Chicago blames IBM's clone-fighting price cuts. "AST must feel it needs to trim to meet that," he said.

AST's products that will be announced in the next few months include a scanner input system, a low-end laser printer and some connectivity products, which will expand AST's role in the desktop publishing market.

Connectivity tools in the works will allow both micros and terminals to share a laser printer, according to Ray Jeter, an AST technical sales instructor. Coaxial connections will be provided for direct IBM 3270 communications and twinaxial connections for IBM's System/36 or 38, Jeter said.

Reasons for a stock buyback may temper its price benefits



ACTIVE ISSUES
Kathy Porteus

How should investors interpret stock buyback programs in technology companies?

A stock buyback occurs when a company purchases up to a preannounced number of its outstanding common shares. Companies that recently repurchased stock include Honeywell, Inc. (HON — 76⅝), IBM (IBM — 145½), NCR Corp. (NCR — 51⅛), Lotus Development Corp. (LOTS — 35½) and Quantum Corp. (QNTM — 17½).

Stock buybacks attract attention because, historically, they have a positive effect on a stock's price. For example, on the day IBM announced it would repurchase up to 10 million, or nearly 2% of its outstanding shares, its stock price rose more than four points.

According to Michael R. Weisberg, director of technology research for Robertson, Colman & Stephens, several studies show that one year after a buyback program, the stock's price appreciation is "very favorable" relative to that of the overall market.

Basically, there are two reasons for this positive reaction. First, buying back stock reduces a company's number of outstanding shares, thereby increasing the earnings each remaining share receives. A company with prospects for higher earnings per share usually piques investor interest.

Second, a company often buys back shares when management considers current prices a bargain based on historic valuation standards or on future business expectations. According to Michael Murphy, editor of "The California Technology Stock Letter," investors take notice of buybacks for the same reasons they watch insider buying.

Although investors initially benefit, stock buybacks can raise longer term questions. Repurchasing stock to take advantage of cheap prices, Weisberg suggests, may be balanced by "changing secular fundamentals that could keep the valuation of technology stocks — relative to that of other emerging growth companies — lower than they have been."

John LeFrere, managing partner with Delta Capital Management, says buybacks are a sign of a mature industry. Normally, a growth company will invest in its future by pursuing new business opportunities or devoting more resources to research and development.

"A company buying back stock," LeFrere says, "is effectively admitting that it won't be growing as fast." The increased return on equity that results from a buyback is not a correct reason investors should pay premiums to the market multiple, LeFrere contends.

Murphy disagrees: "If a company is able to raise money cheaply through debt, turn around and use that money to buy back some stock to earn a higher rate of return, then that is good for shareholders."

Before determining what's good and what isn't, shareholders should carefully evaluate the reasons behind a stock buyback program. According to LeFrere, AMP, Inc. (AMP — 37⅝) has a consistent buyback policy for its employee stock plan, so its buyback does not indicate slower growth expectations. But small capitalization companies, such as Quantum, generally warrant further examination, LeFrere says.

Another example, NCR, has had excess cash, and buying back stock is one way to invest it. This benefits NCR shareholders and provides lower taxes on such gains than would be the case with increased dividends.

IBM has regularly repurchased stock for its employees and probably bought back twice the usual number of shares this year because management believes the stock is undervalued. Companies also repurchase stock as an antitakeover measure or as a means of pumping the stock to obtain a better sale price.

Investors must not only evaluate individual stock buyback programs, but also recognize that positive market reaction to a buyback is accompanied by longer term issues.

Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

DCA boasts 90% earnings increase

By James A. Martin

ALPHARETTA, Ga. — Digital Communications Associates, Inc. (DCA) last week reported a 90% earnings increase for fiscal-year 1986.

DCA earned $20.6 million, compared with $10.8 million for fiscal 1985. Sales for the year, which ended June 30, were $137.8 million, a 39% increase over the previous year's $99.2 million. Earnings per share were $1.80, compared with $1.06.

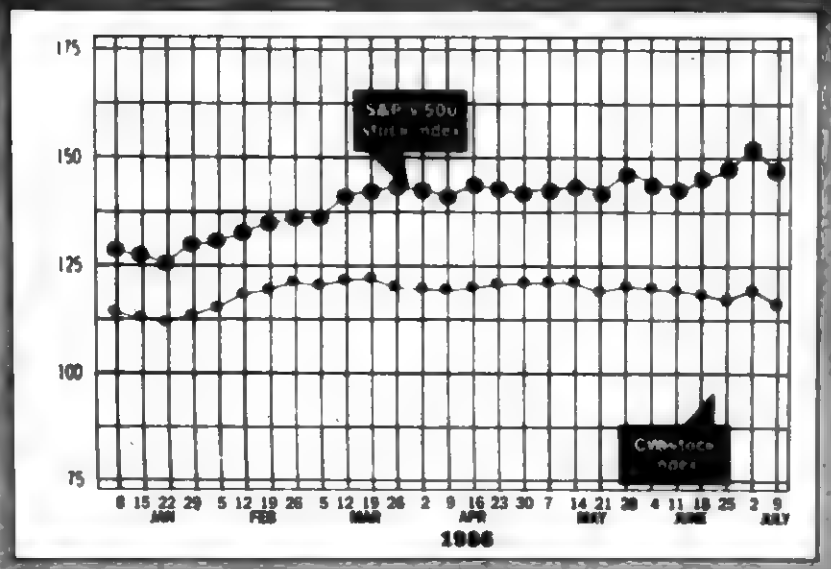
For the fourth quarter, net income rose to $5.7 million, or 47 cents a share, from $3.3 million, or 33 cents a share, a 70% increase. Sales were $34.6 million, compared with $31.7 million, an increase of 9%.

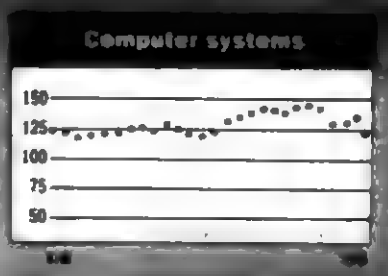
The fourth-quarter and fiscal-year results were "far better than management had implied earlier," said Andy Schopick, vice-president and senior analyst at Gartner Securities Corp. in Stamford, Conn. "DCA is an extremely well managed company, especially financially and in product positioning," Schopick said.

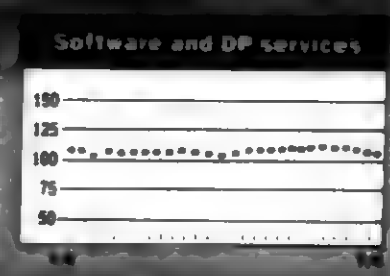
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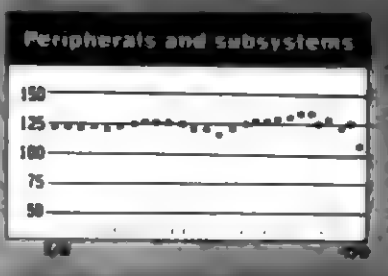
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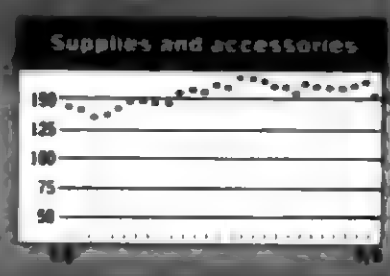
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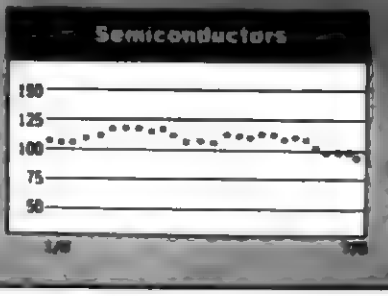


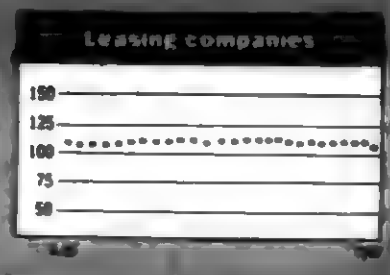












All indexes reflect a starting value of 100 on Dec. 31, 1984, and track stock market performance in relation to that base. The CW stock index represents the unweighted average performance of the six subgroups of computer industry stocks.

	7/2/86	7/9/86
Computer systems	126.7	**121.7**
Software and DP services	105.9	**104.9**
Peripherals and subsystems	124.1	**104.8**
Supplies and accessories	155.6	**150.1**
Semiconductors	93.0	**88.9**
Leasing companies	104.2	**103.9**
CW stock index	117.6	**113.5**
Standard and Poor's 500 stock index	151.1	**146.3**

Computerworld stock trading summary

CLOSING PRICES WEDNESDAY, JULY 9, 1986

EXCH		52-WEEK RANGE (1)		CLOSE JULY 9 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS					
O	ALPHA MICROSYSTEMS	5-	9	5 5/8	3/8	6.2
O	ALTOS COMPUTER SYST	9-	19	13 3/4	5/8	-4.3
A	AMDAHL CORP	10-	18	17	-1 1/8	-6.2
O	APOLLO COMPUTER	9-	31	12 5/8	1 3/8	-9.8
O	APPLE COMPUTER INC	14-	39	34 5/8	-1 1/2	-4.1
N	AT&T	19-	28	24 1/2	-5/8	-2.4
N	BURROUGHS CORP	52	71	70	+2 1/2	+3.7
O	COMPAQ COMPUTER CP	5-	18	13 3/8	1 1/8	-7.7
O	COMPUTER AUTOMATION	1-	9	3		+2.1
A	COMPUTER CONSOLES	5-	14	9	-3/4	-7.8
N	CONTROL DATA CORP	15-	39	23 1/2	+1	+4.4
O	CONVERGENT TECHNOL	5-	13	7 1/4	-1/2	-6.4
O	CPT CORP	4-	8	4 3/8	+1/8	+2.9
N	CRAY RESEARCH INC	25-	97	89 1/2	-7 7/8	-8.0
O	DAISY SYSTEMS CORP	10-	38	9 3/4	-1 1/4	-11.3
N	DATA GENERAL CORP	31	76	34	-1	-2.8
N	DATAPOINT CORP	5-	22	7 1/8	-7/8	-10.9
N	DIGITAL EQUIPMENT	42-	91	89 1/2	0	0.0
A	EECO INC	13-	20	18 7/8	1/8	-0.6
N	ELECTRONIC ASSOC	3-	7	4 7/8	3/8	-7.1
N	FLOATING POINT SYST	18-	42	34 1/2	-3 3/8	-8.9
N	FOXBORO	22-	31	28 1/2	-1 7/8	-6.1
N	GOULD INC	20-	38	21	-1	-4.5
N	HARRIS CORP	22-	36	36 3/8	+3 3/4	+11.4
N	HEWLETT-PACKARD CO	29-	46	41 3/8	-7/8	-2.0
N	HONEYWELL INC	54-	87	73 1/2	-3 1/4	-4.2
N	IBM	117-	158	144 1/4	-5 1/4	-3.5
O	IPL SYSTEMS INC	1-	4	3	-3/8	-11.1
N	ITT CORP	28-	57	54 3/4	-2	-3.5
N	M/A-COM INC	13-	24	15 3/4	-1 1/2	-8.6
N	MANAGEMENT ASSIST	2-	28	2 1/2	0	0.0
N	MATSUSHITA ELEC(ADR)	49-	98	81 7/8	-5 3/8	-6.1
O	MENTOR GRAPHICS	13-	30	15 1/8	-3/8	-2.4
N	MOHAWK DATA SCI	1	13	2 3/8	-1/4	-9.5
N	NBI INC	11-	20	11 1/4	-1 1/4	-10.0
N	NCR	25-	56	52 3/8	-1/8	-0.2
N	PERKIN-ELMER	22-	36	27 5/8	-5/8	-2.2
N	PRIME COMPUTER INC	15-	27	17 7/8	-1	-5.2
N	SPERRY CORP	39-	76	75 1/8	-3/4	-0.9
O	STRATUS COMPUTER INC	9-	25	20 3/4	-3/4	-3.4
O	TANDEM COMPUTERS INC	13-	34	31 3/4	-5/8	-1.9
N	TANDY CORP	24-	44	36	-2 3/4	-7.0
O	TELEVIDEO SYSTEMS	2-	4	2 7/8	-1/8	-4.1
O	TELXON CORP	6-	24	22	-1 1/2	-6.3
N	TEXAS INSTRUMENTS	86-	141	119 7/8	+1/2	+0.4
A	ULTIMATE CORP	8-	34	26 3/8	-1 7/8	-6.6
O	VECTOR GRAPHICS INC	1-	1	1/8	0	0.0
A	WANG LABS "B"	15-	29	14 5/8	-1/4	-1.6
A	WANG LABS "C"	14-	29	14 1/4	-3/4	-5.0
N	XEROX CORP	37-	72	56 1/2	-1 7/8	-3.2
	SUPPLIES & ACCESSORIES					
N	AMERICAN BUS PRODS	21-	36	32 1/8	-1	-3.0
N	BARRY WRIGHT	17-	29	18 1/8	-2 1/2	12.1
A	DUPLEX PRODUCTS INC	13-	22	20 3/4	-1/4	-1.1
N	ENNIS BUS. FORMS	14-	28	25 3/8	-7/8	-3.3
N	3M COMPANY	74-	114	109 1/8	-4 7/8	-4.2
N	MOORE CORP LTD	15-	27	25 3/4	-1/4	-0.9
O	STANDARD REGISTER	22-	46	40	0	0.0
N	WALLACE COMP SERVICE	30-	49	46 3/4	-1 7/8	-3.8

EXCH		52-WEEK RANGE (1)		CLOSE JULY 9 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & DP SERVICES					
O	ADVANCED COMP TECH	2	6	4 7/8	1/2	9.3
N	ADVANCED SYSTEMS INC	9-	20	17 1/2	-1	-5.4
N	AGS COMPUTERS INC	10-	25	19 1/8	-1 3/4	-8.3
O	AMERICAN SOFTWARE	9-	15	11 1/2	1 1/2	11.5
N	ANACOMP INC	5-	11	5 1/2	0	0.0
O	ANALYSTS INTL CORP	2-	6	5 3/8	5/8	10.4
O	ASHTON TATE	6-	34	25 1/4	3 5/8	-12.5
O	ASK COMPUTER SYSTEMS	7-	25	10	1 1/8	-10.1
B	ASTRADYNE COMP IND	1-	3	1 1/4	1/8	-8.6
N	AUTOMATIC DATA PROC	18-	39	34	1 3/4	-4.8
O	COMPUTER NETWORK	5-	9	7 5/8	1/4	-3.1
O	COMPUTER ASSOC INT'L	9-	25	22	3	12.0
O	COMPUTER HORIZONS	5-	13	11 3/8	1 1/4	9.9
N	COMPUTER SCIENCES	13-	39	35 5/8	3 3/4	9.5
O	COMPUTER TASK GROUP	7-	19	12 3/4	-1/2	-3.7
O	COMPUTER USAGE	1-	3	2 1/8	0	0.0
O	COMPUTONE SYSTEMS	3-	11	3	-1/2	-14.2
O	COMSERV CORP	1	6	2 1/2	3/4	23.0
O	COMSHARE	7	13	12 1/2	1/2	3.8
N	CULLINET SOFTWARE	12-	33	12 1/8	7/8	-6.7
O	CYCARE SYSTEMS INC	13-	27	13 7/8	1/4	-1.7
O	HOGAN SYSTEM INC	4	12	10 5/8	1/2	-4.4
N	GENERAL ELECTRIC CO	56-	82	76 5/8	4 5/8	5.6
N	GEN'L MOTORS E (EDS)	20-	49	44 7/8	-3 1/8	-6.5
N	GTE CORP	38-	55	53 1/8	2 1/4	4.0
O	INFORMATION SCIENCE	1	5	3	1/4	-7.6
O	INFOTRON SYSTEMS CP	13-	24	15	-1/4	-1.6
O	KEANE ASSOCIATES	10-	20	14 1/4	7/8	-5.7
N	LOGICON	25-	43	31 1/8	-2 1/8	-6.3
O	LOTUS DEVELOPMENT CP	15-	38	34 3/4	-2 1/2	-6.7
O	MCI COMMUNICATIONS	7	13	9 7/8	1/2	-4.8
O	MINGT SCI AMER INC	7-	16	13 5/8	1/4	-1.8
O	MATHEMATICAL APP GRP	1-	8	1/2	0	0.0
O	MICOM SYSTEMS INC	12-	35	12 1/4	-1/2	-3.9
O	MICROPRO INT'L CP	2-	4	1 7/8	1/4	-11.4
O	NATIONAL DATA CORP	8-	25	18 3/8	-2 3/8	-11.4
O	ON-LINE SOFTWARE INT	4-	16	13	3/4	-5.4
N	PANSOPHIC SYSTEMS	14-	35	28 3/8	-2 1/4	-7.3
N	PLANNING RESEARCH	11-	23	18 5/8	1/2	-2.6
O	POLICY MGMT SYSTS CP	16-	35	17 1/4	1 1/2	-8.0
O	PROGRAMMING & SYS	4-	10	9 7/8	0	0.0
O	REYNOLDS & REYNOLD	30-	65	31 3/4	-1	-3.0
O	SEI CORP	13-	27	16 1/2	1 1/2	-8.3
O	SHARED MEDICAL SYST	26-	38	33	2 1/2	-7.0
O	SCIENTIFIC COMPUTERS	4-	8	4 1/2	0	0.0
O	SOFTWARE AG	12-	22	18 1/4	1/8	-0.6
N	URS CORP	10-	18	15 1/2	-3/4	-4.6
N	UCCEL	11-	23	19 1/4	-2 3/8	10.9
O	VM SOFTWARE	17-	31	25 1/2	-2 3/4	-9.7
	SEMICONDUCTORS					
N	ADVANCED MICRO DEV	19-	36	18 3/4	-1 1/4	-6.2
O	ADV D SEMICONDUCTOR	7-	23	8 1/2	-1/2	-5.5
N	ANALOG DEVICES INC	14-	24	16 7/8	1 1/2	-8.1
O	ANALOGIC CORP	11-	16	11 1/4	1 1/4	10.0
N	APPLIED MAGNETICS CP	9-	19	16	7/8	-5.1
O	AMAMTEK	17-	26	17 1/8	1 3/8	-7.4
O	HADCO CORP	3	7	5 1/8	-1/4	-4.6
O	INTEL CORP	21-	33	21 1/2	-1	-4.4
O	MICRO MASK INC	4	12	3 1/2	-1 1/4	-26.3
N	MOTOROLA INC	29-	48	37 1/8	-3/4	-1.9
N	NAT'L SEMICONDUCTOR	10-	15	11 1/8	-1/2	-4.3
N	TERADYNE	17-	33	21 1/8	-1 5/8	-7.1

EXCH		52 WEEK RANGE (1)		CLOSE JULY 9 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	PERIPHERALS & SUBSYSTEMS					
P	AM INTERNATIONAL	3	8	6 7/8	+1/8	+1.8
A	ANDERSON JACOBSON	2	5	2 1/8	1/8	5.5
O	AST RESEARCH INC	7	33	14	3/8	2.6
O	AUTO-TROL TECHNOLOGY	3-	13	4	1/8	-3.0
O	AVANT GARDE COMPUTNG	3-	21	3 3/8	5/8	-15.6
O	BANCTEC INC	6-	13	8	1	11.1
O	BEEHIVE INT L	1-	2	1/8	0	0.0
N	BOLT BERANEK & NEW	20-	48	42	-1 1/4	2.8
O	CAMBEX CORP	1	3	1	0	0.0
N	CENTRONICS DATA COMP	3-	11	6 5/8	+1/8	+1.9
A	CETEC CORP	6-	9	7 1/8	1/8	1.7
A	COGNITRONICS	4-	7	3 7/8	0	0.0
N	COMPUGRAPHIC CORP	20-	36	19 1/2	0	0.0
O	COMPUTER TRANSCEIVER	0	1	3/4	0	0.0
N	COMPUTERVISION CORP	9	44	13 3/4	3/4	5.1
N	CONRAC CORP	12	18	15 3/4	5/8	3.8
A	DATAPRODUCTS CORP	11	20	14 7/8	+1/4	+1.7
A	DATARAM CORP	4	17	7 5/8	7/8	10.2
O	DATA SWITCH CORP	4-	9	6 3/8	3/8	5.5
O	DATUM INC	5-	9	5 3/8	3/4	12.2
O	DECISION IND CORP	10-	20	11 7/8	1 1/4	9.5
O	ENDATA INC	2	8	6 3/8	3/8	6.5
O	EVANS & SUTHERLAND	12	27	21 1/2	1/2	2.2
O	GANDALF TECHNOLOGIES	5-	13	6 3/8	1/8	1.9
N	GEN'L DATA COMM IND	8-	21	10 3/4	1 3/8	11.3
N	HAZELTINE CORP	17	30	18 1/2	1 5/8	-8.0
O	ICOT CORP	3-	12	10 1/8	7/8	-7.9
O	INFORMATION INTL INC	10-	17	16	1/4	1.5
O	INTECOM INC	3-	11	4 5/8	-3/8	7.4
O	MEGADATA CORP	3-	8	3 5/8	0	0.0
A	MSI DATA CORP	7	14	11 1/2	-1 1/2	-11.5
N	NASHUA CORP	12-	27	24 1/8	7/8	3.5
O	NETWORK SYSTEMS CORP	11	27	12 1/8	1 1/8	8.4
N	NO AMERICAN PHILIPS	32	47	42 3/8	2 1/2	5.5
N	NORTHERN TELECOM LTD	28-	41	28 7/8	3/8	1.2
O	OMEX	1	3	1/2	0	0.0
N	PARADYNE CORP	6-	18	7 3/4	5/8	7.4
A	PENRIL CORP	6-	14	6	1/4	4.0
N	PLESSEY CO (ADR)	19-	38	33 1/4	-3/4	2.2
O	PRINTRONIX INC	9-	18	13	1/4	1.8
O	QMS INC	6-	16	13 1/2	-1 3/8	-9.2
O	RAMTEK CORP	2	7	5 1/2	3/8	6.3
N	RECOGNITION EQUIP	9-	17	11 1/2	7/8	7.0
N	SANDERS ASSOCIATES	29	57	56 3/4	+2 3/4	+5.0
O	SCAN-TRON CORP	9-	24	20	3 1/4	-13.9
N	SCIENTIFIC ATLANTA	10-	15	10	-1/8	1.2
O	SEAGATE TECHNOLOGY	5-	13	10 7/8	3/4	-6.4
N	STORAGE TECHNOLOGY	1-	5	3 1/2	3/8	9.6
O	SYKES DATATRONICS	0-	2	1/4	1/16	-8.2
A	T BAR INC	5-	9	5 3/8	1/2	-8.5
A	TAB PRODUCTS CO	9-	15	13 1/4	3/4	5.3
O	TANDON CORP	3-	9	8 1/8	0	0.0
A	TEC INC	4-	13	4 1/4	0	0.0
N	TEKTRONIX INC	47	88	59 1/8	7/8	1.4
N	TELEX	34-	88	55 3/4	-2 1/4	-3.8
O	TESDATA SYSTEMS CP	0-	3	1/2	+1/8	+50.1
N	TIMEPLEX INC	15-	23	16	-5/8	-3.7
N	TITAN CORP	4-	11	8 7/8	1	10.1
O	VISUAL TECHNOLOGY	1-	3	1/2	0	0.0
	LEASING COMPANIES					
N	COMDISCO INC	7	24	20	2	9.0
N	CONTINENTAL INFO SYS	5-	12	10 5/8	1 1/4	10.5
O	FINALCO GROUP INC	3	5	3 1/2	+1/4	+7.6
O	PHOENIX AMERICAN INC	2-	6	3 7/8	+1/8	+3.3
O	SELECTERM INC	8-	12	6 3/4	-3/4	10.0
N	U.S. LEASING	32-	48	42	+3/4	+1.8

EXCH: N – NEW YORK; A – AMERICAN; P – PACIFIC; B – BOSTON, L – NATIONAL; M – MIDWEST, O – OVER-THE-COUNTER; S – SPLIT

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COMPUTER INDUSTRY

INSIDE

Software Research Corp.'s start-up woes have hindered the success of its multivendor connectivity software/**103**

A financial software consultant doubts the value of the IBM-Hogan Systems partnership/**104**

U.S. Sprint has debuted with splashy marketing that emphasizes fiber-optic quality/**108**

Storage Technology agreed in principle to give its creditors 80% equity when the company emerges from bankruptcy/**132**

INSTANT ANALYSIS

"It was sort of one of these very personal kinds of self-examinations which I am given to and have always been given to."

— Mitchell D. Kapor on his decision to resign as chairman of Lotus Development Corp.

Wang to slash work force

'Voluntary separations,' early retirements planned

By Clinton Wilder

LOWELL, Mass. — Unable to generate significant sales momentum for the past 12 months, Wang Laboratories, Inc. said last week that it will eliminate 1,600 jobs, mainly through voluntary means.

Except for the layoff of 220 employees at an Office Information System (OIS) manufacturing plant in Puerto Rico, all of the job cuts will be accomplished by early retirement incentives and a "voluntary separation" program. The reduction of the worldwide work force to 30,000 people is expected to be completed by Aug. 31, reducing annual expenses by approximately $48 million, said Ed Devin, Wang's senior vice-president for human resources.

The announcement came some 13 months after Wang laid off 1,600 workers before posting a $109 million loss, its worst ever, in the fourth quarter of fiscal 1985. Despite that work force reduction, the formerly high-flying office automation pioneer has yet to record more than modest profits in subsequent quarters.

Plagued by top management defections, service complaints and an uncertain corporate direction, Wang has appeared to falter in making the transition from word processing pioneer to full-service data processing vendor.

"We see a real mixed feeling about Wang in its installed base," said Tim Caffrey, a minicomputer analyst with Framingham, Mass.-based International Data Corp. "The need to cut the work force again shows that Wang's long-term inability to improve sales and service is having some impact. A lot of people are just fed up, and in this type of economy that hurts significantly."

Wang Chairman and President An Wang announced separately last week that the company will report a small profit for the fourth quarter ended June 30. The forecast represented a slight improvement from the break-even results Wang projected last month, when the company said it was planning to cut additional jobs. [CW, June 30]

See **WANG** page 132

IBM, Cybernex dispute settled

By Alan Alper

ARMONK, N.Y. — Continuing its aggressive litigation strategy to protect proprietary technology, IBM last week reached an out-of-court settlement with a small disk drive and recording head vendor accused of using IBM trade secrets.

Cybernex Corp. of San Jose, Calif., founded in 1981 by five former IBM employees, agreed to pay an undisclosed multimillion dollar sum to IBM. Cybernex also agreed to several other provisions, including the destruction of inventories that utilized the allegedly infringing thin-film head technology.

In the past three years, IBM has threatened to sue or actually sued a number of companies that it contended misappropriated its technology, including Hitachi Ltd. of Japan.

Separately, Cybernex agreed last week to merge its recording head operation with competitor Read-Rite Corp. of Milpitas, Calif., and also to acquire controlling inter-

See **IBM** page 109

AST reduces staff by 7%, schedules release of products

By Peggy Watt

IRVINE, Calif. — On the verge of releasing a host of new desktop publishing products, AST Research, Inc. announced last week that it laid off 7% of its work force.

The reduction in force, which eliminated 65 positions immediately, was implemented in response to an expected revenue drop in the fiscal year that ended in June, said Jim Ashbrook, vice-president of AST's recently formed personal workstation enhancements group.

Ashbrook said it was too early to count on offsetting the decline with new business from the upcoming product releases. "We're trying to balance our resources for our new ventures," he said.

While AST expects eventually to add positions to its new areas of development, including its communications and systems groups and units for Apple Computer, Inc. and Digital Equipment Corp. products, the

See **AST** page 132

INDUSTRY INSIGHT
Edward Warner

Old countries, new markets

When IBM, Digital Equipment Corp. and other heavyweights of the U.S. computer industry release their quarterly earnings reports this week and next, the reports will likely show international sales contributing more than ever to revenues — and European sales will be found leading the pack.

Europe is a hot market for U.S. vendors because of the dollar's decline in value against European currencies. In addition, analysts say the European computer market's growth has continued largely unabated throughout the duration of the U.S. computer industry slump.

According to Philip DeMarcillac, European research manager for the London office of International Data Corp., the dollar value of the European computer market grew 14% last year. If the dollar drops in value by an additional 5% against the majority of European currencies, he says, U.S. vendors will see 20% to 25% growth in their European markets this year.

What causes the European market to perk, while the U.S. market remains relatively tepid? A simple explanation, according to Susan P. Douglas, New York University professor of marketing and international business, is that the "economies in most major European countries are on the upswing at the moment."

That upswing has been reflected in capital spending, she says, a point echoed by David Altman, an investment analyst with Goldman Sachs & Co. As Altman explains it, "European capital spending has a longer term horizon than it does in the U.S."

In addition, the impact of an economic event often takes longer to be reflected in the buying patterns of European

See **OLD** page 109

Warner is editor of the Computerworld News Service.

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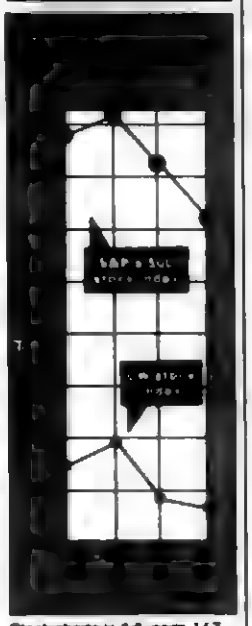
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Executive Report
Voice/data PBXs: A promising data strategy?/**41**

In Depth
Edward Yourdon speaks on office productivity/**53**

TOP OF THE NEWS

Wang Laboratories' unannounced laptop boasts a host of communications options. **Page 4.**

■

Litton Systems, Inc.'s time-sharing operation is closing its East Coast data center. **Page 7.**

■

DEC option allows central management of network resources. **Page 10.**

■

Computer-aided design managers answer the challenge of blending into corporatewide systems strategies. **Page 69.**

■

Absorbing $140 million in lost profits from last month's 26-day strike by communications workers, AT&T reports an 8.5% decline in second-quarter profits to $422 million. Quarterly revenue slips to $8.42 billion, down 1.6% from the year-earlier period. IBM and Honeywell are also feeling a profits pinch, but Apple, Burroughs and Lotus are better off than one year ago. **Page 118.**

■

IBM has won a contract to supply office automation and communications equipment to Ford over archrivals DEC and Wang, sources said last week [CW, June 30]. Disclosure of the contract, potentially valued at between $300 million and $500 million, has been delayed because of objections lodged by DEC Chairman Kenneth Olsen, a member of Ford's board of directors, the sources claimed. DEC and Ford spokesmen declined comment.

■

Software Publishing Corp. this week is scheduled to announce a series of packages aimed at high-end business users. The products, upgrades of the PFS series, include word processing, file management and a spreadsheet, a source close to the firm disclosed. An integrated package that includes communications facilities, aimed at first-time computer users, is also set to be announced. Meanwhile, Software Publishing announced a loss of $737,000 for the third quarter as revenue

See NEWS page 7

ADR utility reveals snags

Monitor's 'snapshots' spot DBMS bottlenecks

By Charles Babcock

PRINCETON, N.J. — Users of Applied Data Research, Inc.'s relational data base management system say a performance monitor announced by the firm last week enables them to fine-tune DBMS operations by spotting bottlenecks that originated in the MVS operating system and teleprocessing monitor.

The beta-site users of the monitor, Look/Datacom, claim that, in the past, such bottlenecks were hidden. Although performance monitors have previously been able to highlight operations of the DBMS or operating system and teleproc-

See ADR page 10

Link may void DEC warranty

By Donna Raimondi

A third-party company's method of providing users with the ability to cluster Digital Equipment Corp. Microvax IIs and VAXs may jeopardize users' operating system warranties, DEC said last week.

The SI Link, a Systems Industries, Inc. product already in use at some Microvax sites but not yet formally announced, is said to provide users with a function that DEC itself does not offer: the ability to cluster Microvax products together with VAX superminicomputers, much as DEC now encourages clustering of VAX models.

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Volume users to get direct Lotus sales

By Douglas Barney

CAMBRIDGE, Mass. — Lotus Development Corp. will sell its entire product line directly to large corporate customers under a program to be announced by the end of the summer, company spokesmen recently told a private gathering of computer industry consultants.

Under the program, which is seen as Lotus' answer to corporate demands for site licensing or volume purchase agreements, Lotus will not go through computer dealers for its large-volume sales. Instead, the program will involve special bids for purchases of 500 units or more to a single location, and Lotus will provide distribution prices for such purchases.

Analysts speculated that eliminating dealers from large purchases will enable Lotus to pass savings on to customers while maintaining its own profitability.

The company did not disclose a specific date for implementation of the program, although company spokesmen did say it would be officially announced during the third quarter.

Speculation about Lotus selling direct has existed for some time and was reignited earlier this month at a press conference when Lotus announced it would sell The Application Connection, a micro and mainframe data extraction and translation program, through a 50-member direct sales force. The firm also disclosed at that time that it has some 150 people staffing sales offices thoughout the country.

Several consultants admitted attending the private meeting but declined to comment on the proceedings. However, *Computerworld* obtained a comprehensive summary of the program.

"Having a direct sales force is certainly consistent with what Lotus has been mak-

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CW SPECIAL REPORT

Packet pioneer: User gamble on synchronous service pays off

By Elisabeth Horwitt

Signing on as the first commercial user of a new synchronous service offered by GTE Telenet Communications Corp. was a gamble for Advanced Micro Devices, Inc. That gamble has finally paid off, but it took almost two years for Telenet to develop the expertise to provide adequate support to its pioneering customer.

The deal with the Silicon Valley microchip manufacturer presented Telenet, now U.S. Sprint subsidiary Telenet Communications Corp., with a unique opportunity to test its synchronous services at a business site.

Packet-switching vendors were just starting to support synchronous communications in late 1982 and early 1983, when AMD was looking for a "reliable, maintainable, flexible, cost-effective" synchronous connection between field offices throughout the U.S. and an information center in Sunnyvale, Calif.



AMD's Erhart

According to AMD data communications manager Robert Erhart, the 1,200 bit/sec. dial-up connections then being used could not adequately support approximately 250 sales representatives who needed to access the data center's six IBM mainframes.

"Our salespeople need quick access to information center data that enables them to generate reports on parts and product information to help them deal with customers," Erhart says.

To AMD, Telenet's packet-switching service looked like an ideal way to upgrade from 1,200 bit/sec. asynchronous dial-up lines to high-speed synchronous communications without taking on the costly, troublesome job of managing a private leased-line network.

But being Telenet's guinea pig had its painful moments for AMD. Telenet made a number of mistakes and miscalculations while trying to get up to speed in a new network-

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NEWSPAPER

Federal agencies spotlight innovation in public sector

By Mitch Betts

WASHINGTON, D.C. — Federal computer executives, stung by the government's recent reputation as a technology laggard, trotted out a few of their innovative computer applications at last week's Government Computer Expo '86.

Federal Bureau of Investigation officials, for example, discussed their use of natural-language processing and expert systems to help criminal investigators.

Susan Church, the bureau's data administrator, said the FBI is using Intellect natural-language query software from Artificial Intelligence Corp. of Waltham, Mass., primarily for prototyping new data base application programs.

She said the bureau can quickly prototype an application by making guesses about users' needs and then refine the model by having users make ad hoc queries using Intellect's English statements.

"Natural-language interfaces are feasible and practicable," Church declared. She praised Intellect for recognizing and clarifying ambiguous queries, tolerating spelling and grammar errors and warning users about "expensive" queries.

The FBI is also building an expert system to help agents investigate organized crime and racketeering suspects, according to William A. Bayse, assistant director of the technical services division. The knowledge base includes the relevant statutes, investigative procedures manuals, expert advice from field agents and the FBI's existing organized crime data base, he said.

Using Intellect as a query language and an inference engine for deductive reasoning, the expert system generates hypotheses about criminal suspects and strategies for further investigation, Bayse said.

Bayse and other federal computer managers said the government rarely gets credit for innovation, despite the fact that there are many advanced applications in the civilian agencies as well as at the Defense Advanced Research Projects Agency, which specializes in artificial intelligence and parallel processing.

Projects under way

Other speakers described a variety of innovative projects under way at federal agencies:

• The U.S. Air Force and Boeing Military Aircraft Co. have developed software for an Integrated Information Support System that integrates the aerospace contractor's incompatible data bases into what appears to the user as a single data base. The pilot project integrates data stored on a Digital Equipment Corp. VAX 11/780 and an IBM 4381.

• The Securities and Exchange Commission (SEC) is developing an electronic filing system to capture and analyze thousands of corporate reports. Likewise, the Internal Revenue Service has tested electronic filing of tax returns (see story page 15).

• The U.S. Navy developed the Document Interchange Format, a set of hardware standards and software that permits the exchange of word processing documents across different brands of hardware. The format has become a de facto standard in many government agencies and may soon penetrate the private sector.

Robert V. Head, who recently retired after a long career as a federal DP executive, said the government's bad reputation for technological innovation can be traced to the anti-government climate of the Carter and Reagan administrations.

Head, now a consultant in Stafford, Va., said another interesting government project is an appellate court case-management system being developed by the Federal Judicial Center. He said it employs AT&T's Unix operating system in a transaction processing environment, rather than a research environment.



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Communications options for Wang laptop

Unit due in fall, to offer VS file transfer ability

By Douglas Barney

LOWELL, Mass. — Wang Laboratories, Inc.'s much-rumored laptop will be announced by this fall and boast a variety of communications options, sources close to Wang said last week.

The Wang laptop reportedly is IBM compatible, weighs 15 lbs and will start at $3,915, which includes a 10M-byte internal hard disk drive; a built-in, letter-quality, thermal-transfer dot matrix printer; and software.

The product's communications facilities center around interactive remote sessions through VS terminal emulation and emulation of Wang's 2110 asynchronous terminal. The machine can transfer files directly to Wang VS systems or through VS to other networked systems by using Wang Office and terminal emulation packages, said Vincent Flanders, associate editor for *Access86*, a magazine for Wang users.

"The aim of the machine is to have a very strong communications ability. It can act as a remote workstation," Flanders said.

The machine can also connect locally to other laptops as well as to Wang Professional Computers and Advanced Professional Computers through its RS-232 port and the use of asynchronous communications software. A Wang official declined to comment on the machine.

Asynchronous communications packages that will be available for the machine include teletypewriter (TTY) emulation, emulation of Digital Equipment Corp.'s VT100 and 2110 emulation as well as packages developed by third parties.

Synchronous packages include IBM 3276/76 bysychronous emulation, IBM 3276 Systems Network Architecture emulation and other packages developed by third parties. Wang will also offer autodial support for the machine's two internal modems, a $495 model with transmission speeds of 300 or 1,200 bit/sec. or a $795 model with speeds of 300, 1,200 or 2,400 bit/sec. While most of the communications software is optional, VS terminal emulation comes standard, Flanders said.

Users gave the laptop mixed reviews based on the specifications provided by *Computerworld*. "I like it. I might buy one for myself," said Jerrie Michaels, systems administrator for Solar Turbines, Inc. of San Diego. Michaels is most pleased with the machine's IBM compatibility, TTY and VS emulation and built-in printer.

The laptop also got high marks from Don Breipenbach, vice-president of MIS for American Family Mutual Insurance Co. of Madison, Wis. "The key for us is that it could be used as a terminal in the office and then detached and taken out and hooked up by telephone," Breipenbach said. American Family might eventually purchase as many as 1,000 Wang laptops, he said.

One user, however, expressed skepticism about the laptop's networking functionality, based on past experience. "We attempted to use some Wang communications software, and the documentation did not enable us to fully utilize the package," said David Godinez, a consultant with Landau & Bartlestein, a Chicago-based accounting firm. "The software support that Wang provides is pitiful in the extreme. They try hard, but their style of organization is poor," Godinez said.

"It is too heavy, built-in printers don't offer anything for anybody, and it is much too expensive to be taken seriously," said William Zachmann, vice-president for research at International Data Corp., about the laptop.

Although no internal floppy disk drives are available for the machine, users can buy a $575 external 3½-in. or a $405 5¼-in. floppy drive. "Their attitude is simply that most people, when they go out in the field, don't want to mess around with floppy disks, especially for programs like Lotus Development Corp. 1-2-3 that require a key disk," Flanders said.

The machine, which runs Microsoft Corp.'s MS-DOS 3.2, probably has two separate ROM BIOS, according to Flanders, which allow it to run either Wang- or IBM-compatible applications software. Unlike other Wang micros, the user does not have to reboot the system when switching between Wang and IBM applications. The machine cannot, however, run Wang applications that use bit-mapped graphics.

The machine comes standard with 512K-bytes of random-access memory (RAM) and uses an Intel Corp. 8086 microprocessor running at 8 MHz. With its rechargable nickel-cadmium battery, the machine can operate from three to six hours.

The laptop comes with two expansion slots, one for an internal modem and one for another memory expansion. Ports include an RS-232C port, an optional monitor port, a small computer system interface, a 10-pin RJ-14 jack for a numeric keypad and mouse and two RJ-12 phone jacks.

Options for the machine include a $130 acoustic coupler, a $695 512K-byte RAM expansion card, a $95 numeric keyboard, an additional battery pack, a streaming tape cartridge backup system and an automobile cigarette lighter power adapter.

IBM boosts main memory of System/88

By Donna Raimondi

IBM has added main memory increments and disk controllers to its System/88 fault-tolerant machine. The enhancements are said to expand memory up to four times and improve the machine's price/performance.

The enhancements originally came from the System/88's manufacturer, Stratus Computer, Inc. Stratus has been shipping them since July 1 but did not publicize the enhancements because "they are 256K chips, which is not new technology," a spokesman said.

The enhanced memory is available in 8M-byte increments for users of the System/88 4575 Model 20B processor, which brings the maximum memory of that system to 12M bytes. The memory comes in 8M-byte and 16M-byte increments for the 4576 Models 040 and 060 processors, which now can be configured up to 64M bytes. The 8M-byte memory increases cost $36,500, and the 16M-byte memory costs $68,500.

In addition to increasing the memory, the price per megabyte has dropped considerably for the System/88, said an IBM spokesman. For example, on the $51,000 version of the System/88 4575 Model 20B processor, the price per megabyte fell from $12,933 to $7,188 with the addition of the 8M-byte memory.

The controllers allow System/88 direct-access storage devices (DASD) to exchange information with System/88 processors that have main memory greater than 16M bytes. The 1020 DASD controller, selling for $6,630, is used with the IBM 4580 disk drive. The 1030 DASD controller, priced at $9,180, is for the 448M-byte IBM 4581 disk drive.

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Packet pioneer: Gamble pays off

From page 1

ing environment. "Telenet had only dealt with the asynchronous dial-up world up until then," Erhart says. "We were their first customer. To put it very-nicely, it's been an educational experience for both of us."

"AMD forced us to develop our synchronous services to the level they are now, especially in the areas of network management and support," agrees Leigh Hamby, director of IBM programs at Telenet. "It took us a while to realize how we needed to customize our customer support for the IBM environment."

Initially, AMD planned to set up a private, synchronous X.25 network by installing packet assembler/disassemblers (PAD) at both the data center and remote sales sites. Telenet was then one of the few vendors supplying private X.25 PADs with synchronous support.

But AMD decided that it did not want to maintain and manage a private network. "We wanted to avoid the trouble and expense of having 3010s at each sales site," Erhart says. "We had enough trouble maintaining the 3274 cluster controllers. Besides, we wanted field office people to concentrate on supporting our customers, not fooling around with communications equipment."

The microchip manufacturer decided to use Telenet's packet-switching service — on the condition that the vendor could provide Synchronous Data Link Control-to-X.25 conversion on its own facilities. Telenet announced such a service in the summer of 1983. By December 1984, 23 of the 37 AMD sales sites were linked to the Sunnyvale data center over Telenet's X.25 network. (See diagram, this page).

Between two and eight IBM Personal Computers or terminals at each site are tied to a 3274 controller to send synchronous transmissions to the nearest Telenet node over a dedicated 4.8K or 9.6K bit/sec. leased line. A Telenet X.25 PAD then converts the synchronous transmissions to X.25 protocols so that they can be routed over Telenet's network, then sent to the AMD data center in Sunnyvale over three 14.4K bit/sec. leased lines. A TP3010 at the data center converts the X.25 packets back to synchronous protocols and sends them on to an IBM mainframe.

Not a bargain

AMD pays between $40,000 and $45,000 per month for Telenet networking services, leased equipment and dedicated access lines. This is not a bargain rate, according to Erhart: "We pay a high premium for the service — 5% to 15% over end-to-end leased-line connections, depending on traffic conditions and distances covered — but it's worth it for several reasons."

The biggest plus is that AMD has been able to leave most network installation, maintenance and management tasks to Telenet. "We only need to have communications staff at our three data center sites," Erhart says. (Field office personnel do not access the other two data centers.) "When we have to move a sales office, I just tell Telenet and they take care of everything." Telenet has been able to obtain leased-line connections between AMD remote offices and the vendor's network centers much more quickly than the typical three- to six-week postdivestiture lead time, Erhart adds.

Erhart notes that AMD would not have been able to cost-justify the high-speed synchronous links at several of the sales offices if it meant installing and maintaining X.25 equipment at each site. "It's a very solid, reliable system now; that's why we've just installed packet-switching connections on four more offices, bringing the total up to 27."

But this halcyon period began only about eight months ago, according to Erhart. In the early days of their relationship, vendor and customer jointly uncovered several problems that needed to be worked out before Telenet's synchronous service could be commercially viable.

Early on, AMD discovered that Telenet had overestimated the number of user circuits that could be handled by a TP3010 PAD at the data center. "Telenet thought one 3010 could handle host access by users in four or five offices," Erhart says. "It could only support three offices." This problem was encountered during the initial testing of the Telenet link and solved before the full network was installed.

The second problem, which took close to two years to solve, arose from the fact that, initially, Telenet's support staff had virtually no experience in synchronous communications. "Telenet's support people grew up in the dial-up world," Erhart says. "They were not trained to handle a synchronous network. When we had a problem, they took too long to arrive and didn't know what to do when they got there. We wound up with extended downtimes and confusion."

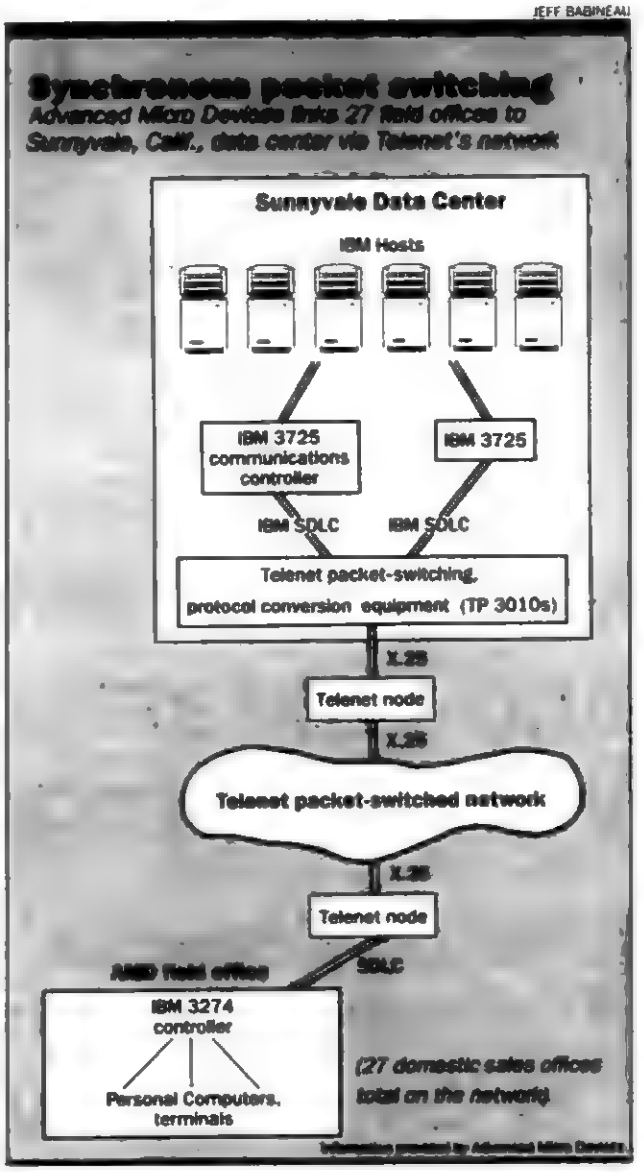
Hamby admits that it took Telenet a while to understand the extent of the gap between asynchronous and synchronous networking needs. "For instance, with asynchronous dial-up connections, if one port goes down, the customer can simply dial into another port. We didn't realize at first that this doesn't work with dedicated synchronous links."

AMD's increasingly loud complaints about network downtime helped to galvanize Telenet into overhauling its synchronous support facilities from mid-1983 to 1984, Hamby notes. The vendor trained a team in Systems Network Architecture and set up a synchronous support desk. It also installed additional network diagnostic tools that can re-create or isolate problems in a synchronous environment. "But that wasn't enough for AMD, which has no network management staff of its own," Hamby says. At the microchip manufacturer's request, Telenet provided a support person dedicated to addressing AMD's unique networking needs.

Telenet now maintains ongoing contact with AMD's network. "They call us every evening for the network status of all our sites," Erhart says. "That way we can catch problems before they become serious." Telenet's diagnostic tools can re-create, isolate and fix a network problem — often remotely.

Gradually, during the last six to eight months, AMD achieved its goal of 99% network availability during prime office hours of 8 a.m. to 5 p.m. for sales offices in all U.S. time zones. Prior to that, network availability was between 60% and 80%, Erhart notes. "The improvement is mostly due to Telenet's training and staffing efforts. Now, when we have a problem, they get right on it."

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Litton shuts N.J. data center, signals time-sharing mart drop

In-house shift blamed for decline in demand

By Alan Alper

FAIRFIELD, N.J. — Litton Systems, Inc.'s Computer Services division will close its data center within the next three or four months as part of a consolidation of its East Coast processing services, *Computerworld* has learned.

A source close to the Litton Systems' division last week said employees were notified on July 11 that the time-sharing operation would be closed on Oct. 3. Computer Services division Vice-President and General Manager Bill Guide acknowledged last week that all processing at the Fairfield operation would be shifted to a sister facility in Reston, Va., "within the next three or four months." The operation's New York sales office, however, will remain open, he said.

Litton's consolidation efforts reflect general trends in the processing services industry. Declining computer and mass storage costs, increased availability of packaged software in addition to the proliferation of personal computers and advancements in communications technology are all factors swaying end users away from time-sharing services and over to in-house computing, according to a report issued late last year by International Data Corp. (IDC) , a market research concern in Framingham, Mass.

"The more traditional portion of the business — time-sharing — is just not as profitable as it once was," Karen Kugel, an analyst with IDC, noted last week.

IDC estimates that the market for processing services will grow from roughly $12.4 billion this year to $16 billion in 1990, a compound growth rate of 7%. Litton Computer Services had revenue of about $38 million last year, $6 million of which was derived from the data center here, Guide confirmed.

The Westlake Village, Calif., firm's decision to close the Fairfield data center had more to do with "duplication of facilities" than with poor business prospects in the Northeast, Guide said.

"We're looking for ways to maximize our capacity and keep our operation as efficient as possible. This is a way of lowering costs, which today is the name of the game," Guide said.

The shift to the Reston data center, which leaves the firm with only one other processing site in Woodland Hills, Calif., will have minimal impact on the firm's Northeastern customers, he noted.

"It doesn't matter to most of our customers, since much of our business is done on a remote basis," Guide pointed out.

Roughly 25 of the data center's 50 employees have been offered positions in Reston, Guide said.

The close of the data center comes roughly two years and three layoffs after it was acquired from Informatics General Corp. In the operation's heyday, around 1981, it employed about 140 people and generated approximately $20 million, sources said.

One source said the operation was closed because it had lost customers to a variety of other time-sharing vendors, such as General Electric Information Services Co., Boeing Computer Services Co. and McDonnell Douglas Information Systems Group.

Guide claimed, however, that smaller, local firms are implementing lower cost structures to win business. "The smaller guys don't have the overhead to maintain. The big guys don't have the economies of scale that they would like," he maintained.

TOP OF THE NEWS

NEWS from page 1

declined to $4.6 million from $9 million a year earlier.

■

IBM executive W. Frank King, responsible for long-term IBM strategies for Unix-based products, has joined the board of directors of the Unix /Usr/Group. King, a key figure in the development of IBM's RT PC, is the first IBM executive to answer the users group's request for IBM representation. "The evolution of AT&T's Unix operating system into a viable commercial product and the development of multiple Unix-based IBM products has created a need for IBM to participate in users groups that are related to the coordination and promotion of Unix-based products," King said.

■

Beta sites for release 5.0 of Relational Technology, Inc.'s Ingres relational DBMS have begun receiving tapes. One user said last week his first beta tape arrived in early July.

■

Data General is set to release a mid-range Eclipse MV machine in late July or early August, a DG spokesman said. Similar in design to the MV20000 and MV2000 released last year, it is said to equal a DEC VAX 8200 minicomputer in power but is priced similar to the Microvax II.

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BIOS shipped for 80386 systems as vendors seek standard

AT compatibles may challenge superminis

By David Bright

NORWOOD, Mass. — Phoenix Technologies Ltd. last week announced that it shipped ROM BIOS for Intel Corp. 80386-based machines to 15 manufacturers that are designing IBM Personal Computer AT-compatible products around the microprocessor.

By taking advantage of the 80386 chip's increased speed, ability to address 4G bytes of main memory and 64 trillion bytes of virtual memory, improved pipelining and on-chip memory management, the new class of desktop machines should offer performance rivaling that of superminicomputers. In addition to running at least two or three times as fast as 80296-based IBM AT systems, 80386-based systems would be able to simultaneously handle multitasking of applications running under Microsoft Corp.'s MS-DOS, Unix and proprietary operating systems.

One of the first companies to produce an 80386-based machine will be Advanced Logic Research, Inc., of Irvine, Calif. Advanced Logic Research is planning to have its engineering-oriented Access 386 system, which will incorporate the Phoenix BIOS, available by the fourth quarter of this year.

Additionally, Corvus Systems, Inc. expects to ship in the fourth quarter an 80386-based file server using a BIOS developed by Award Software, Inc. in Los Gatos, Calif. Award claims to have six OEMs for its BIOS.

While this is Phoenix's first BIOS that does not emulate an existing IBM hardware environment, Phoenix claimed it had taken care to maintain IBM AT software compatibility. "Other [non-IBM] manufacturers of both computers and boards are moving quickly on 386 products," said Phoenix Chairman Neil Colvin. "The level of compatibility and quality of the ROM BIOS for these systems continues to be a critical design factor."

According to Phoenix, its 80386-based BIOS includes functions designed specifically for the 80386, such as support for processing speeds up to 20 MHz, full 32-bit memory testing, support for the 80387 numeric coprocessor and virtual disk and overlay management features.

Phoenix also announced last week that the Personal Computer Extended Technology Standards Committee had reviewed the preliminary bus standards proposals earlier this month and would release the 16-bit bus specification with a 32-bit extension option by Sept. 1.

Given the possibility of a non-IBM standard, "IBM may be forced to play its hand," observed Jan Lewis, president of the Palo Alto (Calif.) Research Group. "By and large, IBM would not want to come out with an 80386 machine until probably 1988, because it tends to milk product life cycles."

Some vendors have vowed to abstain from introducing 80386-based systems until the market is formed. "We're going to sit on the sidelines on that issue and wait to see in what direction the market goes," commented Ed Juge, director of marketing planning at Tandy Corp. "When IBM enters the market, we'll know what the standard is."

Volume users get direct Lotus sales

From page 1

ing noises about. We think they will have a direct sales force," said Bob Therrien, a member of Paine Webber, Inc. technology group, who was not at the closed meeting. According to Jim Manzi, Lotus chairman, the firm will announce the program by Aug. 15, Therrien said.

However, Lotus spokeswoman Jennifer Strayton said the firm would announce its program by Sept. 5 and declined to release details of the program.

The corporate buying program will reportedly also provide a way to eliminate copy protection for select corporations.

At press time, it was unclear whether dealers would play any role in such sales; however, sources close to Lotus say they believe that dealers will have no role in these corporate sales. "The goal is not to have a middleman," one source said.

In addition, Lotus will offer an "extended value plan." Under this plan, users with at least 500 to 1,000 personal computers, half or more of which are eligible for Lotus upgrades, can pay $125 per workstation per year and receive automatic upgrades, the ability to remove copy protection and credit toward the purchase of Lotus companion products.

Companion products were designed to enhance the use of Lotus core products 1-2-3 and Symphony and include 1-2-3 Report Writer; Hal, an unreleased natural language interface; Symphony Spelling Checker; Symphony Text Outliner; and Spotlight desktop manager.

Limited liability contracts

Large corporations can also receive limited liability contracts under which the firm is liable for only the purchase price of any software that is illegally copied. This will be provided free to any customer with more than 100 Lotus-equipped PCs.

Large and medium-size customers are eligible for Lotus' Corporate Access, which consists of 50% discounts on any two Lotus companion products and toll-free telephone support of up to eight calls per month to a senior Lotus technician.

Small customers will be eligible for Lotus Prompt, which includes the same services as Corporate Access, but will cost $150 per year.

Electronic distribution of software, downloaded from corporate mainframes, will be offered to firms that commit to the purchase of $150,000 or more worth of Lotus products.

The electronic distribution system is currently running on VM-based mainframes and will eventually become available under MVS. Lotus will most likely offer this capability on mid-range systems such as the IBM System/36, a source said. Lotus will also add authorized training centers.

Sources also indicate that Lotus will announce a $495 networking product for network servers by the end of the year. Lotus has publicly committed to releasing a network version of 1-2-3 by the end of the year, spokeswoman Strayton said.

A consultant who asked not to be identified said the Lotus program will result in no real savings to corporations that have been buying in volumes from mail-order firms at low prices. Dealers will not lose much business because they rarely sell in volume to large firms, be added.

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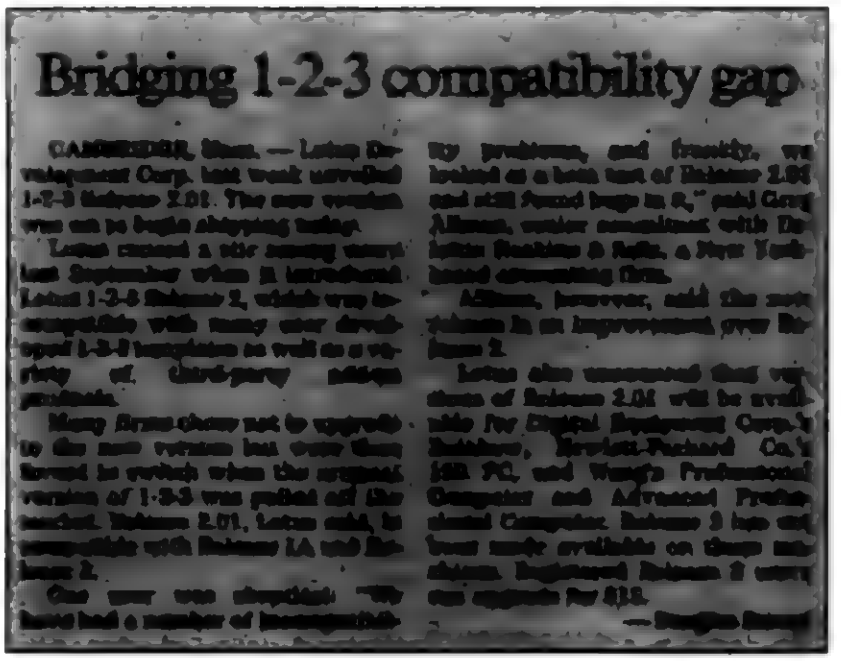
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PDSFAST	48 sec.	.7 sec.	122	$1.75
47 cyl. PDS Unload to Tape				
iebcopy	58 min.	14 min. 52 sec.	97,253	$92.05
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SOFTWARE ENGINEERING OF AMERICA SEA

DEC sends centralized network manager up against SNA

RSM assaults Blue stronghold

By Elisabeth Horwitt

LITTLETON, Mass. — A centralized network resource management system introduced last week by Digital Equipment Corp. addresses a market long-dominated by IBM Systems Network Architecture (SNA) products, according to one industry analyst.

The Remote System Manager (RSM) Version 1.0 permits network resources, such as files and software, to be managed from a central server, the company claimed.

The software package converts a VAX or Microvax running VMS into a server that performs file backup, software updates and distribution and printing services for all VAX, Microvax II and Vaxstation II client systems on a network. RSM is compatible with Decnet communications software and Ethernet local-area network protocols.

"Centralizing network expertise makes life easier for everybody by taking the 'use diligence' pressure off the users," said David Terrie, president of Boston-based Newport Consulting.

"You could look at this as a direct counter to IBM, who already offers these capabilities bundled into its Token-Ring network management software, Netview. That has always been IBM's strength: centralized control of a network and the security and staff savings that come with it," Terrie said. With RSM, DEC offers a network management approach that rivals IBM's SNA-based products, he added.

Needed capabilities

The introduction of RSM saved Grumman Corp. the trouble of developing the same capabilities in-house. "That's how much we needed those capabilities," said Robert Meihofer, manager of systems technology for the aerospace company's testing facilities in Calverton, N.Y.

"It addressed our need to maintain all of our systems and application software in a central location," Meihofer said. RSM helped Meihofer's group distill a distributed, multinode network into a single, centrally controlled system, he reported.

"As the number of workstations on a network increases, the responsibility for managing the facilities devolves on the users, who are not always up to it," said DEC Network Interconnect marketing manager Steven Hargrave. "Ethernet already provides facilities for managing network wiring and boards; Decnet manages network node configurations; and RSM allows central management of operating systems and applications."

By enabling system managers to store current versions of operating system source code and application programs in one central location, RSM facilitates "the time-consuming job" of maintaining consistency throughout successive application changes and software updates, Hargrave noted.

The RSM server also performs file backup and restoral for client workstations.

Available in August, RSM consists of two software modules. The RSM Server runs on MicroVMS or VMS operating systems and Decnet VAX software. Prices range from $1,500 for the Microvax II to $7,500 for the VAX 8800. RSM Client runs on MicroVMS and Decnet VAX. Prices range from $300 for the Vaxstation II to $900 for the Microvax II.

ADR utility reveals snags

From page 1

and teleprocessing monitor, no product has offered glimpses into all three at the same time.

The users also noted the new product incorporates the features of ADR's existing MVS performance monitor, ADR/Look.

Two beta-site users said Look/Datacom is able to take a statistical snapshot every 15 minutes of the activities in Datacom/DB, ADR's relational DBMS offering, as well as CPU busy and wait times, paging rates, disk drive use and channel capacities.

With such information, Darren Franchow, data base administrator at Deseret Medical, Inc., a Sandy, Utah, medical device manufacturer, has been able to see what percentage of I/O traffic to his disk drives is related to data base operations.

"If we run into contention between two batch jobs using the same direct access storage device, we can move the data bases closer to the Volume Table of Contents [disk directory]," reducing the amount of arm movement and speeding operation, he noted.

In addition, Look/Datacom counts the number of times data is accessed after it has been pulled off the disk and stored in CPU buffers.

A few weeks ago, 70% of his systems' calls to read data were scoring hits or reading information in buffers. Franchow decided he could improve that average by taking advantage of the 8M-byte memory recently added to his IBM 4381.

He allocated the memory to the operations with the heaviest data base traffic and started getting hits in the range of 85% to 95%, speeding overall performance.

"If I notice this figure going down for one job, I can modify the keys on that data base," he said. Modifying the data base keys ensures that more data will be transferred into buffers when that data base is in use.

In a similiar vein, a Tulsa, Okla., energy producer, Mapco, Inc., has been a beta-site user of Look/Datacom for three months. MVS system engineer supervisor John Young said he considers the buffer "hit ratios" supplied by the product "one of the critical issues" in improving data base management system performance.

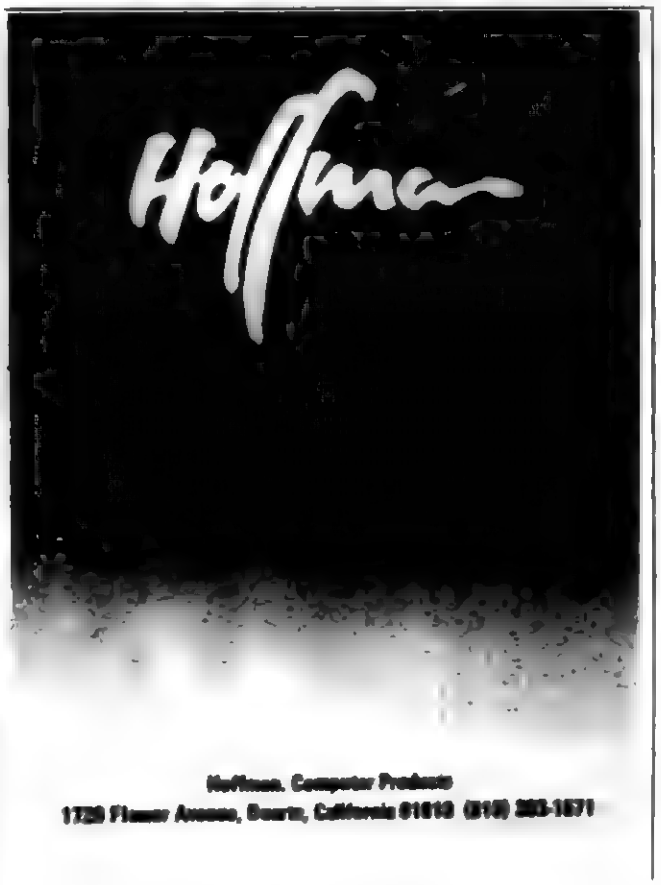
In addition, Young said he has been watching disk arm contention from statistics provided by Look/Datacom and found he could reduce contention by placing frequently accessed data sets on different disk drives.

Look/Datacom's on-line feature enables him to derive a picture of how the DBMS, operating system and teleprocessing monitor, in this case, IBM's TSO running with MVS on an IBM 3083, are functioning together at any time of day.

One reason Look/Datacom appears so powerful to users is the meagerness of its predecessor, the DBMS monitor provided with Datacom/DB. It provided an average of statistics at the end of the day but no data specific to peak usage. As a result, manual records had to be kept of the day's activities before system operators could guess what the statistics meant, according to Young.

Both users said the monitoring of all three systems together represented maximum tuning possibilities. "Now we can look into the data base and, if it's hung up, see if it's because of calls coming from CICS," Franchow said.

Look/Datacom is available immediately at a price of $35,000 for all IBM 370-family mainframes; CICS monitoring is an additional $12,200 option.



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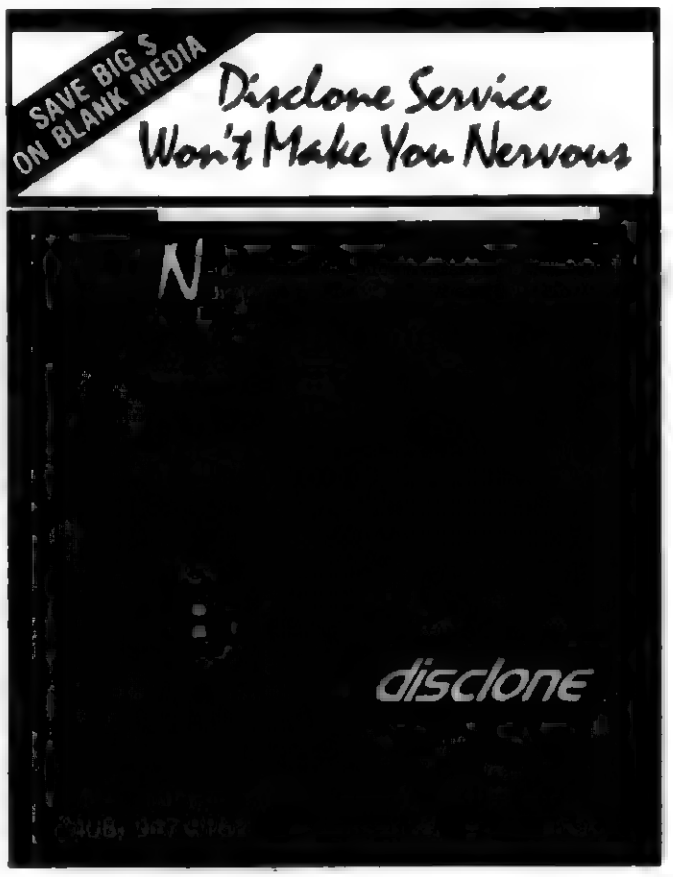
IBM offers DB2 monitor

WHITE PLAINS, N.Y. — IBM last week announced a performance monitor for its DB2 that will allow IBM customers to tune up their relational data base management systems.

Called the DB2 Performance Monitor, the widely anticipated product will make users "more comfortable" with DB2 and able to experiment in resolving bottlenecks in its operation, according to Scott Smith, researcher with the New York brokerage house of Donaldson, Lufkin & Jenrette, Inc.

The monitor provides multicolor graphic information on DB2 performance. It will be leased for $975 per month and sold for a one-time charge of $29,000. The monitor is available immediately, IBM spokesmen said.

— Charles Babcock



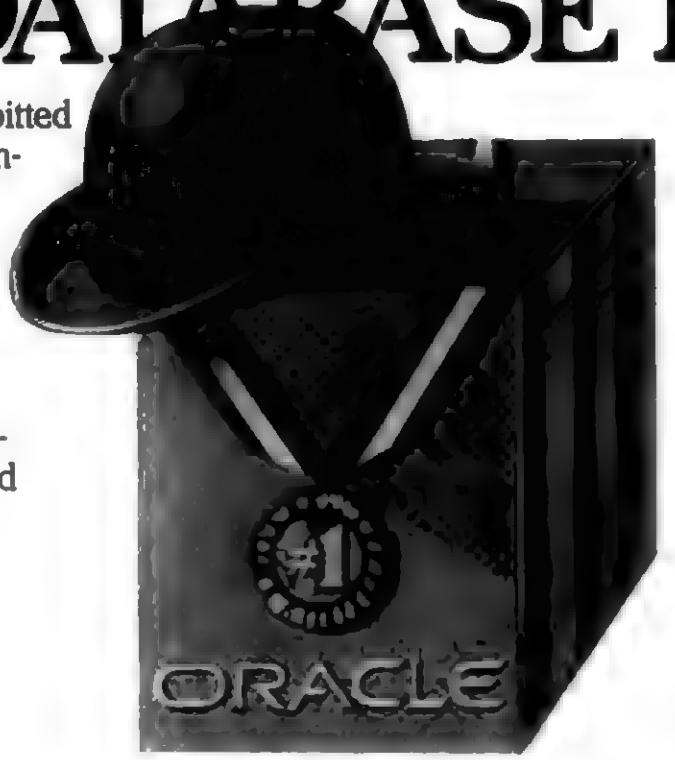
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Mobile ..... Sep 10
AR Little Rock ..... Sep 30
AZ Phoenix ..... Aug 6, Oct 16, Dec 2
CA Los Angeles ..... Aug 6, Sep 11, Oct 14, Nov 13, Dec 16
Newport Beach ..... Sep 25, Nov 11
Sacramento ..... Jul 22, Sep 18, Oct 30
San Diego ..... Aug 7, Oct 7, Nov 6
San Francisco ..... Aug 5, Sep 9, Oct 14, Nov 6, Dec 9
San Jose ..... Aug 7, Sep 23, Oct 21, Nov 13
CO Denver ..... Sep 18, Oct 21, Dec 10
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FL Ft. Lauderdale ..... Nov 19
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MO Kansas City ..... Nov 12
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MS Jackson ..... Sep 11
NC Charlotte ..... Nov 6
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NJ Cherry Hill ..... Nov 20
Conven Station ..... Aug 7, Aug 28
Iselin ..... Jul 22, Sep 16, Oct 9, Oct 30, Nov 13, Nov 20
Princeton ..... Sep 25
NM Albuquerque ..... Sep 16, Dec 10
NY Albany ..... Jul 23, Sep 11, Nov 20
New York City ..... Jul 24, Aug 12, Aug 26, Sep 3, Sep 17, Oct 2, Oct 22, Nov 6, Nov 25, Dec 9
Rochester ..... Aug 13, Sep 9, Oct 15, Nov 18, Dec 10
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Ft. Worth ..... Sep 23, Nov 13
Houston ..... Aug 19, Sep 11, Oct 16, Nov 20, Dec 4
Lubbock ..... Oct 2
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Memorex reduces prices on 3270 peripherals, maintenance

Cuts hit printers, controllers, VDTs

By Donna Raimondi

SANTA CLARA, Calif. — Memorex Corp., in a bid to increase sales, has slashed prices by 15% to 50% on its IBM 3270 Personal Computer-compatible peripherals, products and maintenance.

The price cuts encompass display terminals, printers, controllers and port upgrades. "These reductions are part of a strategy to broaden our market share in the 3270 user environment," said Bill Etheredge, vice-president of marketing.

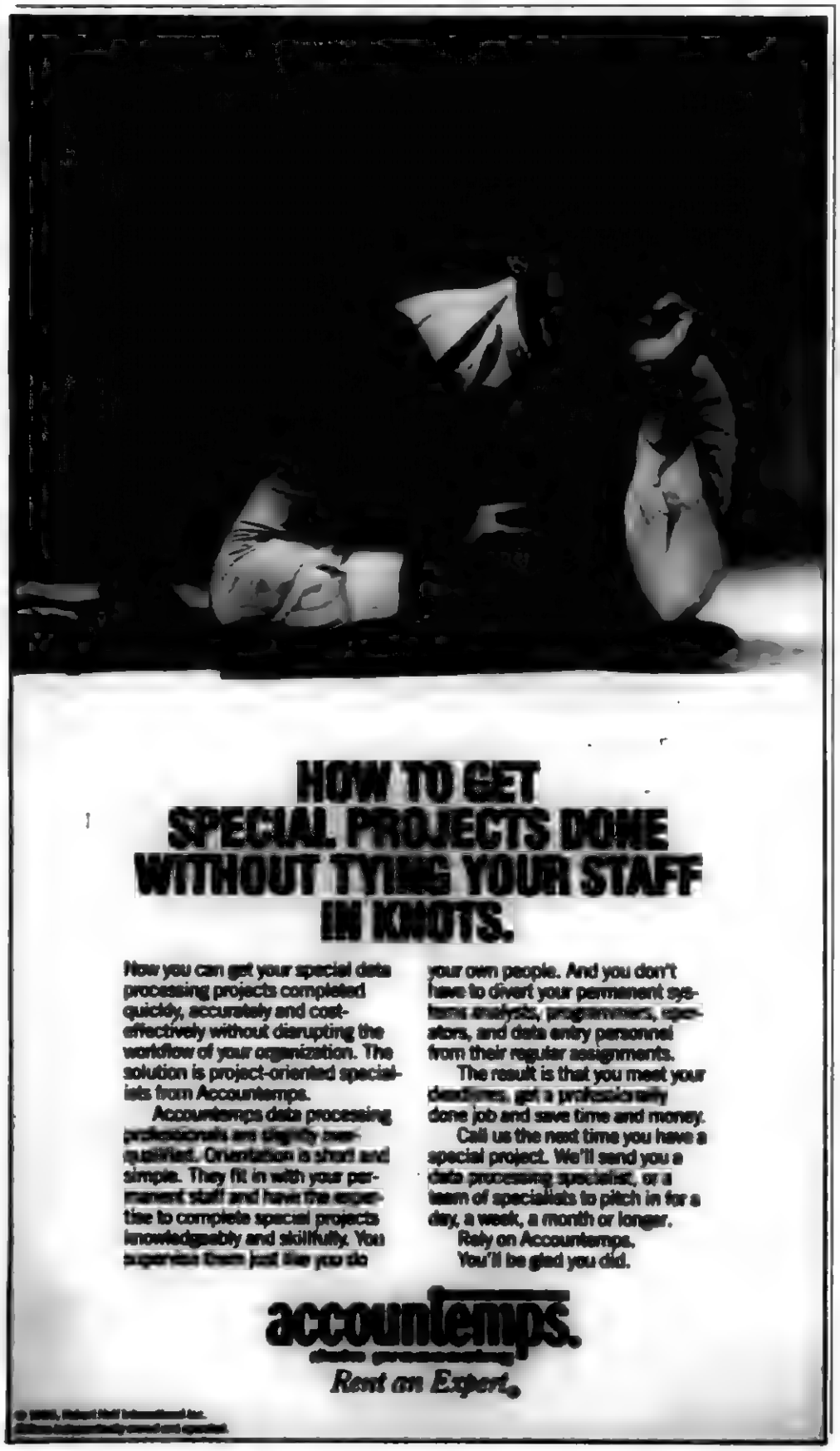
The Memorex 2178 12-in. display terminal, a plug-compatible replacement for the IBM 3178 display, has been reduced in price 27%, from $1,350 to $985.

The company cut the monthly maintenance rate for its 2114-1 printer from $46 to $30, a 35% reduction, while the price for the printer remained at $3,600.

The price for the 2068 multifunction printer was cut by 15%, from $6,495 to $5,495, and a nine-month free maintenance period was added to all 2068s installed in the second half of 1986. The standard warranty is an additional three months. Price, maintenance and warranty changes to remote and local cluster controllers include the following:

- The 2274-2A local controller — price lowered from $17,000 to $12,500 (26%); annual maintenance reduced to $344, a 51% decrease.
- The 2174-8 remote 8-port controller — price reduced from $5,295 to $4,000; maintenance decreased 47%, to $204 per year.
- The 2274-IC remote 8- and 16-port controllers — prices cut by 16% and 22%, respectively, and from $13,000 to $10,200 for the 32-port version; maintenance rate slashed 48%.
- The 8- and 16-port upgrade prices cut in half to $800 and $1,200, respectively.

Prices are based on single quantities, and price changes are effective immediately, Memorex said. The standard warranty on all controller models is extended from three to 12 months.



Link may void DEC warranty

From page 1

However, the SI Link clustering capability requires users to download nine modules from the VAX VMS to the MicroVMS system, a procedure DEC last week said may void its operating system warranties.

The SI Link, which costs approximately $38,000 for a two-CPU starter unit, uses Ethernet as the communications medium and the System Industries' 9900 series cluster servers to give cluster functionality under DEC's VMS 4.0 and above, said James Jones, marketing director.

The SI Link can cluster the entire VAX series, including Microvax IIs, Jones said. DEC's Vaxcluster does not allow the Microvax II to be connected, a DEC spokesman said. In order to cluster Microvaxes, however, the customer must be willing to pull down nine modules of the VAX's VMS operating system that DEC has not included in the Microvax's MicroVMS operating system, Jones said.

"DEC says this is illegal, and it could be sticky about it if it wanted to, but if a customer owns a full VMS license, he can do anything he wants with it. The same goes for leased VMS." The Milpitas, Calif.-based System Industries does not supply or support those modules; the customer must do any necessary software changes.

'Would void warranty'

DEC, however, does not agree that the customer can do anything he wants with his purchased or leased operating system. "We are working on whether or not the move is legal," a spokesman said, "but it almost certainly would void the warranty on the MicroVMS software." At press time, DEC did not have enough information on the new product or its use to respond officially.

"I trust that pulling down the nine modules would work," said Nigel Haslock, a consultant with AGS Computers, Inc. of Mountainside, N.J., who has worked extensively on DEC clusters. "It is not the most elegant approach. It is messy to buy a product that tells you that you have to go find all the bits and pieces, but its probably worth it."

DEC's Microvax II customers have been asking DEC to provide clustering ever since the Microvax came out, Haslock added. "It's the file sharing you want more than anything else, and I'm sure that this would give it to you," he added.

The System Industries system does not use DEC-type computer interconnects, DEC's HSC 50 controllers or RA disk device hardware, as DEC's clustering system does, said an SI Link user in Eugene, Ore. "DEC's system is very pricey compared with this one — it would have cost us more than $60,000," he added, for a system that would not include his Microvaxes. The user's company has two VAX-11/750s and three Microvax IIs hooked together with the SI Link.

'Important to share disks'

An MIS manager at a Canadian university has a VAX 8600 and seven Microvax IIs linked. "We looked at DEC's Vaxcluster, but they can't cluster Microvaxes yet, and it was important to us to share disks," she said.

"We have achieved our goal of being able to read and write from all Microvaxes to all the disks." Asked about the problems in bringing down modules on her 8600's VMS operating system to her Microvax's MicroVMS, the user said, "I can do anything I want. It's my software. I paid for it, and I am running it on the Microvaxes."

The SI Link provides functions such as distributed lock manager, distributed file sharing and distributed job and print queue. It also supports multiported disk controllers and dual-pathed disks, Jones said.

The System Industries cluster system cannot perform shadowing, tape-to-disk or disk-to-tape backup as DEC does through its controller. It is limited to eight CPUs and eight disk drives, as opposed to the 16 each possible with DEC's Vaxcluster.

The Ethernet passes control information, and the SI 9900 server handles high-speed data transfer directly to each CPU in the cluster. An 8M-byte SI Disk Cache Processor can be added to the 9900 server for $15,500.

World Digest

IBM fights clone BIOS

By Charles Brown

LONDON — IBM has reportedly told Computoprocessing Ltd., maker of the Compro 88, an IBM Personal Computer clone, that Compro 88's BIOS contains a substantial part of the IBM PC's BIOS, violating IBM copyrights.

IBM has given the firm 14 days to change its BIOS, but the company claims IBM's accusation is "absolute garbage" and is planning legal action.

Computoprocessing is the latest UK firm to take a stand against threats from Big Blue. Compulink, a PC users group, and two UK vendors — Qubie Ltd. and Hoki Koki Computers Ltd. — have all claimed IBM is using UK copyright laws in a way that violates the laws on competition of the European Economic Community. The European Community Commission has launched an investigation into the allegations.

Earlier this year, in an unsolicited letter, IBM warned British Telecom to avoid buying products that might include illegal components. The letter had reportedly been sent to British Telecom when IBM learned the firm was considering buying PC clones as low-cost alternatives to IBM's machines.

A British Telecom spokesman said the IBM letter referred specifically to the Compro machine, then under evaluation by British Telecom.

IBM confirmed that it wrote to British Telecom but said in a prepared statement that "IBM has not written to any company suggesting that they should not buy a 'particular' PC, nor has IBM taken any action against innocent 'end users' who bought a PC with an infringing BIOS program."

Computoprocessing Director Clive Lambert said he became aware of IBM's intervention when British Telecom asked him to prove his machines were legal. British Telecom has since been satisfied by the Computoprocessing's answer and the fact that the Compro 88 is recommended by the UK Treasury's Central Computer and Telecommunications Agency.

"As far as we are concerned, the machine is squeaky clean," a British Telecom spokesman said.

IBM, however, claimed to have found three elements of the Compro's BIOS — those dealing with video, print screen and timer addressing — in violation of IBM's copyright. An IBM report said there was a similarity of between 78.7% and 94% between Compro's and IBM's BIOS routines.

The differences between the two BIOS, according to an IBM lawyer, do not "in any way alter the IBM programmers' original expression, and in my view these changes have been introduced to disguise the fact that copying has taken place."

Lambert said the charge was groundless. The Compro BIOS, he said, was produced by an outside systems analyst. The similarities found by IBM cover only 10% of the Compro BIOS, he said, adding that those similarities would be present in any IBM-compatible BIOS.

"Putting a copyright on these routines is like putting a copyright on the calendar," he argued.

Itoh, Flexible pact

TOKYO — C. Itoh and Co., a large Japanese trading company, has announced it will distribute and service Flexible Computer Corp. products in Japan. Flexible makes the Flex/32 parallel processing computer. Initial deliveries will begin in the third quarter of this year, C. Itoh said. The Flex/32 reportedly will be marketed by C. Itoh's subsidiary C. Itoh Techno-Science Co.

Japanese Unix push

TOKYO — Eight Japanese computer hardware and software vendors — including Fujitsu Ltd., NEC Corp. and Hitachi Ltd. — have established a group that will seek to port AT&T's Unix operating system to several 32-bit personal computers.

The group, managed by Soft Bank Corp., a software vendor, said it expects a standardized version of Unix within the year. AT&T and Japan's Ministry of International Trade and Industry reportedly will serve as observers.

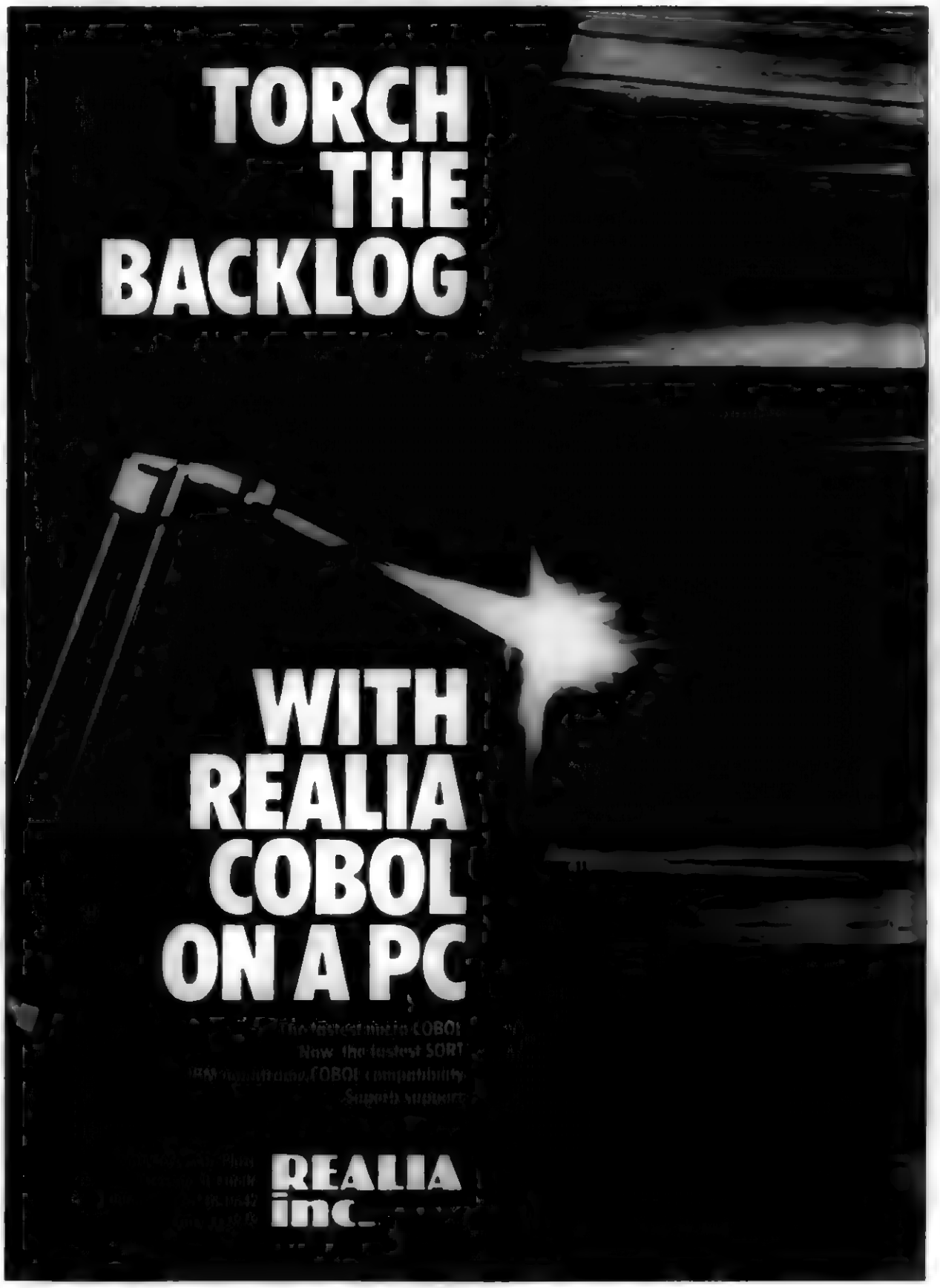
EEC fights chip pact

TOKYO — The European Economic Community (EEC) is opposed to a tentative settlement reached in trade negotiations between the U.S. and Japan semiconductor firms.

The EEC, a 12-nation trade consortium, said it believes its interests have been ignored in the latest rounds of the talks and that Japanese chip exports to Europe may ultimately be restricted.

EEC representatives met with Japanese trade officials for high-level discussions earlier this month in Brussels. The EEC representatives were reportedly reassured by the Japanese that the price monitoring system included in the tentative settlement with the U.S. was only aimed at curbing alleged Japanese chip dumping in the U.S. market.

Information compiled from the Computerworld International News Service.



Parallel expands fault-tolerant line with supermicros, minis

Three-machine rollout aimed at office users

By [redacted]

SANTA CRUZ, Calif. — Parallel Computers, Inc. last week announced three new fault-tolerant systems that range from supermicro to minicomputer size. The systems are all hardware fault tolerant with redundant processors, memory and storage.

Designed for critical applications, the AT&T Unix-based machines will cost from $34,900 to more than $80,000 for basic configurations.

"These systems are really variations on a theme Parallel has been working on for the past four years," said Omri Serlin, consultant at Itom International in Los Altos, Calif. Parallel's prior 300XR system had Motorola, Inc. 68010 chips, whereas two of the new machines contain 68020s.

The new 200XR and 400XR series are intended for installation in the office environment, a Parallel spokesman said. They have fully redundant architecture to ensure continuous operation and complete data protection.

Parallel has had problems reaching the customers who would benefit most from small fault-tolerant systems, Serlin added.

"They are trying to sell in a supermicro market, which attracts first users like small businesses that are moving from a paper office to a computerized office. First users don't understand fault tolerance until after they have had some kind of problem," Serlin said.

Parallel has a missionary job ahead of it, Serlin said. Although it has made some very respectable deals — such as an OEM agreement with Scientific Games, Inc., the Atlanta-based developer of computer systems for state lotteries and a partnership agreement with Ameritech Development Corp., a division of the Chicago-based firm that owns the Bell communications companies serving much of the Midwest — Serlin says he doubts Parallel has sold more than 40 systems since it started shipping the 300XR in April of 1985.

The XR systems contain built-in dual uninterruptible power subsystems to protect them from external power conditions. Each system is able to diagnose, isolate and identify any failure while it continues to run. System modules can be replaced by nontechnical personnel, Parallel said.

The XR series can diagnose itself; a built-in "phone-home" feature allows it to then automatically dial up Parallel's service center. The 200XR incorporates dual Motorola 68010 processors, and the 400XR uses dual 68020s. Basic configurations of both systems include 86M-byte disks, 2M bytes of main memory and eight user ports. Quantity-one prices are set at $34,900 and $39,900, respectively. The 400XR can be expanded to 516M bytes of disk storage and up to 256 ports with a distributed I/O processor option.

A distributed I/O processor allows terminals to be connected to a single computer by attaching 16-port cluster controllers to a local-area network (LAN). The distributed I/O processor costs $11,200 for a basic 16-user model, two of which are needed to add the maximum number of users. Each additional 16 ports added to a distributed I/O processor cost $4,500. The LAN is built into the unit.

The 500XR series has dual 68020 processors supporting up to 8M bytes of memory, 256 users and up to 3G bytes of disk storage. The basic unit consists of 2M bytes of main memory, 168M-byte disks and 16 users for $79,900. Memory can be added in increments of 2M bytes for $8,700 or 4M bytes for $15,900. The 168M-byte storage can be replaced with a 344M-byte unit for $9,500. Additional storage expansion cabinets can be added for $12,000, and a storage cabinet filled with 688M bytes worth of disks costs $52,000. Multiple cabinets can also be added.

To support 256 users, the 500XR also needs the distributed I/O processor.



Processor runs on single chip

By [redacted]

SANTA CLARA, Calif. — A start-up semiconductor company last week introduced a set of high-performance digital signal processors capable of performing vector processing on a single chip.

Zoran Corp.'s ZR34161 vector signal processor is an integrated circuit with vector processing capabilities that permit operations to be performed on blocks of information or vectors, as opposed to being performed one piece at a time.

Suited for industrial automation, image processing and geophysics applications, Zoran's vector signal processor runs on the IBM Personal Computer AT and Digital Equipment Corp. VAX machines.

Zoran also announced two digital filter processors, the ZR33481 and

In with electronic filing system, out with antique regulations

SEC finds breaking up with paper hard to do

By Mitch Betts

WASHINGTON, D.C. — As the Securities and Exchange Commission (SEC) prepares to turn its experimental Electronic Data Gathering, Analysis and Retrieval (EDGAR) filing project into a full-scale, mandatory system, officials are finding they first must revise decades-old regulations to accommodate electronic filing of corporate reports.

"There are rules that require 8½-by 11-inch paper and binding on the left side, things that are truly paper-based concepts," says Patricia M. Jayne, special counsel for the EDGAR project. "They obviously have to be changed for electronic filing with the commission," she adds.

The SEC is still struggling with the issue of legal signatures, according to Jayne. Federal law requires most SEC filings to be manually signed by a company official, but for the EDGAR pilot project, the SEC bent its rules to allow the use of passwords, or personal identification numbers (PIN), instead.

Although SEC officials plan to continue using passwords with the full-scale system, they are trying to resolve complaints that the passwords are not secure enough.

"Security concerns have been expressed because once the PIN is typed on the filing, it is visible to anyone who has access to the filing before transmission," according to a recent SEC notice that seeks public suggestions on how to resolve the problem.

The SEC is not the only federal agency grappling with the legal issues of paperless government. The Internal Revenue Service plans to store millions of tax returns on optical disk and then destroy the paper copies; however, criminal investigators at the Department of Justice are opposed because that would prevent forensic examination of the fingerprints and signatures on the paper returns, according to Frank Moore, manager of the IRS' optical disk project.

The SEC also is concerned about how to accept graphic and image material as an electronic filing. The SEC tested various systems for handling digitized graphics but found that none of them was cost-effective, so it is planning to allow narrative descriptions of the graphics.

"For example, a description of a pie-shaped chart would indicate the percentages in each of its wedges, their titles and other descriptive information," the SEC document says.

Perhaps the most complex issue facing the SEC is that of data tagging. Although the EDGAR system has full text search capabilities, the SEC says it needs some form of data tagging to isolate specific financial numbers for complex calculations by SEC analysts.

The SEC experimented with a prototype artificial intelligence program called the Financial Statement Analyzer, which had a 94% success rate under controlled conditions. However, SEC officials say it is not yet feasible to integrate the specialized AI program with the EDGAR mainframe data processing environment.

Consequently, the SEC is leaning toward a procedure whereby filers submit a special disclosure form containing the key figures, which the EDGAR system extracts and computes for financial analysis.

Because the EDGAR system will be mandatory for most SEC filings, the agency plans to establish a "hardship exemption" for those who demonstrate that they do not have access to computer equipment or service bureaus.

But Jayne warns that hardship exemptions will be rare since the commission accepts not only direct transmissions but also diskettes prepared on 85 different types of microcomputers and word processors.

The SEC recently issued a request for bids on the full EDGAR system. Responses are due Sept. 10, and a contract is expected to be awarded by year's end, the SEC says.

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the ZR33881.

Zoran said its chip is capable of performing up to 340 million operations per second and is suitable for the implementation of real-time image processing systems.

Used primarily in telecommunications and military applications, digital signal processing takes analog data signals, including information gathered by sensors, and processes them in digital form.

According to Will Strauss, president of Forward Concepts Co., in Tempe, Ariz., digital signal processing architecture is processor intensive whereas traditional data processing techniques are memory intensive. " If you want to process images in real time, you have to have a digital signal processing-based engine," Strauss noted.

Zoran's $700 ZR34161 vector signal processor is priced at $700. The ZR34161 for the IBM PC AT is priced at $3,000, and a version for the DEC VAX is $5,000. The DEC filter processor, available in four or eight stages, is priced from $275 to $490.

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VIEWPOINT

EDITORIAL

The economy as crutch

A stagnant economy like that currently threatening the U.S. can become an all-too-convenient curtain behind which individual companies cloak their own shortcomings. Thus, there are those that are quick to translate the U.S.' general economic malaise into a computer industry slump.

However, invocations of a slump are not heard around Maynard, Mass., where Digital Equipment Corp. continues to feast on 1986. If economic woes have stopped customers from committing capital to information systems purchases, someone forgot to alert DEC's ever-lengthening line of shoppers.

Nor has Wang Laboratories, Inc. been sitting around bemoaning its fate. It has re-examined its priorities, put its product offerings in order, particularly in the area of networking/integration, and taken steps to trim its bloated work force through early retirement incentives. Granted, Wang still faces a few major questions that require tough answers, but its actions show a willingness to focus on solving real problems rather than finding excuses for them.

Ditto Apple Computer, Inc., which underwent Wang-like self-analysis two years ago and last week announced its first revenue increase in five quarters.

Also in the microcomputer area the top three software firms — Lotus Development Corp., Microsoft Corp. and Ashton-Tate — have soared to new sales heights, proving that good management and good products will sell strongly into the harshest economic environments. The recent successes of micro hardware vendors Epson America, Inc. and Tandy Corp., both written off as contenders at one time or another, serves notice that solid products and rock-bottom pricing can keep savvy competitors in the game.

These exceptions to the supposed industry slump seem to confirm what MIS executives have been saying for some time: they are ready, eager and able to spend on equipment *so long as it meets their real needs.*

So though economic woes contribute, their effect on the industry's health may be greatly exaggerated by poor corporate performers searching for a convenient out. A good hitter will work his way out of a slump. It is up to the management teams at such companies to find a way to get their product batting averages back up, and the simplest way is to begin concentrating on the immediate task at hand: listening to what users really want.

Notes & observations

Kudos to the six high-tech companies tapped by *Black Enterprise* magazine for being one of the "25 best places for blacks to work," and particularly to Xerox Corp., which headed the list. The magazine's list — compiled by polling 600 companies, identifying those with the strongest affirmative action programs and then surveying 1,700 of their employees — reported that minorities are "significantly better off" at AT&T, Digital Equipment Corp., General Electric Co., Hewlett-Packard Co. and IBM as well as at Xerox. At DEC, affirmative action has gone beyond hiring: "We've said [to managers], 'You *will* hire women and minorities, and you *will* promote them,'" said one DEC equal employment opportunity manager. "Now we're trying to change people's attitudes."



LETTERS TO THE EDITOR

Data privacy rights still unclear

After carefully reading the contributions of three responsible spokesmen opposed to federal interagency file matching, I find the issue as murky as ever.

Robert Ellis Smith, publisher of *Privacy Journal*, in his letter "Data sharing threatens privacy" [CW, June 2], likens file matching to a general search of all houses in a neighborhood, which the Bill of Rights prohibits. Herbert R. J. Grosch, dean *emeritus* of the computer jet set, agrees in "Personal data belongs to individuals" [CW, June 2], in effect calling the practice "dragnetting."

The general search of all houses in a neighborhood is a combination of two distinct and independent elements: searching a home without a warrant or probable cause and performing a search repeatedly over a complete area.

The Bill of Rights prohibits the first, but not the second. Smith and Grosch must be taking this unstated logical step: By the association of the two independent elements in the neighborhood search, the second is so contaminated by the first as to become accursed even when occurring separately.

Smith also says "simply . . . that federal agencies ought to comply with the nondisclosure requirements of the Privacy Act of 1974 and the Tax Reform Act of 1976."

Some provisions of the Privacy Act, taken in isolation, appear to place the individual in control of the use of records pertaining to him. However, when taken as a whole with all exceptions and exemptions, the act appears merely to limit the disclosure of personal information to necessary and lawful purposes in pursuit of important public policy needs as determined by specific statutory authority. It also requires written requests, justification and accountability for disclosures.

Smith may be interpreting the act as prohibiting the en masse request, justification and accountability that an interagency file match would require.

The Tax Reform Act of 1976 specifies the agencies to which taxpayer information may be disclosed and does not allow the match with files on welfare recipients and delinquent student loans. The 1984 tax act, according to the editorial "Computers aren't the issue" [CW, April 14], not only allows but requires the match. When Smith asks federal agencies to comply with the law, he excludes the 1984 act.

Grosch says in effect that the individual is the sole and absolute owner of information about himself. He places no conditions or qualifications, and makes no distinction as to type of information. Apparently there is nothing the citizen is required to do or refrain from doing to preserve this expectation of absolute privacy.

Jerry Berman, director of the ACLU Project on Technology and Privacy, in an interview with *Computerworld*, "ACLU technical leader addresses privacy law, civil liberties" [CW, July 7], believes with Smith and Grosch that access to files of personal data should be handled exactly as if the data had been provided under an explicit agreement of absolute confidentiality.

Agreed: Any violation of an applicable, operative nondisclosure statute, rule, explicit or implicit understanding is reprehensible and should be effectively deterred and fully redressed.

But the hard question at hand is the following: What are our rights when we provide information without the inducement of confidentiality? Perhaps the time has come for *Computerworld* to solicit an article from an attorney qualified in the subject.

I have attemped to show that we are still in dire need of knowledgeable but nontendentious answers to these questions:

- What really are our privacy rights, and what (Constitution, statutes, cases) gives them to us?
- Which information about ourselves is intrinsically private and which is not?
- What actions on our part (for example, disclosures to strangers under circumstances other than confidential) operate to waive these rights?
- What are we required to do to preserve our expectation of privacy?
- What would be required in order to expand our privacy rights to the breadth envisioned by Smith, Grosch and Berman?

Daniel I. Lasser
Rockville, Md.

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VIEWPOINT

IBM shifts strategy to make clones, profit on software

Long ago, IBM decided to launch an experimental little business selling personal computers — much like the ones Apple Computer, Inc. was so successfully selling, but with a different chip inside.

As luck would have it, the IBM name (and a new software package from Lotus Development Corp. called 1-2-3, "similar to Visicalc but better") persuaded a lot of people that this was no toy, and the IBM Personal Computer became a certified success.

In fact, the PC has been so successful that virtually every company in the computer business (and many who entered just to serve this marketplace) has a PC ("similar to IBM's but cheaper"). But the IBM name retained its magic; customers wanted the real thing and were willing to pay extra for it. Until . . .

PCs and clones readily available

Until now. Now you can get the IBM PC anywhere and a reasonable facsimile thereof from anybody. Sophisticated customers now realize it is not a computer they want; they want a box that can run Lotus' 1-2-3, or Ashton-Tate's Dbase or whatever.

Now IBM is in the clone business too. Its PC sells mostly on the basis of price (as indicated by last week's cuts in dealer prices), because customers know they can get the same machine from another reseller or the same capabilities from another manufacturer.

What is IBM going to do about it? A likely short-run solution is to sell an Intel Corp. 80386-based PC that is not quite compatible. If Compaq Computer Corp. did this, of course, no one would buy it, and no software vendors would rewrite their software to run on it. Only IBM can get away with being incompatible. (Its original PC, of course, was not compatible.)



By ESTHER DYSON

This new system could probably run most existing programs, but to get the full benefit of it you have to use specially written software, which — surprise — does not run on anyone else's systems. But in the long run the other clones will follow IBM's lead, and IBM's edge will be only temporary.

Change the game

But do not get the idea that IBM is losing its power. It is simply shifting attention — its own and the customers' — to software, where the econimics work in its favor, and to the DP environment, where it still controls (most of) the customers who buy in volume.

While a PC inevitably costs a certain amount to manufacture and deliver, the incremental cost of a software sale (beyond sales costs) approaches zero.

Thus IBM is at a great advantage in selling software, as it has a larger customer base to spread costs over. (That is, fixed costs are a higher percentage of the total than for hardware, and so each dollar of revenue above the break-even point generates more on the bottom line.)

So, instead of vainly trying to add value to the PC (as Businessland, Inc. and Computerland Corp. are doing) and differentiate it that way, IBM is now selling added value unbundled — in the form of "connectivity" software. By pricing the PCs low and the software high, IBM is acting appropriately to make money at the potentially high-return high end and simply to maintain market share at the profitless low end without bleeding too profusely, if possible.

If the strategy doesn't work, well, IBM's John Akers has intimated that the company may actually abandon such commodity markets rather than stick around at a loss.

Account control

IBM's announcement of 127 separate items at the 1986 National Computer Conference was just the first in a long string of such announcements that will be needed to deliver on the company's promise of connectivity. There is still a long way to go before PCs, minis, mainframes and remote systems will work together seamlessly, but the direction is clear.

You can now integrate your PC nicely into a mainframe environment, with access to mainframe files using the Server-Requester Protocol Interface. Eventually, using Advanced Program-to-Program Communication protocols, you will be able to develop applications that execute partly on the mainframe and partly on the PC. This is no mean programming feat, nor is it a facility you are likely to find in packages on the shelf at Computerland. . . . Score one more point for account control.

Customers may trust commodity manufacturers to build boxes, but most of them will trust only IBM to connect them.

By promoting connectivity — for which there is a genuine need — IBM is thus playing to its greatest strengths. And it is also playing to its customers' preferences, drawing the PC back into the world of MIS and helping its traditional customer base of MIS managers to retain their power.

They are likely to respond with gratitude — or at least with orders for the kind of software that will maintain the centralized world they flourish in.

Dyson is editor and publisher of "Release 1.0," a newsletter covering the computer industry and the transformation of artificial intelligence into a commercial technology.

MIS: Guardian of data, protector of business' knowledge base

READER'S PLATFORM

By SCOTT L. PETTIT

The MIS or DP or Information Division of an organization is generally recognized as having responsibility for custodial care of the corporate asset broadly defined as data. This responsibility normally includes the visible activities of gathering, processing and reporting the data as well as the less visible responsibility of maintaining integrity, retention, security and reconstruction of the data.

In addition, the Information Division also contributes or controls the format, definitions, relational characteristics and longevity of this corporate asset. We assemble the data into information and announce we have responsibility for information management. Thus we are information managers and can rightfully call our group the Information Division.

So far, no problem. We all know these responsibilities and strive to achieve them while endeavoring to persuade others to fully understand the significance of our role.

However, the Information Division, or perhaps more appropriately considered the 'id,' is not only the custodian of the data, but also at least a partial custodian and frequently the ultimate (and often the only) source of definition for the current and collective history of the procedures, processes and new ideas that *are* the business.

All of the business operations that are given to the Information Division are transposed into algorithms, structures and relationships. They are given definite and finite meanings. They are entrusted to computer specialists where they are recorded in glyphics that have translation half-lives related to the tenure of the programmer. The originating business specialist goes on to other issues or career pursuits and is replaced by someone who knows how to request the automated process. Over time, the organization's business processes are archived by the Information Division.

In addition, the Information Division is the focal collector, plays a major definitional role and is the ultimate implementor of all ideas, past and present, that require computerization or integration with computerized business processes.

During the formative stages new ideas frequently assume a relatively clean environment. However, in reality most new ideas and processes have been preceded by other new ideas and processes, each building on the other. Seldom does the old get removed before the new is implemented. The final implementation must deal with the cumulative complexities of this process.

The management of the corporate Information Division comes to us through a multitude of controls and management tools. It is a function of development methodologies, project management, systems analysis, computer languages, modularity, data base management and so on.

Regardless of the tools, the cumulative effect of organizational change leaves the systems designers with the responsibility for homogenizing the new with the old and making sure all variations have been identified and analyzed and that they will produce a logical result regardless of the obscurity or "likelihood it will ever happen."

Can we establish a debt ceiling on change and variations? Establish sunset laws on all new ideas? Throw it all out and start over (just prior to our farewell address)? Hire a competent consultant (not oxymoronic but in much too short supply)?

I suggest that the first task is to help the business understand the dual role the Information Division may be playing. That the custodial responsibility for data and the accompanying information management is a very big and very important task.

But that the unintentional assumption of the knowledge base that rightfully belongs to the functional departments of the organization should not be entrusted solely to minute fluxes spinning about on magnetic media or recorded in some third- or fourth-generation language and filed in a computer program library.

Or should it? What about artificial intelligence?

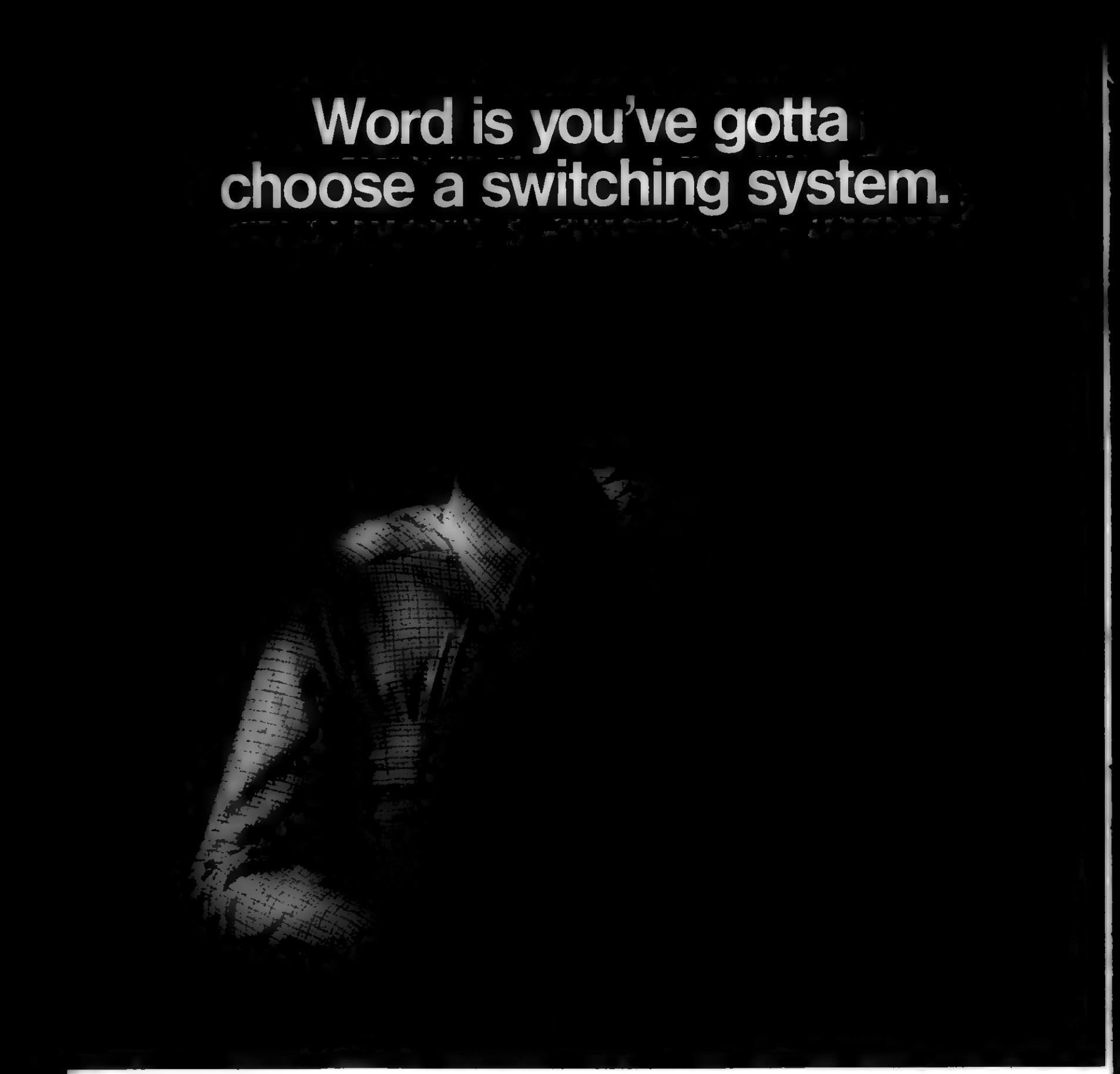
Is the emergence of expert- and knowledge-based systems in some way a recognition that conventional computerization of the business operations has allowed these operations to grow beyond reasonable expectations for normal comprehension? Is artificial intelligence or even expert systems the solution? Or will it encourage a business to go back to a more manageable set of options?

In the grand scheme of things, is the Information Division intended to be the source of understanding for those processes that have gone beyond normal comprehension?

Pettit is vice-president of MIS for the Farm Credit Banks of Omaha.

***Computerworld** welcomes opinion pieces from its readers. Submissions to the "Reader's Platform" column should be typed, double-spaced and no longer than six pages. Manuscripts become the property of CW, which reserves the right to edit them for the purposes of clarity and brevity. Submissions should be addressed to Editor, **Computerworld**, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.*

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DATA STREAM
Daniel J. Rosenbaum

Playing politics with regulation

Just when you thought it was safe to go back into the market . . .

This is an election year, so it is not entirely surprising that there are more attempts in Washington, D.C., to change the regulatory underpinnings of the communications industry.

What is startling is the number of such attempts and the apparent power behind them. Congress is trying to take power from the U.S. District Court and give it to the Federal Communications Commission, while the Supreme Court is taking power from the FCC and giving it to the states. All the while, the District Court is being a bit more lenient in its waivers.

Confused? You should be; it is confusing.

Maybe Senate Majority Leader Robert Dole (R-Kan.) did not think the tax bill would keep him busy enough this year. At the reported behest of those in the White House, Dole introduced a measure last month that would move the job of overseeing divestiture from the U.S. District Courts and the Justice Department to the FCC.

There are serious questions about the impact and propriety of the Dole measure. Does the FCC — a regulatory body in the executive branch of government — have any business administering an antitrust consent decree, which was arrived at and administered through the judiciary branch? Does the FCC have legal jurisdiction over the computer and equipment business, hav-

See PLAYING page 22

Rosenbaum is chief operating officer of Winston/Smith Associates, publisher of the industry newsletter "Wiretap."

VAXs linked on MAP net

Software lets manufacturers develop own applications

By Elisabeth Horwitt

SANTA BARBARA, Calif. — A recently introduced interface from Advanced Computer Communications enables Digital Equipment Corp. VAXs that run Unix to communicate with other devices over a local-area network conforming to the Manufacturing Automation Protocol (MAP) industry standard.

MAPVX enables a VAX running University of California at Berkeley Unix 4.2 or DEC Ultrix-32 to communicate with any other device equipped with a MAP 2.1 interface, said John Risque, Advanced Computer Communications' director for program development.

The device implements all currently completed MAP protocols, he added. MAP is a set of networking specifications based on the IEEE broadband token-bus standard and was designed for factory communications.

The growing number of MAP interfaces from Advanced Computer Communications, Industrial Networking, Inc. and Motorola, Inc. "are not significant until MAP specifications are finalized," commented Dale Kutnick, a senior analyst at Stamford, Conn., consulting firm, the Gartner Group, Inc.

MAP Version 3.0, which should be available late this year or early in 1987, "will have more capabilities than the current version," Risque said. "Our intention is to meet 2.1 specifications and upgrade to the 3.0 version of MAP when it becomes available early next year."

MAPVX consists of a front-end communications processor board, a broadband radio frequency modem board, and VAX-resident software. Upper level MAP communications protocols that are included with the software "provide a framework for applications to be written either

See VAXs page 20

Digital Centrex previews ISDN

By Elisabeth Horwitt

NEW YORK — As part of its strategy to provide Integrated Services Digital Network (ISDN) offerings on its central office-based Centrex systems, New York Telephone Co. recently announced Intellipath II, a digital version of the divested Bell operating company's Centrex III analog transmission service.

They also introduced Centrex-LAN, a local-area network that enables customers to send data at rates of up to 19.2K bit/sec. over the same twisted-pair, local-loop connection to the analog Centrex system.

The divested operating company intends to "be the leader of information services in New York state by providing Centrex customers with ISDN capabilities," said Executive Vice-President and Chief Operating Officer Francis Austin Jr.

See DIGITAL page 20

Southwestern Bell files to offer regional packet switching

By Elisabeth Horwitt

ST. LOUIS — Southwestern Bell Telephone Co. earlier this month filed for regulatory permission to offer packet-switching services to regional customers. "Theoretically, we could have a tariffed offering by September; but that's pretty unlikely," said product manager Michael Delaney. "Interventions by Tymnet, Inc., Telenet Communications Corp. and the other packet-switching vendors could get pretty heavy."

The divested Bell operating company has requested permission to offer, as part of its proposed Microlink II service, basic packet-switching transmission and protocol conversion. Customers would be able to use the service to link multivendor sys-

See SOUTHWESTERN page 22

INSIDE

Gateway Communications adds an asynchronous server/20

NEW THIS WEEK

- Western Telematic offers Rab-14 switching system
- Bridge Communications announces communications server

For more on these and other new products, see pp. 81-86.

INSTANT ANALYSIS

"A lot of small technologically sound firms are stillborn because customers won't buy their products, but wait for the bigger guys to come out with standards. The antitrust laws, which are not being enforced, were instituted to prevent this from happening."

— Joaquin Gonzalez, senior analyst, Gartner Group, Inc.

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Board makes PC a net server

By Elizabeth Hewitt

NEW YORK — An asynchronous gateway that enables users to dial either into or out of an IBM Personal Computer local-area network (LAN) was introduced by Gateway Communications, Inc. at the PC Expo held in New York recently. The company also announced support of a new version of its G/Net PC LAN.

A nondedicated IBM PC, Personal Computer XT or AT equipped with Gateway's new G/Async expansion board becomes a communications server through which PCs on the network can share up to 16 asynchronous ports.

The server is bundled with two software packages: Ascom IV, asynchronous communications software from Dynamic Microprocessor Associates, and PC Anywhere, an asynchronous remote control program from Digital Microsystems, Inc.

A G/Async board supporting four ports is priced at $1,440 and available now.

G/Net Plus, the latest version of Gateway's LAN offering, includes as a standard feature the Local Bridge, which connects two or more G/Net Plus LANs. Also bundled with G/Net Plus is Gateway Network Access Method, Gateway's networking software, which provides hooks to the vendor's SNA, X.25 and asynchronous gateways. A two-node G/Net Plus starter kit costs $1,895.

VAXs linked on MAP net

From page 19

by software developers or the manufacturers themselves," Risque said.

File Transfer and Management software handles file transfer between different devices.

Manufacturing Message Service "provides a hook for applications that send commands to robot devices," Risque noted.

Common interface

Common Applications Services Elements provides a common interface for applications that run on top of a MAP network.

Network Management Agent provides a common interface that enables MAPVXs to send network statistics to a network management host for monitoring and analysis.

Advanced Computer Communications claimed that it was able to double the throughput of the MAPVX front-end board by incorporating its proprietary Quadbus architecture.

MAP layers

The front end handles MAP layers two through four, with layers five through seven performed by the VAX software.

Scheduled for beta test in the third quarter of 1986, the MAPVX has a target price of $10,000, Risque said.

Advanced Computer Communications plans to come out with a MAP interface for Q-bus systems such as Microvax II by the end of this year, he added.

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Digital Centrex previews ISDN

From page 19

Intellipath II is available to business accounts that have at least 100 lines and whose sites are served by a New York Telephone central office equipped with a DMS-100 digital switch, Intellipath Product Manager Philip Bruno said. The local carrier has currently installed DMS-100s in approximately 50 out of an estimated 200 central office sites, he added.

Standard Intellipath II features include Touch-Tone support and custom calling services such as three-way calls and access to speed calling lists.

The optional Communications Management Module enables the telecommunications manager to access network traffic statistics and details on calls as well as to reconfigure the long-distance route selection system.

The optional Data Management Module provides 56K bit/sec. data transmission between customer and central office premises.

Centrex-LAN allows computer devices on a customer's premises to exchange data at rates of up to 19.2K bit/sec. via an AT&T Datakit switch installed at New York Telephone's central office. Data and voice transmissions travel over the same twisted-pair, local-loop connection, with a multiplexer routing voice transmissions to the Centrex and data to the Datakit. The service is available only to customers located within 18,000 feet of a central office, Bruno said.

Enhancements to existing analog Centrex systems are increasingly offered by local telephone companies "that are being held hostage by large businesses threatening to put out requests for proposals for digital private branch exchanges," said John Powers, vice-president of strategic services at Dedham, Mass., consulting firm, Telecom Management Corp.

But the new features "do not address user needs in terms of control, data network requirements and costing," he added. "For one thing, users have to pay for each additional feature over and above the basic Centrex rate. I think the solution is to provide digital services to businesses that need them, while leaving analog Centrexes for the users who don't. New York Telephone seems to be doing this."

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Playing politics with regulation

From page 19

ing decided in its landmark Computer Inquiry II that it does not?

If the FCC does have that jurisdiction, what are the implications for the regional holding companies and their customers? The FCC these days is in a deregulatory mood, while the District Court has been scrutinizing carefully each waiver request filed by the regional holding companies.

Perhaps Judge Harold Greene will get the hint that seems to be emanating from the White House and will begin seeing things the FCC's way.

Maybe he has gotten the hint already. While the consent decree prohibits the regional holding companies from any manufacturing domestically, Greene and the Justice Department recently agreed to let Ameritech open manufacturing plants overseas. Similar waivers are certain to follow. The holding companies are not likely to get permission for manufacturing domestically for quite some time, but their overseas operations will position them well in the event the decree is eased.

While the Senate is trying to increase the FCC's powers at the expense of the District Court, the Supreme Court found a way to reduce the FCC's sway and give more power to the states.

The high court found recently that states are allowed to overrule the FCC when it comes to equipment depreciation rates for local phone companies. The decision seems fairly esoteric; the precedent it sets is alarming and may have a dramatic effect on your business and phone service.

Depreciation schedules are extraordinarily important to the telephone companies. Depreciation rates directly affect phone rates, so they are a frequent target of state Public Utility Commissions.

Pacific Bell, in the days before divestiture, was virtually held hostage by the California Public Utilities Commission, which forced the telephone company to depreciate its equipment so slowly that it was unable to perform adequate expansion and maintenance. Rates were kept low but at the expense of service.

If the states have sole authority to set depreciation schedules, there is a real danger that local politics could overshadow the needs of either a local telephone firm or its customers.

The implications of the Supreme Court's ruling are even more worrisome. To date, the FCC has had sole authority over all communications activities, based on the assumption that the intrastate portion of communications was part and parcel of any interstate communications. When all communications were carried by one company, that undoubtedly was true.

Today, though, interstate and intrastate communications are often handled by entirely different corporations. Does the federal government have any authority over purely intrastate transactions? If not, can telecommunications rationally be administered on a state-by-state basis?

The regulatory story did not end with divestiture. The rules are constantly evolving, and many of the changes will have a direct effect on you and your business.

More to the point, you can have some effect on those changes. Make friends with representatives of your state Public Utilities Commission. Pay a visit to your congressman. Whatever your viewpoint, make it known — because the moves are happening now. And if you do not speak up now, you have got no business complaining when the game does not suit you later.

Southwestern Bell packet switching

From page 19

tems at different sites, Delaney said.

"A local packet-switching service benefits customers because it enables them to cut down on communications installations," Delaney explained. "Instead of installing communications hardware and software to handle an array of bisynchronous, Synchronous Data Link Control and asynchronous devices at various sites, customers can leave all that to the network service."

Another potential benefit offered by Microlink II is better quality of service through redundancy, error checking and other reliability and management features that can be built into the all-digital network, Delaney said.

The service will also act as a link to interstate public packet-switching network vendors such as Telenet. "Although we realize that in some cases we'll be competing with the interstate networks, we want our primary thrust to be complementary," Delaney said. "We have customers now who are not in areas served by Telenet."

In order to win Federal Communications Commission permission to offer protocol conversion, Southwestern Bell must prove that it will keep separate its regulated and nonregulated operations, Delaney said.

"The value-added network vendors want to make sure we don't use profits from our regulated telephone business to subsidize new, competitive offerings. We also have to prove that our marketing and sales people don't get special access to the telephone company's customer base," he explained.

Microlink II rates will average 3½ cents per kilocharacter, with volume and time-of-day discounts available.



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Duquesne Systems, a long time leader in providing software for managing shared devices for MVS and MVS/XA users, is now home for the Single Image Software product line. SIS products let you effectively manage the sharing of tape drives, DASD, and consoles, while maintaining data integrity.

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If you buy a government surplus auto and find it needs repairs, the fact that the car was advertised as being in good repair will not help much. Courts have upheld the no-warranty-provided disclaimer in the sales contract, shifting risk to the buyer.

It doesn't seem fair, does it? Yet "as is" disclaimers appear to be the current philosophy in the software industry. Whether they can endure in an era of consumer protection is open to question.

Warranty disclaimers are not popular devices. Courts have begun tagging them "unconscionable" and "unilateral, self-serving statements."

In line with that thinking, a seller is allowed to exclude, or disclaim, warranties only under certain conditions. Courts are then free to decide what those conditions are. Using this discretionary power, the courts have begun chipping away the warranty disclaimer doctrine.

"Disclaimers should be brought to the buyer's attention before the contract for the sale is made," the courts have stated. "They become self-serving when the buyer learns of them after the sale.

"The disclaimer must be so conspicuous that a reasonable person will notice it," they continued. "It must be communicated to the buyer."

See DISCLAIMING page 27

Wilson is a St. Louis patent attorney.

AI to drive 5GL software

Added functionality to move applications work to users

By Charles Babcock

BURLINGTON, Mass. — Fourth-generation languages are a transitional step to a fifth generation of software that will use artificial intelligence, according to George Schussel, president of Digital Consulting Associates, Inc.

The added functionality of fifth-generation languages will allow application development to move out of the data processing center and into end-user departments, he told the 170 attendees of his firm's conference on Software Trends for Executive Planning and Strategy in Burlington last week. The noted data base management system expert led off the conference with a discussion of fourth- and fifth-generation technologies.

Schussel said a fifth-generation solution to the applications backlog is unlikely to arrive overnight.

Unlike third-generation languages, such as Cobol, there is no standard defining a fourth-generation language, nor is there likely to be one.

"The National Bureau of Standards came to me and said they wanted to set a standard for fourth-generation languages. I had to tell them the languages are changing so rapidly, you can't put any standards on them," he said.

Instead, the languages will continue to evolve, adding functionality, and "one day we'll just say we're in the fifth generation," he said.

A fifth-generation language will be built around an active data dictionary "driving an array of software," including a DBMS and development language. It will also rely on expert systems that design data bases, provide automatic data access methods in response to queries and generate code from program designs, Schussel predicted.

Artificial intelligence offers the prospect of providing greater end-user access to the development environment through speech recognition and natural language interfaces, he continued.

See AI page 26

IBM low-entry SNA extension creates decentralized net for small processors

By Charles Babcock

WHITE PLAINS, N.Y. — IBM recently announced an extension of its Systems Network Architecture (SNA) that is said to allow Series/1, System/36 and 38 processors to be tied together into decentralized networks.

Called SNA Low Entry Networking (LEN), the extension can also tie together System/88s and 3820 page printers. IBM's previously announced System/36 peer-to-peer networking is based on SNA LEN. LEN will be available in the fourth quarter, company spokesmen said.

SNA LEN uses one set of protocols to establish SNA sessions as required between 2.1-type nodes on a network. The 2.1-type nodes include the Series/1, System/36 and 38 processors. The network is decentralized, company officials said, with each node having its own control point, unlike a mainframe SNA session in which a host serves as a centralized control point.

Physical connections between nodes may be leased telephone lines, switched lines, connections across a local-area network, X.25 virtual circuits or X.21 connections, IBM spokesmen said.

Each node maintains a directory of local logical units and logical units on peripheral nodes attached to it but not to the network. A request to connect to another logical unit initiates a search of the local directory. If the logical unit cannot be found, the Locate request is sent to adjacent nodes, which in turn send requests to their adjacent nodes until the object of the search is found.

Because each node will pass on the re-

See SNA page 26

INSIDE

Wang unveils a package that eases creation of office data bases/**26**

Management Science America adds a billing module to its accounts receivable package/**27**

NEW THIS WEEK

- Aion Corp. offers an application development tool for IBM's 370

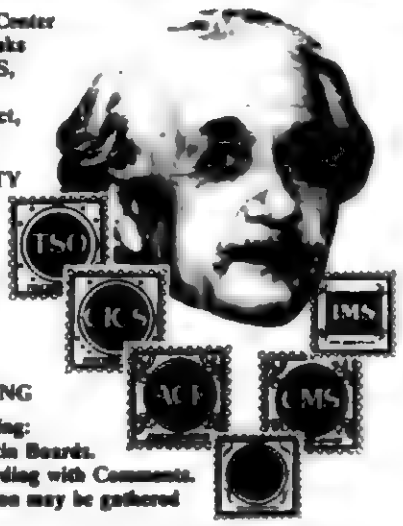
For more on this and other new products, see pp. 81-85.

INSTANT ANALYSIS

"The information center was a transition avoidance strategy: 'Implement end-user computing, and the backlog will decrease.' It was the opposite. It stimulated demand for applications."
— Vaughan Merlyn, Merlyn Consulting, Inc., at the Software Trends for Executive Planning and Strategy conference

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Wang package aids data base programming

LOWELL, Mass. — Wang Laboratories, Inc. recently unveiled Memorybase, a package for creating office data bases and applications without the assistance of professional programmers.

Memorybase offers a subset of the features of Wang's Professional Application Creation Environment (PACE) and uses Wang's VS DMS/TX data management system, providing the recovery and integrity features of that system, Wang said.

Users may organize data as a collection of records and subrecords. Memorybase permits number, character, digit, date and time fields and text fields of up to 2,020 characters. Users may locate records either by searching on specified fields or by performing a words-in-text search, company spokesmen said.

The product is integrated with Wang Office, Wang Word Processing and other Wang office applications, spokesmen said.

Available in August, Memorybase is licensed for $4,000 on Wang VS 5, 6, 15, 25 and 45; $6,000 on VS 65, 85, 90 and 100; and $8,000 on VS 300.

AI to drive 5GL software

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The development environment will tend to migrate to high-powered workstations, where users will have the undivided power of the workstation processor, he said.

Schussel's other comments on software trends included the following:

■ IBM's promotion of DB2 does not mean the game is over for independent DBMS vendors. DB2 is installed in fewer than 1,000 sites and will represent only 8% of the market by 1988.

■ "The time for AI commercial success is close at hand," and some companies have already quietly incorporated human expertise into applications. The expert systems, however, cannot handle a broad range of business problems.

■ AT&T has succeeded in pushing Unix System V as a standard.

■ A $500 million subsidiary software industry will grow up on the beltways of Washington, D.C., devoted to developing Ada applications for the government.

■ The software industry will continue to grow by 40% a year and by the early 1990s will represent 30% to 40% of the information industry.

SNA addition creates net

From page 23

quest until the unit is found, the search can be conducted without the originating node needing prior knowledge of the network's topology. The feature also offers flexibility in network formation, avoiding the restrictions of star, ring or other configurations, IBM spokesmen claimed.

The network honors message priorities, moving higher priority messages first, and provides flow control to make sure messages are not lost if buffer capacities are in danger of being exceeded, spokesmen noted.



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Disclaiming 'as is' software

From page 23

Continuing to scrape away at disclaimers, courts carefully scrutinize the warranty disclaimer to determine if it complies with statutory requirements. They examine the language to ensure there is no doubt that both parties intended a disclaimer. Courts also consider the reasonableness of the disclaimer. All of this indicates that courts look on warranty disclaimers with disfavor.

It appears that a disclaimer is permitted to override a guarantee of fitness depending upon whether the defective goods result in a monetary loss, injury or property damage. If the defect results in personal injury or property damage, the disclaimer will be found an ineffective tool. On the other hand, if the loss is only an economic one, the warranty disclaimer may be effective.

> ***Continuing to scrape away at disclaimers, courts carefully scrutinize the warranty disclaimer to determine if it complies with requirements.***

Also considered is the sophistication of the purchaser. If the purchaser is knowledgeable, it is more likely he was willing to assume the "as is" risk.

These guidelines may not be useful very long. There is a growing feeling that software should be subject to the same standards of quality other goods must meet. The California state legislature proclaimed this view recently when it proposed a bill (Bill AB1507) prohibiting the use of the warranty disclaimer in software marketing.

If the bill passes, California will no longer sanction the sale of "as is" software. Return privileges, lawyers' fees and some measure of damages are provided for in the bill.

Even before California aimed its proposal at the software industry, many states had gradually abandoned the concept of relieving a vendor of product liability through the use of a warranty disclaimer. Disclaimer-containing contracts have not been enforceable in Georgia, Kansas and Maryland for a dozen years.

More recently, Maine, Massachusetts, Michigan, Minnesota, Mississippi, Vermont, Washington and West Virginia placed limitations on a manufacturer's right to disclaim or avoid standing behind his goods. How, then, is software to be marketed?

In the case of elaborate, complex software, perhaps a method resembling chemical sales is workable. A technical sales representative might run the program in the purchaser's system prior to purchase. Another method might be to provide the program under a confidential disclosure agreement for a specified test period, after which the software would be leased or purchased.

The effect of the disclaimer of warranty is to shift the risk of program failure to the buyer. Whether the software developer can continue to shift such losses is in doubt.

CLARIFICATION

A story on Martin Marietta's Ramis II [CW, May 19, p. 4] stated "tests of DMF Concurrency showed it performed about 4.5 transactions per second lightly loaded with 19 users."

To clarify the situation, Robert E. Roach, director of Ramis II marketing, said there were 51 on-line Ramis II users in addition to the DMF Concurrency users.

Management Science America adds billing capability to account system

By James A. Martin

ATLANTA — Management Science America, Inc. recently introduced a billing module to be added to its accounts receivable system, an addition that will reportedly enable users to track customer relationships throughout a sales cycle.

The module, priced at $45,000, was designed to provide on-line and remote entry of order information, automatic tracking of detailed sales history and the ability to make inquiries into the status of both open and closed orders.

It runs under MVS and DOS/VSE, as does Management Science America's accounts receivable package, on IBM 370 family mainframes.

The module was designed to provide real-time update capabilities and also pricing, invoice generation and complete sales and use tax capabilities, company spokesmen said.

The company further reports that the billing module was designed to enable faster response to customer inquiries and to ensure proper handling of customer requests. In addition, it can provide information on outstanding receivables, spokesmen said.

The module will be available in September.

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SYSTEMS & PERIPHERALS



HARD TALK
James Connolly

Battles in the super market

Now, the rules are changing. The attacks on the supercomputer market are coming from all directions — from start-ups, from established U.S. vendors jumping into a new field and, at last, from Japan.

For many years, the supercomputer industry consisted largely of Cray Research, Inc., a few well-meaning start-ups like Denelcor, Inc. and a wing of Control Data Corp. They would shout that they had a way of solving big problems that were unworkable on traditional mainframes, and they did battle in an arena in which some observers thought only a dozen or so machines would be needed nationwide. That dozen-or-so figure was surpassed a few years ago.

But indicative of how fast the supercomputer industry has changed is the fact that 14-year-old Cray is now the veteran — the establishment — that is the target for the newcomers. Cray has become king of the hill and has boosted the installed base by taking about 30 orders a year for the past two years. Newcomers now use Cray's performance numbers as the standards by which they measure their own systems. Even some of those vendors who don't claim to be better than Cray have invoked Cray's name in their press releases or have sought to be compatible with Cray equipment.

Within the past year, the fight for the supercomputer dollar has heated up, with IBM seeking to head off users considering moves to Cray machines by

See BATTLES page 30

Connolly is Computerworld's senior editor, systems & peripherals.

Centronics enters laser mart

Pageprinter keys effort to revitalize profit outlook

By James Connolly

NASHUA, N.H. — Attempting to drive from its long-term position in the dot matrix printer market into the nonimpact printer market, Centronics Data Computer Corp. has introduced its first laser printer.

In addition to releasing its 8 page/min Pageprinter 8, the company announced two low-end serial dot matrix printers, a value-added reseller support program and a twin-axial interface to link its current minicomputer and mainframe printers to the IBM System/34, 36 and 38.

Company officials said the announcements are keys to rebuilding a revitalized Centronics, a company that reported annual losses from 1981 through 1984 before posting a $648,000 net in 1985. "Centronics today is a much stronger company than any of you may be familiar with," said Robert W. Kilcullen Jr., vice-president of sales for Centronics, in introducing the products to analysts and the press.

Kilcullen said the desktop laser printer is only the first in a family of laser printers and that printers with higher speeds will be offered within the next year. The laser printer, like other Centronics products, is targeted at the reseller and OEM markets.

The Pageprinter 8 was designed to work with multiple personal computers in office environments. Centronics claimed that the $2,495 printer will provide price/performance gains over existing laser printers in its class because of its high duty cycle, the durability of its consumable components such as developer and toner and its ability to emulate various popular nonimpact printers. The company claimed a per-page user cost of 2.7 cents, a 5,000 page/mo duty cycle and a life cycle of 300,000 pages.

The laser printer is based on Sharp Corp. electrophotographic copier technology and a Motorola, Inc. 68000 microprocessor as a controller. Standard memory is 256K bytes; a 1.5M-byte memory

See CENTRONICS page 31

Apollo launches prepackaged systems based on Domain series

By Rosemary Hamilton

CHELMSFORD, Mass. — Apollo Computer, Inc. has introduced the first in what it said will be a number of prepackaged systems based on its Domain Series 3000 Personal Workstations.

Customers who purchase the packages are offered discounts from application software vendors participating in the Apollo program.

The first package is aimed at the computer-aided software engineering (CASE) market, and the vendor said it will announce additional packages this summer. Five software vendors, including Cadre Technologies, Inc., Intermetrics, Inc., Oasys, a division of Xel, Inc., Teledyne Brown Engineering and Thomson-CFS, are offering application packages for the CASE systems at discounts ranging from 25% to 44% on single licenses.

In addition, Apollo will offer a 10% discount on a one-year warranty option, a 40% discount on installation charges and a discount of up to 23% on training courses.

According to Ken Pomper, marketing manager for CASE, Apollo decided to market prepackaged CASE systems because "it was confusing to customers when we came out with all these software tools and didn't really say how they fit together."

The CASE package is offered in three configurations. The CASE Starter Pack, which sells for $89,900, comes with five Domain Series 3000 Personal Workstations with 4M bytes of memory each, three 72M-byte disks and a 60M-byte cartridge

See APOLLO page 31

NEW THIS WEEK

- Digital adds a two-screen configuration on Vaxstation II/GPX workstation
- Omnicomp Graphics offers a graphics display system for the Multibus II

For more on these and other new products, see pp. 81-85.

INSTANT ANALYSIS

"This is not a good time to be selling technology. The market is depressed and people are not making investments over and above what they need."

— Trilogy Ltd. President Gene M. Amdahl on whether Trilogy plans more deals like the $10 million packaging technology sale to Digital Equipment Corp.

Users warming up to Sun following winter of discontent

Usenet support up, growing pains quelled

By Rosemary Hamilton

Sun Microsystems, Inc. has recently responded to numerous complaints of poor support and service by beefing up its efforts in those areas, with the result that a number of users that were highly critical of Sun last winter are now saying they are satisified with the vendor.

"All the complaints I had are now in the past," said Mark Plotnick, a member of the technical support staff at the Murray Hill, N.J., facility of AT&T Bell Laboratories. "As of now, I can't think of any outstanding problems."

Plotnick was one of several Sun users who voiced their concerns about Sun early this year on the Usenet electronic bulletin board, which is primarily for users of the Unix operating system. Sun 32-bit workstations run under University of California at Berkeley Unix 4.2.

Overall, users characterized Sun as a company that has not been able to keep up with its rapid growth and, as a result, has neglected the installed base. In a series of memos posted on Usenet, users related such experiences as waiting four weeks to get the price and part number of a tape controller, forbidding certain Sun field engineers to touch their equipment because they had such poor experience with service and the repeated failure of field offices to return telephone calls.

"I think it's fair to say that product demand has outstripped our ability to keep up with it," said Robert Lux, vice-president of customer support at Sun. "The image was accurate, but we're quickly getting control of it. We're not experiencing any problems that any other fast-growth company hasn't experienced."

Lux, who joined Sun after leaving rival company Apollo Computer, Inc. early this year, came on board specifically to improve customer relations. Aware of the Usenet complaints, Lux said that Sun has taken great strides since that time, and many users agree with him.

"We're going through a good period with Sun now," said Tom Wadlow, a systems engineer at the Schlumberger Palo Alto Computer Aided Systems Laboratory. "They have fluctuated. I've had really good and very bad experiences with them. There have been times when we scream our heads off and then things get better."

Another West Coast user, who requested anonymity, said he was angered by the Usenet comments because "Sun is having normal growing pains, and we've had worse experiences with other vendors."

"When we complained and made a big deal, they came through," said Erik Freed, systems development engineer at Aurora Systems, Inc. in San Francisco. "I guess that shows the difference between a busy company and one that does bad business."

Aurora Systems makes video graphics systems based on Sun processors for the broadcast industry. On the Usenet in February, Freed

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Battles in the super market

From page 29

adding vector processors to IBM 3090 mainframes. Young companies such as Sequent Computer Systems, Inc., Elxsi Co. and Convex Computer Corp. have tried to grab the low-end portion of the supercomputer market with minisupercomputers and near-supercomputers.

Established vendors such as Intel Corp., Floating Point Systems, Inc. and BBN Advanced Systems, Inc. have tried to bracket Cray with massively parallel or cube-architecture machines that they claim can provide anywhere from entry-level to greater-than-a-Cray performance.

But now Cray and CDC, with a smaller user base served by its ETA Systems, Inc. spin-off, are facing a new challenge, a threat that seemingly had been more talk than reality for so long. Japanese vendors are finally focusing on the U.S. supercomputer market after years of industry speculation about how powerful Japanese computers would be when they were built and how soon they would hit the U.S. market.

Well, Amdahl Corp. is reportedly almost ready to announce its first U.S. sale of a Fujitsu, Ltd.-built supercomputer after selling four Fujitsu systems in Europe, and NEC Corp. of Tokyo has announced its first U.S. sale to the Houston Area Research Center. In addition, NEC and Honeywell, Inc. have reached agreement on a joint venture to market NEC SX-1 and SX-2 systems in the U.S. and Canada.

NEC, Fujitsu and Hitachi, Ltd. have long boasted that their supercomputers will outperform Cray systems, with Fujitsu and Hitachi claiming the added benefit of being IBM compatible. Now the speculation apparently can be brought to a close. It will be interesting to see what happens when enough of the Japanese systems are installed to allow side-by-side benchmark comparisons, rather than relying upon observers scurrying about the globe to catch a glimpse of the competitors.

Then it will be still more interesting to see whether, a few years from now, those Japanese companies and the U.S. vendors promoting new architectures can start to dent Cray's market dominance, and whether the people paying the tab can benefit from the renewed competition.

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Users warm up to Sun's services

From page 29

said that Sun had not informed him that it had rescheduled an important delivery. Then in June, Freed said that Sun was behind schedule in shipping the CPU boards but that it was not yet a problem because Aurora had not stepped up its own production. In July, Freed said, "Things are coming in fast enough now."

In an interview in early June, Plotnick of Bell Labs said he had been promised an on-site maintenance person since late 1984 and that Sun had yet to provide such a person. At that time, he said, his so-called on-site maintenance consisted of "someone who would show up at no guaranteed time" when a problem was reported.

"It usually takes several days to get someone out here," he said in June. "Then we have to wait for the parts they order. And then wait for them to come back again."

Of the many suggestions this group received, two of the major user concerns were better delivery schedules and better installation services.

However, in an interview this month, Plotnick said the on-site maintenance person "was brought in a few weeks ago," and that he is "fairly satisified with Sun right now."

Lux said he organized a task force at Sun that visited customer sites during April and May to find out what the real problems were. Of the many suggestions this group received, Lux said two of the major user concerns were better delivery schedules and better installation services.

Lux said Sun is committed to providing products in a timely fashion. He added that a new manufacturing facility in Milpitas, Calif., will double the capacity of Sun's current facility in Mountain View, Calif. The Milpitas facility is expected to ship a nominal amount of products soon, and eventually, it will replace the Mountain View facility, which Lux said is "not very sophisticated." That plant will be converted to office space.

The company has also doubled the size of its U.S. service organization in the past six months and plans to triple it by year's end, according to Lux. Although he would not provide specific numbers on the U.S. service group, he said the company had 150 service employees worldwide before it began increasing the ranks.

Donald Mosley, systems support technician at Washburn Direct Marketing in Charlotte, N.C., is another user that has seen improvements. "We haven't had any problems lately," he said. "We've had a few hardware questions that they did answer promptly. We seem to be able to get answers more quickly from them than we used to."

Centronics in the laser mart

From page 29

module is optional. Resolution is 300 by 300 dot/in. The printer emulates Diablo Systems, Inc. 630 and 630 ECS printers, Epson America, Inc.'s Epson FX printer and IBM's PC Graphics printer and Proprinter.

According to industry observers, Centronics is the only manufacturer other than Sharp to use Sharp's print engine.

Analyst Charles Lecompte of Datek Information Services, Inc. said the laser printer appeared to be comparable in price and performance to other laser printers in its class.

But he noted that he was surprised that the Pageprinter 8 handles only 100 sheets of paper at a time, which has been a user complaint about competing machines based on a Canon U.S.A., Inc. print engine.

Centronics also announced its TX line of printers, which includes seven existing Centronics models adapted for use with the System/34, 36 and 38.

The adaptation for the Printstation 250, 260, 353 and 358 printers and Linewriter 400, 855 and 1200 band printers consists of adding twin-axial interfaces.

The low-end dot matrix printers announced at the same time are the Printstation 210 and Printstation 220, which are said to perform at 180 char./sec. in draft mode and 45 char./sec. in near-letter-quality mode.

The two printers reportedly share parts commonality in major modules.

The difference between the two is that the 220 prints 136 columns, and the 210 prints 110 columns. The 210 costs $499, and the 220 costs $598.

The company also announced its Preferred Reseller Support Program, which officials described as a one-stop, single-vendor solution for a reseller's printer needs. The program includes inventory management, customer service, hot line assistance, volume discounts and promotional support.

Apollo tools prepackaged

From page 29

tape drive. The package includes five software tools, documentation and two compilers from a choice of C, Fortran or Pascal.

The hardware and associated software would regularly sell for $100,760, Pomper said.

Four of the software tools — a debugger, an interface developer, an electronic mail function and a communication tool that coordinates work among a team of developers — are offered with five licenses each. Likewise, each of the two compilers will have five licenses. Apollo will provide a site license, which covers up to 100 users, for its Domain/Pak, a recently introduced performance analysis tool kit.

The CASE Project Pack, which comes with 10 Series 3000s, sells for $159,900. It has five 72M-byte disks and a 60M-byte cartridge tape drive. It includes a site license for all of the associated software, which is the same software provided with the Starter Pack.

The CASE Server Pack, which costs $192,900, is the same package as the Project Pack, except for the additional Domain File Server with 500M-byte disk drive.

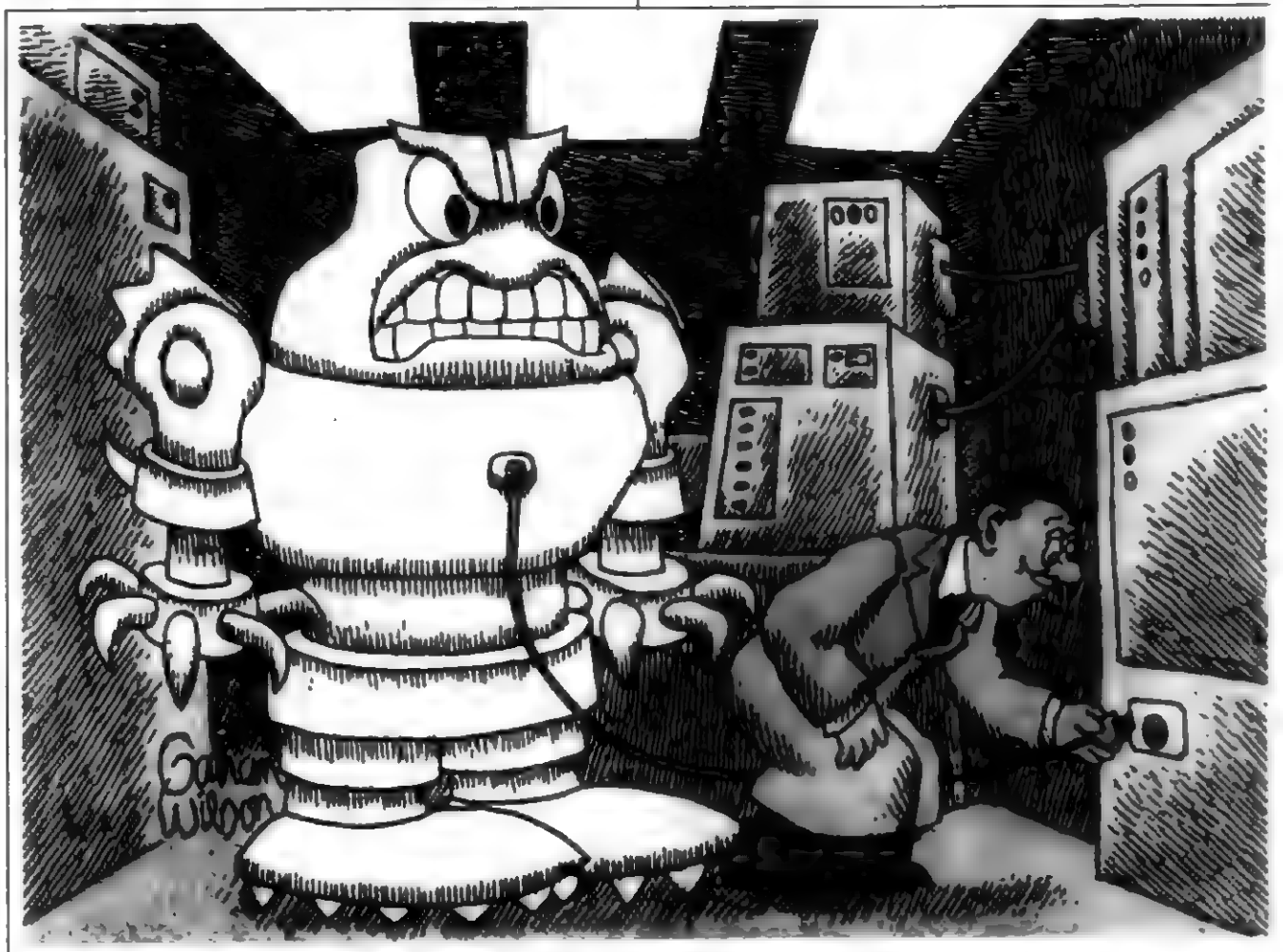
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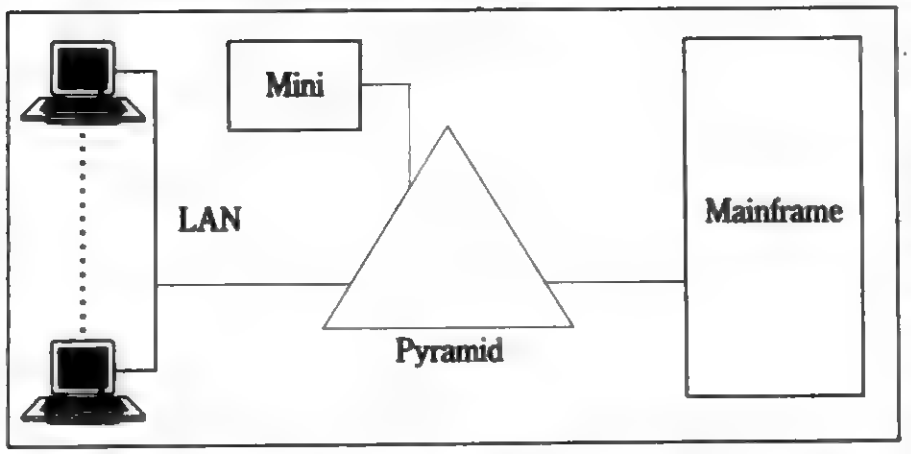
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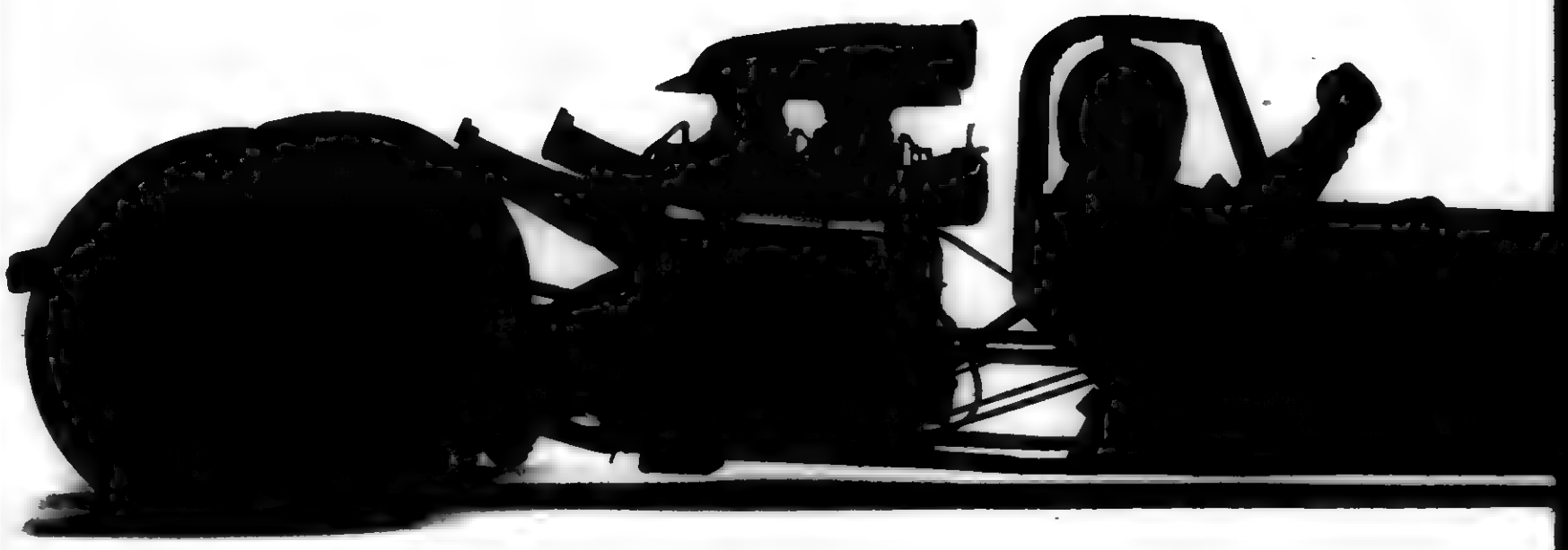
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PYRAMID TECHNOLOGY

The Shape of Performance.

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GUESS WHO WINS THE DATA BASE RACE?

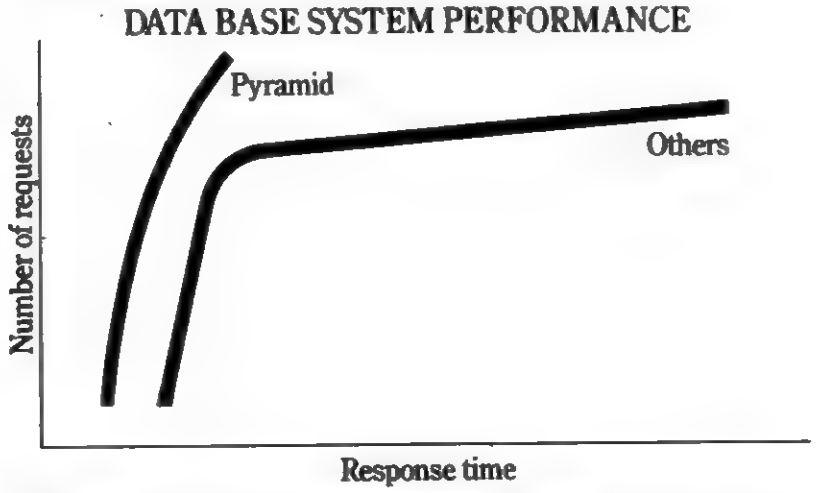


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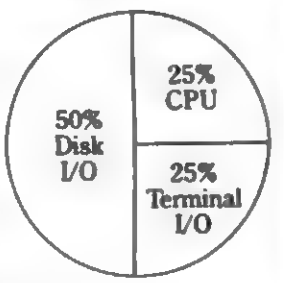
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		Sep 25	NJ	Iselin	Sep 9
		Nov 20	NM	Albuquerque	Aug 26
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	San Diego	Oct 8			Oct 21
	San Francisco	Aug 12			Dec 9
		Oct 15		Rochester	Aug 30
		Dec 3	OH	Cincinnati	Nov 20
	Sunnyvale	Oct 1		Cleveland	Oct 15
		Nov 19		Columbus	Dec 10
CO	Denver	Nov 11		Toledo	Nov 18
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MICROCOMPUTERS



MICRO BITS
Eric Bender

What's Best just might be

Unlike most personal computer software, General Optimization, Inc.'s What's Best spreadsheet optimization software often explicitly cost-justifies itself, churning out figures on bottom-line savings. And those savings can make the package's cost almost irrelevant, users say.

Carol Ronan, now vice-president of the public finance division at First National Bank of Chicago, used General Optimization's package at a former job to handle debt restructuring. What's Best saved one hospital more than $1.5 million, she estimated.

Introduced quietly last fall, What's Best has become the first linear programming micro package to gain widespread recognition. Running concurrently with Lotus Development Corp.'s 1-2-3 or Symphony, the software shows a familiar 1-2-3-style screen and lets users solve optimization problems — such as "What's the best schedule for this staff?" or "What's the optimum mix of these products?"

In Ronan's case, the package gave the bankers better ways to deal with arbitrage limitations on debt restructing, she said. "We had been doing this kind of restructuring on a trial-and-error basis, spending a lot of hours finding an appropriate mix between taxable and tax-exempt borrowing. . . . The markets move too quickly; we didn't have time to spend 80 or 100 hours guessing."

Linear programming software that could handle this kind of problem has been available on larger systems for years, but that was not really an option for her. "Linear programming on a mainframe was way too complicated," Ronan said; she doubted that suitable staff support would have been available.

See WHAT'S page 40

Bender is East Coast editor for PC World.

Quadram focuses on optical mart with video data bases

By Douglas Barney

NORCROSS, Ga. — By late summer, Quadram Corp. will ship Quadvision, its entry into the fledgling video data base systems market.

The system will consist of a compact disk/read-only memory (CD-ROM) player, a laser disk, personal computer hardware and software that will allow firms to build video data bases that provide customers with visual and text information such as catalogs, product availability and demonstrations.

The product is the result of a joint effort with software developer Comsell, Inc. of Atlanta and will be sold mainly to firms such as hardware store chains to replace stacks of product catalogs.

"The customer type will be a manufacturer or product distributor who will engage his dealer network or customer network in the purchase of these systems at every location so there is a common medium for distributing the information," said Ben Dyer, president of Comsell. "It provides a very effective alternative to print."

"This is a wildly neat way to tie two businesses together, such as manufacturers to wholesaler or wholesaler to retailer," said Bob Brown, president of Quadram.

The system will sell in quantities for $5,000 to $7,000 and includes a hard disk-based personal computer developed by Quadram. "The hardware is an IBM Personal Computer-compatible base built on our Datavue portable computer's components. The unit is about the size of a Xerox Corp. machine," Brown said. In addition to its video capabilities, the computer will run IBM-compatible applications software. CD-ROM and laser disk suppliers have not been finalized, Brown said.

"The software allows you to create a video data base that allows you to access either the text that is on the CD-ROM player or the videos, be they stills or moving videos, on the laser disk," Brown said.

See QUADRAM page 38

Easybusiness tools, support programs woo micro managers

By Peggy Watt
and Douglas Barney

SAN JOSE, Calif. — Computer Associates International, Inc. today announced a new Job Costing module for its Easybusiness Systems Plus Series of accounting software, and enhanced its Easybusiness Systems Payroll module.

The firm is also targeting the corporate microcomputer manager with aggressive deals that promote the company's maintenance and support programs as much as its products.

In addition to the $595 Job Costing module, enhancements to the Easybusiness line involve the ability to highlight important information; Exchange, a facility for importing and exporting data between microcomputer applications; and an automatic printer selector that simplifies the setup of printers. The new products will

See SUPPORT page 38

Portable drive moves PC files

By David Bright

NORTH HOLLYWOOD, Calif. — Microcomputer Memories, Inc. has repackaged its Transpac internal 3½-in. Winchester disk drive subsystem into a self-contained, externally attached portable with the same name. Microcomputer Memories expects the subsystem to be used for moving files between IBM Personal Computers, upgrading existing systems, making backups and providing security.

Measuring only 2.6- by 4.15- by 5.9-in., the Transpac comes in preformatted 10M-byte and 20M-byte models priced at $595 and $895, respectively. The Transpac runs off the host computer's power supply. When the unit is attached to a system that already has a hard disk, it automatically becomes either the C or D drive.

According to Marketing Vice-President Rick Eirich, transporting the Transpac is easier than using floppy disks or disk cartridges to move Winchester hard-disk data

See PORTABLE page 40

NEW THIS WEEK

- Significant Statistics enhances statistical software for IBM PC and compatibles

For more on this and other new products, see pp. 81-85.

INSTANT ANALYSIS

"It makes me feel like a Scrooge."

— Ralph Ianezzi Sr., show director for PC Expo, on kicking children out of the show that is restricted to corporate buyers of PCs and related products

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Support programs woo managers

From page 37

be available this month, said Alan Wortman, product manager for Easybusiness.

The Payroll module has been enhanced to handle up to 21,000 employees and can handle more types of taxes and pay rates, Wortman said.

Computer Associates' two-month promotion, launched earlier this month, offers Supercalc4 free with the purchase of a $150, one-year maintenance program, according to a Computer Associates spokeswoman. Volume purchase rates bring the price down to $89 for 25 copies. Corporate site licensing is also available.

The maker of Supercalc and Superproject also expects to establish a formal corporate advisory panel by the end of the year, Nancy Twomey, marketing manager, said.

"We're not in the feature wars anymore," said Michael K. Crosno, vice-president for marketing. "Customers are certainly looking for a baseline of products, but they're looking for support and standards and control."

The maintenance program includes a technical support hot line, 24-hour service for corporate licensees and such upgrade delivery options as electronic distribution and overnight mail service. Optional benefits include training programs and access to a users' electronic bulletin board. Upgrades are free during the program's one-year renewable term, and Computer Associates typically releases a product update yearly.

The special promotion is also aimed at users of other spreadsheets who can trade in their current programs for Supercalc. It also carries a 15-day, money-back guarantee. First mailings are going to 5,000 microcomputer managers, Twomey said.

"Our corporate strategy is not to be first, but maybe second or third. We're close to first from the timing, but we take more time to make a better solution," Crosno said.

Maintenance plans are also available for the project management software program, Superplan, but feature wars are still raging in that market, he added. "That's a very narrowed group of users," he said. "We are not finding corporations standardizing on project management software."

Quadram focuses on optical mart

From page 37

The mastering of disks is the most expensive aspect of the system. According to Dyer, putting video information on 50,000 products onto a laser disk costs some $150,000. The reproduction of the disks is only some $20, he added. Because of the cost, the mastered disks will be used on a number of systems.

"All a person has to do to get into the business is to bring in a cardboard box full of their stuff, and we will put it together for them and supply the hardware to do the job," Brown said.

Firms interested in the product can bring materials such as advertising, catalogs and order sheets, and have them put onto the laser and CD-ROM disks. Under the joint marketing agreement, Comsell will master the disks for customers.

Expert system financial tool out for small business

By Eddy Goldberg

SALT LAKE CITY — Sterling Wentworth Corp. has announced the August release of Businessplan, a tool for financial planners serving small-business owners and self-employed professionals.

Businessplan draws on the expertise of James Jenkins, financial planner and company founder and chairman. Jenkins' expertise has been supplemented by feedback drawn from the approximately 500 clients who use the company's Planman product, according to Rick Farr, marketing vice-president.

Jenkins' expertise has been incorporated into Businessplan in the form of 7,500 decision rules (If-Then statements). In addition, the system contains about 500 parameters that can be adjusted to allow a financial planner to tailor the product to his own philosophy and style.

Working with the information provided by the client and the planner, Businessplan will produce recommendations in areas such as risk management, pension planning, income tax planning, employee benefits and, in addition, will review a business' finances. "We've gone from the problems of the real world and built backwards to expert systems," said company President Gary Williams.

Priced at $4,500, Businessplan will be marketed to financial planners, accounting firms, insurance companies, brokers and banks that serve small-business owners, Williams said.

Businessplan will run on an IBM Personal Computer with a hard disk, a Personal Computer XT, AT and compatibles with 512K bytes or more of internal memory and with Microsoft MS-DOS Version 2.0 or higher. According to Sterling Wentworth, it requires 4M bytes of disk memory, and the company recommends a hard disk with a minimum 10M-byte capacity.

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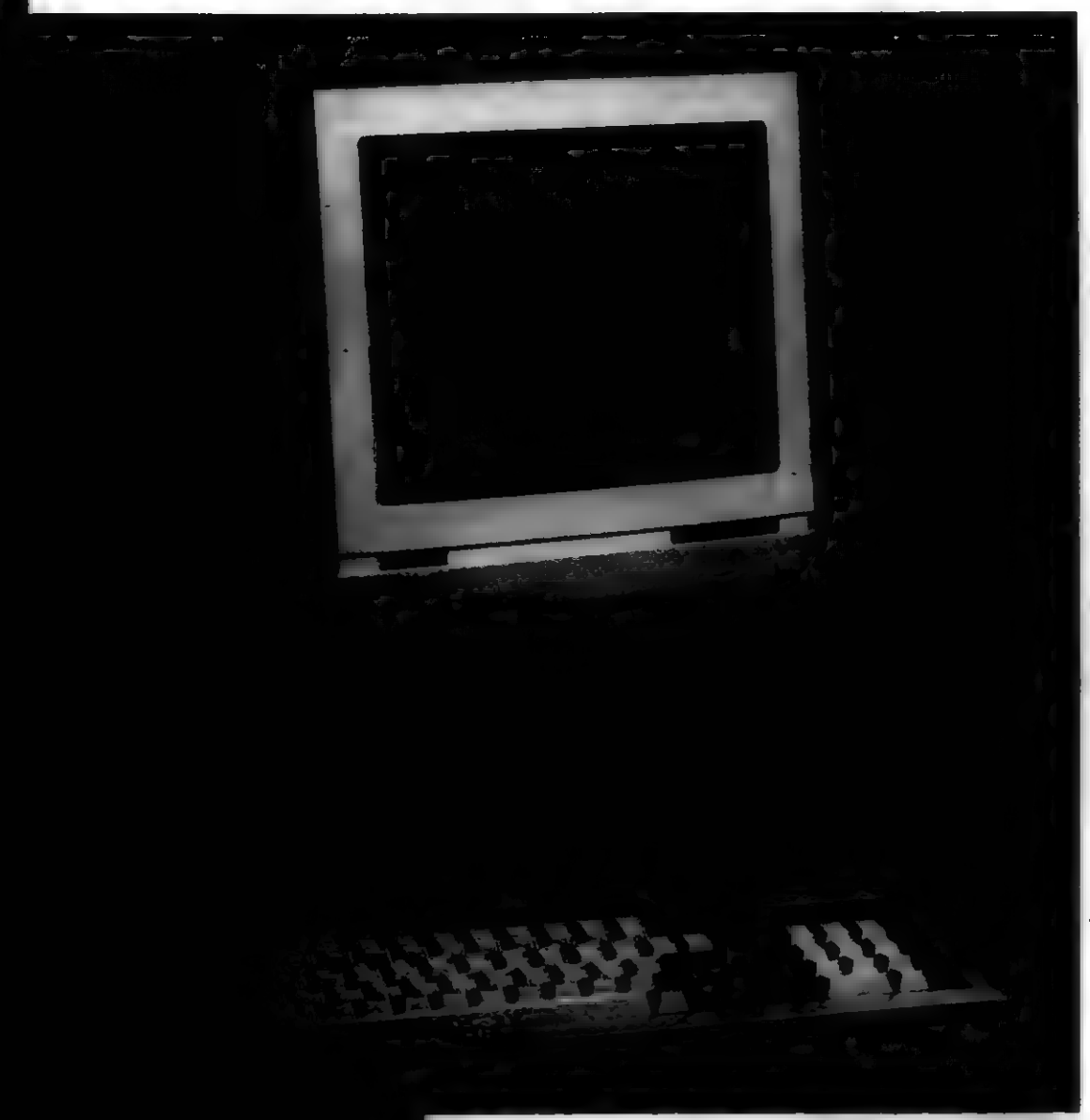
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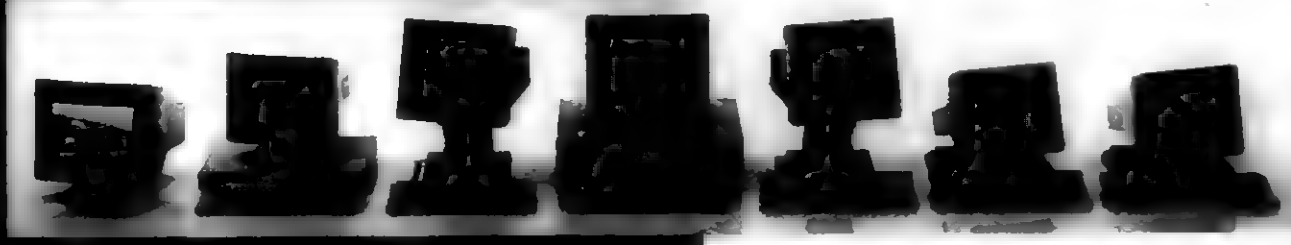
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What's Best just might be

From page 37

Brad Hall, a group controller at an integrated petroleum company that does run linear programming software on mainframes, emphasized What's Best's ease of use and the familiar 1-2-3 screens. "It's important to be able to set up the model itself in Lotus rather than use the complex model generation you find on mainframes. . . . It's just a much more flexible tool than any of the mainframe modeling tools I've seen."

Hall described one exercise in optimizing a shipment of coal. The total bill for an IBM Personal Computer AT clone, software and printer came to $6,000 or less. But the coal-blending exercise "would have saved us over $10,000, and we have 50 of those a year," he said.

Richard Ridington of Soft Industries Corp., a consulting and training outfit in Southington, Conn., is employing What's Best to cut costs for a sausage-making company. He pointed out that such optimization tasks are typically repetitive, high-volume situations and that if they can be handled, their costs are likely to represent only "a drop in the bucket."

"We have found it to be an enormously helpful tool," said John Pacholick, president of Chicago-based Illinois Corp., the largest office in the Rollins, Burdick, Hunter Co. insurance system. "It gives our account executives some good news when they go out to talk to a client."

In today's bleak insurance climate, "clients are traumatized a bit," Pacholick said. His firm employs What's Best to find innovative ways to cut insurance costs by lowering clients' overall cost of business. "Nobody had ever looked at payroll, which is the largest factor in workers' compensation," Pacholick said. Additionally, "we're working with some clients to better optimize inventory costs and transportation costs."

Like many people with MBAs who briefly studied linear programming in school, Pacholick had not considered exploiting the technology afterwards. But "putting linear programming into Lotus all of a sudden made a great deal of sense to me," he said.

What's Best also sells to those who are not so familiar with Lotus products. "We were all just learning 1-2-3 at the time," Ronan recalled. "None of us are programmers; we're all bankers. The only drawback was that we did have to figure it out using macros and such in Lotus."

The software was generally praised for ease of learning and use, although some pointed to a need to understand the underlying problem-solving techniques.

"I found no bugs whatsoever," Hall said. "It really is a user-friendly program; you don't have to be a technician to use it. . . . I thought the documentation was very good, although I would have liked to have a little more detail on the theory of linear programming."

"It's extremely powerful, but there's still a substantial learning curve," Ridington commented. "You have to understand linear programming to a certain degree; that's more than what's required to run a spreadsheet. For example, formulas must be linear. If a nonlinear formula is included, What's Best will detect it and abort — but how many people know what a nonlinear formula is?"

Bumping into software barriers

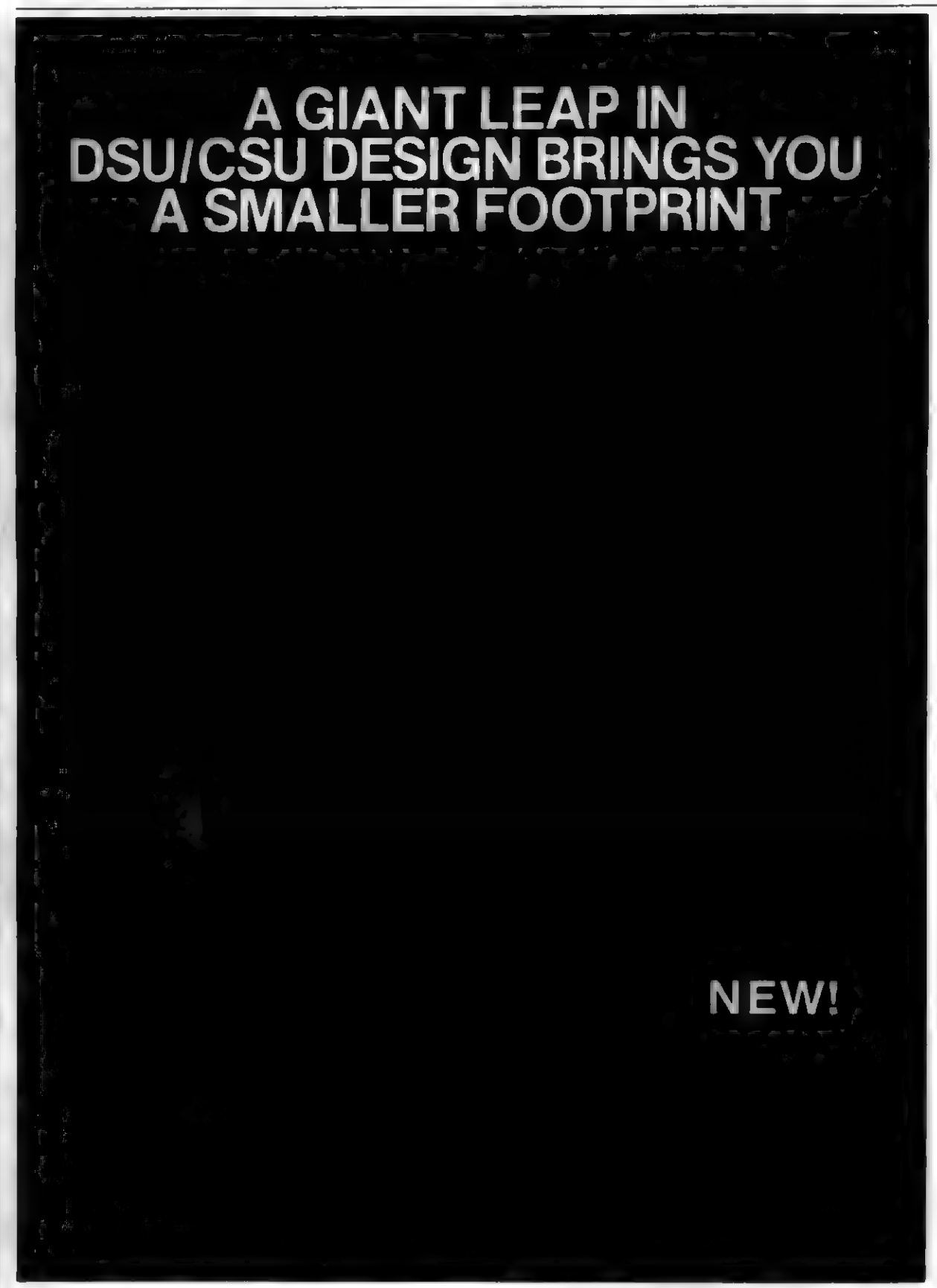
Working on one highly complex What's Best model that optimizes distribution of refinery products from about 200 locations, Hall began bumping into some software barriers. "The total model has about 15,000 cells, and What's Best is limited to 8,000 cells," he noted.

However, not all 15,000 cells were used in the optimization itself, so the problem was overcome through 1-2-3 macros that made calculations and then read results into another file. Even so, it took two hours to run — a requirement "which kind of blew General Optimization away," Hall noted.

General Optimization got high marks for support. "They're very willing to work with you," Ridington remarked.

The most common user suggestion was for additional consulting services from the supplier. "I'd like to see them having several people dreaming up new financial applications full time," Ronan said.

General Optimization offers four versions of What's Best, ranging from a $49.95 education version to a $995 version that needs 640K bytes of memory and handles spreadsheets with up to 4,000 variable cells.



Portable drives moves PC files

From page 37

between systems. When data security is required, the subsystem can be unplugged from the personal computer and locked in a safe place.

While the Transpac has an average access time of 65 msec, Eirich claims its average track-to-track access time of 6 msec makes it one of the fastest backup devices available.

Eirich said there was not much demand for the internally mounted version of the Transpac because many people did not want to open their PC cases to mount the drive, and several IBM PC-compatible systems simply do not have enough room inside. "The reaction told us that it needed to be external," he said.

The Transpac comes with a bus extender board, cabling and a travel case.

Executive Report

Edited by Janet Fiderio and Becky Batcha

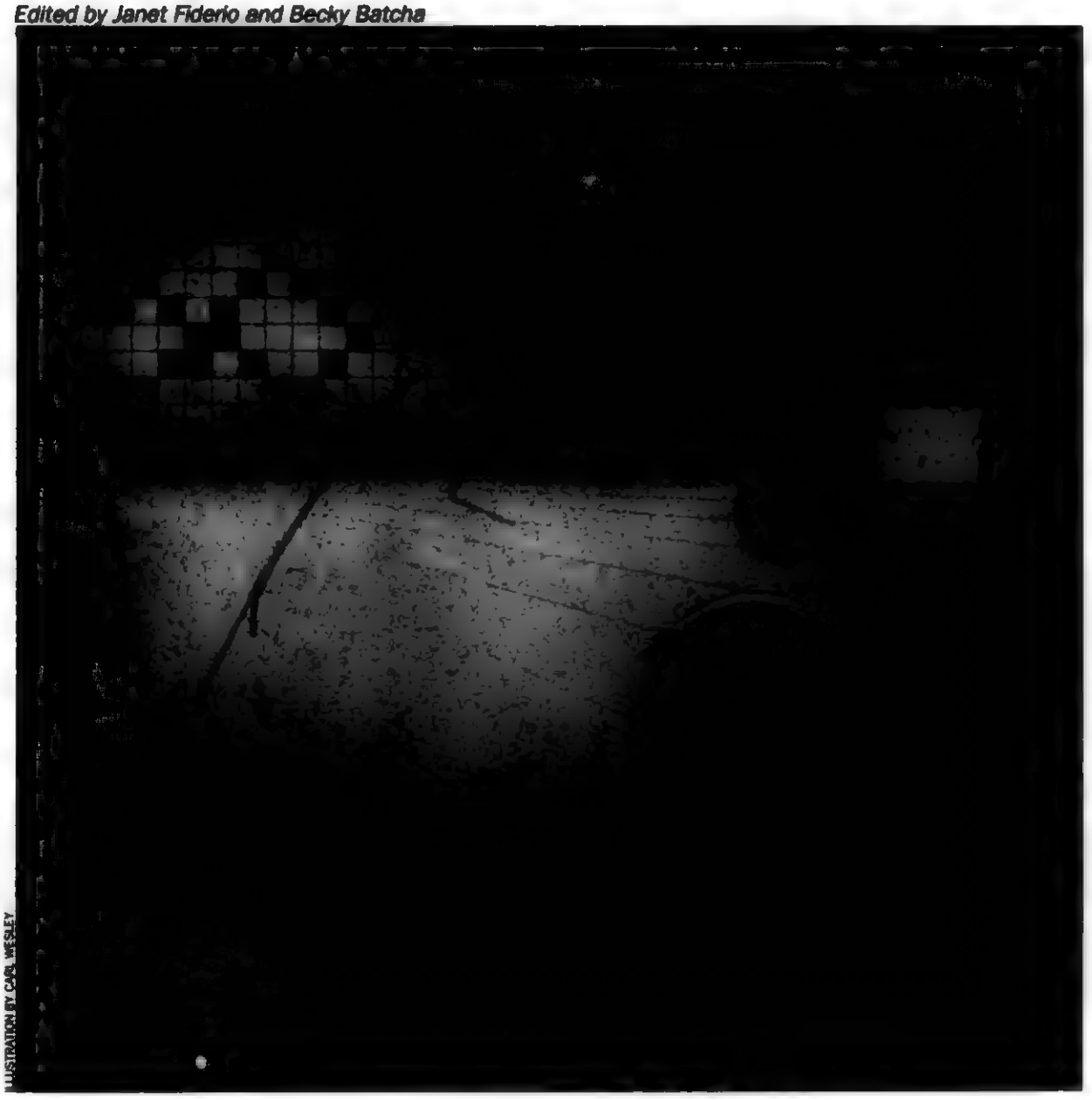


ILLUSTRATION BY CARL WESLEY

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Voice/data PBXs

MIS asks: Are switches a long-term data strategy?

By JOHANNA AMBROSIO

Hedging their bets against the private branch exchange's expansion into data territory, more and more MIS managers are seeing to it that their voice switches at least embody the potential to handle data — even if their corporations do not use that capability just yet.

Estimates suggest that approximately 20% of the country's largest companies use their PBXs to switch some, though not all, of their data. The more data-intensive the organization, the more likely it is to switch data through its PBX. Banks and research organizations, for example, tend to log heavy use.

One user that switches a healthy portion of data through its PBX is Bergen Brunswig Corp. in Orange, Calif. The firm distributes medical and surgical supplies and health and beauty aids to pharmacies throughout the U.S. Bergen Brunswig employes some 3,500 people, about 600 at corporate headquarters.

The company's Rolm Corp. CBX Model II operates in the Orange facility, an intelligent building that had been wired before the firm moved in, according to Anthony Vallerio, vice-president of information resources.

The building is home to more than 70,000 feet of IBM's cabling scheme. Every office comes outfitted with electrical, phone and computer outlets.

Bergen Brunswig opted for a PBX because of the "flexibility the CBX offered to our casual users," Vallerio says, notably the ability to perform both voice and data functions. He also appreciates the ability to accommodate staff and equipment changes with relative ease.

When workers switch offices or need to upgrade their voice and data equipment, the firm can simply plug the required equipment into a wall; technicians need not lay new wire.

Employees can also retain their extension numbers when they change offices, so the firm's phone

Foward-thinking managers are laying the groundwork for the day when all voice and data traffic may be switched over a PBX. But there's a chance that the day will never arrive.

Ambrosio is a Queens, N.Y.-based free-lance writer specializing in technology and business.

MIS asks: Are switches a good data strategy?

Continued from previous page

directory need not go through constant reprints.

Attached to the CBX are 63 Rolm Cypress terminals and 47 Juniper terminals. Managers and executives use the Cypress units, which are display screens with a phone and keyboard. They include features such as autodial, a clock, a calendar and a private phone directory. Vallerio recently ordered 12 more Cypresses, which he expects to arrive in the next two months.

The Juniper machines are phone handsets attached to an IBM Personal Computer and are used mostly by secretaries. Both the Juniper and the Cypress allow users to hold a phone conversation and bring up information on their displays at the same time.

Vallerio stresses that only Bergen Brunswig's casual users tend to rely on the PBX. "For heads down, heavy usage we have terminals directly connected to [our host]," he says. Some IBM PCs and about 350 terminals are connected to the firm's IBM 3090 host through IBM's Cabling System, bypassing the PBX. "I don't know what I'd buy if I had to run heavy data through the PBX," Vallerio says.

The firm also uses the PBX for modem pooling, so its library and market research departments can access outside data bases. And field workers transmit information from portable computers through the PBX into various workstations.

Vallerio likes the PBX's voice messaging capabilities, which he says turns the switch into a giant answering machine. Some 450 headquarters employees can leave messages for each other through the system.

The messaging system eliminates telephone tag and memo writing and allows workers who are on the road to retrieve messages that come in for them.

Bergen Brunswig is now investigating the possibility of adding a local-area network (LAN) for departmental use. If the firm installs a LAN, it will not switch data through the PBX but will rely on a file server for file and resource sharing.

> ***"The price of a PBX may not be as high as it seems, given the potential long-term savings."***

Analysts sometimes call voice/data PBXs a downtime disaster waiting to happen because of their reliance on a single, master controller; if the switch fails, the entire network goes down with it. But Vallerio says his system has not gone down once since its installation more than a year ago.

He also says that purchasing the PBX was a costly endeavor but insists the move makes sense in the long run. "You need to look at the cost over the life of the building," he explains. "How many times do you throw away your telephone?"

Adding data handling to a PBX is tremendously expensive: Companies pay at least $800 per user — including software and hardware on the terminal and host ends — to add typical data capabilities to a voice PBX. Initial, voice-only PBX installation charges run near $1,000 per telephone port.

Moreover, according to Henry Becker, a senior consultant for Peat, Marwick, Mitchell & Co. in New York, supporting data involves a fixed cost. "You're paying for the network to accommodate something, whether or not it's actually being used," he says. If a terminal hangs off a PBX port, for example, the network must be configured to handle the terminal's data flow whether or not the machine is actually being used.

This wastes capacity that could otherwise be occupied by more telephones. "It's just too darned expensive to occupy a PBX with something that

Continued on page 45

User Profile

Boom or bust, flexible PBX pipeline carries oil firm's erratic voice/data flow

By MICHAEL SULLIVAN-TRAINOR

Only the hardiest of communications managers would ever want to trade places with Rick Tuss. As supervisor of telecommunications for Conoco, Inc., an oil company in Houston, Tuss and his staff have had to rearrange voice and data lines more than 5,000 times in the past year for 2,400 employees.

"That means we've moved everybody more than twice," he says, with nary the slightest trace of fatigue in his voice.

Fluctuating oil prices and other trends require employees at Conoco's headquarters to change their responsibilities with a fair amount of frequency. As the employees switch roles, their communications requirements change. Tuss says an easily rearranged digital private branch exchange provides the most cost-effective way to keep up with the company's voice and data traffic.

"We've had to be extremely flexible, especially in the last year and a half, because Conoco has undergone a great deal of organizational and structural changes," he says.

Ease of maintenance and management — the ability to provide voice and data communications support with one work group and a single cable plant — was the other factor that led Conoco to select Intecom, Inc.'s IBX S/40 PBX two years ago, when the company constructed its headquarters building.

Since then, the PBX has met the firm's data communications requirements and has allowed cost savings through modem pooling and other technical efficiencies. In addition, with the number of changes that the system has undergone, the PBX has more than paid for itself in terms of flexibility.

The setup has produced such impressive results, in fact, that Conoco's computer operations department has approached Tuss' telecommunications department for advice on whether the PBX can support local-area network (LAN) traffic as well. "They see the benefit of being able to use the PBX for moves, adds or changes without the enormous cost of rewiring the coaxial cable," Tuss says.

In its old headquarters building, Conoco had leased a PBX from AT&T Information Systems, and the oil firm considered continuing the arrangement at its new home.

But a careful study showed that buying the Intecom product would prove less expensive and would give Conoco greater control over its communications.

Under the lease arrangement, the company had been paying AT&T for every move, add or change; it received no guarantee that the adjustments could be made promptly.

Under the current arrangement, Tuss' department charges users an average of $76 per change, keeping the money inside the company. Users pay less for changes and receive more certainty that work will get accomplished on time.

Relying on a single switch like the IBX system has one disadvantage, according to Tuss, but the good outweighs the bad.

"You do have all your communications in one device, and if that fails, you're dead in the water," he says. "But by the same token, the reliability of a PBX is much higher than any of the computing equipment attached to it." He puts his PBX's reliability at 99.9% and says Conoco counts on redundancy to protect itself from the minor chance of failure.

The firm's installation consists of one PBX that handles 3,400 lines, 500 of which carry simultaneous voice and data transmissions. About 2,900 telephones and 500 data devices — including personal computers, dumb terminals and dedicated word processing systems — tie into the PBX. The system switches voice and data simultaneously and carries both synchronous and asynchronous traffic.

Transmission of word processing documents among IBM Displaywriters and dumb terminals constitutes most of the synchronous traffic, but IBM Personal Computer users contribute as well. The PCs' file transfers and peripheral device sharing operations are synchronous communications.



> ***"The reliability of a PBX is much higher than any of the computing equipment attached to it."***
>
> — Rick Tuss
> Conoco, Inc.

Asynchronous controllers that operate on the system give users access to five Digital Equipment Corp. VAX-11/750s and 11/785s in Houston and to two Control Data Corp. Cyber processors and a newly installed Cray, Inc. X-MP computer at Conoco's central computer department in Ponca City, Okla.

To expand the installation's networking capabilities and ensure continued vendor support, the company is currently upgrading from the IBX S/40 to the IBX S/80.

Intecom has chosen the S/80 as its flagship product and reportedly plans to provide more support and enhancements for the new system than for the older one.

Conoco plans to bring up its new S/80 by mid-July. In response to the computer operation department's request, Tuss will try to exploit the PBX's data communications capability through Intecom's Lanmark local-area network connection.

Conoco is planning pilot tests of the system both for replacing coaxial cable and for interconnecting with Ethernet.

In addition to the PBX, Conoco's Houston complex supports a number of local-area networks for departmental tasks. The firm considers the LANs a better choice than the PBX for small groups of computers that operate in close proximity and require high-speed data communications. The local-area networks include IBM's Token-Ring and DEC's Decnet, which handles scientific applications. ■

Sullivan-Trainor is a Computerworld senior writer.

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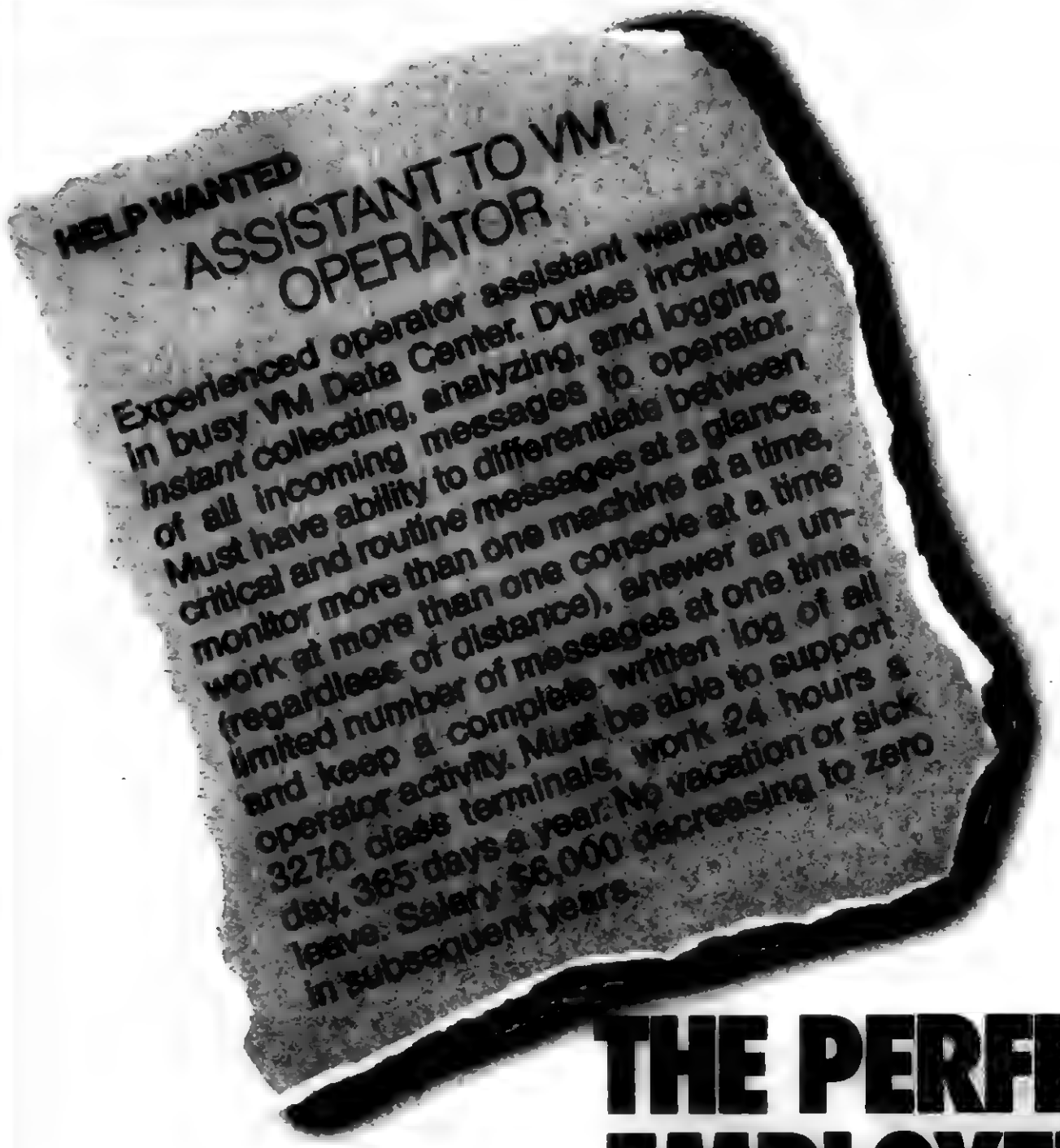
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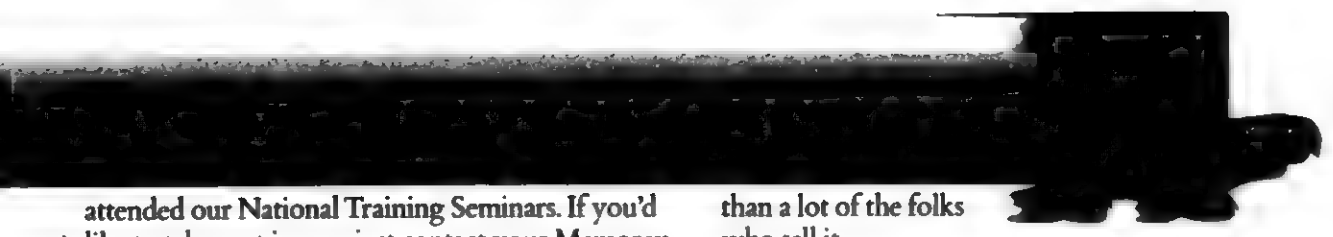
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Continued from page 42

may sit there much of the time," Becker adds.

The price of a PBX system, however, may not be as high as it seems, given the long-term cost savings the system can offer. Some companies, for example, use the wiring from their PBX switch in lieu of more expensive transmission schemes.

They make use of spare wire pairs in their phone lines to link personal computers and other low-speed data devices. By using their PBX systems' existing wiring, the firms eliminate the need to lay costly coaxial cable.

One such user, First Chicago Corp., a financial firm in Chicago, gained a handsome windfall when it decided to go with that approach. "We're saving $1,000 per workstation, because we've eliminated the need for coaxial cable," according to Donald Hollis, First Chicago's executive vice-president.

Twisted-pair wires that the company laid for its AT&T System 85 PBX switch support between 300 and 400 data devices — mainly IBM Personal Computers and 3270 terminals — as well as 10,000 telephones.

> ***'Architecture is the most important decision an end user can make.'***
>
> — Jerry McDowell
> Vanguard Telecommunications

"We're talking big bucks," Hollis says. Beyond the current cost benefit, Hollis sees his voice/data system as a doorway to the future of PBX networking. With the switch and the wires installed and operational, he says, "We're in the position to take advantage of the technology as it becomes available."

Ron Orazine, a senior consultant for Network Systems Design Corp., a consulting firm in Waltham, Mass., recounts another case in which a user firm is looking to take extra advantage of its existing PBX system. The firm, a manufacturer, is hoping to use a spare set of phone wire to support an automatic link between electronic time clocks and corporate payroll records.

He notes that almost every phone cable in every organization contains a set of wire that lies idle yet holds great potential. "That spare set of wire isn't doing anything, so why not use it?" Orazine asks.

Evaluating products: Distinct architectures

MIS managers who need to decide among data-handling PBXs may find themselves puzzled by the apparent lack of diversity. At first glance, the major vendors' products look remarkably alike:

- Virtually all PBXs can switch low-speed data, typically anything under 64K bit/sec., which is generally the internal speed limit of personal computers, terminals and other data devices.
- Additionally, most major PBX vendors' products are designed to accommodate higher speeds when terminal devices demand quicker switching.
- To make matters worse, almost all the major vendors offer identical features — especially for voice. Least-cost routing, call accounting, call forwarding and speed dialing are all commonplace.

Indeed, architecture is about the only distinguishing trait among today's PBX systems. But it is a crucial distinction. "Architecture is the most important decision an end user can make," according to Jerry McDowell, a general partner at Vanguard Telecommunications, a con-

Continued on next page

Revamped Centrex poses formidable challenge to PBXs

By ROSE VALENTA

As advocates of total system ownership and control exalt the benefits of the private branch exchange and other customer premises setups, the regional telephone holding companies are building a sturdy case for the Centrex service. For many users — even small businesses — Centrex offers a viable alternative.

In direct reaction to the challenge posed in the past few years by PBXs, the phone companies have endowed Centrex with some appealing features:

- Centrex now enables companies to rearrange their own stations.
- For a price, the phone companies will provide station message detail recording and advanced automatic route selection.
- One regional phone company even supports local-area networking that is based, as Centrex is, at a phone company's central office (CO).

These capabilities overcome the disadvantages that some users have come to associate with Centrex service: expensive additions, moves and changes; limited automatic route selection; and inadequate data switching capabilities. Centrex's rise from the ashes has put PBX makers and other customer premises equipment (CPE) makers a little on edge, and well it should.

The North American Telecommunications Association (NATA), an industry association for CPE vendors, expects the appeal of enhanced Centrex service to directly cause the loss of more than two million on-premises phone lines — approximately $1.6 billion in sales.

In response, NATA has petitioned the Federal Communications Commission to review the market. The association suspects that the phone companies may be subsidizing low Centrex rates by raising residential phone rates.

The phone companies retort that Centrex service simply outmatches PBX switch technology. They note, for example, that PBXs tend to rely on 20-year-old switching technology while Centrex and other CO services use more modern switches. The argument works to a degree, but customer premises equipment from AT&T Information Systems, Northern Telecom, Inc., Intecom, Inc., Rolm Corp., CXC Corp., Ztel Corp. and other major vendors is typically based on very modern digital switch technology.

Unquestionably, Centrex service does provide a number of outstanding features: 24-hour maintenance, backup power, full processor redundancy and freedom from both the responsibility of allocating floor space and the cost of maintaining an equipment room. Also, when a phone company's CO equipment gets upgraded, the user enjoys the benefits of plant modernization without incurring the capital expense.

Like most PBX systems, Centrex is virtually nonblocking, so traffic will typically flow without interruption. It can accommodate data terminals at speeds up to 4.8K bit/sec. using conventional modems and can also support personal computers, facsimile devices and dedicated word processors using faster, specialized modems.

The AT&T #1A ESS switch that lies at the core of most phone companies' Centrex services is capable of offering users sophisticated features such as switched modem pooling, message desk service and reports about traffic on uniform call distribution facilities.

Enhanced control features that are available through the #1A ESS (including flexible route selection, deluxe automatic route selection and automatic route advance) can provide users with least-cost routing capabilities that rival those featured in modern PBX systems.

Bell Atlantic Corp., one of the seven regional holding companies, even offers a CO-based local-area networking (LAN) feature that allows users to switch data through the central office at speeds ranging from 1,200 to 19.2K bit/sec. CO-LAN service can support communications speeds up to 56K bit/sec. among hosts at the user's site and up to 6M bit/sec. over T1 and fiber links. Most data switching equipment is located at the central office.

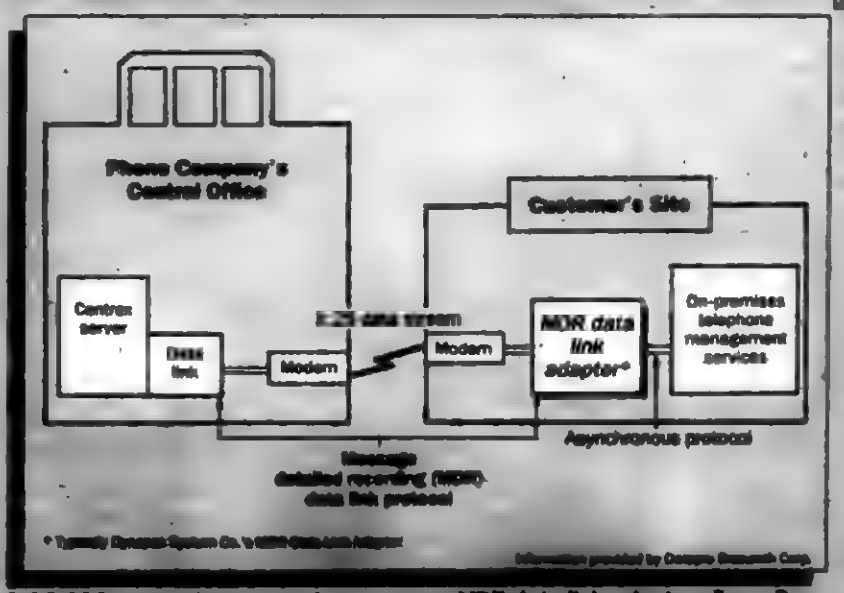
Bell Atlantic targets the service at medium-size and large organizations (businesses and government agencies with at least a few hundred phone lines). Other regional phone companies expect to offer similar capabilities by year end.

Large users can also take advantage of Centrex station message detail recording to premises (SMDR-P) capabilities that rival the reporting capabilities of PBX systems (see chart). To hook in to the service, a firm must buy a protocol converter that costs just over $3,000. Small users typically cannot justify the outlay for SMDR-P.

Although small firms cannot generally afford to get PBX-quality service from their local phone companies, they can obtain Centrex services that rival less-advanced electronic key systems. The phone companies, in fact, offer services designed specifically for users with fewer than 25 phone lines.

Services for small users typically include intercom and call transfer capabilities, three-way conferencing and Touch-Tone service. Speed dialing lists are optional, but they do not match the capacity that users can get with customer premises equipment. ■

CALL ACCOUNTING AND NET OPTIMIZATION COME TO CENTREX SUBSCRIBERS



A $3,000 protocol converter known as an MDR data link adapter allows Centrex subscribers to take advantage of services that were previously available only to users of PBXs and other customer premises equipment.

Valenta is an associate editor for "Datapro Reports on Telecommunications," an information service published by Datapro Research Corp. of Delran, N.J.

Continued from previous page

sulting firm based in Morristown, N.J. "The architecture determines how easily the PBX handles voice and data and whether or not the switch is redundant."

Generally, a PBX's architecture can be either centralized or distributed:

Centralized PBXs rely on one switch to handle all traffic. The arrangement makes sense for companies that operate out of just one building or out of a few buildings situated near each other. Centralized switches may not be practical, however, for firms that occupy many buildings that lie miles apart.

A few years ago, centralized PBXs presented a problem of system integrity: If the central switch failed, so did the entire network. Vendors of distributed systems chided users of centralized switches for putting all their eggs in one basket. Today, however, most centralized systems come with enough built-in redundancy to prevent total system crashes. Analysts say that a potential centralized switch buyer should ask about redundancy, but they also note that most vendors provide an ample amount.

Decentralized PBXs, on the other hand, parcel out control to a number of decentralized nodes. If one node fails, the others will definitely continue to operate. Distributed switches often suit extremely large office campuses better than centralized switches do.

The three largest PBX vendors — AT&T, Rolm and Northern Telecom, Inc. — all offer both centralized and distributed products. All, moreover, are adding some decentralization to their centralized PBXs in a move toward distributed switching.

Because of the increasingly blurred line between centralized and distributed switches, users should take architectural differences in stride, according to Henry Dortmanf, director of consulting services for the Angus Telemanagement Group, Inc. in Toronto. Dortmanf suggests that users ignore labels and choose their PBX system the same way they would any major purchase: by determining their needs then buying the product that best meets those needs.

Three alternatives to PBX service

User firms that consider the future of voice/data PBXs too risky or the initial capital outlay for a system too hefty may find solace in other options. The most commonly suggested alternatives are Centrex service, data switches and local-area networks (LAN).

Centrex. A practical choice, one to which users have been flocking in droves, is everyone's old favorite: Centrex. The service, left to languish for years, has recently been enhanced by the regional Bell holding companies (see story page 45).

Many phone companies now offer integrated voice/data switching, local-area network connections and systems integration. They also promise to outfit Centrex with interfaces to Integrated Services Digital Networks and to give users faster and faster speeds and higher and higher throughputs. If PBX manufacturers do not keep up with Centrex providers, in fact, they could find themselves rapidly losing market share.

In its most basic form, Centrex is a PBX located at a local phone company's office. Because the phone company maintains the switch, users need not face network management hassles or pay the price of buying PBX equipment outright. Also, when users need additional lines, the phone company — not the user — will accommodate the growth.

However, there are disadvantages. With an in-house PBX, employees can call each other without tying up local lines; with Centrex, they cannot. Centrex users also face limitations on the features they can acquire: They can only get what the phone company offers and cannot shop around for additional capabilities.

Data switches. A second option is to install a data switch, which — at an average price of $400 per user — costs far less than adding data onto a PBX.

A data switch is generally thought of as a data-only PBX. Because it is less sophisticated, it cannot handle integrated voice and data; users still need to run their voice traffic through a separate, voice-only PBX.

Even though the data switch option forces users to support two distinct networks, it can make good financial sense for users that need to move a lot of data from building to building. "About the only thing I don't like about a data switch," Peat Marwick's Becker says, "is that it's one more box to maintain and program and another vendor in the shop."

Network Systems' Orazine, on the other hand, feels that a voice/data PBX is almost always the better alternative, because it eliminates the costs of installing and maintaining separate networks, hardware and software. Further, PBXs require fewer dedicated ports on a firm's host than data switches do.

Still, he says, data switches offer a sound option for supporting the data needs of power users — for example, engineers and other employees who rely heavily on computer-aided design and manufacturing systems.

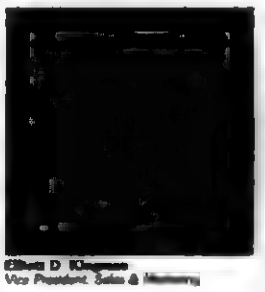
Local-area networks. Although some observers have portrayed it as such, the LAN is not a competitor to the PBX. Most large organizations need both — PBXs for switching voice and low-speed data traffic, LANs for connecting office machines.

Even if PBXs someday gain the ability to support high-speed traffic, they will never replace local-area net-

Continued on page 48

> ***A few years ago, centralized PBXs presented a problem of system integrity: If the central switch failed, so did the entire network. Today, however, most centralized systems come with enough built-in redundancy to prevent total system crashes.***

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CPI vs. DMI: A rebellion without a cause in the standards arena

By T. DOANE PERRY III

Everyone needs a bit of melodrama to liven things up from time to time, which is why communications industry observers keep tabs on the soap opera struggle between advocates of computer-to-private branch exchange interface (CPI) and digital multiplexed interface (DMI), two PBX interface standards.

Expert's Opinion



IDC's Perry

Right now, the script shows CPI as the hero, because the interface has its roots in the popular 56K bit/sec. world. Digital Equipment Corp. and Northern Telecom, Inc. back CPI.

But the plot also embodies eventual triumph for DMI, because its 64K bit/sec. structure complements the Integrated Services Digital Network (ISDN) standard, rumored to be the future star. AT&T developed DMI with support from Hewlett-Packard Co. and Wang Laboratories, Inc.

Actually, the standards contest is a wash. In real life, there are no raging battles among the interfaces but rather a gradual evolution from one to the other: CPI to DMI to ISDN.

The variety and progression inherent in the evolution provide valuable alternatives for users, who can hang on to equipment until they feel ready to switch over to a new standards environment. This is how the evolution will proceed:

- Throughout the 1980s, CPI will continue to flourish among the installed base of 56K bit/sec. transmission facilities.
- At the same time, DMI will gradually gain strength as users install 64K bit/sec. systems.
- Eventually, both CPI and DMI will coexist. DMI, in fact, should be able to incorporate CPI.
- Later, sometime around 1990, ISDN will provide a useful third signaling alternative.

This movement toward standardization is a slow, steady extension of a 3-year-old effort to promote a common interface. The impetus behind the effort was to strengthen the PBX's data role by lowering the cost of connectivity among PBXs, computers and local-area networks.

Standard interfaces also permit PBXs to switch data from microcomputers or terminals to a host computer over common, inexpensive two-pair telephone wiring.

Proposals for the CPI and DMI standards went before the Electronic Industry Association's standards committee less than one year apart.

Northern Telecom and DEC submitted their proposal for CPI in July 1983. In the fall of 1984, DEC announced the first CPI product. The CPI/32-A, priced at $7,200, is designed for DEC VAX computers that operate under VMS. The CPI interface multiplexes 24 synchronous data channels at speeds up to 56K bit/sec. over twisted-pair wire.

In March 1984, AT&T and Hewlett-Packard challenged CPI by proposing the DMI standard interface. DMI is based on AT&T's System 85 PBX Release 2 hardware and software. It features 23 data channels and one common signaling channel, each supporting speeds of up to 64K bit/sec. A DMI link between the HP 3000 computer and the AT&T Systems 75 and 85 will be available next month for $9,300, including supporting software for the HP 3000.

International Data Corp., a market research firm in Framingham, Mass., predicts that the annual market for DMI interface shipments will grow at a compound annual rate of 65%, expanding from just under 7,000 units this year to about 50,000 in 1990.

Northern Telecom claims to have installed 7,000 CPI interfaces. The firm also plans to support ISDN, however, with chip sets and interfaces from Motorola, Inc.

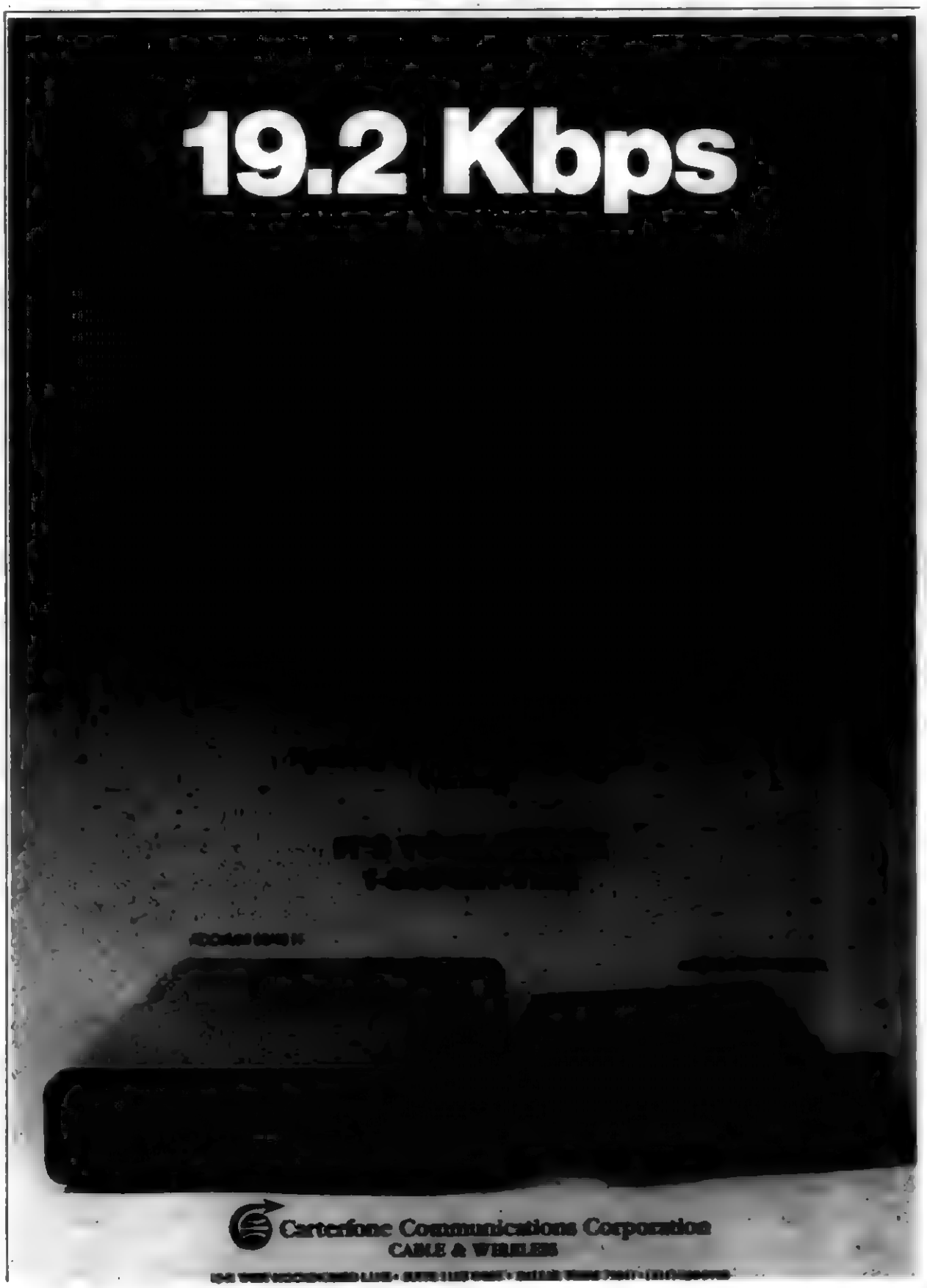
The danger here is that vendors like Northern Telecom, AT&T and Siemens Communications Systems, Inc. will create slightly different flavors of ISDN. If vendor-specific ISDNs develop, much of the global, dynamic flexibility of the concept will fall by the wayside.

Another danger is that the obsession with the struggle between CPI and DMI will keep industry participants from focusing on more substantial problems.

CPI and DMI are only low-level physical connections. Without higher level software connections — connections at the applications and presentation level — users cannot achieve smooth network integration and cannot employ their systems to accomplish useful work.

Instead of watching the soaps, then, industry figures should concern themselves with the development of higher level links. ■

Perry is the senior telecommunications consultant for communications research programs at International Data Corp., a Framingham, Mass.-based market research firm.



Continued from page 48

works; at most, PBXs will act as controllers or gateways to LANs. Vanguard's McDowell sets the matter straight. "A LAN is a series of boxes hooked together through some processing link," he says. "The PBX isn't a transport mechanism; it's a switch."

PBX and LAN vendors have been working for some time to develop interfaces between their products and to computer systems. The following are among the most significant cooperative ventures:

- Wang Laboratories, Inc.'s recent acquisition of Intecom, Inc.
- IBM's purchase of Rolm.
- A joint development agreement between GTE Corp. and Fujitsu Ltd.
- An effort by AT&T Information Systems, Honeywell, Inc., NCR Corp. and Hewlett-Packard Co. to develop interfaces between AT&T's PBXs and the other computer companies' equipment.

Managers who decide to go with the PBX option and buy data add-ons for their voice switches would be well advised to act quickly.

Thanks to heavy competition and a soft market, prices are at an all-time low as vendors undersell their products. "Prices are about as low as they're going to go," says Ernie DeNigris, director of switching systems product management for AT&T Information Systems.

Vanguard's McDowell agrees, but gives users some incentive to wait a little longer. "Prices themselves won't come down," McDowell says. "But features will be far superior. There will be more modularity and support of more management functions."

But Ian Angus, president of the Angus Telemanagement Group, says that prices will drop even further. He sees even better days ahead for PBX buyers. "There are too many vendors in the market," he notes, "and everyone's fighting to stay alive."

The market is in such flux, with vendors struggling to outmatch each others' data capabilities, that potential buyers will have a difficult time pegging which vendors will survive and which will drop out.

Even a strong market presence today does not assure a vendor contin-

Continued on page 50

PBX market stable for now

But what will happen next is anyone's guess

By ROSE MULA

Despite start-up companies' efforts to unseat established leaders, private branch exchange vendors' market shares seem likely to remain utterly stable during the next year, according to industry observers.

"The market isn't really percolating," says Susan Lehto, director of telecommunications for the Yankee Group in Boston. "Activity is rather flat." Still, as vendors struggle to top each other's voice/data capabilities, pressure on the status quo will mount.

Right now, the market looks like this:

- AT&T and Northern Telecom, Inc. command a strong lead over other PBX makers, claiming about 20% of the market apiece. By most analysts' count, AT&T maintains a slight edge.
- Rolm Corp. holds a firm third place, with an 18% to 19% share.
- Mitel Corp. and NEC Telephones, Inc. run about neck and neck for fourth place, at 8% to 10% of the market, followed by Siemens Communications Systems, Inc., GTE Corp. and Harris Corp.

"In general, PBX vendors fall into four categories," says Ian Angus, president of the Angus Telemanagement Group, Inc., a consulting firm in Toronto, "the pacesetters, the contenders, the outside-chancers and the also-rans."

The pacesetters are, of course, AT&T, Northern Telecom and Rolm. Together, they control at least 60% of the market.

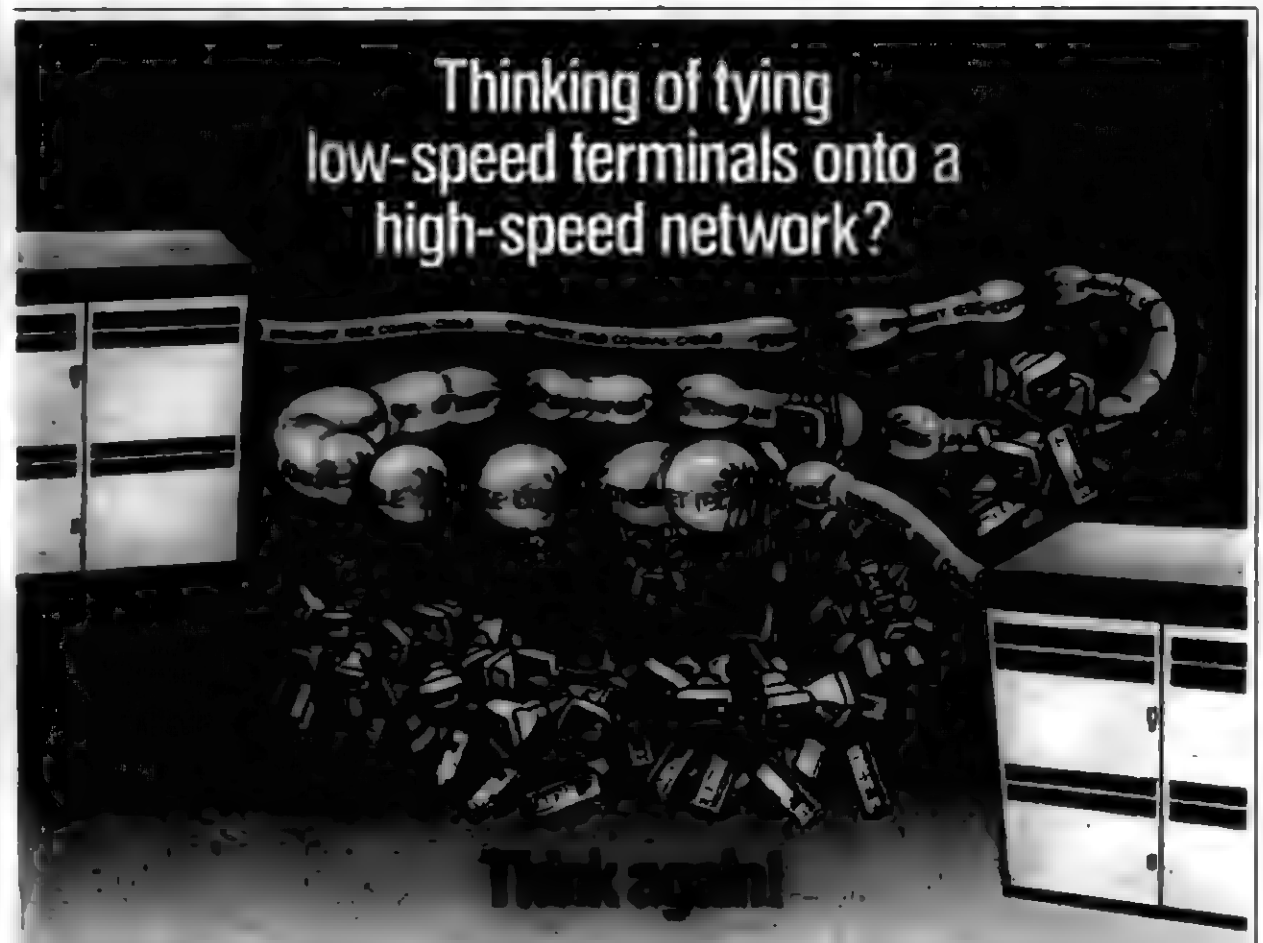
The contenders, according to Angus, are Mitel, NEC Telephones and Intecom, Inc. — second-tier firms with strong enough financing, resources and products to challenge one of the big three. Intecom holds a negligible share in the overall PBX market but is strong enough in large-user sales and in voice/data switching to challenge the market leaders in those areas. In addition, Wang Laboratories, Inc.'s recent purchase of Intecom solved the PBX firm's financial problems. The three contenders share about 20% of the total market.

You don't have to be a mathematical genius to figure out that the remaining 20% of the pie needs to be sliced wafer thin if each of the 30+ other manufacturers who supply PBXs to the U.S. is to get a share. Market forces are likely to turn most of the outside-chancers into also-rans within a few years. "It's obvious that the market can't support them all," Angus says.

Some natural boundaries hem the market in. Kenneth Oshman, former president of Rolm, has been known to say that the nice thing about the

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Mula is a free-lance writer based in Waltham, Mass.



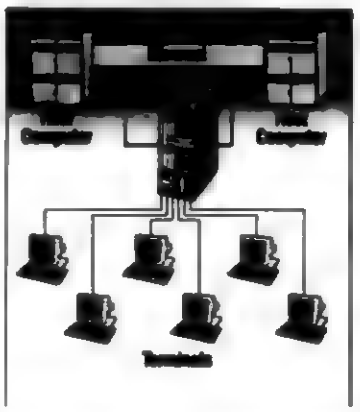
A high-speed LAN is ideal for file transfer, distributed processing and CPU-to-CPU communications. But using it for terminal traffic can cause problems.

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PBX business is that everybody needs one — the terrible thing is that everybody needs just one.

At one point, the industry lived primarily on economic growth, supported by the birth of new businesses that needed PBXs. Today, it enjoys a new surge because of a massive technological transformation from analog to digital operations.

But most of the transformations will take place by the end of the decade, and when users reach digital saturation, only slow, natural growth will remain. "That's maybe 6% to 8% a year — not enough to support 35 to 40 companies," Angus notes.

Some manufacturers are therefore carving out specialized niches. Intecom, for example, has captured a healthy share of the market for systems with more than 1,000 users. And Interconnect Planning Corp. has picked up about 80% of Wall Street by custom-designing systems for the financial industry.

David Systems, Inc. is also prospering from niche marketing. The firm sells the David Information Manager, a highly specialized set of peripherals that works with a PBX to provide local-area networking and data transmission. The company sells the product to firms that rely on Centrex and similar analog telephone services but want some voice/data capabilities.

According to the Yankee Group's Lehto, however, niches may not provide a haven for start-ups much longer, because the big guns are beginning to train their sights on specialization.

"Rolm, with its newly announced Redwood system, and AT&T, with its recently introduced System 25, are looming ominously on the horizon," Lehto says. "They're making the small niche marketers very nervous." Rolm markets Redwood to users with between 75 and 100 phone lines, and AT&T has indicated that System 25 will target users with between 75 and 200 lines.

Another survival strategy for PBX vendors is to build strength offshore. Organizations in the U.S. spend about half of the world's telecommunications dollars, but rich markets exist elsewhere.

Angus notes that Mitel, for example, is selling into Great Britain and looking toward Third World nations. Similarly, Northern Telecom sells a good deal of equipment to Asian and Japanese concerns and is launching a major marketing effort in China.

Even these efforts, however, cannot ensure that the large manufacturers will maintain their leading positions. To remain competitive, all PBX vendors will need to offer substantial data processing capabilities within the next two years.

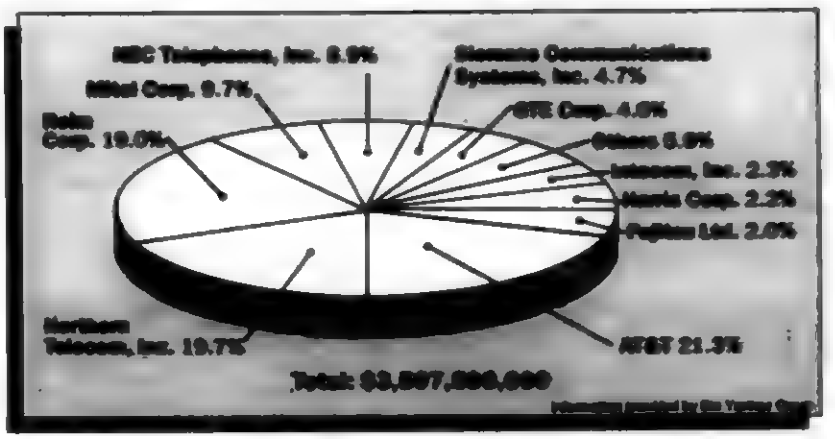
Northern Telecom, for example, needs to develop data processing capabilities or acquire a company that already supplies them, Angus says. "Northern Telecom could do well enough in pure voice, but they would no longer be viewed as a key player."

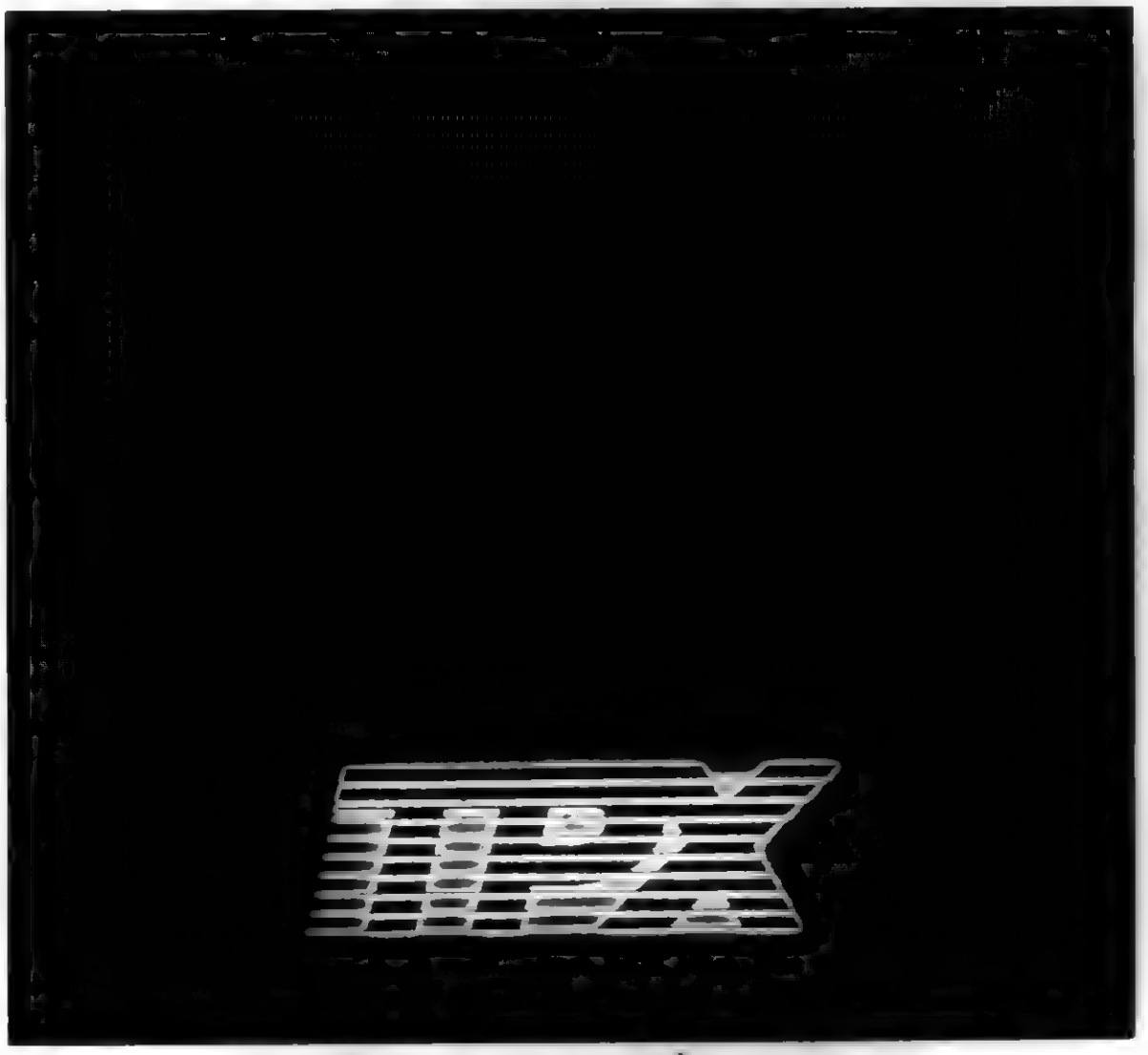
The growing importance of voice/data integration does not bode well for the smaller manufacturers, either. "Many of the smaller companies, including those who claim to have a terrific product, will go out of business," Angus says. "Without an enormous amount of capital, no company — no matter how terrific its product — can survive."

A number of small manufacturers have sprung up recently, especially in Massachusetts, a state that Angus claims is to telephone manufacturers what California is to religions. "Anyone who owns a garage there and can think of a short, snappy name ending in 'X' starts a phone company and announces that he's invented the greatest new architecture since Bell."

Then the entrepreneur finds venture capitalists, who raise $3 million for him, and he thinks he's got it made. But $3 million is nothing, Angus points out. "The big guys throw that much away on memo pads." The best a small company can hope for, he says, is that its technology is good enough to attract a big buyer. ■

PBX MARKET SHARE: VENDORS' PORTIONS OF A $3.6 BILLION PIE





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MIS likely to control PBX

If newcomers to integrated voice/data private branch exchange networking follow the leaders in the field, MIS departments will wrest control of the corporate PBX from communications groups — but only after some messy, disruptive turf wars.

Within firms that have integrated the management of voice and data, MIS has typically come out on top. Most firms, however, have yet to reach that point.

In theory, many corporations' voice and data managers integrate their efforts. But in practice, the situation is another story altogether, most observers agree. "They still don't talk to each other," says Ian Angus, president of the Angus Telemanagement Group, Inc. in Toronto. "Turf protection is getting in the way of solving problems."

Analysts also agree that the outcome of the current battle will shape the direction of the PBX network. Since MIS seems likely to take control, MIS will probably determine the future of the PBX. Systems professionals will see that the switch eventually functions as a core provider of business applications rather than as a simple voice switch.

Given the responsibility and opportunity that PBXs can bring, MIS managers should take it upon themselves to learn about voice traffic and PBX architectures, Angus suggests, and should try to get involved in any PBX acquisitions that their firms undertake.

— JOHANNA AMBROSIO

Continued from page 48

ued health. "The market is in a transitory stage, so size and present positioning speak only for today," Orazine says. Angus agrees that even users who choose to go with a traditionally stable vendor cannot consider themselves totally safe.

Despite the market's uncertainty, though, most large, forward-looking users have at least laid the groundwork for voice/data PBX functions — just in case network technology should come to center on the PBX switch.

The market will remain unstable for at least five years, according to Orazine, and many users will want to upgrade their switches before the storm settles.

To ease nervous MIS and communications managers, many consultants suggest the following precautions:

- Be as sure as possible that the vendor is a long-term player by ascertaining its market strength.
- Get recommendations from other users.
- Insist on an open architecture that can continue to grow should the vendor go belly up.

An open architecture is one of the most important features for users to look for, according to Orazine. "Make sure the PBX can interface with other vendors' equipment, so you won't be locked in," he says.

Careful preparation now will pay off especially well if the PBX becomes the standard hub of corporate communications. And many observers feel it will.

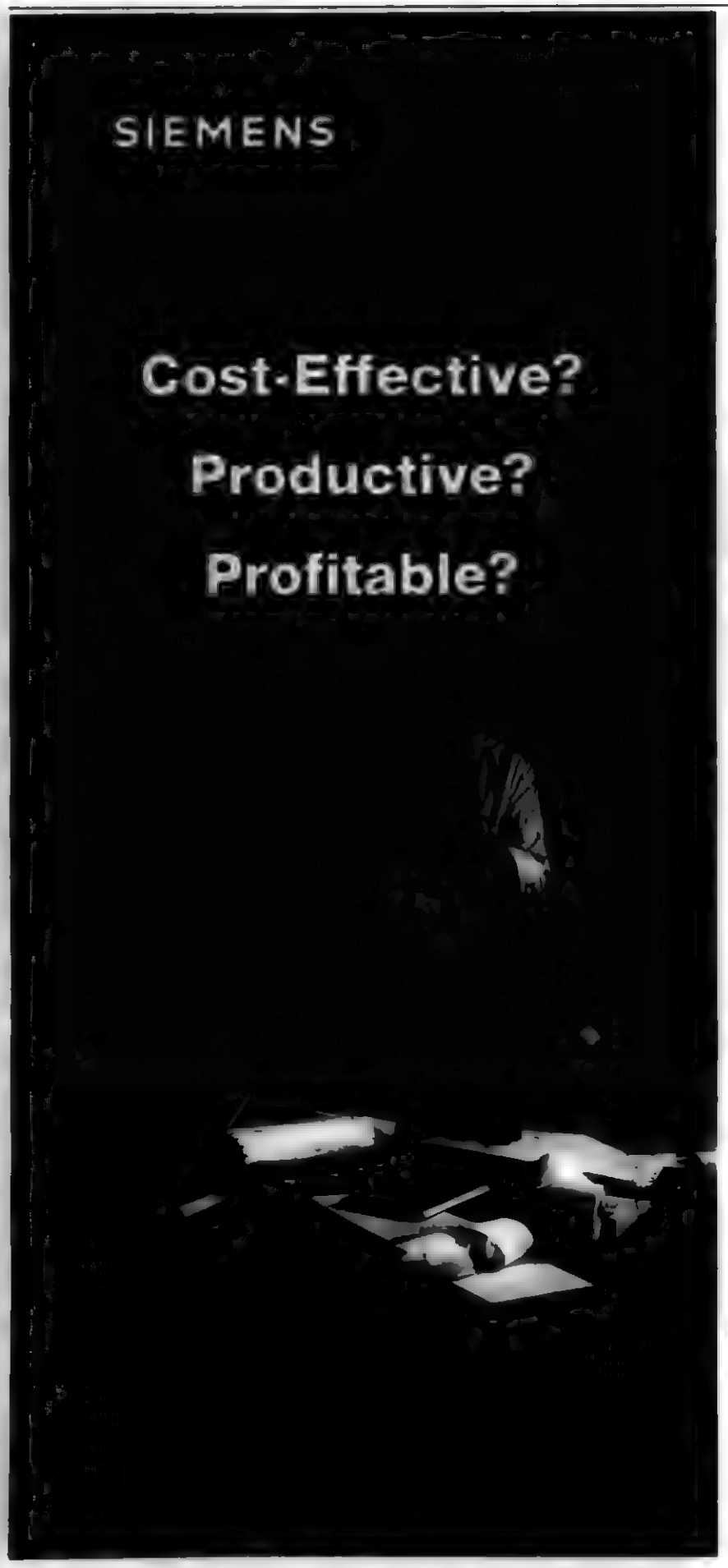
Vanguard's McDowell, for example, expects the PBX to take over as the controller of almost all information that enters, leaves or is routed around a corporation. "In the future, we'll call the PBX an integrated office switch," he says.

In this scenario, the voice/data switch would be just as important to a firm as computers are today. The PBX would assume the role of a giant traffic cop, switching voice, data, text, graphics and video. Users would need to manage and control only one network rather than two, and they could reap the benefits of the ensuing economies of scale.

Other observers, however, look to the future and see a more familiar scene: voice traffic traveling over PBXs, data traffic taking the traditional routes.

"I'm a great fan of technology," Peat Marwick's Becker says, "but I'm pessimistic in this case."

One thing is certain: The PBX has already begun a transition. Where it will end up, no one knows for sure. ■



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In Depth

Paper chase: Keeping up with office productivity

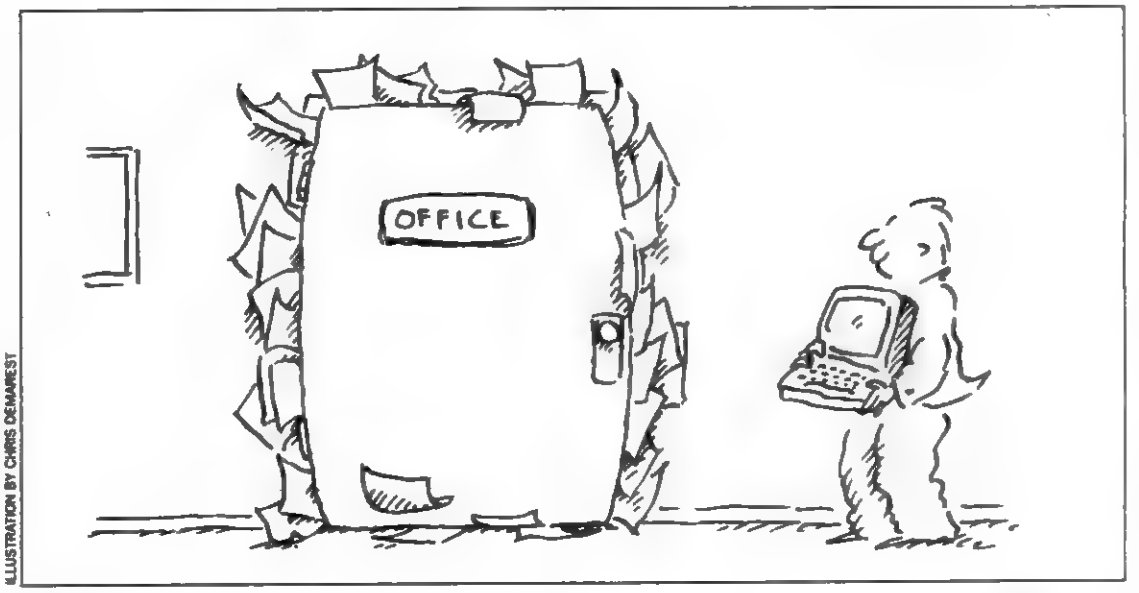


ILLUSTRATION BY CHRIS DEMAREST

A company can compete successfully only if its office workers are properly equipped to use the best available technology to help them do their jobs. Waiting until 1990 — or tomorrow — to start the process may be too late.

About the author

Yourdon, chairman of Yourdon, Inc., is author and advisor for the Yourdon Press Computer Series, now published by Prentice-Hall, Inc., Englewood Cliffs, N.J. This article is excerpted from his newest book, Nations at Risk *(Yourdon, 1982).*

By EDWARD YOURDON

There are several major arguments in favor of office automation, all involving different aspects of productivity. For example, we know that office expenses currently account for approximately 25% of the cost of doing business in most companies; by the end of the decade, the figure will rise to approximately 45%. Increasing salaries, a decreasing work ethic and the continuing shift toward a service-oriented, information-based economy make it more and more important to improve the effectiveness and efficiency of office activities.

While industrial productivity increased by 90% in the 1970s, office productivity increased only 4%, and costs doubled. Clearly, there is a need for improved productivity.

Many organizations are also finding it increasingly difficult to hire competent clerical and administrative people, thus making it necessary for the few competent administrators to be more productive and for managers to do more and more activities for themselves.

There once was a time when a manager could dictate a letter, give it to a secretary to type and expect the secretary to spell the words correctly. Now it is more common for the manager to correct the secretary's spelling; indeed, the manager often finds that it is faster if he types the letter himself.

I came to this conclusion several years ago when my secretary asked me if I knew the ZIP code for New Zealand. When I explained, as patiently as I could, that New Zealand was not a state like New Mexico, she looked at me blankly and asked if I knew the area code so that she could call information and get the ZIP code. She has, thankfully, moved on to greener pastures. I have been typing my own letters ever since.

Coping with correspondence and commuting

Letters, unfortunately, suffer another indignity after being mistyped by the modern secretary — the (shudder) post office. There once was a time when the post office was a relevant, useful, important part of society; that time ended, by my reckoning, around 1963. How American business has managed to survive dealing with the post office for the past 20 years is a mystery to me.

Why anyone would willingly use the post office today is an even greater mystery. Electronic mail (E-mail), high-speed communicating printers, intelligent copiers, facsimile copiers and a variety of other telecommunications products make the post office an increasingly irrelevant artifact of society. This is especially true for communications between business organizations (as opposed to communications between business organizations and the retail consumer).

Approximately 75% of business-to-business correspondence consists of documents generated by the sender's computer and processed by the receiver's computer. It is an act of madness to put the post office between those two computers.

Business organizations are also finding that transporting workers from home to office is costing more money. In addition, the commuter transportation infrastructure is getting more overcrowded and closer to collapse in many cities. If it costs an employee $200 a month for a commuter

train ticket, his employer pays for it, usually in the form of a salary high enough to make the job attractive. And if the train is delayed for an hour every day during the winter season, the employer pays for it, usually in the form of decreased productivity, sometimes in the form of increased absenteeism.

An attractive alternative is telecommuting: Let the employee work at home. To do this requires not only a personal computer in the home but also a companywide infrastructure of electronic mail, telecommunications and other OA technologies.

Office automation will eventually cause a major decline in, if not the ultimate demise of, a time-honored tradition — the business trip. Long-distance travel is becoming more expensive; more important, it is increasingly regarded as a time waster. A businessman often finds that he spends a full day traveling to a meeting and a full day traveling back; this overhead for a one-hour meeting is extremely costly.

Though video teleconferencing technology still has not been accepted by American business, it looms on the horizon as the replacement for the business trip.

There are some important secondary benefits that come with OA. They include the following:

- Reducing "media transformations" — extraneous dictation, converting a rough handwritten document into a typewritten document and so on.
- Reducing "shadow" functions — time wasters that accompany communications-related tasks but contribute nothing to productivity. The information content of a typical intraoffice business telephone conversation, for example, is about 30 seconds, but it is accompanied by about five minutes of social pleasantries with which both parties would often happily dispense.
- Eliminating some functions altogether — for example, the mail room.
- Reducing "information float" — rather than waiting three days for a report to be mailed from a branch office to Galactic Headquarters, electronic mail can move the report in a fraction of a second.

Melody Johnson, an observer of the OA movement and an analyst at Kidder, Peabody& Co., has remarked that "the office of the future will always be in the future." Indeed, our vision of the automated office in 1986 is likely to be very different from our vision in 1990. Much of our 1990 vision will depend on just how much the technology of telecommunications, computer hardware and computer software — especially such things as artificial intelligence — has managed to advance.

Today, OA generally includes — in addition to the standard collection of typewriters, dictation machines, duplicating machines and so on — four computer-based technologies: word processing, electronic mail, electronic filing and video teleconferencing. Exactly which one is most important depends on the nature of the business and the activities of the professional workers (see story next page).

In general, information retrieval seems to be the most common use of OA technology at the present time. A Honeywell, Inc. survey of some 700 knowledge workers in September 1984 found that knowledge workers use office automation technology to communicate with other computer users (43%), for word processing (50%), to analyze numbers or financial information (73%) or to retrieve information from data bases (82%).

> ***Knowledge workers in the U.S. were paid $400 billion in 1979; clerical workers received only $125 billion. It doesn't take a genius to understand that a 15% improvement in managers' productivity would save a lot more money than a 15% improvement in that of their secretaries.***

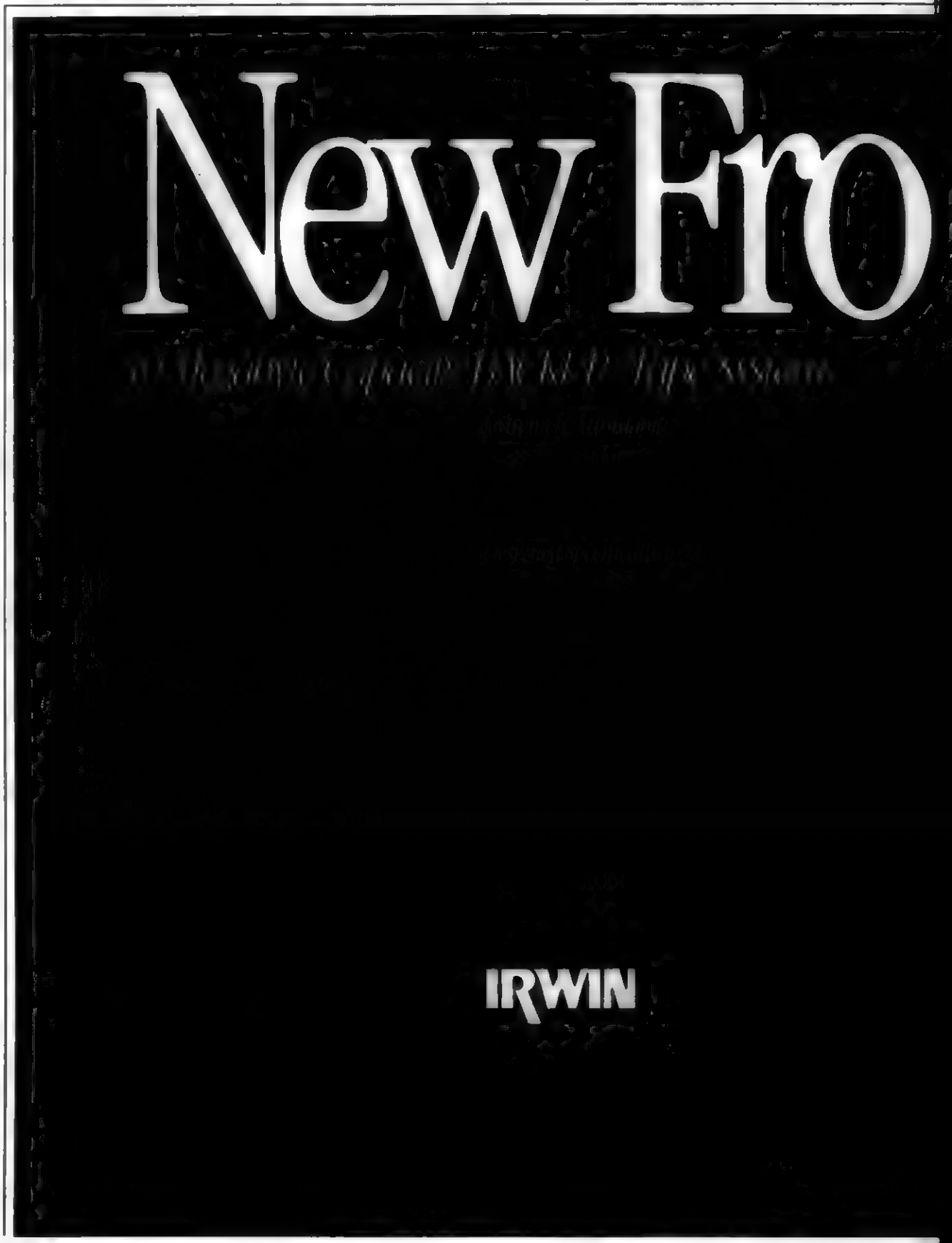
Word processing

Word processing is the one part of office automation that is widely accepted and reasonably well understood. It is also the OA technology with the least leverage because it is used by clerical workers more than by managers and other highly paid professional workers (the so-called "knowledge workers").

A study by Booz Allen & Hamilton, Inc. concluded that knowledge workers in the U.S. were paid $400 billion in 1979; clerical workers received only $125 billion. It doesn't take a financial genius to understand that a 15% improvement in productivity on the part of managers would save a lot more money than a 15% improvement on the part of secretaries.

Nevertheless, it is the secretaries who have received most of the OA technology so far. The market for simple, clerical word processing systems is 60% saturated already; the market for OA technology for managers and professionals is only 20% saturated. According to Honeywell's survey of office automation trends, 75% of the knowledge worker community has access to word processing, and 95% of those with access use their word processors.

On the other hand, the same survey showed that nearly eight out of



10 knowledge workers with access to word processing equipment still delegate word processing work to secretaries or assistants.

Electronic mail

Electronic mail is a simple concept, but it represents as important and powerful a form of communication as the telephone. The familiar old telegraph system and its newer cousin, telex, could be regarded as forms of electronic mail, but these relics are not as important as the computer mailbox form of electronic mail. The latter form requires a dumb terminal or personal computer on the sender's desk and receiver's desk; telephone lines link the terminals to a central computer, which can store and forward messages.

Actually, electronic mail (of the computer mailbox variety) has existed since the mid-1960s, when time-sharing and on-line computer systems first began to appear. However, they were generally available only to a small community of end users who had other reasons for using the computer.

For example, airline reservation clerks who accessed the terminal all day long found that in addition to their normal transactions, they could send electronic messages to other airline reservation clerks.

Programmers in an organization's MIS department often had the ability to communicate through terminals in addition to their normal software development activities.

But now the concept is spreading beyond these special interest groups. We are beginning to see organizations in which everyone has access to a computer terminal for sending and receiving messages. Indeed, to really make the concept work properly, a large number of employees need a terminal at home as well as in the office, and there should even be portable terminals for the employees who need to travel away from the office.

Conceptually, there is nothing complicated about electronic mail. The sender simply indicates the name(s) of the person or persons to whom he wants to send a message and then proceeds to type the message itself.

Of course, there are many elaborations upon this basic theme; for example, the sender can create different mailing lists so that messages of one kind will automatically be sent to everyone in the marketing department.

Some electronic mail systems have a return-receipt-requested feature so that the sender can tell exactly when the receiver got the message. And receivers generally have the option of responding immediately to their electronic mail, printing it on paper, rerouting it to someone else, filing it for later retrieval and so on.

A 'cold' medium

Though simple in concept, electronic mail is a fundamentally different kind of communications medium from the telephone. It is, for example, a "cold" medium: The receiver judges whether the sender was in a good mood or a bad mood when he composed his message. The message does not carry the nuances, the facial expressions or the intonations that a verbal, face-to-face conversation carries. Electronic mail sent from the boss to a subordinate at 2 a.m., on the other hand, does carry with it an unspoken message: If the boss is working at 2 a.m., the subordinate thinks, then maybe I should be, too.

Within a single organization, the electronic mail facilities are usually provided by the MIS organization or by an OA group. The computer may be the same one that runs the accounting programs, but it is often a separate machine dedicated to communications.

For business-to-business communications, it is more common to use a commercial E-mail service: General Electric Information Services Co., ITT, Telenet Communications Corp. and MCI Communications Corp. are the better known

mirwin!

Prime targets for automation

Exactly which office automation technology is most important depends on the nature of the business and the activities of the professional workers. Communications consultant Walter Ulrich points out that the average professional worker spends his time in the following ways:

1% to 5%: Document creation. An obvious candidate for word processing.

5% to 8%: Thinking, planning, analyzing. "Outline processor" capabilities of some word processing systems can help, as can spreadsheet programs and other software packages found on personal computers. Doing this work at home — away from the office — can vastly increase the effectiveness of the planning work; electronic mail and home-based personal computing facilities make this feasible.

15% to 20%: On the telephone. This could be shortened with electronic mail.

20%: Distributing, filing and retrieving documents. Electronic mail and electronic filing could help here.

40% to 45%: Face-to-face meetings. These could be more efficient through video teleconferencing and computer-based teleconferencing.

— EDWARD YOURDON

commercial providers currently.

Electronic mail, as described here, is not yet a big business. In comparison with the 500,000 Telex machines that generate $700 million in annual revenue for Western Union Corp. and the 470,000 facsimile transmission machines that generate $650 million in revenue for the telephone companies, there are only 225,000 subscribers — generating less than $150 million in revenue — for the commercial E-mail services. The U.S. Postal Service still dwarfs all of these, with revenue of $24.4 billion in 1983.

However, E-mail's future looks bright, and it is obviously a bandwagon that progressive companies are jumping on. One consulting firm, International Resource Development, Inc., estimates that the $150 million business could grow to $5 billion in annual revenues by 1992. Another firm, International Data Corp., estimates that the number of electronic mailboxes is growing at a rate of 68% annually and that the base of 225,000 mailboxes will increase to more than three million by 1987.

Communications consultant Walter Ulrich believes that the E-mail market is doubling every year and will reach the level of nine billion messages per year by the end of the decade. Another firm, Eastern Management Group, estimates that by the end of 1983, 18% of American businesses had some form of computer-based electronic communications, and another 20% were actively planning for its implementation.

E-mail growth factors

One reason for the rapid growth of E-mail is simple economics. Five years ago, it cost as much as $4 per message to send electronic mail; by 1984, the cost had dropped to 86 cents per message and to as little as 5 to 7 cents for in-house systems.

The second important reason is the widespread and continuing proliferation of personal computers. By 1987, more than 16 million personal computers will be installed in offices, and 11 million of those will have communications facilities.

Electronic mail is similar to the telephone in one important respect: Until both sender and receiver are subscribers on the same network, they can't communicate. In fact, we can carry this concept one step further. Unless everyone in the organization has immediate access to a personal computer or a terminal connected to an E-mail facility, electronic mail will remain a relatively unimportant fad. This was its fate during the 1960s and 1970s, when only the programmers in the MIS department could use it.

But when there is a terminal on the president's desk and on the janitor's desk and on the desk of everyone in between, then it becomes a powerful new dimension of communications. The janitor can send a message to the president, even though he might never have the opportunity to meet him in person, and the president can send a message to the janitor. Horizontal communications — as opposed to vertical communications, which travels up and down the organization's formal chain of command — is an immediate consequence of electronic mail. Some will find this rather frightening, but it is like a breath of fresh air in most companies.

This universal access to E-mail exists only in a handful of small companies today. Even the computer manufacturing companies, with access to computer hardware at cost, have not yet established a 1:1 ratio of terminals to employees. Digital Equipment Corp., for example, has 25,000 employees generating an estimated 100,000 messages per day on an in-house electronic mail system; another 20,000 are waiting for the chance to join the system. IBM, certainly one of the most efficient organizations in the world, expects to have a ratio of 2.2 employees per computer terminal by 1986. Most other technologically progressive companies — the leading banks, for example — have only a few thousand employees on their E-mail systems.

Steve Caswell, editor of the newsletter, "Electronic Mail and Message Systems," summarizes the possibilities and the future of electronic mail quite well by saying that it ". . . will open up a whole new world. I don't know how fast it will catch on . . . habits change slowly. But over a 10- to 20-year time frame, it may rival the telephone."

For anyone whose business requires the communication of words, data, concepts, ideas, proposals and contracts — which is just about all of us — these are important words to consider. The concept of running a business today without a telephone boggles the mind; 10 years from now, the concept of running a business without electronic mail will appear equally insane.

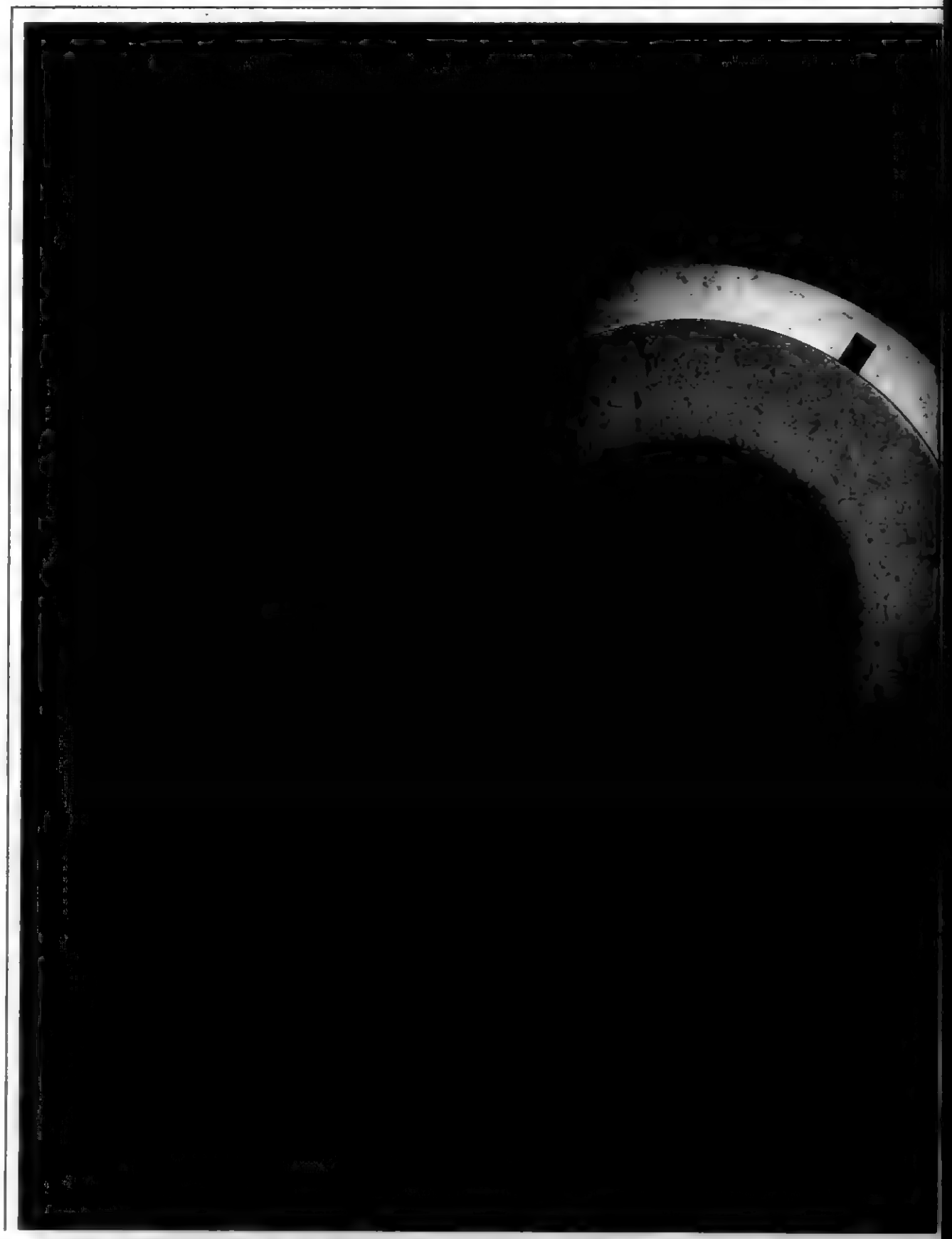
Electronic filing

Electronic filing is an obvious adjunct to personal computers, word processing and electronic mail. One needs the facility to store, retrieve, duplicate and transmit documents from one workstation to another.

Ten years ago, this was a rather novel concept: If one had any form of office automation, it consisted of a dumb terminal connected to a computer that never had enough storage capacity.

Today, the situation is fundamentally different. Mainframe computers now have, in the typical cases, between 10 times and 100 times as much storage as before.

More important, personal computers offer users their own storage space, under their own control. Nobody likes to keep copies of a confidential document on a mainframe computer for which security is suspect. Floppy disks and Winchester disks offer the combination of




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23 Systems Manager/Systems Analyst
31 Manager/Supervisor/Programming
32 Programmer/Methods Analyst
35 OA/WP Director/Manager/Supervisor
38 Data Comm./Network Systems Mgmt
41 Engineering/Scientific/R&D/Technical Mgmt
51 Manufacturing/Sales Reps/Sales/Marketing Mgmt
60 Consulting/Management
70 Medical/Legal/Accounting/Mgmt
80 Educator/Journalist/Librarian/Student
90 Other ____

3 COMPUTER INVOLVEMENT (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor or consultant
A. Mainframes/Supermins
B. Minicomputers/Small Business Computers
C. Microcomputers/Desktops
D. Communications Systems
E. Office Automation Systems

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security and convenience: A single floppy disk can store several hundred pages of information and can be easily locked away in a desk drawer.

The need for electronic filing can be understood by looking at one statistic: American business now deals with 400 billion paper documents; that number is growing by 70 billion documents a year. We are in danger of drowning ourselves in paper.

Today, most organizations have not connected the filing capabilities of PCs to the microfilm and microfiche equipment used to store massive quantities of documents — documents that were generally not created by the organization's computers.

> ***American business now deals with 400 billion paper documents; that number is growing by 70 billion documents a year. We are in danger of drowning ourselves in paper.***

Teleconferencing

Video teleconferencing is the only OA technology that I have my doubts about. The reason is quite simple: It violates what author John Naisbitt calls the "high-tech/high-touch" principle. Putting everyone in a conference room surrounded by bright lights and cameras makes them feel uncomfortable. Projecting their images onto a TV screen invites the inevitable comparison with TV actors and news reporters; most of us don't do very well in that kind of comparison.

Video teleconferencing requires the simultaneous participation of all parties, which is a terrific nuisance when the participants are in different time zones. The equipment is expensive, which means that the teleconferencing facilities have to be reserved in advance.

Figures compiled by Honeywell in its 1984 survey of knowledge workers provide an interesting commentary. While 53% of the respondents had video teleconferencing facilities available in their organizations, only 30% rated the technology "very useful." By contrast, 75% of the group had access to word processing, and 77% rated it "very useful." Similarly, electronic mail was judged "very useful" in the same proportion that it was made available: 40% had such facilities available, and 41% said it was very useful. It would appear that video teleconferencing is oversold at the present time.

The time will come in about five years when our computers and our telephones are married together so intimately that we will no longer view them as separate objects. The low-resolution, primitive computer display screens that we use now will have been replaced by high-resolution color graphics screens substantially better than current TV screens. The bandwidth of our telephone lines will have improved to the point that we can transmit voice, data and graphics images in real time.

We will all have such a device on our desk and another at home and another in our car (or whatever we use for transportation). Then we will have the technology base for videoconferencing; it will be another five to 10 years after that before the business culture learns how to use that technology.

In the meantime, the only form of teleconferencing that is technically feasible and attractive is text-based teleconferencing using electronic mail facilities. The only difference between this form of teleconferencing and standard electronic mail is the degree of sophistication.

Teleconferencing facilities allow a participant to join a conference at any point and to see a record of previous communications on the conference topic between other participants. Some of the commercially available teleconferencing facilities, such as those offered through Compuserve, Inc.'s Compuserve and Readers Digest Association, Inc.'s The Source, allow participants to use pseudonyms (on the theory that anonymity encourages open, candid discussions) and private exchanges between participants in addition to the broadcast form of communication.

Problems with office automation

Why has office automation caught on so slowly in the business world? Probably the biggest single reason is that, as Steve Caswell says, "Habits die hard." Consultant Louis Nauges has compiled a list of typical arguments — or, in his opinion, alibis — for not using office automation technology. They include the following:

- Automation is for blue-collar workers, not white-collar workers.
- It's not for me, it's for others.
- Nobody else is doing it.
- We don't know who to put in charge of OA.
- Our managers will bicker over control.
- Let's first define an OA plan.
- Our managers will do the work of secretaries.
- Managers will waste their time with OA tools.
- What will our managers do with the time they save by using OA tools?
- We have always worked this way.
- It's not the right time.
- Our people are not ready for OA.
- We're waiting for the ideal tool.
- The next generation of OA tools

will be better.

- OA is too expensive.
- Tomorrow, OA will be less expensive.
- I don't know how to justify my OA investment.

There are, of course, individual cases where these reasons are valid; you must be the judge of that within your own organization. However, the important thing to remember is this: Sooner or later, office automation will be an essential ingredient in every business. That much we can all agree on, just as a consensus gradually developed that every office worker should have a telephone.

The only question is whether your company will begin installing OA technology today or whether it will wait for another few years until some magical revelation indicates that the time has arrived.

Today, nobody bothers to cost-justify a telephone; it's accepted as a universal standard. No white-collar worker in his right mind would work for a company in which the corporate policy forbade telephones for its workers. Within five years, the same will be true for electronic mail, electronic filing, word processing and personal OA workstations. So, the important question is not whether your organization has OA today but whether it is making plans and commitments to ensure that it will be there within five years.

The economics of office automation

In many organizations today, OA is still regarded as too expensive. But the economics are as follows:

- The average well-equipped OA workstation costs $10,000. You can buy a dumb terminal for about $300 if you already own a time-sharing system or mainframe with which to connect it. You can also spend $30,000 to $40,000 for a high-powered scientific/engineering workstation with high-resolution graphics capabilities and 100M bytes of disk storage. But will $10,000 buy enough computing power to keep the typical office worker happy?
- A manager/professional with a salary of $40,000 costs his organization $40 per hour (assuming an overhead of 100%).
- Accounting practices in most organizations will allow the workstation to be amortized over three years.

With these economic assumptions, the bottom line is this: If the workstation saves the manager/professional 1½ hours per week of work (or about 3.75% of the working week), it has paid for itself. Circumstances are obviously different in every organization, but it's hard to imagine that the combination of word processing, electronic filing and electronic mail couldn't save at least that much.

However, OA for managers and professionals is really practical only if virtually the entire office has it. Word processing can be used by an individual manager/professional with his own solitary workstation — but such a scenario is almost the same as for a manager who has the only telephone in the office.

Need for speed

The first typewriter was built in the 1700s and demonstrated to the queen of England. However, it was more than a century later, in 1868, that C. L. Sholes patented the device in the U.S. Two businessmen bought the patent rights and demonstrated the typewriter at the Chicago Exposition in 1870. Business organizations were slow to adopt this new technology, though, feeling that correspondence demanded the personal touch of a handwritten document.

It was not until World War I that the demand for rapid, voluminous output overcame this reluctance. And though the electric typewriter was first demonstrated before 1920, another 20 years went by before it caught on. Even now, we are left with a vestige of century-old office automation technology. The standard Qwerty keyboard, which was designed to slow down typists and thus prevent the keys from jamming, is about 30% slower than the seldom-used Dvorak keyboard.

The business office, for a variety of reasons, is slow to change and slow to adopt new technology. A century ago, we could afford this: Most of the resources of an organization were invested in its factories, its raw materials and its machinery. But today, a century after the invention of the typewriter, we can no longer afford to move slowly.

The office is at the center of the information-based competition for economic supremacy. A company can compete successfully only if its most important assets — the information workers in the office — are properly equipped, properly supported and properly trained to use the best available technology to help them do their jobs.

To do this will be difficult: American corporations currently invest only $2,000 to $3,000 per office worker for equipment, and the figure will have to climb to $10,000 to $15,000 within the next five to 10 years to provide proper support. Very few organizations have done this already; many others (especially the larger ones) have begun the process and expect that it will take as long as 10 years to finish.

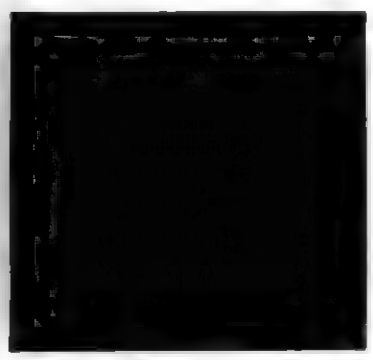
Somewhere in the 1990 to 1995 time frame, the process will be complete within industry. Those with the "office of the future" will have survived, and those still wedded to the technology of telephone and typewriter will be filing for bankruptcy. For any company of a moderate size — with annual revenue of, say, $100 million or more — the window of opportunity is rapidly slamming shut. It will be far too late to start the office automation process by 1990; it will probably be too late by 1988, and it could be too late tomorrow. ■

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In Depth

The cost of an expert

To quantify the value — and potential savings — of an expert system in a corporate environment, MIS should first understand how much an expert costs the company.

By LEILANI ALLEN

Increasingly, corporations are turning to technology to improve their competitive edge. Banks, airlines, retail stores and other large companies are finding innovative ways to use computers to offer new products and services, to identify and exploit new marketplaces and to improve decision making in highly competitive situations.

One of the key technologies in the information systems field during the next decade will be the development and commercial application of expert systems. The technical and economic obstacles to widespread use of expert systems have largely been overcome, and the costs associated with expert system development and use are also dropping sharply. One of the key issues now confronting information systems executives is the need to quantify the value of such a system for their particular corporate environments.

To do so requires, first of all, a clear-cut understanding of how much an expert actually costs. Only then can we determine how much might be saved by distributing, supplementing or perhaps replacing this expertise with sophisticated software. Only then can we make valid judgments on how best to capitalize on the company's most precious resource — its expertise.



CW PHOTO BY P. CHARLES LADOUCEUR

Knowledge makes the difference

Expert systems engineering is an outgrowth of the academic research field of artificial intelligence. AI, simply defined, is a branch of computer science that concerns itself with techniques of symbolic, rather than numeric, processing.

AI has an enormous variety of subfields, ranging from natural languages to research in visual and voice recognition and other human-machine interface technologies. On the hardware side, AI has spearheaded Japan's fifth-generation project to develop supercomputers, which are fundamentally knowledge processing machines.

The area of AI that has garnered the most attention is expert systems, also called knowledge systems. An expert system is software that codifies the facts, rules and heuristic reasoning making up the knowledge and experience base of human experts and makes them available to other individuals for problem solving, instruction or diagnosis. Currently, dozens of expert systems are actively in use around the world (see chart page 63), for everything from oil exploration to medical diagnosis to computer configuration.

What is an expert system? How is it different from conventional systems? In traditional data processing systems, the specific application expertise is encoded in both the program and the data. In expert systems, the expertise is encoded in the data only — the knowledge base. The program structures are separate, forming the inference engine, and the data structures can be changed independently of the program structures. Thus, a new set of data structures can use an existing set of program structures.

An expert system used to prepare income tax forms might, for example, be used to generate other financial forms as well, just by changing the data in the knowledge base — not the program in the inference engine.

Hurdling obstacles

Many critics charge that artificial intelligence plays a small role outside of scientific or engineering environments and that its role in business is extremely limited. These arguments typically come from one of three bases:

Philosophical — those who question the foundations of AI by refusing to believe that machines can "think." A recent example is *Mind Over Machine* by Hubert and Stuart Dreyfus (Macmillan: The Free Press, New York, 1986). The authors argue that the mechanistic model of human reasoning frequently employed by AI researchers is inadequate for describing higher level thought processes.

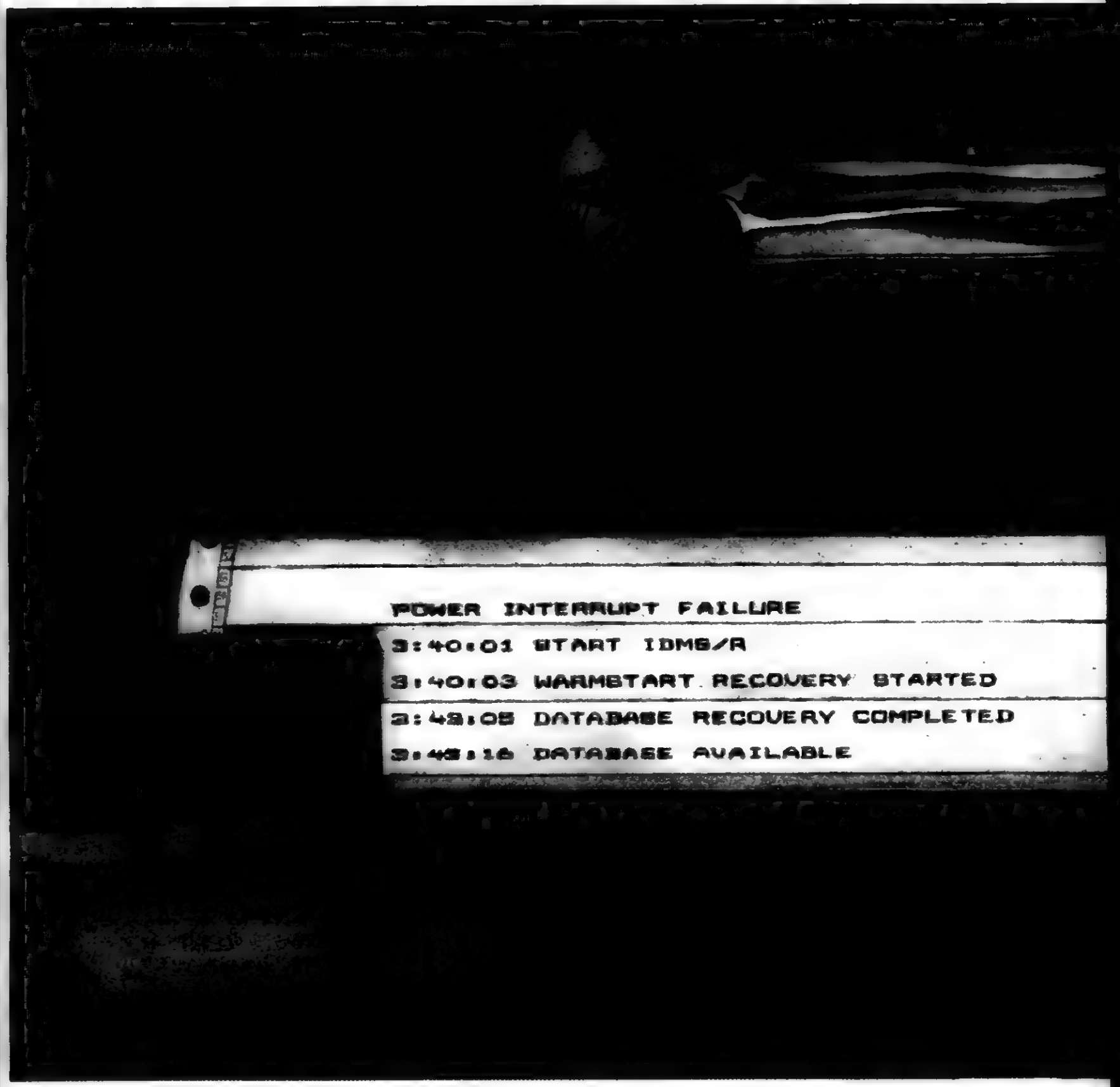
Technical — those who doubt that current or future hardware and software systems will ever have sufficient capabilities to deal with the truly interesting problems or who believe that AI is just conventional programming dressed up in new clothes.

Economic — those who look askance at

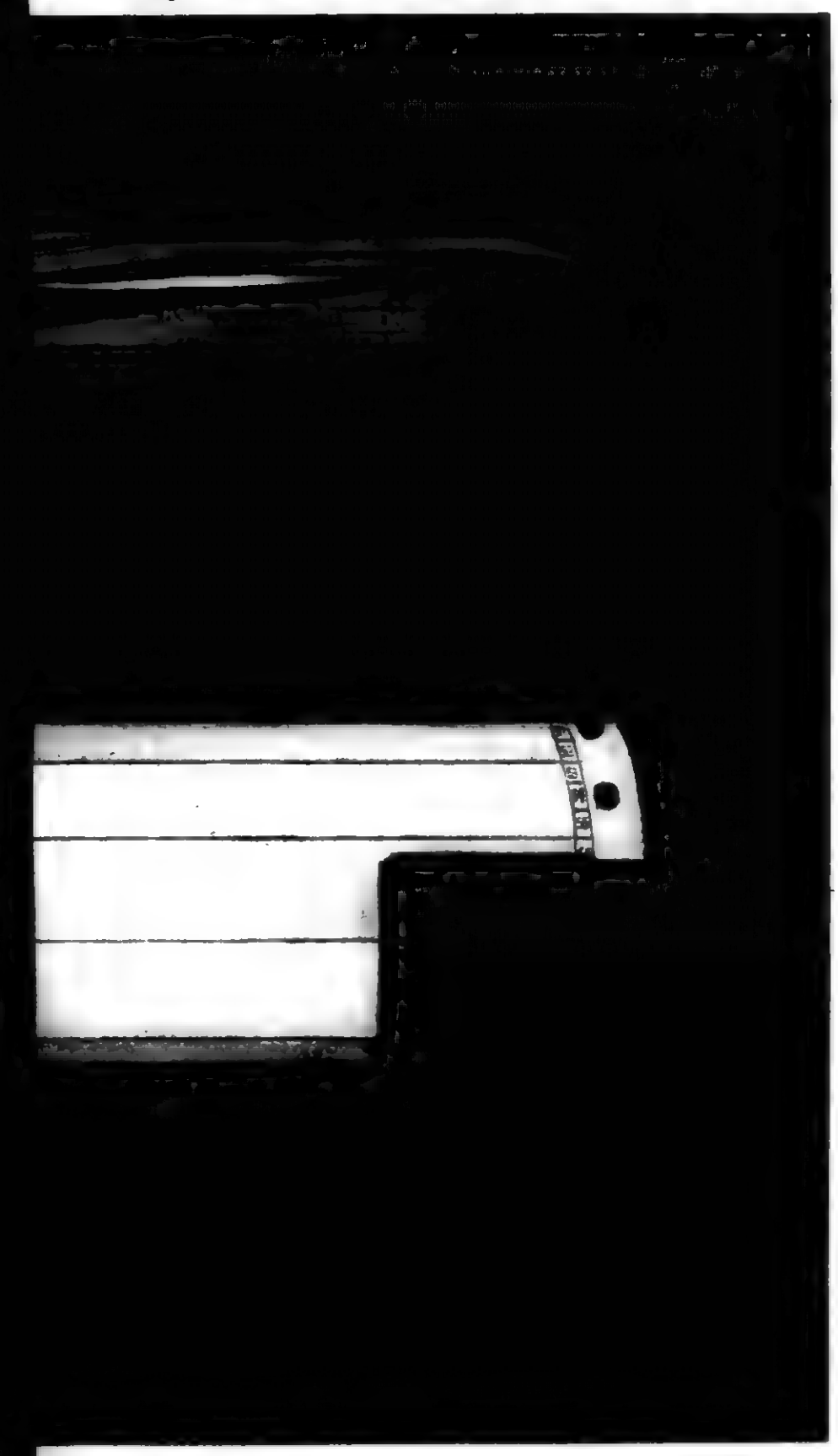
About the author

Allen is president of Knowledge Consortium, an Oakland, Calif., firm specializing in information management. She is also the publisher of "Infovoice," an audio cassette-based technology update service.

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the heavy investment required for expert systems and doubt that the payback will ever be realized. Even AI proponents routinely cite development costs of $1 million or more.

Until recently, the key sources of expert system costs were the special-purpose processors that had to be installed for development and production and the high price of knowledge engineers — those rare individuals who extract the knowledge of the subject-matter experts and distill this wisdom in codified form. Today, however, both of these economic obstacles have been minimized. Expert systems are being built to run under conventional operating systems on conventional hardware, including personal computers.

> ***Faith, gut feeling and plain old curiosity are as important as financial viability in determining which technologies succeed or fail.***

On the mainframe side, IBM has developed an expert system, called Yes/MVS, to assist operators in MVS installations with job scheduling and other tasks. It was developed using the LISP programming language running under the VM operating system. A second version of the product will be developed using PL/I and will run under native MVS as well. Specialized AI front-end processor interfaces are also being developed for conventional mainframe computers.

On the micro side, firms are enhancing the capabilities of the IBM Personal Computer AT and compatibles with Intel Corp. 80286 chips. The projected introduction of Intel's 80386 chip in 1987 will represent yet another leap forward in allowing expert systems to run comfortably on standard equipment. A hybrid solution is to use programs such as Intellicorp's Knowledge Engineering Environment PC-Host to keep part of an expert system on the mainframe and part on a Personal Computer.

Whether expert systems and other AI applications run as well on conventional hardware as they do on special equipment is not really the issue. The point is that they can run on a firm's normal installed base of machines.

The other cost factor, software development, is dropping dramatically because of the introduction of low-cost AI development tools for both mainframes and personal computers. These systems, called shells, enable skilled programmers (and sometimes subject-matter experts themselves) to develop their own expert systems directly. Thus, the economic picture is changing rapidly and opening the door to wide-scale commercial application of AI technology.

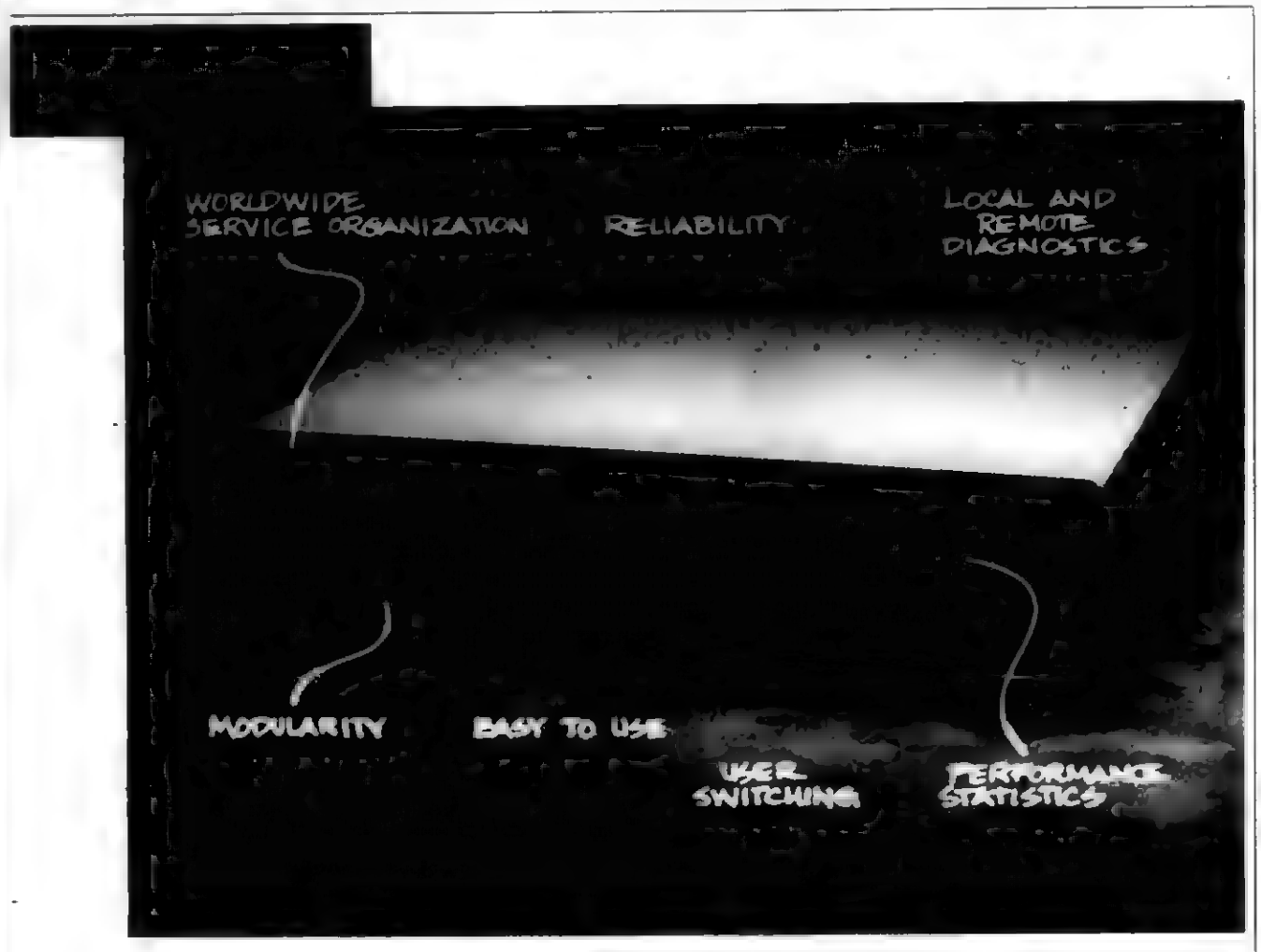
The cost of an expert

Most of the expert systems currently in use were developed in medical or engineering applications. I chose the latter category to investigate because I felt there would be more uniformity regarding costs. For simplicity's sake, I concentrated on engineers working in the electronics industry. The cost categories I took into account include the following:

- Salary.
- Benefits.
- Recruitment/turnover.
- Profit sharing.
- Performing bonus.
- Travel.
- Training.
- Facilities.
- Support.

Salary. The American Electronics Association in Palo Alto, Calif., publishes an annual salary survey of its member companies, subdivided by region and company size. I assume that only larger companies (for example, those with more than 500 employees) would be likely to implement an expert system. I further assume that the expert in question would have at least 20 years of experience.

The survey average



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yielded an annual salary for hardware engineers of $54,000; software engineers at similar levels of experience had an average annual salary of $52,200. In verifying the accuracy of this figure with several firms, I found the estimate to be, if anything, slightly conservative.

Benefits. Salary alone does not tell the story. Radford Associates of Santa Clara, Calif., publishes an annual benefits survey of Silicon Valley firms, almost all of them in the electronics business. The 1984 survey indicates benefit costs, including insurance, time off and retirement plans, that come to $16,524, or 30.6% of base salary.

Recruitment. The Radford survey revealed the average recruitment cost per hire for exempt, nonmanagement personnel to be $3,500. In addition, most of the companies surveyed paid referral bonuses averaging $580 per hire. Total recruitment cost was thus $4,080.

Another aspect to this issue is replacement costs. For the companies participating in the survey, the turnover cost for our skilled engineer was approximately 30% of the payroll cost, or $16,200 on the base salary in question. Assuming that the engineer was recruited ($4,080), stayed for five years and was replaced by someone at the outgoing salary level of $54,000 ($16,200), total costs would be $4,056 per year ([$4,080 + $16,200] ÷ 5), or 7.5% of base salary.

Profit sharing. Direct profit sharing was a fairly common phenomenon for the firms in question; for the survey participants, it averaged 7.9% of base salary. For our engineers, this would mean $4,266.

Bonus. Employees of this caliber are also likely to receive a bonus or commissions and royalties on patents or inventions. Such additional payments would not exceed 10% of base salary, or $5,400 per annum.

Travel. These employees are also most likely to be sent on troubleshooting assignments or to conferences and classes. Assuming six three-day trips per year at an average cost of $1,250 ($800 airfare, $150 per diem) yields an additional $7,500 per year, or 13.8% of base salary.

Training. I assumed two professional seminars per year at $1,250 per class plus an additional $500 for books, manuals and periodicals. This comes to $3,000 per year, or 5.6% of base salary.

Facilities. Our experts must have physical facilities to do their work. These can be as modest as a cubicle or as extensive as a laboratory.

Included would be office space (cost per square foot times size), equipment, telephone, furniture, electricity and so on. *Business Week* (Feb. 25, 1985) reported that the national average of office space per worker was 225 sq ft. Cost-per-square-foot figures for office space vary around the country. In the Silicon Valley, monthly rents ranged from 63 cents to $2.45 per square foot, with most locations costing between $1.70 and $2. Premium office space in San Francisco costs $3.08.

Using an average of $2 per square foot per month for office space ($5,400), $2,531 for equipment, $1,200 for telephone service and $1,200 for furniture and electricity, total facilities costs came to $10,331 yearly, or 19.1% of base salary.

Support. An expert of this caliber would likely have direct access to experienced administrative support. The "1985 Radford Salary Survey" found mid-level administrators and secretaries in the San Francisco area averaging $1,492 to $1,515 per month, rounded off to $18,000 per year. Added to this are benefits, profit sharing and facilities costs. I did not assume the administrator would engender recruitment or travel costs or receive performance bonuses over and above profit sharing. If this is the case, the total figure should be increased accordingly.

The secretary's facilities costs would be the same as for the engineer, except equipment costs would probably be lower. I assumed a $4,000 personal computer or word processor amortized over three years plus $500 per year for supplies. This yields an annual cost of $1,833 for equipment. My final assumption was that the engineer in question would only require half the administrator's time. Total support costs add up to $17,492.

The other side of the support question is the amount of money the company must spend to supervise and manage the engineer. After various attempts, I found it impossible to pinpoint to what level of manager this expert would report (to set a base) or how many other employees such a manager would supervise (to set the percentage); these figures should be readily available.

Thus, the total "incidental" expenses come to $68,569, or 127% of the base salary (see chart next page).

Using the cost estimates

How can these figures be used in calculating the value of an expert system? The simple approach is to view expert systems as replacements for human beings. In this case, the value of the system would be the annual employee cost multiplied by the expected life of the system.

However, as H. L. Mencken once observed, "For every problem there is a solution that is simple, neat and

Some expert systems worth the cost

Project/*Author*	Application Area	System Description
Auditor *C. Dungan* *University of Illinois*	Business	Selects procedures to be used by an independent auditor
Taxadvisor *R. Michaelsen* *University of Illinois*	Business	Provides estate planning recommendations for client
R. 1 (later called Xcon) *J. McDermott* *Carnegie-Mellon University*	Computing	Configures the DEC VAX-11/780 computer system
Xcel *Digital Equipment Corp.*	Computing	Extension of Xcon to assist sales people in selecting appropriate computer systems
RAVEL *Xerox Corp. Palo Alto Research Center and Stanford University*	Engineering	Experimental system to aid in the development of very large-scale integration design
Sacon *J. S. Bennett, R. S. Englemore* *Stanford Heuristic Programming Project (HPP)*	Engineering	Advises structural engineers in using the structural analysis program Marc
Orb *T. R. Addis* *International Computers Ltd.*	Fault diagnosis	Diagnosis of faults in computer hardware and software
Ratties *T. R. Addis* *International Computers*	Fault diagnosis	Diagnosis of faults in computer hardware and software
Courtier *T. Wolf, A. Goodman, R. Strong* *Cognitive Systems, Inc.*	Finance	Provides high-quality investment advice for portfolio management to bank customers in Belgium
Prospector *P. Hart, R. Duda* *SRI International, Inc.*	Geology	Aids geologists in evaluating mineral sites for potential deposits
OPIS *M. S. Fox, A. Smith, M. Greenberg* *Robotics Institute, Carnegie-Mellon*	Manufacturing	Experimental system that models, monitors, schedules and manages large projects
Mycin *E. Shortliffe* *Stanford HPP*	Medicine	Diagnoses certain infectious diseases and recommends appropriate drugs
Puff *J. C. Nunz* *Stanford HPP*	Medicine	Analyses results of pulmonary function tests for evidence of disorder
VM *L. M. Fagan* *Stanford HPP*	Medicine	Provides care suggestions for patients needing breathing assistance
Drilling Advisor *E. A. Feigenbaum et al* *Teknowledge, Inc. for IBM-Aquitaine*	Resource exploration	Diagnoses oil well problems and recommends corrective and preventive measures
Genesis *Intelligenetics*	Science	Helps scientists plan and simulate gene-splicing experiments
Dendral, Sweeney *E. A. Feigenbaum et al* *Stanford HPP*	Science	Identification of organic compounds by analysis of mass spectrographs

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wrong." Even the most sophisticated expert system is unable to outthink a human. Moreover, these systems are not yet able to learn or to think independently or creatively. So where might an expert system be profitably employed? There are eight possible approaches: preservation, cost-avoidance, distribution, reassignment, training, supplement, opportunity and competitive edge

• *Preservation.* One of the key difficulties companies find is retaining the expertise of departing employees. An engineer with 20 or more years of experience possesses a vast store of knowledge about how a given system or process works — knowledge that simply cannot be replaced, even if another engineer is hired to fill those shoes. By codifying some of the departing engineer's expertise, the firm can preserve that knowledge to help solve future problems. Campbell Soup Co., for example, recently created an expert system to codify the 44 years of expertise of one of its production engineers.

Calculating the value of the expert system could focus on the cost of the departing engineer multiplied by the number of years the system is expected to be of use. Thus, if the veteran earned $122,000 and the system would be in use for three years, its value would be $366,000. If a more junior engineer was hired to take the expert's place, the calculation would take the pay differential between the two engineers multiplied by the number of years the system would serve as a mentor.

In the most drastic scenario, the whole process or product line might have to be shut down if the expertise were no longer available. In this case, the profits from the process or product would be compared with the cost of developing and maintaining the expert system.

• *Cost-avoidance.* Another way to look at this scenario would be on the basis of cost-avoidance. Would having the expert system mean we could delay hiring the junior engineers for some time? The system's value would then be the junior engineers' costs multiplied by the number of months hiring was delayed.

Another approach would be to calculate the cost of bringing in consulting or training help to supplement the junior engineer's expertise. A third approach would be to focus on the problems themselves and calculate what it would have cost the company to solve the problem if the expert system had not been in place.

• *Distribution.* Cost-avoidance becomes particularly relevant if experts are hired merely to keep the expertise available in different locations. It's far less expensive to ship software around the country than to move families. GTE Data Services, Inc., expects to use an expert system for remote troubleshooting on its long-distance networks.

• *Reassignment.* Suppose it is not feasible or appropriate to replace the expert. It is still possible for the system to add value by allowing scarce expertise to be reassigned from a support role to a development role that would have a greater impact on the bottom line.

For example, one or more product engineers might support a number of sales representatives in a sales territory. These representatives are constantly asking for product enhancements, which are delayed because of lack of resources. If an expert system could answer the majority of representatives' and customers' technical questions, the company might reassign the engineers to enhancement activities. In this case, the value of the expert system would be the market impact of the enhancements — the additional units sold or existing units upgraded.

• *Training.* Even if permanent reassignment is not feasible or desirable and distribution is not an issue, the cost of training new employees on the features and functions of company products and services can be exorbitant. Very often, senior people are recruited to teach novices, either on a formal or informal basis. Even a professional training staff must call upon the experts for assistance in detailed technical training.

For labor-intensive industries such as banking and insurance, having an expert system available to newcomers to explain the complexities of, say, international funds transfers or commercial underwriting could save countless hours of time for senior specialists and could focus their attention on generating new business.

Such systems might also help standardize service and result in fewer errors. For example, American Insurance Group in New York has built a $1.9 million production model of an expert system that would perform these functions in 14 offices nationwide and is expected to pay for itself in 2½ years.

In such a case, the value of the expert system would be calculated by first ascertaining the cost of the expert on a per-hour basis, determining the average number of hours of interaction each recruit requires from this expert and multiplying this figure by the expected number of recruits per year.

Let us say a commercial insurance department has five senior underwriters at an average cost of $100,000 per year (approximately $50 per hour). Each underwriter spends, on average, 160 hours per recruit during the recruits' first year in training giving advice, answering questions and so on. The company expects to add four new employees in the coming year.

If an expert system could halve the amount of interaction, its value would be as follows:

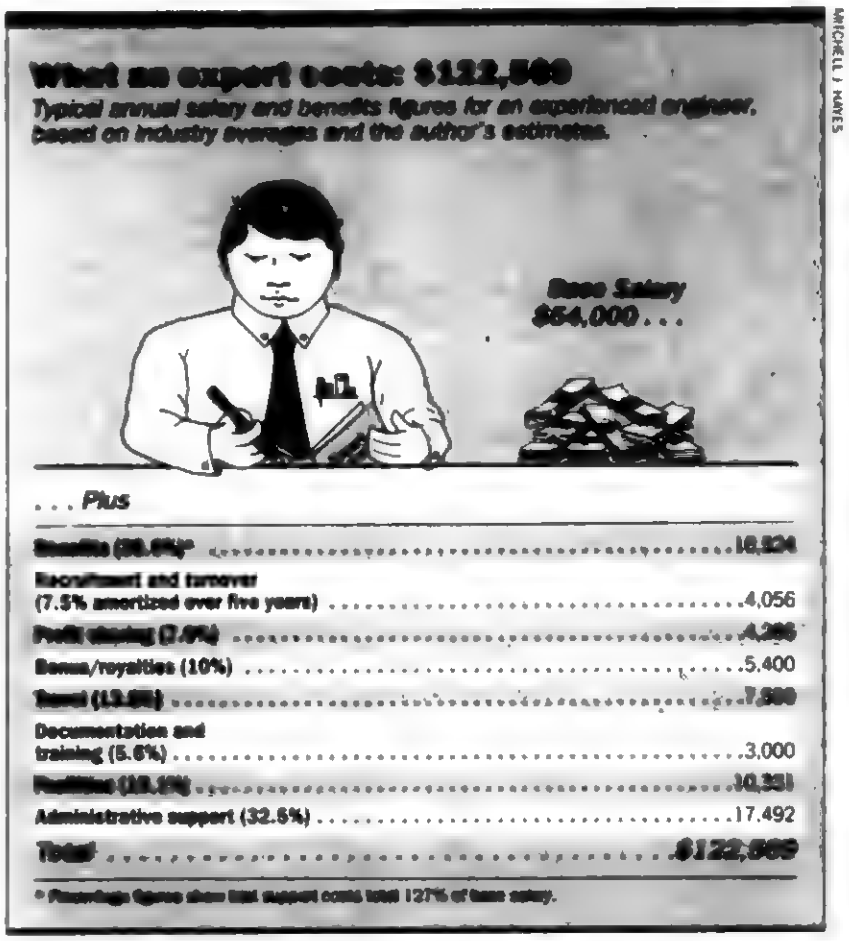
$50 x 160 hours = $8,000
$8,000 x four recruits = $32,000
$32,000 x five underwriters = $160,000
$160,000 ÷ 2 = $80,000

This number would be multiplied by the number of years the system would last without major enhancement and, as usual, would be balanced against the development costs.

• *Supplement.* Of course, there is no reason to assume that the senior underwriters — or loan officers, branch managers and other personnel — would not also use the expert system to test and verify their own judgments in tricky cases by drawing on the expertise of their colleagues in-house or anywhere in the world.

This, of course, is the rationale behind most of the medical systems in use. Sometimes the results can be dramatic. Last year, an elderly patient arrived at the LDS Hospital in Salt Lake City. As part of the check-in procedure, he gave his medical history to the hospital's expert system called Help. The system combined the information with the results of the patient's EKG to

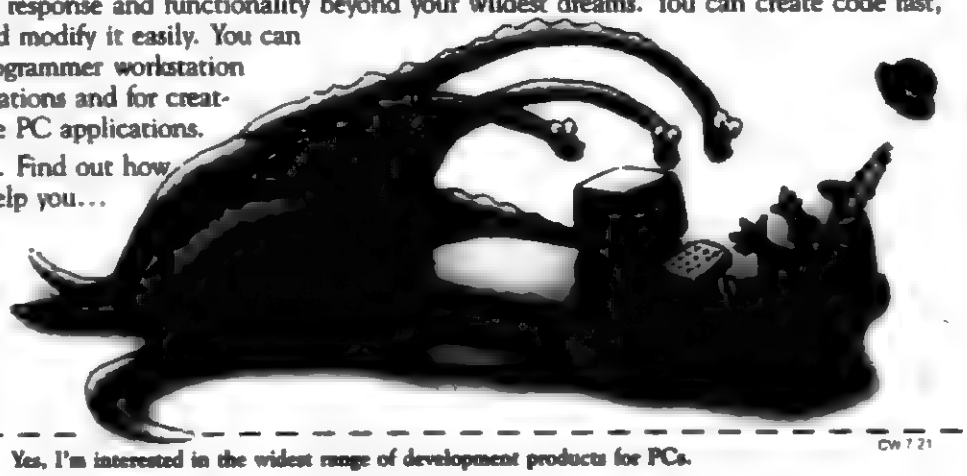
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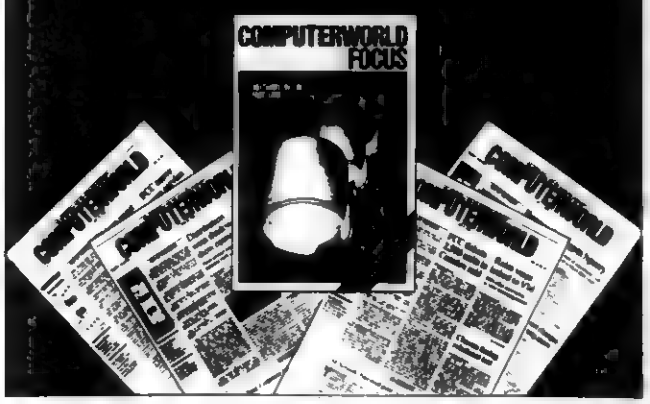
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Investing in an expert system: What you need

Because of the incredible range in complexity of expert systems, establishing average or typical costs for system development and maintenance is impossible.

Costs range from a few thousand dollars to develop a simple system on a personal computer to several million dollars for a stand-alone configuration.

The following list contains the broad categories of costs that an installation is likely to encounter in creating an expert system. Least-cost alternatives are listed first.

Initial familiarization with the technology.
- Self-study tutorials.
- Formal classes.
- Outside consultants.

Development.
- Additional hardware.
  - — Upgrade PC.
  - — Upgrade memory, direct-access storage device, CPU.
  - — Outside service bureau.
  - — Dedicated special-purpose system.
  - — Existing hardware.
  - — Percentage of installed micro base dedicated to expert system-related activities.
  - — Percentage of current mainframe configuration dedicated to project.
- Additional software.
  - — Artificial intelligence development shell.
  - — Additional programs or utilities (data base, spreadsheet, graphics packages).
- Existing network.
  - — Percentage of existing configuration to be dedicated to the development effort.
- Additional network.
  - — Higher speed or dedicated lines and nodes to be used by the designated experts and/or developers.
- Existing labor.
  - — Calculate fully loaded cost for time spent by developers, experts and supplemental staff.
- Additional labor.
  - — Calculate fully loaded cost for added staff (full- or part-time, permanent or temporary, including consultants).

Integration with existing systems.
- Programming effort for reliable data transfer.
- Testing for system function, integrity.
- Update documentation.
- Procedural changes.

Training.
- For developers.
  - — AI concepts.
  - — Expert system development techniques.
  - — New hardware and/or software.
- For users.
  - — Interaction with the system.
- For managers.
  - — Using the system to make business decisions.
  - — Understanding system possibilities and limitations.
- For systems staff.
  - — Performance implications of new hardware and software.
  - — Troubleshooting or other operational techniques.

Project administration.
- Cost/benefit analysis.
- Supervision.
- Reporting.
- Interaction with AI vendor.

Maintenance.
- Resolving operational difficulties.
- Expanding the knowledge base.
- Validating cost/benefit analysis.

In most cases, the costs will be similar to those for any software development effort, including familiarization and training costs. In some instances, costs may actually be lower than with conventional software systems, especially in the user interface area.

Most expert systems are self-auditing; that is, they instantly allow the user to see how the system arrived at its conclusion. This negates the need for voluminous documentation. In addition, good AI shells support creation of self-descriptive screens, virtually eliminating the need for special training.

Over the long run, the most significant costs stem from an ongoing relationship with the AI vendor. The issue here is whether the installation gains self-sufficiency in the technology. Can you build Version 2 of the system without additional assistance or are you dependent on the vendor for enhancements? Dependence means the development costs will reoccur each time a new version is created.

The more a firm is willing to invest in training its own experts, the less it will end up paying outsiders. Moreover, the company will realize added return on its training investment by then having employees who can use their expertise in creating additional expert systems.

— LEILANI ALLEN



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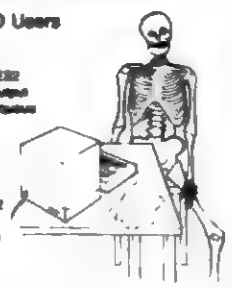
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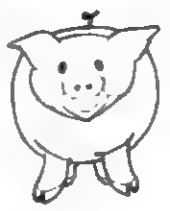
- RAPID retrieval of JES2 and JES3 spooled output
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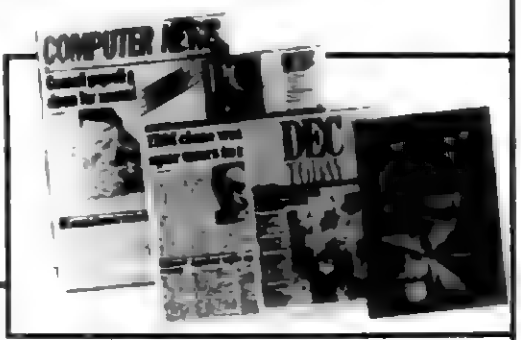
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Continued from page 84

correctly diagnose that he was having a heart attack. Surely the patient would assign the expert system an extremely high value indeed.

At Westinghouse Electric Corp., an expert system with slightly more than 100 rules helps engineers select the materials needed for building nuclear penetrators. Considering the financial — not to mention political and moral — consequences of faulty decisions in this area, the expert system may eventually bring in a thousandfold return on investment.

In this sense, the expert system would be a supplement to existing expertise, and its value would increase correspondingly. This added value would be particularly evident in professions such as finance and accounting, in which decisions are strongly affected by changes in laws or regulations.

These changes could be input to the expert system inexpensively and easily, and the experts could then ascertain the effect of the rule change on the company's policies or procedures. The dollar values here become softer but would probably best be calculated by assessing the relative percentage of decisions requiring up-to-date information and the dollar value of these decisions (revenue generated, clients gained, competitors forestalled).

• *Opportunity.* The best way to justify a new technology is to focus on its ability to generate additional revenue, not just reduce operating costs. Expert systems may allow companies to offer whole new activities. For instance, Shearson Lehman Brothers, Inc., a subsidiary of American Express Co., is using an expert system to perform interest rate swapping. Of the $15 million the firm earned last year through this activity, $1 million could be attributed to the installation of the system.

Government agencies can also offer new services by using expert systems. The U.S. Department of Agriculture keeps a Personal Computer-based system in place to determine when crops need irrigation and pesticide treatment.

• *Competitive edge.* Ultimately, expert systems can and will be used to give corporations an advantage in the marketplace. A well-known example is Digital Equipment Corp.'s Xcel system, which performs the tedious and time-consuming task of configuring DEC's mini systems. This results in decreased lead times, a factor that can be exploited to increase hardware sales. Many software firms are adding expert components to their existing products in order to increase differentiation and maintain a leading-edge profile.

Whether or not these interfaces are expert systems in the strict sense is unimportant. If some kind of intelligent interface is required because of competitive pressure or market demand, then the increase (or simple preservation) of market share is calculated and used to offset the development and maintenance costs.

Caveats

Every application is not necessarily appropriate for the development of an expert system. There are certain key prerequisites, chief among them being the existence of a known body of expertise in a given field.

I am not attempting to prove the validity of the figures I used for the calculation. The dollar amounts will obviously have to be calculated using real data from each enterprise. The important point is the methodology.

Also, in no way am I attempting to place a price tag on human beings, nor do I advocate widespread replacement of human workers with machines. Like most people, I would still prefer to have my workplace populated by humans.

Rather, I am trying to help executives quantify the value of the corporation's existing investment in expertise and whether this usually significant investment can be enhanced through judicious application of expert system technology.

> ***Campbell Soup Co. recently created an expert system to codify the 44 years of expertise of one of its production engineers.***

Faith factor

In addressing emerging expert systems technology from a financial perspective, this article presents a technique to quantify the cost of a human expert. This quantification can then be used to assign a value to the system that would preserve, redistribute, supplement or increase the availability of scarce human expertise. This value can then be balanced against the cost of developing and maintaining the expert system to determine whether the technology makes good business sense.

In any financial analysis, it is childishly simple to manipulate the figures to arrive at the desired conclusion. No doubt such dubious accounting has been, and will be, used in expert systems development as well. On a more positive note, every business decision maker can cite numerous examples of successful and profitable ventures that were initiated despite what the numbers said.

Faith, gut feeling and plain old curiosity are as important as financial viability in determining which technologies succeed or fail, and I surely do not expect to supplant them. Rather, analyses such as these can focus our attention on the key issue — that technology is assessed from an economic perspective. ■



MANAGEMENT



TAKING CHARGE
Les Gilliam

Scoring your career success

Is your career zipping along in the fast lane, or have you ended up on the access road, not sure if a dead end is ahead? If your progress has leveled off, have you stopped to take a real, hard and honest look at your capabilities and potential? What are the principal factors that need attention to get you back to upward mobility?

Most of the problems or difficulties that data processors encounter on their career ladders will likely fall into one or more of the following seven categories: health, attitude, time management, customer relations, planning and control, communications skills and application of knowledge.

How would you rate yourself on these? Do any of these areas need improvement?

• Health. It seems that most everyone in computing these days is continuously under some kind of pressure. The pace is fast, the manpower inadequate, the deadlines unrealistic and the budget woefully small. The days grind on, and energy ebbs. In some circumstances, it truly is the survival of the fittest.

To succeed then, requires a disciplined program of vigorous exercise, proper diet and regular checkups. The ability to maintain a consistently high level of physical and mental energy puts you ahead of the competition.

• Attitude. How do you feel about your job, your boss, your peers and your subordinates? Do you look for op-

See **SCORING** page 76

Gilliam is an independent computer and management consultant based in Ponca City, Okla.

Integrating corporate CAD

Changing roles requires manager skills, teamwork

By Rosemary Hamilton

The computer-aided design (CAD) department was once an isolated world of engineering and design professionals within a corporation. But as more and more organizations attempt the vast task of corporatewide integration, CAD managers are faced with the challenge of maintaining productive departments while serving the broader information requirements of their organizations.

These managers must not only contend with the formidable technological task of linking different computer systems within the organization, but they must also work toward blending three vastly different worlds. CAD managers must minimize conflicts as they team their engineers with the manufacturing department and then with the corporate MIS department.

CAD managers interviewed by *Computerworld* say there are a number of approaches toward solving this conflict, from establishing committees with representatives from the three organizations to having a computer-aided design and manufacturing (CAD/CAM) manager actually join MIS and function as the engineering and manufacturing voice within that group.

The conflicts between these departments have "historically been a problem in American industry," says Robert Brauburger, chief engineer at Chrysler Corp. "The majority still struggle with it. We have set up a committee to eliminate that problem."

According to Brauburger, the committee includes representatives from manufacturing, engineering and MIS. "Each is different in its method of approach. You use a different type of person in each of the three areas."

Engineers, he notes, generally have a "highly academic backround," whereas manufacturing is made up of mainly "tool engineers," and MIS people have strictly a "business backround."

The only way to satisfy individual needs and meet overall corporate goals is to continually stress and promote "affiliation and compromise," he advises. By doing so, this committee has managed to develop a five-year plan that maps out how

See **INTEGRATION** page 74

Northeast DP salaries top scale

By Donna Raimondi

Florida computing systems directors in large shops who want to double their annual salaries may be able to do so just by moving to the Big Apple.

According to the 1986 Local Metropolitan Computer Salary Survey, conducted by Source EDP Personnel Services, Inc., New York computing systems directors in large shops earn an average of $105,000 per year, as opposed to a relatively paltry $58,700 in the Florida cities of Tampa or Orlando. The study examines 63 computer-related nonmanagement, management and sales positions in 56 metropolitan areas in nine regions of the U.S. and Canada.

Small and medium-size computer installations pay much less than large ones. The director of a small shop, defined by the study as one with the equivalent of an IBM System/34 or smaller machine and a staff of fewer than 10 people, will generally earn from $20,000 to $35,000 less than the large-system director. A director of a medium-size shop, in control of an installation with the equivalent of an IBM 4300, 3031 or System/38 and from 10 to 40 staff members, can expect to earn $10,000 to $20,000 less than the director of a large shop.

"In looking over the results of past years' studies, I noticed a current trend for salaries to remain at a fairly steady rate," says Sheryl Link, a spokeswoman for Source EDP. The studies, conducted since 1966, show that salaries rose fairly rapidly from the middle 1970s to the early

See **NORTHEAST** page 71

INSIDE

Managers on the Move/**70**

Calendar: Shows, conferences, seminars/**76**

INSTANT ANALYSIS

"To get promoted from the MIS department to chief information officer, it's not so much who you know, it's who knows good things about you."

— Grady Baker, executive vice-president, Georgia Power Co.

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MANAGERS ON THE MOVE

David M. Carlson has been promoted to the position of vice-president, corporate information systems, of K Mart Corp. of Troy, Mich. He will be responsible for development, implementation and maintenance of all corporate systems including accounting, administration, distribution, point-of-sale and finance, as well as a recently announced satellite project. Carlson, 45, joined K Mart in July 1985 as vice-president, electronic merchandise systems. Last November, he was elected to the board of governors of the Uniform Code Council, and in



David Carlson

April, he became a member of the board of directors of the Information Systems Division of the National Retail Merchants Association.

■

Charles J. Peoples has been appointed assistant regional commissioner for data processing in the Southwest Region for the U.S. Internal Revenue Service. He will work out of the region's Dallas headquarters, assisting the regional commissioner in planning, coordinating and evaluating the processing of returns, computer services, revenue accounting, public affairs and taxpayer service. Peoples, 45, began his government career with the Library of Congress, joined the IRS in 1966 and has since held several positions in its service centers. Peoples succeeds **Henry H. Philcox**, who was named the IRS deputy assistant commissioner for returns and information processing at the national office.

■

Bruce Stevens has been named vice-president, corporate management information services, for Carlson Companies of Minneapolis. He will be responsible for data processing, telecommunications and office automation. Stevens, 39, recently joined the company after serving as director of information networks at Northern Telecom, Inc. of Nashville.

■

Hillary Reilly has been named executive director, information services, at Software AG of North America, Inc. in Reston, Va. Previously she was responsible for corporate information services for the Federal Home Loan Mortgage Corp. In her new position, Reilly will create strategic directions for the company's information resources.

■

William Parton has been promoted to director of data processing at Reliance Standard Life Insurance Co. of Philadelphia. His present responsibilities for data processing systems programming and operations will be increased as data processing systems are brought in-house. Parton joined the company in 1984.

■

Edward F. Phares has been appointed divisional vice-president, corporate information systems, of American Hoechst Corp. in Somerville, N.J. Phares joined the company in 1972 as a senior programmer analyst and later served in several positions, including manager and director of corporate information systems.

■

William A. Dvorak has been named senior manufacturing systems analyst at ITP Boston, Inc., where he will be responsible for the support of manufacturing engineering services. Dvorak comes to ITP Boston from Charles Stark Draper Laboratories, where he was a program manager.

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3161	IBM 3101 Model 881 ADDS Viewpoint* Hazeltine 1500* Lear Siegler ADM-3A* Lear Siegler ADM-5* TeleVideo 910*
3163	IBM 3101 Model 881 DEC VT 52* DEC VT 100* TeleVideo 950*
3164	IBM 3101 Model 881

For example, our basic ASCII Display Station, the IBM 3161, emulates up to six terminals. And the advanced-function 3163 emulates a number of higher level ASCII data streams.

Features	3161	3163	3164
Screen size	12"	12"	14"
Lines x characters	25x80	25x80	25x80
Character matrix	8x16	8x16	8x16
Double-sized characters	No	Yes	Yes
Line drawing characters	24	24	24
Vertical scroll	Jump	Jump/ Smooth	Jump/ Smooth
Definable function keys	24	24	24
Windowing	No	Yes	Yes
Partitioning	Horiz.	Vert./ Horiz.	Vert./ Horiz.
Characters in buffer	1920	7680	7680

What's more, every one of our ASCII terminals can operate in its own function-rich native mode.

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Our unique plug-in cartridges allow for considerable flexibility in your operation. For example, simply by switching cartridges you can shift a terminal from one data stream to another.

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All our ASCII terminal keyboards have 102 keys. But that's not all they have in common. Every keyboard also has a low profile, gentle contour and typewriter touch.

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Northeast DP salaries at top

From page 69

1980s and then leveled off "because of recession and extreme competition for jobs," Link says. Salaries picked up again in 1983 and 1984, then leveled off again for 1985 and 1986.

The second highest salaries do not always go to big-city managers — but they do go to Northeasterners. Average salaries for large-shop directors range from $85,000 to $86,500 in New York's Westchester County and on Long Island, parts of central and northern New Jersey and Connecticut.

The computing systems director of a large shop is one who controls the equivalent of an IBM 3033 or 3080 series or larger with a staff of more than 40 people.

Although the Tampa and Orlando areas earn the distinction of paying the least for large-shop directors, these areas are closely followed by Louisville, Ky., at $60,000; the Raleigh, Durham and Greensboro, N.C., area, at $60,800; and the Indianapolis and Fort Wayne, Ind., areas at $61,000.

Companies in the nine Middle Atlantic metropolitan areas shell out the highest salaries, paying an average of $78,900 for top-level managers. But salaries in individual municipalities range widely.

Salaries in the Middle Atlantic region decrease from New York's $105,000 all the way to $62,400 in Richmond, Va. Large-shop directors in other Middle Atlantic cities earn salaries of $64,300 in Baltimore, $70,200 in Philadelphia, $72,900 in Pittsburgh and $78,600 in Washington, D.C.

The South Atlantic region, composed of Atlanta; Charlotte, N.C.; Raleigh/Durham/Greensboro; Miami; and the Tampa and Orlando areas, has the lowest average remuneration for U.S. directors of large computing centers at $61,200. Pay ranges from Atlanta's $63,800 to Tampa's $58,700.

Pay at Canadian companies for large-system computer center directors is shown in the study to average $76,000; however, that is expressed in the Canadian dollar, which is worth about three-fourths of the U.S. dollar.

Pay there ranges from $81,900 (Canadian — about $59,800 in U.S. dollars) in Edmonton and Calgary, Alta., to $71,000 (Canadian — about $51,800 in U.S. dollars) in Montreal and Ottawa.

Pacific region second

The Pacific region follows the Middle Atlantic for second highest salary level in the U.S. Pay ranges from Los Angeles' $82,000 and Orange County, Calif.'s $78,100 to Portland, Ore.'s $63,800 and Seattle's $63,700. San Francisco's directors can expect to earn $74,600, whereas their brethren in the Silicon Valley pull in $76,300, and those in San Diego earn $68,800.

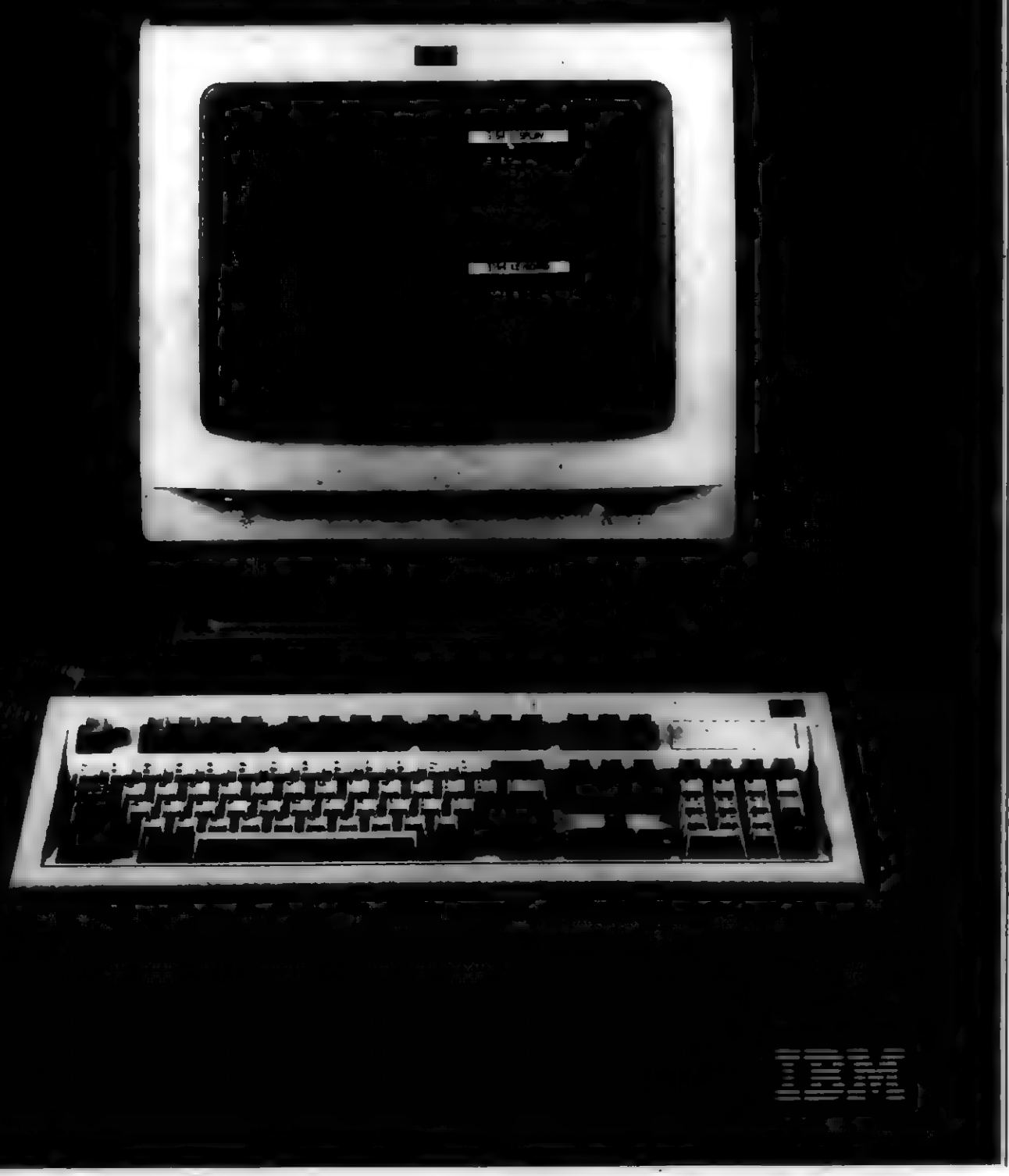
Third place goes to New England, where the average of Boston's $69,900, Hartford, Conn.'s $67,100 and New Hampshire's $64,400 is raised considerably by Upper Fairfield County, Conn., and the New Haven, Conn., areas, which average $77,900.

Close on New England's heels is the West North Central region, with an average director pay level of $68,800. Chicago leads that region with $76,400, and the Des Moines, Iowa, and Omaha areas are at the bottom with $64,300.

The South Central region has an average director's salary level of $65,500, followed by the Mountain states' $64,800, East North Central's $64,100 and South Atlantic's $61,200.

Computing systems directors in small shops receive roughly the same pay level as large-shop operations managers, medium-size shop technical services managers, senior analysts, project leaders and consultants with more than seven years of experience as well as data base administrators and specialists, also with more than seven years' experience.

The case in color.



Series/1

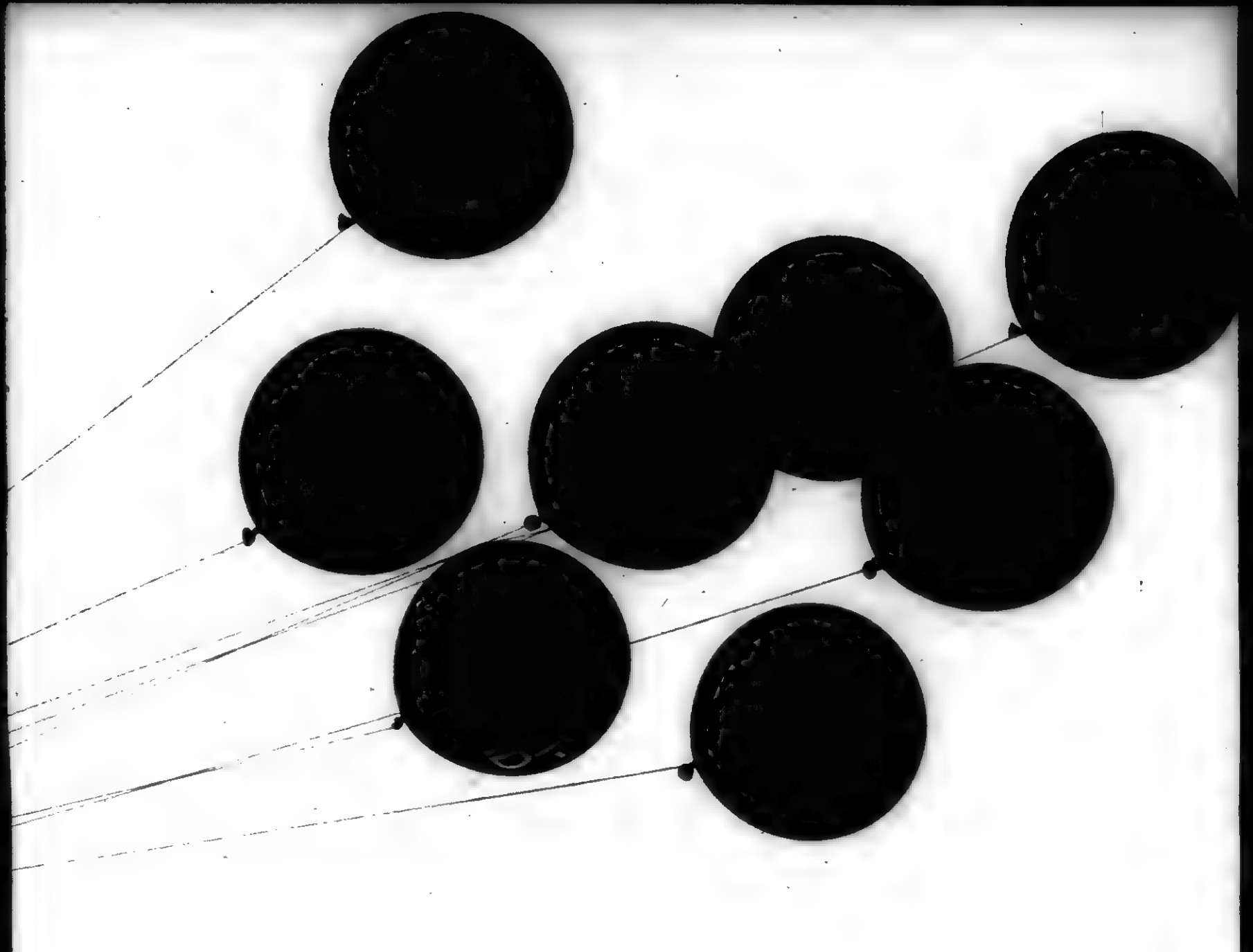
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NETWORKING

Integration of CAD

From page 69

Chrysler will "develop interfaces between different brands of computers," according to Brauburger.

Rather than take the committee approach, General Dynamics Corp. includes the CAD manager in the MIS organization. As director of CAD and a member of MIS, called the data systems division, Doug Lewis says it is more advantageous to have a strong voice for engineering and manufacturing within MIS than to have a representative approach MIS from the outside.

"I came up from engineering and have worked in manufacturing," he says. "I'm closer to that world than MIS." Working within MIS has "minimized conflicts," he notes.

However, there are also underlying tensions between engineering and manufacturing divisions, and Lewis must coordinate the efforts of both. Furthermore, he must coordinate the 10 different geographic divisions.

Between engineering and manufacturing, "there's friction if you let engineering take the lead," Lewis says. Manufacturing must ultimately make the parts that engineering designs, and often manufacturing claims that engineering designs parts without taking the manufacturing process into consideration.

"Manufacturing is usually much happier when they are involved in the process from the beginning," Lewis says. "We can't let engineering go off on its own."

Lewis also works to coordinate the different divisions across the country to maintain corporatewide consistency and downplay rivalry among divisions.

Representatives from the different divisions meet "to iron out problems regarding the technology and to generate excitement about new technologies," Lewis says. The divisions also publish newsletters to keep their counterparts in other areas informed of their activities.

The manager of engineering at Marathon Electric Manufacturing, Inc., a maker of motors and generators in Wausau, Wis., also reports to the director of MIS.

"There really isn't a conflict between MIS and engineering in our case because I have a very supportive boss," says Peter Link, manager of engineering systems. "He has a good understanding of engineering and a natural inkling toward that."

> ***'Manufacturing is usually much happier when they are involved in the process from the beginning.'***
>
> — Doug Lewis
> General Dynamics Corp.

However, Link says the relations between engineering and manufacturing do not run as smoothly. "I try to deal with it, but it hasn't been too successful yet," he claims. "One way would be to make them sit together, but that doesn't always work."

However, Link expects the relationship to improve in the future. "As we mature in CAD/CAM, that will force a better understanding because they'll be using the same data."

At American Motors Corp., which began automating its CAD operation in late 1983, the engineering and manufacturing departments are "distinct from the MIS group" on matters that pertain to specific departments, says Cary Coverdill, supervisor of CAD methods.

However, he adds, all departments are in "close communication" on general-purpose issues, such as acquisition of equipment like word processors that would be used throughout the corporation. On matters of procuring engineering systems, "MIS doesn't get involved," he says.



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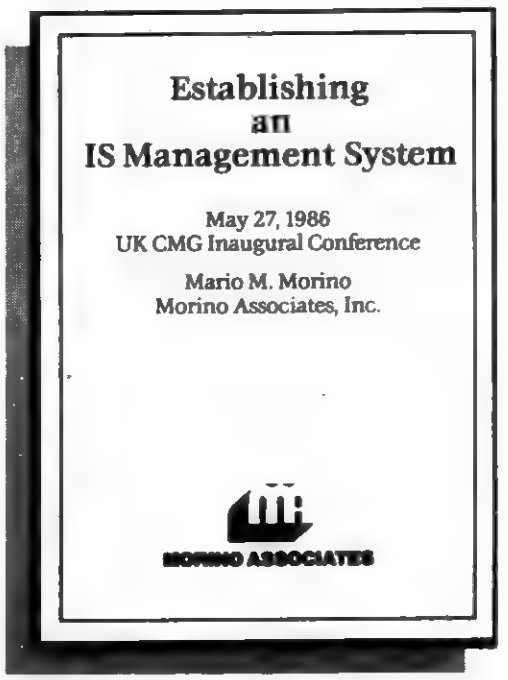


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Scoring your career success

From page 69

portunities to complain or find excuses? Are you self-centered and only looking out for No. 1?

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The transition from professional to manager is often difficult for the data processor. After having the responsibility for producing the technical product, it is hard to turn oneself loose from the tasks and tools that have become so familiar. However, growth in the supervisory or management ranks will be directly proportional to the ability to accomplish desired results through delegation.

• Customer relations. Do you think of your users as customers? How often do you get out of your office to go to the users' turf and try to better understand their environment, problems and goals? Data processors often have a reputation for sitting in their ivory towers, behind their walls of security, waiting for the user to beg for service. The No. 1 priority must be the solving users' problems.

The user should be treated as a customer who has a choice in purchasing your services and should receive a high-quality product at a competitive price.

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Good communication depends far more on common sense and sensitivity to people and circumstances than on speaking or writing ability. Do not misunderstand. Grammar is important, as is properly organized material, but the primary objective is that the listener or reader gain an understanding of the intended message.

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• Application of knowledge. Your knowledge is a composite of formal education, experience and self-motivated learning. Unless this knowledge can be applied to solving user or management problems, it is of little or no value to you or your employer.

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CALENDAR

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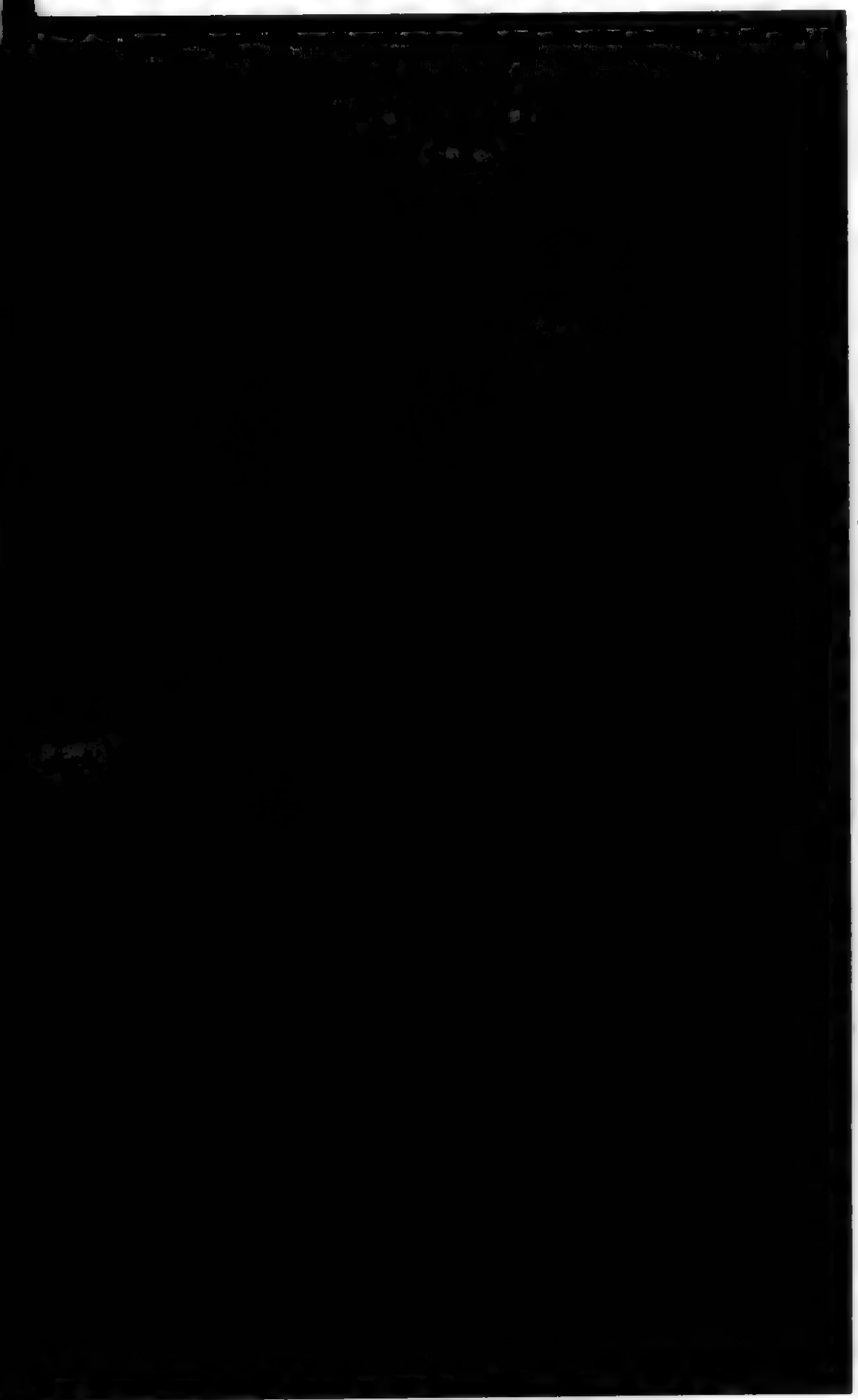
JULY 27-31, ANAHEIM, CALIF. — **Third Annual Information Center Conference & Exposition.** Contact: Information Center Conference & Exposition, Weingarten Publications, Inc., 38 Chauncy St., Boston, Mass. 02111.

JULY 28-29, AVON, COLO. — **How to Manage Data and Information as a Resource.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

JULY 28-29, BOSTON — **Fast Algorithms Seminar.** Contact: Technology Training Corp. Seminars, Dept. FA, P.O. Box 3608, 3420 Kashiwa St., Torrance, Calif. 90510.

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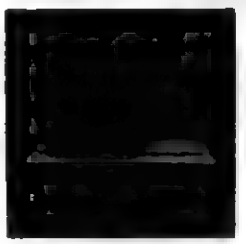
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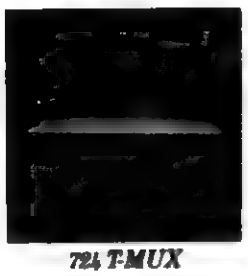
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NEW PRODUCTS

Tool lets PC, 370 share applications

The Aion Corp., of Palo Alto, Calif., has introduced an expert system application development tool for the IBM 370.

Called the Aion Development System/MVS, the product is said to be fully compatible with the Aion Development System/PC (ADS/PC), which supports IBM Personal Computers and compatibles. Available in August, the Aion Development System/MVS is priced at $60,000.

According to the vendor, applications built on a personal computer using the Aion systems can be used on a mainframe. The Aion Development System's open architecture reportedly allows for integration of existing data files and applications and also offers a generalized procedural escape to any callable routine.

Extended data structures can interface with other data bases and applications can be transported between the PC and the mainframe system.

Major features

Major features of the system include a series of real-time interactive editors with extensive Help features and a hierarchical outliner that enables developers to work on each part of a problem separately and then merge the results.

The system offers full screen, multiple-window interfaces, the vendor stated. Graphics include stacked bars and multiple lines as well as bars, pies and lines. Report generation language includes value substitution and formatting commands.

According to the vendor, the system can be used by software application builders with no prior experience in expert system-development because each system includes an application building component that includes all development functions needed to create, test and run knowledge-based applications.

Aion has also introduced a stand-alone execution system for the ADS/PC called the Aion Execution System/PC. The stand-alone execution system costs $750, according to Aion.

Software aids cell notation

Spreadsheet Auditor's copy protection removed

Consumer Software, Inc. of Gilroy, Calif., has released the Spreadsheet Auditor Version 3.0, said to integrate cell notation, interactive error checking, sideways printing and documentation. The company also removed the copy protection from the software.

The Spreadsheet Auditor 3.0 includes index commands for easier documentation and an interactive tutorial outlining the best way to design a sound spreadsheet, according to a spokesperson for Consumer Software. The Spreadsheet Auditor 3.0 is priced at $149.

The product's Cell Noter is said to allow users to attach a note to any cell in a spreadsheet. These notes can later be called up and viewed from within Version 3.0 or used as a random-access memory-resident utility with a Lotus Development Corp. spreadsheet.

The interactive checking feature of the Spreadsheet Auditor 3.0 allows users to test for common errors and highlight problem cells. The product also includes a split-screen function.

According to the company, customers who purchased the Spreadsheet Auditor Version 2.0 between April 1 and July 15 will receive an upgrade to Version 3.0 at no charge. All other registered users can receive the Spreadsheet Auditor Version 3.0 for $30, the vendor said.

Spreadsheet Auditor 3.0 runs on IBM Personal Computers and compatibles.

V-EMM offers virtual memory capability without EMS board

Fort's Software of Manhattan, Kan., has announced Release 2 of the company's V-EMM software package, designed to provide true virtual memory capability for various programs that support the Lotus/Intel/Microsoft Expanded Memory Specification (EMS).

Unlike the first release of V-EMM, which needed an EMS board to operate, V-EMM Release 2 will operate with or without EMS boards and with or without IBM Personal Computer AT extended memory boards.

According to the vendor, on systems with an EMS board installed, the virtual expanded memory is composed of real expanded memory plus auxiliary expanded memory provided by a hard disk drive.

On systems without EMS hardware, the virtual expanded memory is composed of simulated expanded memory plus auxiliary expanded memory.

In either case, up to 8M bytes of virtual expanded memory are available to EMS applications, according to the vendor. Simulated expanded memory is drawn from conventional memory and/or from the PC AT's extended memory. Release 2 also includes EMS random-access memory disk software.

Like virtual memory implementations on mainframe computers, V-EMM reportedly provides users with the illusion that they have more expanded memory than is actually installed in their computer.

V-EMM Release 2 is priced at $89.95. According to Fort's Software, current licensees of V-EMM can receive a free upgrade to Release 2 upon request.

Requirements for V-EMM Release 2 include an IBM Personal Computer, Personal Computer XT, AT or compatible; IBM PC-DOS 2.0 through PC-DOS 3.2; and a minimum of 192K bytes of conventional memory.

An IBM Fixed Disk Drive and Fixed Disk Adapter or compatible are required if a PC AT extended memory board is not present. The program also supports any EMS-compatible board, including Enhanced EMS boards and PC AT extended memory boards, the vendor said.

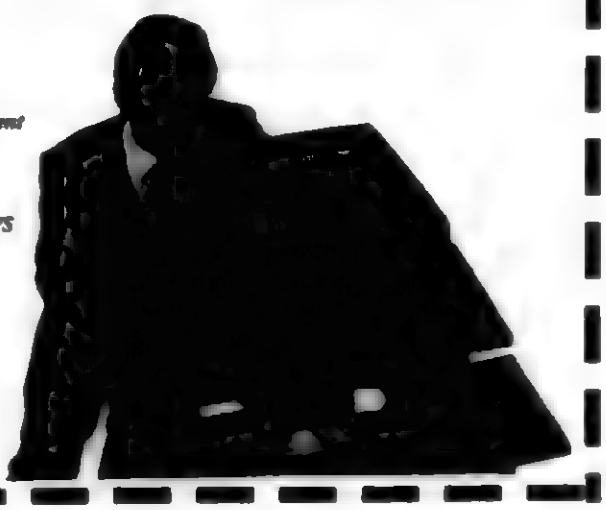
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NEW PRODUCTS/SOFTWARE & SERVICES

SOFTWARE & SERVICES

Systems software

John A. Keane and Associates has ported its **QMS Programs** software for real-time statistical process control and quality information management to IBM 370 mainframes in the VM/CMS operating environment.

Composed of 46 quality-specific modules, QMS Programs provides applications in such areas as vendor ratings, defect analysis, instrument calibration, final inspection and batch release.

The software is available on Digital Equipment Corp.'s PDP-11, Microvax, VAX and Vaxclusters and will be available on IBM 4361 series in September. It ranges in price from $36,000 to $160,000.

John A. Keane and Associates, 575 Ewing St., Princeton, N.J. 08540.

Information Industries International has announced **EZ4U**, a productivity system for the IBM OS operating environment.

The EZ4U system features a programming language, including subscripted variables, string functions, automatic loop detection, IBM System Management Facilities extraction, built-in line printer graphics and linear regression and forecasting. EZ4U can be used to generate spreadsheets, write letters and create Gannt charts, bar graphs and populate and reformat files.

A site license for EZ4U is $5,500.

Information Industries International, P.O. Box 3278, Humble, Texas 77347.

MICROS

Software enhancements

Significant Statistics has enhanced its **Sigstat** statistical software package for IBM, Hewlett-Packard Co. and compatible personal computers.

The package has 34 added programs. They include cluster analysis, linear programming, statistical quality control, exploratory data analysis and nonparametrics.

Other added features include expanded capabilities for its range of basic data description, univariate and multivariate analysis of variance and covariance, general linear models, regression, multivariate, multidimensional scaling as well as time series techniques, according to the vendor.

The Sigstat package is priced at $595. Current Sigstat users can upgrade to the new version for $75.

Significant Statistics, 3336 N. Canyon Road, Provo, Utah 84604.

■

Master Computer Systems, Inc. has announced **Formix Version 2**, a language-independent, personal computer-based screen management system and software development environment.

Formix Version 2 is said to include such features as 45 additional screen functions in a panel-oriented environment. Formix Version 2 also includes a memory-resident executive to manage all screen processing on behalf of the application program, according to the vendor.

Formix Version 2 is written in assembly language.

Formix Version 2 costs $695.

Master Computer Systems, 9531 W. 78th St., Eden Prairie, Minn. 55344.

■

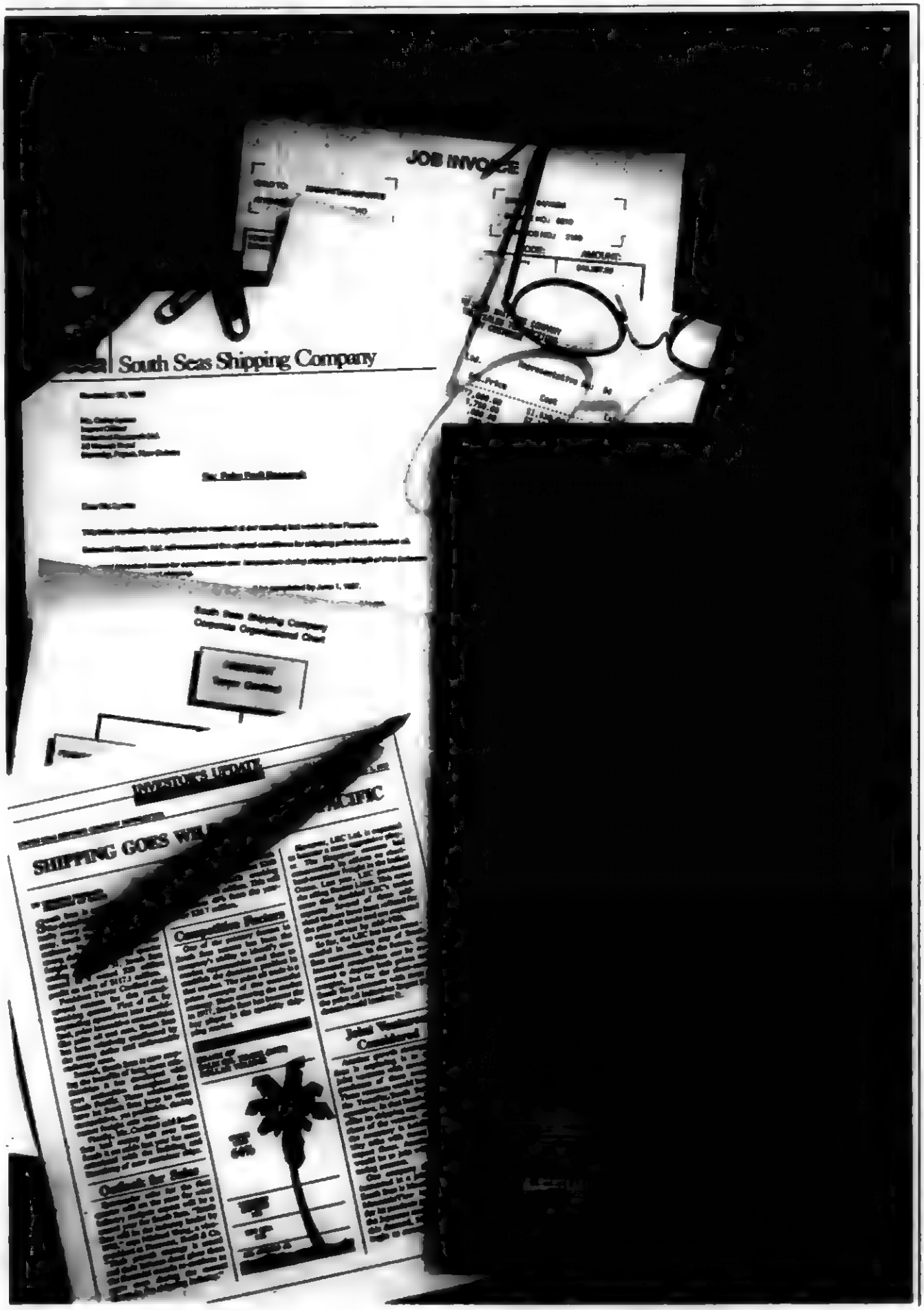
Newtek Industries has announced **Compu/Chart 2**, an enhanced version of its market-trend analyzer and technical analysis program for Digital Research, Inc. CP/M-based and Microsoft Corp. MS-DOS-based microcomputers.

Compu/Chart 2 is said to create and maintain any number of data files on investment instruments for a base period of 144 points, which may include 144 price entries and 144 volume entries in addition to other data that relates to trading action and plans.

According to Newtek Industries, Compu/Chart 2 generates market analysis tools in the form of 14 different charts, status reminders and alerts. The program is also said to generate on-screen interpretation texts.

The Compu/Chart 2 analysis program is priced at $199.95.

Newtek Industries, P.O. Box 46116, Los Angeles, Calif. 90046.



COMMUNICATIONS

Controllers

Western Telematic, Inc. has introduced the **RAB-14 switching system**.

The switching system is said to electronically switch up to 196 independent AB switches. According to the vendor, it can be used for switching between separate computer systems, single lines or for switching groups of lines between multiplexers or modems.

The system consists of individual channel modules that switch seven RS-232 lines between ports A and B and a common port C and a control rack that controls the power supply and control logic.

RAB-14 switching system costs $150. The control rack costs $550.

Western Telematic, 2435 S. Anne St., Santa Ana, Calif. 92704.

Protocol converters

Bridge Communications, Inc. has introduced its **Communications Server/1-3270** (CS/1-3270), said to permit the connecting of IBM 3270 terminals to both IBM and asynchronous host computers over an Ethernet local-area network.

CS/1-3270 reportedly increases flexibility in the IBM-only environment by substituting local networks for IBM cable multiplexers and enabling IBM terminals to connect to alternate IBM hosts by using the network's data-switching features.

The CS/1-3270 can be configured with up to four 8-port SIO/78 modules, for up to 32 connections.

The CS/1-3270 costs $20,000 for a maximum 32-port configuration.

Bridge Communications, 2081 Stierlin Road, Mountain View, Calif. 94043.

SYSTEMS & PERIPHERALS

Processors

Digital Electronic Systems has introduced its **Computerist Mainframe** 32-bit computer system.

The Computerist Mainframe system includes a small computer system interface, 1M byte of random-access memory, a real-time clock, seven interrupt priority levels, seven-bus master arbitration, two RS-232 ports, one Centronics Data Computer Corp. printer interface, a floppy disk controller and floppy disk drive. Options include an IEEE floating-point coprocessor, a paged memory mapping unit and a 16M-byte memory board.

The Computerist Mainframe system is priced at $5,000 for one to nine users.

Digital Electronic Systems, 302 S. Main, Estill Springs, Tenn. 37330.

Graphics systems

Omnicomp Graphics Corp. has introduced the **Omni 2000 GDS** graphics display system designed for Intel Corp. Multibus II systems.

The Omni 2000 GDS has a 1,280-by 1,024-pixel display resolution and monochrome to true color from a palette of 16.7 million colors.

A minimum Omni 2000 GDS configuration consists of two modules. The system's display list memory can be configured from zero to 16M bytes. Each Omni 2000 GDS also provides for direct-memory access, programmed parallel I/O and serial RS-232 interfacing.

The Omni 2000 GDS costs from $9,500.

Omnicomp Graphics, 1734 W. Belt North, Houston, Texas 77043.

■

Digital Equipment Corp. has added a **two-screen configuration** to its Vaxstation II/GPX workstation.

The configuration consists of two consoles running on a single Microvax II processor. The configuration can either be used by two users or by a single user in dual display mode. In the two-user version, each user gets a dedicated graphics coprocessor and window manager.

The two-screen Vaxstation II/GPX configuration includes a Microvax II processor with floating-point unit, 5M bytes of memory, two 8-plane graphics coprocessors and two 19-in. color monitors.

The two-screen Vaxstation II/GPX configuration costs $48,700.

DEC, 146 Main St., Maynard, Mass. 01754.

PRICE REDUCTIONS

Vectrix Corp. has announced price reductions for its **VXPC graphics board sets** and the **VX384 graphics controllers**.

The price of the VXPC graphics board, said to display 512 colors from a palette of 4,096, has been reduced to $1,995. The VXPC graphics board, said to display 512 colors from a palette of 16.8 million colors, now costs $2,495.

The reduced price for the VX384 graphics controller is $3,295.

Vectrix, 2606 Branchwood Drive, Greensboro, N.C. 27408.

■

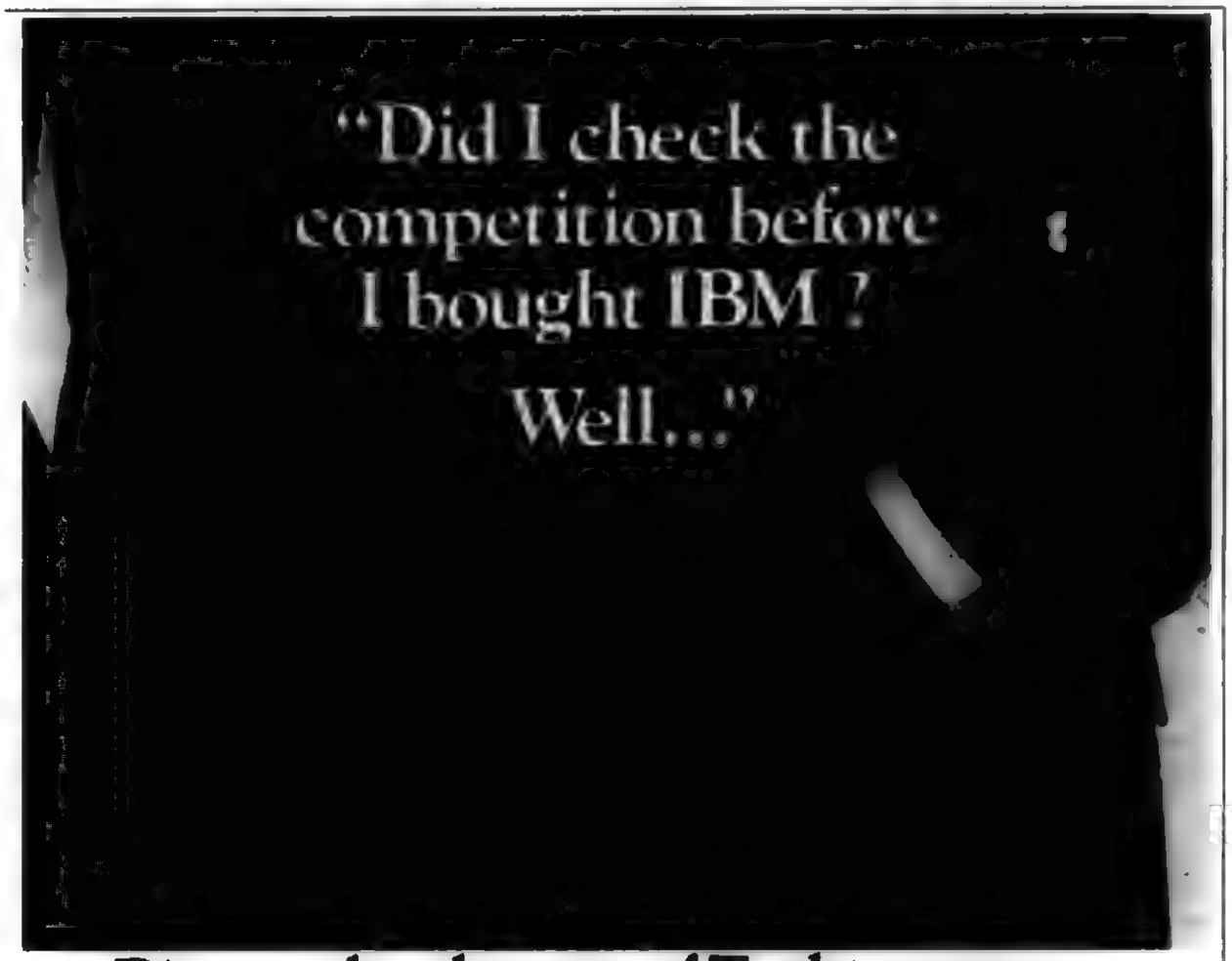
Spur Products Corp. has reduced the price of its IBM **1403-N1 printer** and **1403-N1 printer controller**.

The 1403-N1 printer controller enables mainframes and minicomputers to drive the 1403-N1 high-speed impact printer said to print 1,100 line/min.

The 1403-N1 printer controller with computer interface now costs $9,000.

The price of the remanufactured 1403-N1 printer has been reduced to $4,000.

Spur Products, 13469 Beach Ave., Marina Del Rey, Calif. 90291.



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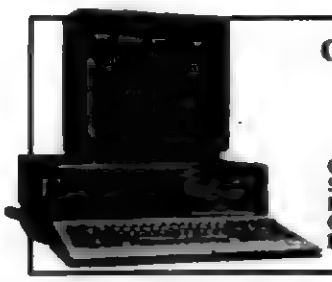
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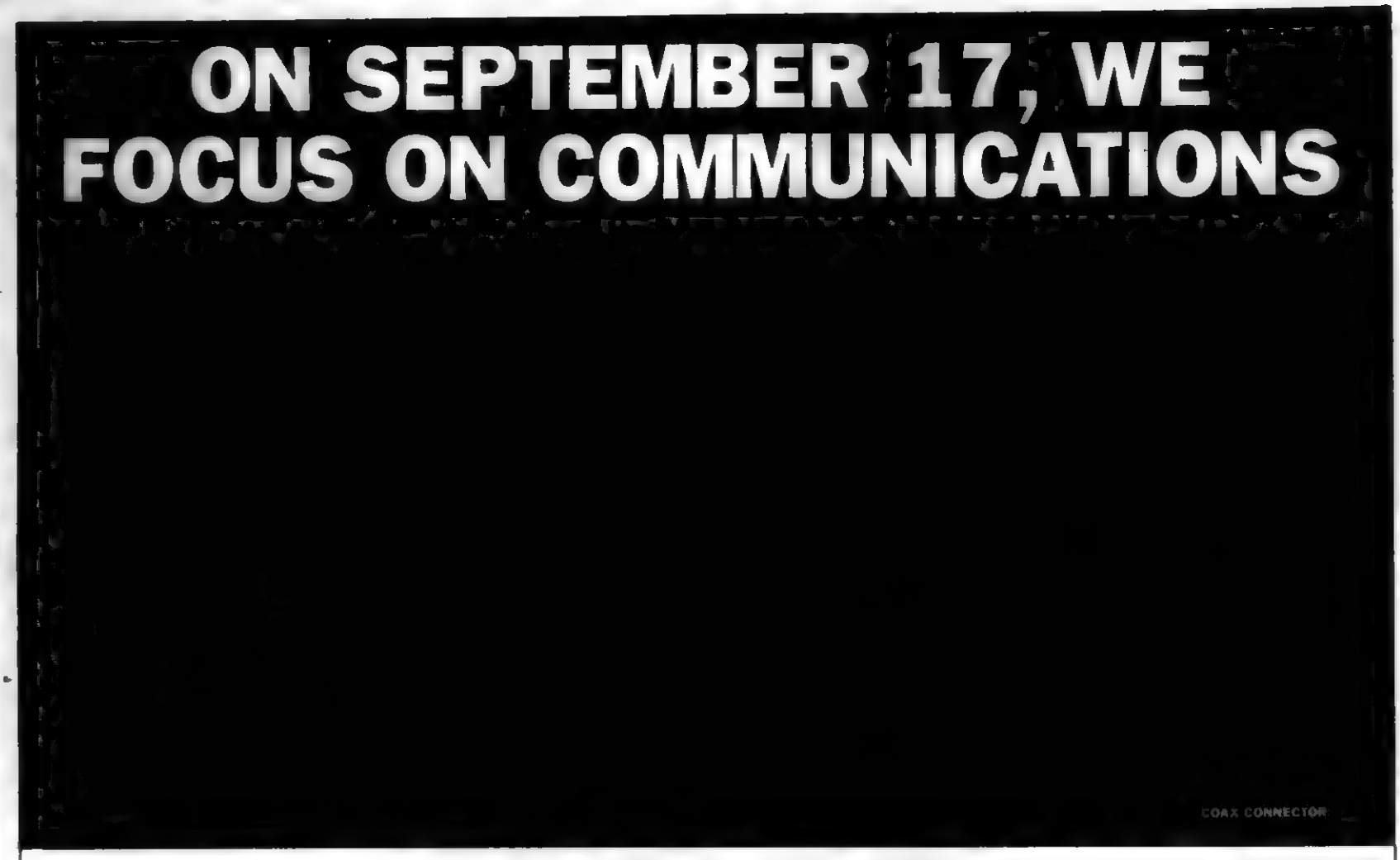


Compare the Tandy 3000 HD with an IBM PC/AT

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Maximum Memory	12 MB	10 MB
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*Based on IBM price list, April 2, 1986. Tandy 3000 HD price applies at Radio Shack Computer Centers and participating stores and dealers (monitor, adapter and MS-DOS not included). Radio Shack is a registered trademark of Tandy Corporation. IBM is a registered trademark of International Business Machines Corp. MS-DOS is a registered trademark of Microsoft Corp.

ON SEPTEMBER 17, WE FOCUS ON COMMUNICATIONS



No matter what level you look at, the clear trend in computers these days is toward networking and communications. Which is why manufacturers are burning the midnight oil to make sure their computers can talk. Not just within their own product line, but with other popular brands, too.

In our September 17 issue of Focus, we'll review the hottest technologies in the fast-moving communications field, particularly at the systems level. Then we'll look at the up-and-coming technologies for linking different architectures and provide cost-effective tips on transport systems. Complete with trial-by-fire techniques and new product evaluations from users.

Then we'll zero in on systems integration.

In this issue we'll pay special attention to the various techniques and strategies involved in systems integration. Like SNADS, LU 6.2, and other ways to connect departmental-level systems with the corporate mainframe and desk-top micros.

We'll discuss Lans and the most effective implementations. And we'll wrap up our special section with a look at issues like connectivity and compatability, and strategies for getting the most of existing equipment while planning for the future.

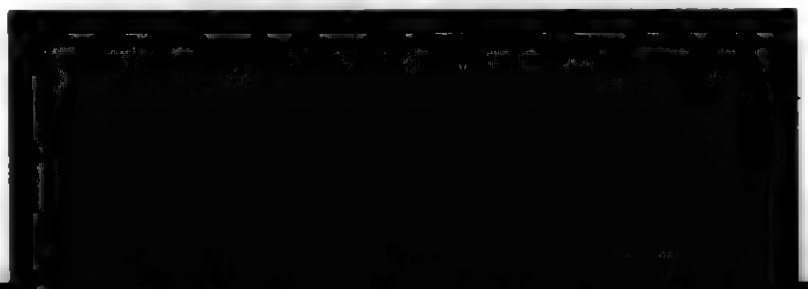
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Issue: September 17 - Closing: August 8



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COMPUTER INDUSTRY

Section begins on page 118

Walker steps into the black with $1.5M Saudi Arabian deal

Defense pact helps firm regain a profitable path

By Maura McEnaney

SAN FRANCISCO — After a year of being buried in the mire of layoffs, organizational changes and financial losses, Walker Interactive Products, Inc. appears to be resurfacing.

The financial application software company, which reportedly was unsuccessfully put up for sale late last year [CW, Sept. 23], recently announced a $1.5 million contract with Saudi Arabia's Ministry of Defense and Aviation for sales and service of its General Ledger, Accounts Payable, Purchase Order and Inventory applications. It was the largest sales contract in the company's history.

The contract was welcome news to Walker, on the verge of bankruptcy after liabilities grew and sales dropped from $20 million in 1984 to $10 million in 1986. "We really are back after the financial difficulties we had in 1985," says Craig Carlson, executive vice-president and general manager responsible for Walker's U.S. operations.

Launched as a consulting company by software entrepreneur Jeff Walker in the mid-1970s, the company attracted large venture capital investments and was reborn as Walker Interactive Products in 1980. It soon earned a strong reputation for its interactive software architecture.

Revenue leaps to $20 million

A heavy emphasis on fast growth and marketing pushed revenue from $1 million in 1980 to $20 million in fiscal 1984. But users and analysts admit those years also saw Walker lose its technical edge in the marketplace.

Unable to handle the expansive growth, the firm began having problems with its software releases, and sales began to slip. In fiscal 1985, revenue fell to $17 million and high expenses left the company with a substantial loss; Walker, a privately held company, would not disclose the amount of the loss.

"There were a lot of problems with Release 14 [of General Ledger]," says Randall McDonald, manager of financial analysis systems for the Ministry of Lands, Parks and Housing in Victoria, B.C. "It needed fixes during the installation, which made it seem as though it was not thoroughly tested."

Walker executives are quick to admit the same problem. "In 1984 our shipment was poor, and we weren't turning around product fixes," Carlson admits.

About a year ago, Walker's venture capital dried up, and financial troubles mounted. Walker was ousted and investors brought in Bruce Coleman, president of systems software firm Boole & Babbage, Inc., with the hope that he would sell the troubled software firm.

Although speculation centered on a possible purchase by Cullinet Software, Inc., Management Science America, Inc. or McCormack & Dodge Corp., a buyer never materialized. Coleman did restructure the company, closing its sales offices and trimming its work force to 85 employees.

In December he returned to Boole & Babbage, but he continues to serve as Walker chairman. While Carlson oversees the U.S. office in San Francisco, Walker President David Brownlee operates out of a 15-man office in the UK.

With a pared-down staff and a resurrected interest in software development, Walker says it turned a profitable quarter for the quarter ended March 31 — the third profitable quarter in the history of the company. The Saudi contract will figure substantially in a profitable second quarter ended in June, Carlson says. Sales this year will be flat at about $10 million.

'Revamped our products'

"We've gone through and significantly revamped our products," Carlson notes. "We're delivering products that really work, are easier to install and better documented."

Users of Walker software have been awaiting Version 4 of its Accounts Payable and Purchase Order applications. The release, which now provides users with the same utilities as General Ledger, is available in Canada and the UK and is expected to be announced in the U.S. by the end of the year, he says.

Walker users also say they have noticed some changes in the software firm. "When we get a product, it installs a lot better," McDonald says. And, although the Canadian Ministry has been anticipating Release 4 of the new products, "Two years ago we could have pressured them into giving it to us whether or not they were ready. Today, they are not going to crumble under our pressure."

Despite these changes, some analysts are skeptical about Walker's chances for success in the marketplace.

"If they are simply going to try to get into the market with their old products, that will not be enough," says William Shattuck, analyst for Montgomery Securities. "There are some fairly major structural changes going on in application software. The market needs distributed applications. More bells and whistles on the same engine is not going to be enough."

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IBM earnings slide again

From page 118

"Since costs are lumped into a single sum, it's hard to tell whether it's product or overhead costs that are the problem," noted Bob Djurdjevic of Phoenix-based Annex Research. "We won't know until IBM releases its 10Q later in the quarter."

An IBM spokeswoman said selling, general and administrative expenses in the U.S. were down in the first six months of 1986 from last year. She declined, however, to quantify the amount.

In a prepared statement, IBM Chairman John Akers re-emphasized earlier assertions that IBM is tightening discretionary expenses. "We continue to manage our business prudently and control costs, expenses and resources."

Akers stressed that the mediocre financial results will not alter the firm's strategy. "We are managing the business for the long term and believe our investments in research, development, plant and equipment will prepare us for future business opportunities."

Work force decreasing

In that regard, he added that while IBM continues to decrease its overall U.S. work force through attrition, it is adding more people to its domestic marketing organization.

The IBM chairman noted that the second-quarter results reflect the continuation of the business slowdown in the North American economy that began in 1985. "Sluggish capital spending in North America and uncertainties about U.S. tax reform legislation and transition rules have negatively affected our orders and shipments," he explained.

Repeating a statement made at an analyst meeting in San Jose, Calif., last month, Akers said that unless capital spending in North America improves, it will be extremely difficult for IBM to show earnings growth in 1986.

Annex's Djurdjevic said IBM would be hard-pressed to repeat last year's strong fourth-quarter performance when it finished with earnings slightly beneath 1984's results after warning of a potential severe shortfall.

"It's going to be harder this year because they're not finishing off a ramp up of the 3090," he explained, adding that in the fourth quarter, IBM will have Amdahl Corp. and National Advanced Systems Corp. to contend with.

Based on first-half results, Hutton's Geran said he is revising his 1986 and 1987 earnings estimates downward. He now expects IBM to earn $10.02 a share this year and $12 a share in 1987, down from his earlier estimates of $11 and $13.25 a share, respectively.

"That means down third and fourth quarters," he said. "It won't be until at least the first quarter of next year that IBM gets out of this mess."

Akers said that while worldwide orders and shipments were below last year's first half, demand for large processors and storage devices remains firm. The firm declined to say which product areas were most affected by soft demand or to quantify order and shipment levels. The spokeswoman did say, as in the first quarter, that the 3090, 4381 and Personal Computer AT were "doing well."

Weak dollar beneficial

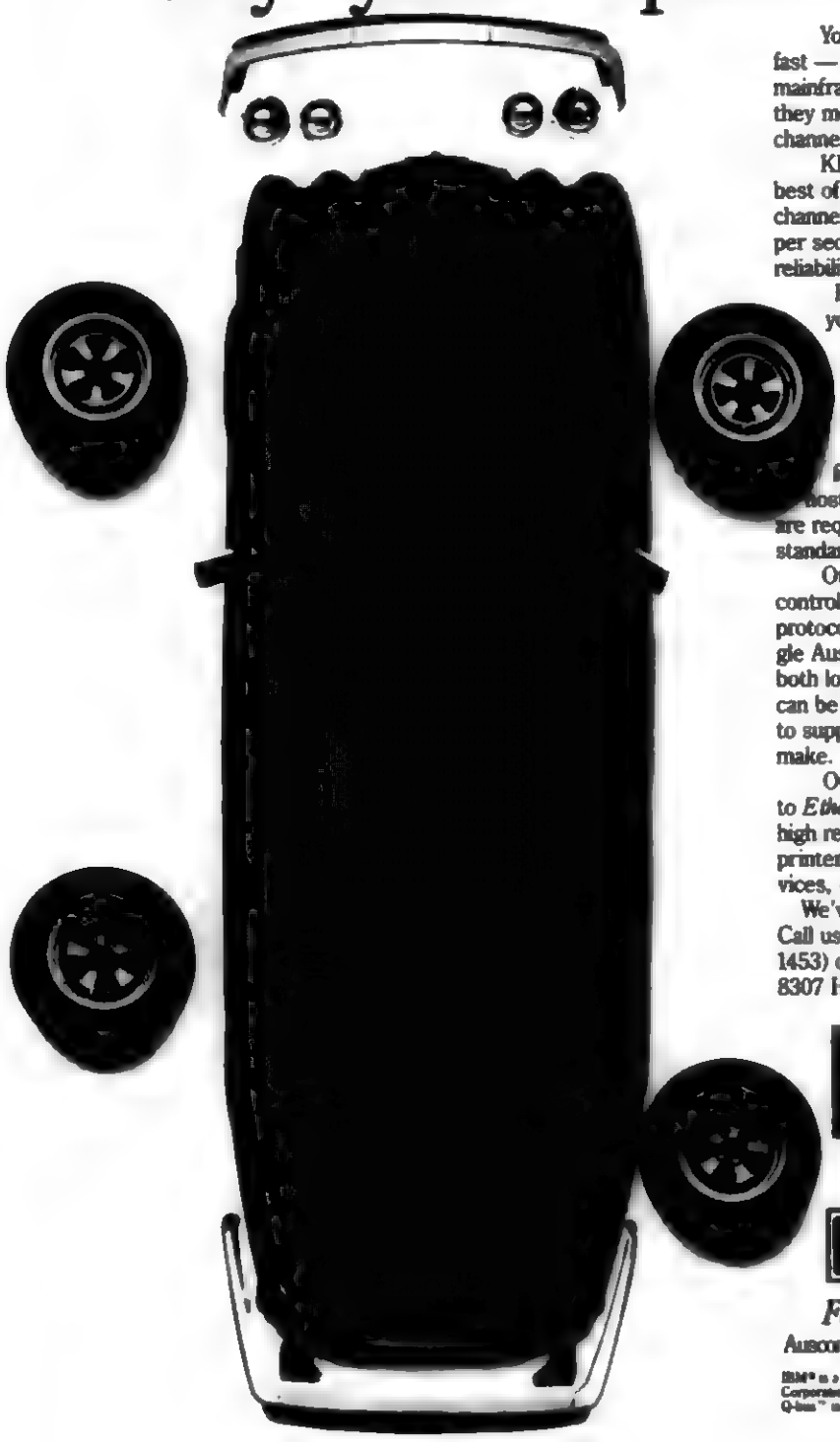
The weakening value of the U.S. dollar had a beneficial impact on first-half results, IBM said. The lower value, compared with last year's rates, improved 1986 aggregate revenue by $2.08 billion and increased net profits by $325 million, IBM estimated.

Robert Fertig, president of Enterprise Information Systems, a research firm in Stamford, Conn., contended that the worst for IBM may be over.

The firm, he said, is entering a marketing mode with many of its new products, such as its mid-range processors, soon entering production. Price cuts across IBM's product line, while hurting profitability, have effectively stimulated revenue, he noted.

"IBM has also completed a management reorganization, begun in the fourth quarter, that was expensive and caused many of its marketing people to move all over the place and caused some salespeople not to make quota," Fertig added.

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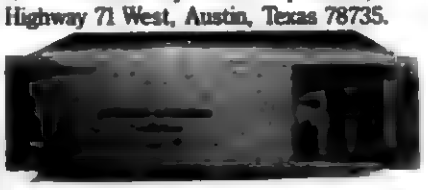
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Bjorn Nordemo
Vice President
Data Arts & Sciences, Inc.
Weston, MA

Bjorn Nordemo is Vice President of Data Arts & Sciences, Inc. (DASI), a contract software agency based in Weston, MA. Although they place people in permanent positions, DASI most often places 'contract programming personnel' — consultants who fit special niches for short or long term commitments in corporations in the New England area.

"Our agency specializes in finding computer consultants — designers of systems, evaluators of hardware and software requirements, and computer programmers to mention a few. We recently were introduced to Computerworld as a potential source for finding these consultants," states Bjorn. *"I liked the idea because I know Computerworld has a broad reach — from MIS/DP directors to computer programmers, in multiple industries and multiple markets — and that's what DASI needs."*

"We had four specific positions for MIS/DP consultants that we needed to fill in northern New England. We used the local newspaper on a weekly basis, but people who are willing to move usually aren't reading the local Sunday paper. So, I felt this was a perfect opportunity to try Computerworld," says Bjorn.

According to Bjorn, he's quite satisfied with the results. *"From Computerworld, we filled 75% (3 out of 4) of the positions with the responses from the first week, and the remaining position with the response from the following week. These results alone made my ads in Computerworld worthwhile."*

And Bjorn also recognizes a second benefit to advertising in Computerworld. *"The beauty of using Computerworld is that it's read by people in the computer industry who have a need for consultants, as well as being read by consultants who need to keep up to date on the marketplace,"* says Bjorn. *"So we not only reach qualified candidates to fill our current openings, but we are creating awareness of the services that DASI has to offer,"* says Bjorn.

"We have some great plans for expansion and as we do, Computerworld is going to play a strong hand in helping us accomplish our goals," concludes Bjorn.

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A PUBLICATION OF CW COMMUNICATIONS

Dole bill prompts ringing opposition to Bell deregulation

Stifling competition, cross-subsidation feared

By Mitch Betts

WASHINGTON, D.C. — Communications equipment and service vendors fear that the regional holding companies will be formidable and unfair competitors if the U.S. Congress or federal regulators allow the baby Bells to enter their markets.

In a flurry of letters to Congress, the vendors have urged legislators not to allow the Bell operating companies into the three markets prohibited by the AT&T divestiture agreement: information services, equipment manufacturing and long-distance services.

The focus of the lobbying blitz is a bill introduced by Sen. Robert Dole (R-Kan.) that would transfer the responsibility of regulating the regional holding companies from U.S. District Court Judge Harold Greene to the Federal Communications Commission, which has shown greater willingness to deregulate the regional holding companies (CW, June 30).

All of the opponents say they are convinced that the FCC would be quick to allow the holding companies to enter the new markets and that the companies would unfairly subsidize their business ventures with revenue from their regulated local telephone companies.

Some new long-distance ventures are concerned with being wiped out by the well-financed holding companies.

Such is the case with the National Telecommunications Network (NTN), a Rockville, Md.-based joint venture of seven regional telecommunications firms developing a nationwide fiber-optic network.

It is worried that the regional holding companies would form a consortium that would duplicate NTN, according to Joel H. Maloff, director of marketing.

"Obviously, we feel that is unfair, since they would be able to use their monopoly position to subsidize that kind of venture," Maloff says. "Even the possibility of such a network would be deadly for us, because we do not have the financial capital to compete with an armada like that," he adds.

Other opponents

Other opponents in the industry include the North American Telecommunications Association, the Independent Data Communications Manufacturers Association and other groups of equipment vendors, as well as ADAPSO, a computer services and software industry association.

By pursuing a strategy of cross-subsidization, ADAPSO explains, the regional holding companies could charge artificially low prices for their new services and charge competitors unjustifiably high rates for access to the local Bell network. The regionals could also manipulate the availability and quality of the communications services upon which their competitors depend, ADAPSO says.

The regional holding companies, in their own lobbying efforts to support the Dole bill, argue that the current regulatory scheme is too burdensome and that it prevents them from offering competitive services.

Moreover, they argue that federal and state accounting regulations will prevent any cross-subsidization.

Industry analysts predict the holding companies would enter the information services market first because of their existing local distribution network.

"If they get into the information services market quickly, they will have a chilling effect upon the existing offerers and any potential offerers . . . simply because of their territorial power and existing facilities," comments Alan Pearce, president of Information Age Economics, Inc. in Bethesda, Md.

In the equipment market, the regional holding companies together would constitute one more competitor in a crowded and troubled market, analysts say.

Pearce speculates the regionals might acquire a private-branch exchange or other equipment vendor as the industry consolidates.

No immediate relief

But Pearce cautions that the Dole bill would not bring immediate relief to the regional holding companies, because the FCC would have to undertake a lengthy regulatory proceeding.

He says they might get faster relief from Greene and the Department of Justice.

George R. Dellinger, telecommunications analyst with Washington Analysis Corp., doubts Congress will have time to pass the controversial bill this year.

Furthermore, he says, the regional holding companies have not demonstrated a compelling need for the legislation, since they are financially healthy and are unable to immediately offer the services that deregulation could produce.

"The most likely market for them to enter is enhanced information services, such as voice mail. But even if they could get in tomorrow, they just don't have the equipment to sell that service now," Dellinger says.

What's missing from this picture?



EXECUTIVE CORNER

Theodore R. Joseph has been appointed president and chief operating officer of Phoenix Technologies Ltd., the new name for Phoenix Software Associates Ltd. **Robert F. Angelo** has been named vice-president of marketing.

■

Wang Laboratories, Inc. has announced several promotions. **Paul Guzzi** has been named to the position of senior vice-president for administrative services, and the following people have been promoted to the positions of vice-president: **Carl Brown** in U.S. sales and marketing, **Paul Demko** in research and development, **Larry Jones** in Wang Financial Information Services and **Eoin O'Driscoll** in manufacturing.

■

Ronald Rowe has joined Adaptive Computer Technologies as president and chief executive officer. He will be responsible for bringing the company's product to market, a result of Adaptive Computer Technologies' maturation from its research and development stage into its production stage.

■

Shosuke Kawai has been promoted to senior vice-president and chief of staff at Epson America, Inc. In this position, Kawai will be the chief liaison between Epson's management committees and the board of directors, as well as intermediary between Japanese employees in America and Seiko Epson Corp. in Japan.

■

Robert Shea, former senior vice-president of Paradyne Corp., has been appointed president and chief executive officer of Formative Technologies, Inc. of Pittsburgh.

Shea succeeds acting CEO **Sam Leinhardt**, who becomes executive vice-president and chief operating officer. Former president **Charles Eastman** has been named executive vice-president and chief scientist.

■

Joan Carlton has been promoted to vice-president within the computer services division at Interactive Data Corp. She will take over management responsibility for the Analystics Systems Group, which maintains and develops the software for the company's financial data bases.

Since joining Interactive Data in 1969, Carlton has held numerous management positions in the systems software department.

■

Mac Lewis has been appointed president, CEO and a member of the board at Computer Network Technology Corp. in New Hope, Minn.

Prior to joining Computer Network Technology, Lewis founded The Systems Center, Inc. in Dallas. He also spent 14 years with IBM, where he held several positions in sales, marketing and product planning.

■

Gerald W. Thames has been named vice-president of communications systems for Martin Marietta's Information and Communications Services company.

Previously with AT&T for 15 years in key engineering, marketing and sales management positions, Thames will be responsible for all telecommunications and commercial communications markets for the Information and Communications systems. He also has corporatewide responsibilities for communications.

■

Stephen E. Cooper has been promoted to president and chief operating officer of Silicon Systems, Inc. Cooper joined the company in 1980 as vice-president of wafer fabrication after working for seven years at Intel Corp.

■

Alfred T. Duncan, previously head of Commodore International in Italy, France and Belgium, has been named CEO of Victor Technologies, Inc. He replaces **Eric Hass**, who has left to pursue new opportunities. **Paul Mahoney** also has joined Victor Technologies as vice-president of sales and marketing.

■

John A. Sasso has been named chief executive officer of Esprit Systems, Inc. Sasso is a founder of the company and has been president, chief operating officer and treasurer since Esprit was formed in 1983. On an interim basis, **Anthony P. Palladino** will continue as chairman and chief financial officer.

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Bell companies sued, misappropriation cited

REDWOOD CITY, Calif. — A communications software company is suing Bell Communications Research Corp. over alleged trade-secret and federal antitrust violations.

American Telecorp is seeking $50 million from Bell Communications Research, several regional holding companies and local operating companies for what it claims is misappropriation of its Cenpak communications software.

The suit, filed in U.S. District Court in San Francisco, claims Bell Communications Research is unlawfully using American Telecorp's "move and change" software.

The software is said to allow companies with Centrex to automatically change telephone locations and let users keep their own extensions without the help from a telephone company repairman.

According to American Telecorp attorney Joseph Alioto, Bell Communications Research is proposing to distribute the software for use to several of its subsidiaries.

A Bell Communications Research spokesman declined comment pending a detailed review of the suit.

— Maura McEnaney

Hit list: Top 10 cliches

From page 118

to develop and service state-of-the-art products."

But if the company has had to bite the bullet with layoffs and other cost cuts, then the line goes, "We have streamlined our operation for maximum efficiency and reduced our break-even point."

3. The "industry-standard" benchmark test of the week. The wars over MIPS and MFLOPS and Whetstones can become meaningless to the point of absurdity. One vendor's CEO said that the user cares only about the time it takes to run his particular application.

4. "We talk to our customers." This is usually followed by the number of miles logged by the CEO in the last six months visiting customer installations. Nothing really wrong with any of that — but dinner with the CEO is no substitute for a quick trip from the field service rep when needed.

5. The explanation for acquisitions. "You can't sit still in this industry. We continue to aggressively expand our business and pursue new market opportunities to enhance our current product line to offer a full-service solution [yes, that word again] to the customer."

6. The explanation for divestitures. This often comes from vendors that were big proponents of No. 5 just a couple of years before.

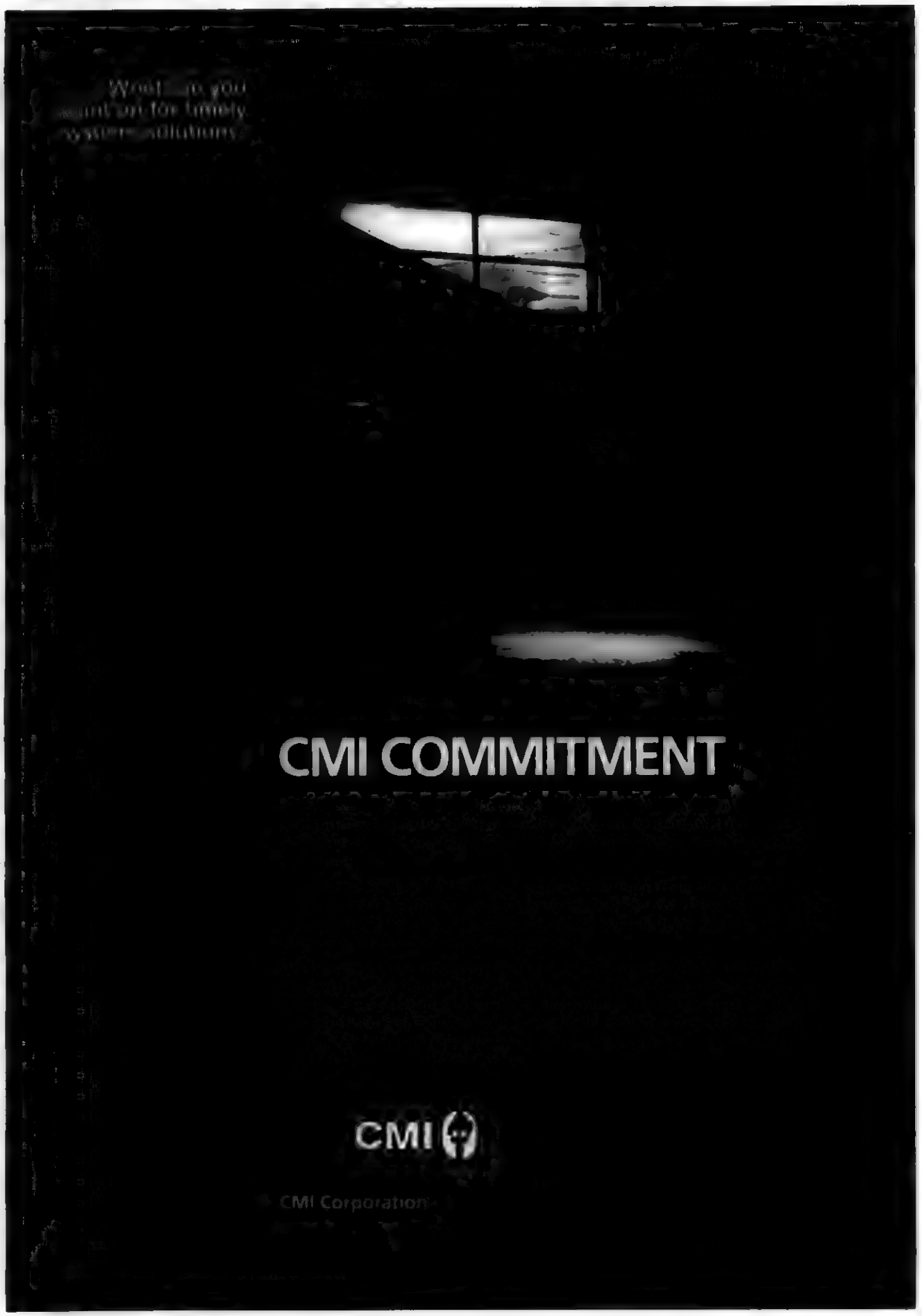
"We had lost sight of our central purpose. But we have refocused on our core businesses, returned to our roots and pared operations not germane to our corporate mission. We have remembered who our target customers are, and we are dedicated to serving them."

7. "We are committed to the Fortune 50/100/500/1,000/2,000 market." A sale to a huge company may be prestigious and make a nice spread in the annual report, but there are hundreds of solid and successful vendors doing fine without hyping that fact. Zenith Data Systems Corp. was considered a micro industry sleeper because it sold mainly to the government and education; now everyone wants to emulate Zenith's success.

8. "We are committed to being the industry's low-cost, high-volume producer." This list had to include one entry specifically from IBM. What Big Blue usually doesn't add is that a record amount of that volume sits in the warehouse, unsold.

9. "Despite the record industry slump, customer interest in our new products is at an all-time high." Translation: We can't seem to be able to sell anything, and we don't know why.

10. (In memory of Herbert Hoover) "Although the economy has been sluggish, we expect business to turn up in the second half of the fiscal year." This is usually a far enough horizon that if the prediction doesn't come true, the vendor can dismiss it as "our best-case scenario," blame the economy or foreign currency differentials and probably avoid shareholder suits.



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"I need to reach both the MIS/DP *and* data comm manager. With Computerworld, I do."

Sharon Paster
Advertising Manager
Codex Corporation







Sharon Paster is Advertising Manager for Codex Corporation, a wholly-owned subsidiary of Motorola, Inc. As a supplier of integrated network systems for use in large corporations, Codex markets a broad range of products, including modems, multiplexers, communications processors, network management systems, and local area networks.

To increase company awareness and establish preference for Codex products, Sharon has chosen Computerworld as a primary advertising vehicle. The reason? Circulation and readership.

Sharon recognizes the important roles played by the MIS/DP manager and the data communications manager in large-volume purchasing of Codex products. *"Our primary customer is the data communications manager. But that person often reports to the MIS/DP manager, whose influence in the purchasing of data communications has been increasing over the last few years."* she explains.

"Many times both the MIS/DP manager and the data communications manager are involved in the purchasing process. Sometimes, depending on the company size, it's either one or the other," notes Sharon. *"So I need to reach both the MIS/DP and data comm manager. And, with Computerworld, I do."*

As for readership, Sharon has conducted studies over Codex's customer base and found Computerworld to be extremely well accepted. *"Of our customers who are responsible for both data processing and data communications, Computerworld is the best-read publication,"* claims Sharon. *"And, for those customers who are responsible for only data communications, Computerworld is the first publication they look to after the leading data communications publication."*

Further proof of Computerworld's credibility is the high response rate to the Codex 800 number in its ads. *"The responses bear out all my research,"* says Sharon. *"Computerworld tops both its MIS/DP competition and the data communications publications as far as quality and quantity is concerned. Computerworld generates the largest number of high quality phone leads from large-volume buyers. And that's exactly what Codex is after,"* she concludes.

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- ✓Turbo Holiday Pack *(Pascal 3.0, Tutor, and Database Toolbox)* . . . 67.
- ✓Turbo Family Jumbo Pack *(Pascal 3.0, Database, Editor & Graphix Toolboxes, Tutor and Gameworks)* . . . 135

Breakthrough *(not copy-protected)*
- ✓Timeline 2.0 . . . 239

Broderbund *(copy-protected)*
- ✓Graphics Library 1 . . . 22.
- ✓Print Shop . . . 35.

Computer Associates *(not copy-protected)*
- ✓SuperCalc 3 Release 2.1 . . . call

Dac Software *(not copy-protected)*
- ✓Dac Easy Accounting . . . 45

Evergreen *(not copy-protected)*
- ✓One Write Plus 1.01 . . . 159

Executive Systems *(not copy-protected)*
- ✓XTREE 2.0 *(file & directory manager)* . . . 37.

5th Generation *(copy-protected)*
- ✓Fastback 5.03 . . . 97

Funk Software *(not copy-protected)*
- ✓Sideways 3.11 . . . 39.

Infocom *(not copy-protected)*
- ✓Cornerstone 5.1 . . . 65.

Lifetree *(not copy-protected)*
- ✓Volkswriter 3 1.0 . . . 147.

Living Videotext
- ✓ThinkTank 2.1 *(copy-protected)* . . . 105.
- ✓Ready 1.0 *(not copy-protected)* . . . 49.

Micro Education (MECA) *(copy-protected)*
- ✓Managing Your Money 2.0 . . . 115

Micropro *(not copy-protected)*
- ✓WordStar 3.31 . . . 179
- ✓WordStar 2000 Plus Release 2 . . . 286.

Microrim *(not copy-protected)*
- ✓Extended Report Writer 1.3 . . . 85
- ✓Clout 2.0 . . . 135
- ✓R:base 5000 1.01 . . . 359.
- ✓R:base 5000 Multi-user 1.0 . . . 719.

Microsoft *(not copy-protected)*
- ✓Multiplan 2.0 . . . 119
- ✓Microsoft Word 3.0 . . . 247
- ✓Windows 1.01 . . . 65
- ✓Quick Basic 1.02 . . . 69
- ✓Project 2.0 . . . 239

Microstuf *(not copy-protected)*
- ✓Crosstalk XVI 3.61 . . . 95
- ✓Remote 1.3 . . . 95.

Migent Software *(not copy-protected)*
- ✓Ability 1.0A . . . $65.

MultiMate International *(not copy-protected)*
- ✓MultiMate 3.31 . . . call
- ✓MultiMate Advantage 3.6 . . . 269

Nantucket Software *(copy-protected)*
- ✓Clipper *(Winter '85 version)* . . . 349.

Paperback Software *(copy-protected)*
- ✓VP-Planner 1.0 . . . 57.

Peter Norton *(not copy-protected)*
- ✓Norton Commander 1.0 . . . 38.
- ✓Norton Utilities 3.1 . . . 59

Quarterdeck *(not copy-protected)*
- ✓DESQView 1.2 . . . 65.

Satellite Software *(not copy-protected)*
- ✓WordPerfect 4.1 . . . 238.

Software Group *(not copy-protected)*
- ✓Enable 1.1 . . . call

Software Publishing *(copy-protected)*
- ✓PFS:File B:01 . . . 84.
- ✓PFS:Write C:01 . . . 84.
- ✓Harvard Total Project Manager 1.1 . . . 299.

Not copy-protected versions due to be released soon—call.

TRAINING

ATI *(copy-protected)*
- ✓*SKILL BUILDER PROGRAMS*

Intro and How to Use:

Data Bases	MS-DOS	
Compaq	PC-DOS	
IBM-PC	BASIC	each 33

- ✓*TRAINING POWER PROGRAMS*

How to Use:

dBase II	dBase III	Lotus 1-2-3
Multimate	Framework	Displaywrite 3
Multiplan	Wordstar	
WordPerfect	Symphony	. . . . each 43.

Individual Software *(copy-protected)*
- ✓The Instructor II . . . 26.
- ✓Professor DOS . . . 33
- ✓Tutorial Set *(both items above)* . . . 49.
- ✓Typing Instructor . . . 26.
- ✓Training for Lotus 1-2-3 *(for vers. 1A & 2)* . . . 37.
- ✓Training for dBase III . . . 37

HARDWARE

Manufacturer's minimum limited warranty period is listed after each company name. Some products in their line may have longer warranty periods.

AST Research *(1 to 2 years)*

SixPakPlus 64k *includes Sidekick vers. 1.5 not copy-protected & DESQView* . . . 169
SixPakPlus 384k *(fully populated)* . . . 219.
AST-5251-11 . . . 579.
AST-3780 . . . 579
✓Advantage 128k . . . 369.
RAMpage! *upgrades to 2Mb* . . . call
✓RAMpage! AT *upgrades to 2Mb* . . . call
Both RAMpage boards support EMS and fully support EEMS

Amdek *(2 years)*
- ✓Video 310A mono monitor *(amber)* . . . 159
- ✓Color 722 - RGB *(EGA compatible)* . . . 519.

Curtis *(lifetime)*

ACCESSORIES
- ✓Low Profile Tilt and Swivel Pedestal . . . 25
- ✓PC Pedestal *(for IBM Mono or Color)* . . . 27
- Portable Pedestal *(for portable computers)* . . . 36
- ✓Printer Stand . . . 18
- System Stand *(for IBM-PC & XT)* . . . 19.
- ✓Universal System Stand . . . 25.

CABLES
- Smartmodem to IBM Cable . . . 17.
- ✓Keyboard Extension Cable *(3 to 9 feet)* . . . 27.
- ✓Extension Cables for IBM Mono Display . . . 33.

SURGE SUPPRESSORS
- ✓Diamond *(5 outlets)* . . . 29.
- ✓Emerald *(6 outlets; 6 ft cord)* . . . 36
- ✓Sapphire *(3 outlets; EMI/RFI filtered)* . . . $47.
- ✓Ruby *(6 outlets; EMI/RFI filtered; 6 ft cord)* . . . 55.
- ✓Command Center . . . SPECIAL . . . 79.

DCA *(1 year)*
- ✓Smart Alec . . . 639.
- ✓Irma . . . 769.

Epson *(1 year)*

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- ✓FX-286 printer *(136 column)* . . . call
- ✓LQ-800 printer *(80 column)* . . . call
- ✓LQ-1000 printer *(136 column)* . . . call

Hayes *(2 years)*
- ✓Smartmodem 300 . . . 139.
- ✓Smartmodem 1200 . . . 389.
- ✓Smartmodem 1200B *(w/Smartcom II)* . . . 349.
- ✓Smartmodem 2400 . . . 579.
- ✓Smartmodem 2400B *(w/Smartcom II)* . . . 539.
- ✓Smartcom II 2.1 *(software)* . . . 69.

Hercules *(2 years)*
- ✓Hercules Color Card *(parallel port)* . . . 159.
- ✓Hercules Graphics Card *(parallel port)* . . . 289.

Intel *(chips: 1 year; boards: 5 years)*
- Above Board PC 64k *(upgrades to 2 Meg)* . . . call
- ✓Above Board AT 128k *(upgrades to 2 Meg)* . . . call
- Above Board PS 64k C/S/P *(upgrades to 1.5 Meg)* . . . call
- 8087 *(for IBM-PC & XT)* . . . 129.
- 8087-2 *(works on 8 Mhz computers)* . . . 177.
- ✓80287 *(for 6 MHz IBM-PC AT)* . . . 225.
- ✓80287-8 *(for 8 MHz IBM-PC AT)* . . . 269.

Kensington Microware *(1 year)*
- ✓Masterpiece . . . 94.

key tronic *(90 days)*
- 5151 keyboard *(deluxe)* . . . 169.
- ✓5153 keyboard *(with touch pad)* . . . 279.

Mouse Systems *(3 years)*
- ✓PC Mouse with PC Paint+ . . . 139.
- ✓PC Mouse with Ready and PC Paint+ . . . 149.

NEC *(90 days)*
- ✓Multisync monitor *(EGA compatible)* . . . 549.

Orchid Technologies *(1 to 2 years)*

Conquest Multifunction Board 0k *upgrades to 2Mb, fully supports LOTUS/INTEL expanded memory specification (EMS)* . . . 264.
Tiny Turbo 286 . . . 459
PC Turbo 286e w/1 Meg . . . 749.
✓Eccell Multifunction Board for the AT 0k *upgrades to 1 Meg, fully supports LOTUS/INTEL expanded memory specification (EMS) and Error Correction Code (ECC), serial and parallel ports optional* . . . 399.

Paradise Systems *(1 year)*
- ✓Color/Mono Card . . . 149.
- ✓Modular Graphics Card . . . 275.

Princeton Graphics *(1 year)*
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- ✓HX-12 RGB monitor *(690 x 240)* . . . 449.

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384k *(fully populated)* . . . 219.
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✓Symphony	Turbo Pascal
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dBase II	✓dBase III

- ✓MultiMate . . . each 12.

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Video 7 *(2 years)*
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- ✓Bernoulli Box 20 Meg w/PC2 card . . . $1999.
- ✓10 Meg cartridge . . . 51.
- ✓Bernoulli Box 40 Meg w/PC2 card . . . 2499.
- ✓20 Meg cartridge . . . 69.

Mountain Computer *(1 year)*
- Drive Card 20 Meg . . . call

PC Connection *(1 year)*
- 20 Meg Hard Drive Card . . . 489.

Seagate *(1 year)*
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Toshiba *(90 days)*
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- ✓AT 360k Drive *(5¼" half-height)* . . . 117.

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- ✓Maxell MD-2 . . . 19.

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- ✓Maxell . . . 34.
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- ✓**Floppiclene** Disk Drive Cleaner *(5¼")* . . . 18.

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Word-a-holics unite!

Trying to decide which word processor to buy is like trying to decide which college to go to. The decision will change your life forever, but you may never know if it was the best one. Here are five tried and proven professional packages. They all have spell checkers. None are copy-protected. And hard drives are recommended for all. See PC Magazine 1/28.



MultiMate Advantage 2.0 with Graphlink and On-File $299
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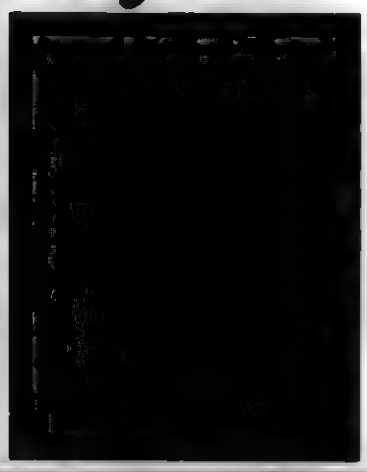
Microsoft Word 3.0 with Outline $247
With a mouse and a graphics card, MicroSoft Word lets you move words around without touching the keyboard, and see what you got without squinting. Without a mouse or a graphics card it's still a powerful word-processor, with "Style Sheets" that simplify formatting, and a built-in outline program.

WordPerfect 4.1 ..... $229
We have a friend who writes for computer magazines. At one time or another he has used and reviewed virtually every major word processor. He now swears by WordPerfect and swears at all the others. Use this program for a while and you'll be able to touch type most of your commands with your eyes closed and your right hand tied behind your back.

WordStar 2000 Plus Release 2 ..... $286
WordStar has had some trouble shedding its image as the lumbering dinosaur of the microcomputer age. But hundreds of thousands of people use it. There are a lot of programs out there to back it up. And this new version gives it the same advanced features as any top-quality word processor. Even the control keys are starting to make some sense.

Volkswriter 3.0 ..... $147
Solid performance with a reasonable price continues to be Volkswriter's claim to fame. It's fast, and boasts one of the original what-you-see-is-what-you-get screens. With the new version's spell checker and more sophisticated print formatting, it is now able to compete functionally with the other high-end word processors. (Our new low price is pretty persuasive too).

Buy one. Get two.



Hey, got a friend? Don't know? Check your database! What? No database? Have we got a deal for you (and your friend). Until June 30, Microrim will send you a *complete* second copy of R:base 5000 free when you send in your warranty card and a copy of our sales invoice. So you can get together with your friend, split the cost for one and get two! Or, you can keep the extra copy at home, at a branch office, or down the hall. R:base 5000 is easy to learn and operate, and has the custom reporting features most users need. Remember, the two for one offer is only good from April 15 till June 30.

R:base 5000 ..... $359
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We've got a problem. The prices we're able to offer on Bernoulli boxes are changing about 10 times faster than we can change this ad. Probably because the machines are selling about 10 times faster than anyone ever dreamed they would. The 20 Meg and 40 Meg versions feature two ½ height drives with removable cartridges. There's a 90 day warranty, and we're an authorized Bernoulli service center—turn-around on repairs is usually 24 hours. Here are our latest up-to-date-but-probably-obsolete-by-now prices!

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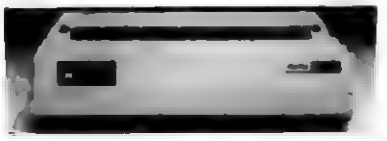
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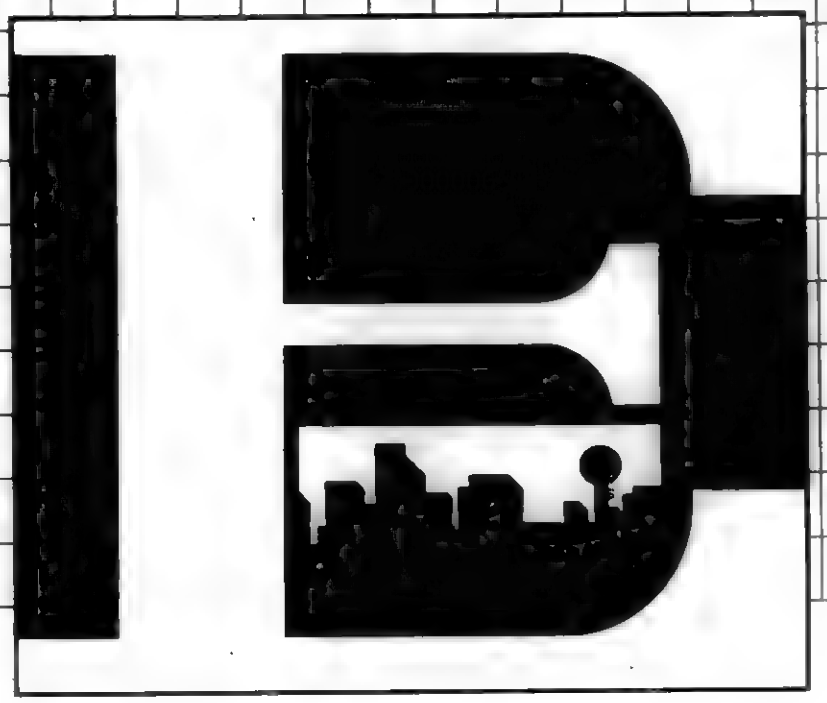
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Hiram, Ohio 44234

Closing date for application is July 31, 1986.

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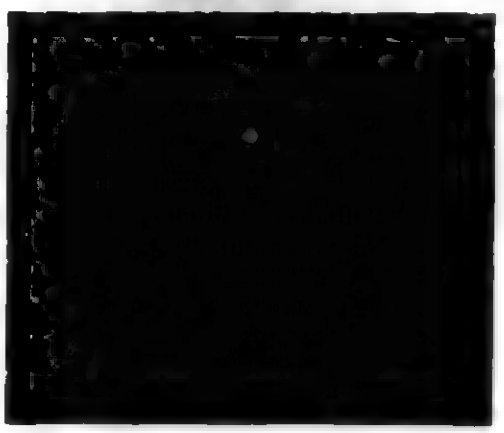
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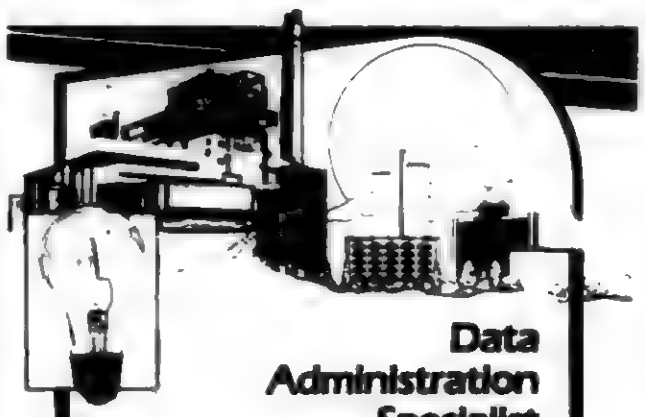
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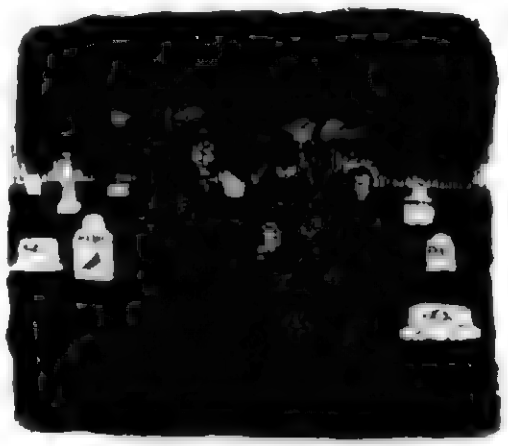
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University of Maryland College Park

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Menlo Park, CA 94025
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Computerworld Headquarters, 375 Cochituate Road, P.O. Box 9171, Framingham, MA 01701-9171
Phone: (617) 879-0700, Telex: 95-1153.

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Foreign Editorial/ Sales Offices

Argentina: Ruben Argento, Computerworld Argentina, Av. Belgrano 406-Piso 9, CP 1092 Buenos Aires. Phone: 34-5583/5584. Telex: 22644.

Asia: Euan Barty, Asia Computerworld Communications Ltd., 701-4 Kam Chung Bldg., 54 Jaffe Road, Wanchai, Hong Kong. Phone: (05) 8L63238. Telex: 72827 (COMWR HX).

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (02) 4395133, Telex: AA74752 (COMWOR).

Austria: Dr. Manfred Weiss, CW Publikationen, Verlagsgesellschaft m.b.H., Josefstaedter Strasse 74, A-1080 Wein, Austria. Telex: 115 542 (sch/a).

Brazil: Eric Hippeau, Computerworld do Brazil, Rua Pedroso de Morais 1553, 05419 Sao Paulo, SP Brazil. Phone: 814-9658-212-8750. Telex: 11 32017 (WORD).

Denmark: Preben Engell, Computerworld/Danmark A/S, Torvegade 52, 1400 Copenhagen K, Denmark. Phone: (01) 955 695. Telex: 31566.

France: Axel LeBlois, Computerworld Communications S.A., 185 Avenue Charles De Gaulle, 92200 Neuilly Sur Seine, France. Phone: 747 1272. Telex: 613234 F.

Hungary: Dezso Futasz, SZT Computerworld, P.O. Box 386, Budapest, 1536, Hungary.

Italy: Daniele Comboni, Computer Publishing Group S.R.L., Viale Restelli 5, 20124 Milano. Phone: (2) 688 9773. Telex: 333436 (GEJIT).

Japan: Mr. Shuji Mizuguchi, Computerworld Japan, 7-4 Shintomi 1-Chome, Chuo-ku, Tokyo 104. Phone: (03) 551-3882, Telex: 252-4217 (Computerworld Japan only).

Steven Yamada, Tokyo Representative Corp., Sanshin Kogyo Bldg., 2-10 Kando Jimbocho 3F, Chiyoda-ku, Tokyo 101, Japan. Phone: 230-4117, Telex: J26860 (reps for all CWCI publications except Computerworld Japan).

Mexico: Henry Morales, Computerworld Mexico S.A. de C.V., Oaxaca 21-2, Mexico City 7 D.F. Colonia Roma, 06700 Mexico. Phone: (05) 514-4218. Telex: 177 1300 (ACHAME).

The Netherlands: Wout Berends, CW Communications B.V., van Eeghenstraat 84, 1071 GK Amsterdam, The Netherlands. Phone: (020) 64 6651. Telex: 18242 (CWCOM NL).

Norway: Mr. Morton Hansen, CW Norge A/S, Hovinveien 43, P.O. Box 2862, Toyen, 0608 Oslo 6, Norway. Phone: (20) 64 77 25. Telex: 76476 9 (CW NOR N).

People's Republic of China: Chen Mingkun, China Computerworld, 74 Lu Gu Gun Road, P.O. Box 750, Beijing 10039, People's Republic of China. Phone: (47) 814 6174. Telex: 222214 (CCW CN).

Spain: Neil Kelley, Computerworld/Espana, Barquillo 21-3 izda, Madrid-4, Spain. Phone: 231 23 85; 231 23 86, 231 23 88. Telex: 47894 (CW E).

Sweden: CW Communications AB, Sodra Hamnvagen 22, S-115 41 Stockholm, Sweden. Phone: 46 8 67 91 80. Telex: 14904 9 (NOVACW).

Switzerland: Gebhard Osterwalder, CW Publikationen AG, Witikonerstrasse no. 15, CH - 8032 Zurich, Switzerland. Phone: (01) 55 10 77. Telex: 816710.

Taiwan: Grace Tang, ACE Media Agency Ltd., Boom 503, 1, Fu Hsin S. Road, Sec. 1, Taipei, 10587, Taiwan, R.O.C. Phone: 751 3636. Telex: 14142 (ACE GROUP). (Representative for all CWCI publications).

United Kingdom: Martin Durham, CW Communications Ltd., 99 Grays Inn Rd., London, WC1 8UT, United Kingdom. Phone: (01) 831-9252, Telex: 262346.

Euan Rose, Bill Dunlop, Barbara Levy, Christine Taylor, Beere Hobson Assoc., 345 Goswell Rd., Islington, London EC1, United Kingdom. Phone: (01) 278 3415. Telex: 311951 (Representatives for CWCI publications).

Venezuela: Kalman von Vajna Nagy, CW Comunicaciones, C.R.L. Torre Maracaibo, Piso 10, Oficina H, Av. Libertador, Caracas, Venezuela. Phone: 72-76-30.

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Vendors report sluggish demand

From page 118

ed Stephen Dube, of Shearson, Lehman Brothers, Inc.

Burroughs Corp. Despite focusing much of its time and energy during the last two months on its acquisition of Sperry Corp., the Detroit mainframe maker was still able to post impressive gains in domestic orders, revenue and profits.

Burroughs' Memorex Corp. subsidiary showed improved order rates for the third consecutive quarter and "a slight profit." Its System Development subsidiary showed "substantial" gains.

While earnings for the quarter were up 41% to $76.2 million, much of the gain — $13.7 million — is a result of accounting changes and divestiture.

Sperry. Meanwhile, the Blue Bell, Pa.-based Sperry said merger costs will reduce profits from $44.4 million to $6.8 million, down from year-earlier profits of $51.5 million. Revenue increased 1.8% to $1.25 billion.

NCR. The Dayton, Ohio-based firm continued to record earnings and revenue gains despite the listless domestic economy. For the six-month period, net profits rose 17% to $129 million, or $1.30 a share, while revenue climbed 14% to $2.12 billion.

"They've done a good job on the cost-control side of the house, keeping expenditures in line with revenue," noted Jay Stevens, an analyst with Dean Witter Reynolds, Inc.

In a separate announcement, NCR said it enacted a stock provision designed to prevent a hostile takeover, even though it said it is not aware of any such plan.

Computer Consoles, Inc. The Waltham, Mass., office and communications systems vendor narrowed its losses in the second quarter, although revenue declined roughly 5% to $33 million from the year-earlier period. The firm's second-quarter loss of $886,000 was significantly less than the $4.6 million deficit totaled in the year-earlier period, while earnings increased almost 56% from the previous period.

Chairman John F. Cunningham said Computer Consoles' upward revenue trend, which is expected to continue in the coming months, should enable the firm "to resume profitability in the second half of 1986 and break even for the year."

Apple Computer, Inc. Chairman John Sculley said Apple's 20% sales gain and $32.3 million profits were attributed to inroads made by its Macintosh computer into the office environment and to the leadership position achieved by the Apple II in the educational market.

The firm, which lost $17.2 million in the corresponding quarter last year, said gross margins as a percentage of net sales were 52.7% and 53.1% for the quarter and half, respectively. For the nine-month period, net profits were up 66% to $121 million, although sales were off 13% to $1.3 billion.

Lotus Development Corp. Newly named Chairman Jim Manzi said the key factors in the firm's second-quarter results, which boosted first-half profits to $23.1 million, or $1.44 a share, on revenue of $135.4 million, were record demand for its 1-2-3 and continued growth in international markets. "We are exceptionally pleased with Lotus' financial performance and increasing strength of the worldwide market demand for our products," Manzi said.

Computer Sciences Corp. Despite start-up costs of various government contracts, the El Segundo, Calif.-based systems and service company turned in sales gains in each of its three major operating areas. A principal contributor to the overall 25% revenue gain was the Industry Services group, which reported a 70% increase in sales to $51.9 million.

Apollo Computer, Inc. Although profits of $1.04 million were still far below the $7.4 million that the computer-aided design and manufacturing systems vendor reported a year ago before it began to feel the impact of the slump, Apollo turned in its highest ever quarterly sales level at $88.4 million, which was up 8% from the first quarter of this year.

Chairman and Chief Executive Officer Thomas A. Vanderslice said higher volumes and added customers should produce greater profits in the future.

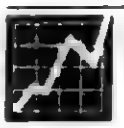
Oracle Corp. The Belmont, Calif., relational data base system vendor announced fourth-quarter sales of $20.8 million, a 146% increase over year-ago totals. Profits at the software vendor climbed to $2.6 million, or 17 cents a share, in the fourth quarter, compared with $1.5 million or 11 cents per share for the same period a year ago.

Sales for the fiscal year ended May 31 topped $56.4 million, a 139% increase over last year's $23.2 million. Fiscal 1986 profits were $5.8 million compared with $1.5 million in fiscal 1985.

Micom Systems, Inc. The Simi Valley, Calif.-based maker of data communications equipment is singing the familiar industry refrain: Weak capital economic conditions are hurting sales and profits.

Although sales in the period — $46 million — were negligibly below those in the corresponding period last year, profits were down to $1.6 million from $2.4 million. Chairman Roger Evans said soft sales of the firm's data private branch exchange had adversely affected results.

Service firms buck slump, stand tall with 20% growth



ACTIVE ISSUES
Kathy Porteus

Against a backdrop of ho-hum computer industry conditions, professional services companies are humming with activity. Stocks such as Computer Sciences Corp. (CSC — 34¼) and Planning Research Corp. (PLN — 18⅜) are being described, in Wall Street jargon, as "exciting stories."

Professional services companies provide customers with outside expertise in automating new applications and integrating systems. Professional services have traditionally meant "loaning out" programmers. Today, many companies offer comprehensive, value-added services that are contracted by a commercial customer or government agency for several years.

Professional services companies have attracted investor attention because of their apparent immunity to sluggish economic conditions, greater earnings visibility from longer term contracts and participation in a market that, by most accounts, is growing 20% annually.

Analysts say the Gramm-Rudman-Hollings legislation should not significantly alter business for service companies such as Computer Sciences that are heavy government contractors. Most analysts also expect professional services to be a major beneficiary of tax revision.

How should an investor play this group?

According to Stephen T. McClellan, vice-president with Merrill Lynch, Pierce, Fenner & Smith, Inc., Computer Sciences' stock "should do well over the next 12 months, even though it has come a long way already." During the past year, Computer Sciences shares appreciated 125%.

McClellan recommends Computer Sciences because of its momentum in the burgeoning systems integration market and its highly visible earnings growth owing to a large backlog of business. McClellan estimates Computer Sciences will earn $1.95 per share in fiscal 1987, which ends March 31, and $2.40 per share in fiscal 1988.

Likewise, Steven Ossad, analyst with L.F. Rothschild, Unterberg Towbin, says Computer Sciences is still undervalued. According to Ossad, Computer Sciences could offer even more rapid growth than the 20% annual earnings gains he projects because the company's earnings are "highly sensitive on the upside to relatively small margin changes." Ossad contends Computer Sciences could claim the kind of multiple investors now attached to Electronic Data Systems Corp. (GME — 44⅝), which trades at roughly 20 times calendar 1986 earnings.

But Christopher Mortenson, analyst with Alex Brown & Sons, says that at current price levels, Computer Sciences is "pretty fully priced." Mortenson recommends Planning Research, which he estimates earned $1.15 per share for fiscal 1986, ended June 30, and will earn $1.50 to $1.60 per share in the current fiscal year.

In recent weeks, Planning Research has backed off its 52-week high of 24 points. "There is a little near-term uncertainty reflected," Mortenson says, "but this stems from events that confirm reasons for longer term investment." According to Mortenson, Planning Research is getting out of businesses "that it shouldn't be in," such as civil engineering, and is focusing on high value-added, high-margin businesses with larger and longer term contract opportunities.

Rothschild analyst David Baratta also recommends purchase of Planning Research. Baratta writes in a recent report that "the company is emerging from a period of depressed earnings" and is now positioned "to become a major systems development supplier to the government market, enabling it to bid on and win large contracts."

American Management Systems, Inc. (AMSY — 16½) is another attractive stock idea in this group, according to Mortenson of Alex Brown. American Management sells software products in conjunction with its professional services.

Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

Semiconductor woes continue

From page 118

sales of $33.1 million; however, profits dropped 65% from 6 cents a share, or $2.1 million, a year ago.

The recession has also taken its toll on semiconductor equipment manufacturers like Varian Associates, Inc. of Palo Alto, Calif.

Last week the electronics supplier and semiconductor equipment company announced hiring freezes, a 5% reduction in its worldwide work force and a 10% pay cut for its executives.

The company said it hopes the moves will cut costs by as much as $30 million.

Varian currently has approximately 13,000 employees. A year ago, the company cut 1,700 employees from its work force.

MSA reports 25% revenue increase

By James A. Martin

ATLANTA — Management Science America, Inc. (MSA), continuing to rebound from the lackluster 1985 fiscal year, last week reported a 25% increase in operating revenue for its second quarter, with $47.6 million, compared with $38.1 million for the same quarter last year.

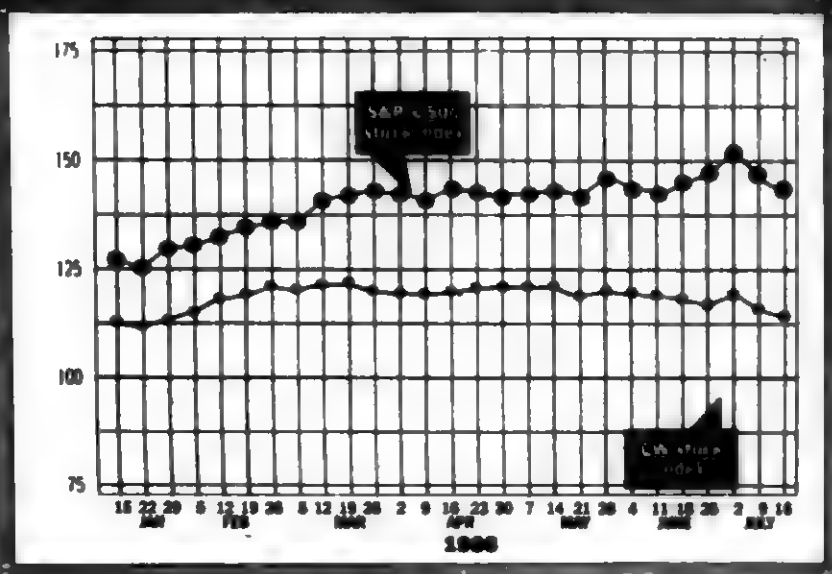
Net income was $5.9 million, or 33 cents per share, compared with 1985's net income of $3.1 million, or 17 cents per share. For the first six months of fiscal 1986, revenue was $77 million, compared with $63 million, while net income was $5.5 million, compared with $342,000.

MSA's revenue and income increases were "very impressive," especially when compared with the strong second quarter of 1985, its best quarter that year, said Chris Mortenson, senior analyst with Alex Brown & Sons in New York.

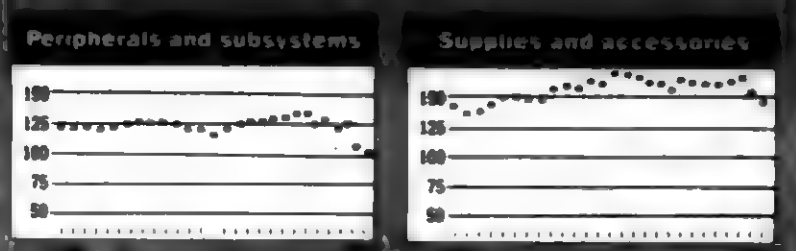
"MSA has been strong in the international market, and they have some good new products that help the whole product line," he added.

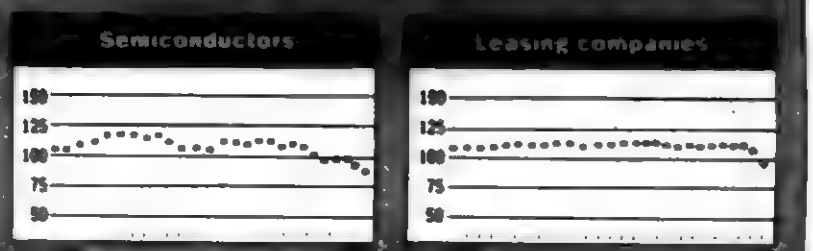
COMPUTER INDUSTRY

Computerworld stock trading index









	7/9/86	7/16/86
Computer systems	121.7	114.9
Software and DP services	104.9	101.1
Peripherals and subsystems	104.9	101.4
Supplies and accessories	150.1	148.2
Semiconductors	85.9	88.1
Leasing companies	103.9	97.2
CW stock index	113.5	112.6
Standard and Poor's 500 stock index	145.2	140.8

Computerworld stock trading summary

CLOSING PRICES WEDNESDAY, JULY 16, 1986

EXCH		52-WEEK RANGE (1)		CLOSE JULY 16 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS					
O	ALPHA MICROSYSTEMS	8	5	5.38	-0.3	-4.4
O	ALTOS COMPUTER SYS	19	10	13.50	-0.3	-1.8
A	AMDAHL CORP	19	10	16.88	-0.1	-0.7
O	APOLLO COMPUTER INC	23	9	10.63	-2.0	-15.8
O	APPLE COMPUTER INC	39	14	33.50	-1.1	-3.2
N	AT&T	26	20	24.00	-0.5	-2.0
N	BURROUGHS CORP	72	52	67.00	-3.0	-4.3
O	C P T CORP	7	4	4.13	-0.3	-5.7
N	COMPAQ COMPUTER CORP	18	8	12.25	-1.1	-8.4
A	COMPUTER CONSOLES INC	12	6	8.00	-1.0	-11.1
O	CONCURRENT COMP CORP	25	1	13.75	-1.3	-8.3
N	CONTROL DATA CORP DEL	29	15	22.75	-0.8	-3.2
O	CONVERGENT TECH	14	6	6.75	-0.5	-6.9
N	CRAY RESH INC	100	44	86.38	-3.1	-3.5
O	DAISY SYS CORP	32	8	8.38	-1.4	-14.1
N	DATA GEN CORP	50	31	32.63	-1.4	-4.0
N	DATAPOINT CORP	13	5	7.00	-0.1	-1.8
N	DIGITAL EQUIP CORP	94	48	84.00	-5.5	-6.1
N	ELECTRONIC ASSOC INC	7	4	4.00	-0.9	-17.9
N	FLOATING POINT SYS INC	46	23	33.88	-0.6	-1.8
N	GOULD INC	38	18	17.88	-3.1	-14.9
N	HARRIS CORP DEL	38	22	33.38	-3.0	-8.2
N	HEWLETT PACKARD CO	48	29	36.38	-5.0	-12.1
N	HONEYWELL INC	87	59	69.00	-4.5	-6.1
N	IBM	162	122	133.13	-11.1	-7.7
O	IPL SYS INC	4	1	3.00	+0.0	+0.0
N	ITT CORP	80	31	53.00	-1.8	-3.2
N	M A COM INC	23	13	16.25	+0.5	+3.2
N	MATSUSHITA ELEC INDL LTD	100	49	81.50	-0.4	-0.5
O	MENTOR GRAPHICS CORP	23	12	12.38	-2.6	-14.2
N	MODULAR COMPUTER SYS	9	6	8.88	+0.0	+0.0
N	MOHAWK DATA SCI CORP	4	1	2.50	+0.1	+5.3
N	NBI INC	20	10	11.50	+0.3	+2.2
N	NCR CORP	57	31	50.13	-2.3	-4.3
N	PRIME COMPUTER INC	28	15	16.38	-1.5	-8.4
N	SPERRY CORP	78	46	75.25	+0.1	+0.2
O	STRATUS COMPUTER	28	15	18.75	-2.0	-9.6
O	SYMBOLICS INC	16	7	7.25	-0.9	-10.8
O	TANDEM COMPUTERS INC	34	13	28.75	-3.0	-9.4
N	TANDY CORP	45	30	33.38	-2.6	-7.3
N	TEXAS INSTRS INC	148	88	110.75	-9.1	-7.6
A	ULTIMATE CORP	35	11	22.63	-3.8	-14.2
A	WANG LABS INC	23	13	13.00	-1.3	-8.8
A	WANG LABS INC	23	13	13.00	-1.6	-11.1
N	XEROX CORP	72	46	50.88	-4.6	-8.3
	SUPPLIES & ACCESSORIES					
N	AMER BUSINESS PRODS	37	25	33.13	+1.0	+3.1
N	BARRY WRIGHT CORP	25	17	17.75	-0.4	-2.1
A	DUPLEX PRODS INC	23	17	18.88	-1.9	-9.0
N	ENNIS BUSINESS FORMS INC	28	15	24.00	-1.4	-5.4
N	3M CO	115	74	108.13	-3.0	-2.7
N	MOORE LTD	28	18	25.38	-0.4	-1.5
O	STANDARD REGISTER CO	50	30	37.00	-3.0	-7.5
N	WALLACE COMPUTER SVCS	80	33	46.25	-0.5	-1.1

EXCH		52-WEEK RANGE (1)		CLOSE JULY 16 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & DP SERVICES					
O	ADVANCED COMP TECH	7	3	4.88	+0.0	+0.0
N	ADVANCED SYS INC	20	11	16.63	-0.9	-5.0
N	AGS COMPUTERS INC	25	14	17.75	-1.4	-7.2
O	AMERICAN MGMT SYS INC	20	6	16.50	-0.3	-1.5
O	AMERICAN SOFTWARE INC	15	9	12.25	+0.8	+6.5
N	ANACOMP INC	7	3	5.00	-0.4	-7.0
O	ANALYSTS INTL CORP	11	6	5.50	+0.0	+0.0
O	ASHTON TATE	34	10	24.63	-0.6	-2.5
O	ASK COMPUTER SYS INC	15	7	9.88	-0.1	-1.3
O	ASTRADYNE COMP IND	3	1	1.38	+0.0	+0.0
N	AUTOMATIC DATA PROC	39	18	31.13	-2.9	-8.5
O	COMPUTER ASSOC INTL INC	25	10	20.00	-2.0	-9.1
O	COMPUTER HORIZONS CORP	15	10	11.25	-0.1	-1.1
O	COMPUTER NETWORK TECH	10	2	6.94	-0.4	-5.1
N	COMPUTER SCIENCES CORP	40	19	33.75	-1.9	-5.3
O	COMPUTER TASK GROUP INC	19	11	12.75	+0.0	+0.0
O	COMPUTONE SYS INC	7	3	2.75	-0.3	-8.3
O	COMSHARE INC	13	9	12.00	-0.5	-4.0
N	CULLINET SOFTWARE INC	28	10	11.25	-0.9	-7.2
O	CYCARE SYS INC	17	10	12.00	-1.9	-13.5
O	DUQUESNE SYS INC	45	11	26.75	-1.3	-4.5
N	GENERAL ELEC CO	83	66	75.50	-1.1	-1.5
N	GENERAL MTRS CORP	90	33	43.25	-1.6	-3.6
N	GTE CORP	56	38	54.75	+1.6	+3.1
O	HOGAN SYS INC	12	4	10.63	+0.0	+0.0
O	INFORMATION SCIENCES INC	4	1	3.00	+0.0	+0.0
O	INFOTRON SYS CORP	23	13	13.00	-2.0	-13.3
O	KEANE INC	19	12	14.00	-0.3	-1.8
N	LOGICON INC	43	28	28.25	-2.9	-9.2
O	LOTUS DEV CORP	39	15	35.50	+0.8	+2.2
O	MANAGEMENT SCI AMER	16	8	13.00	-0.6	-4.6
O	MCI COMM CORP	13	8	9.88	+0.0	+0.0
O	MICOM SYS INC	23	12	11.75	-0.5	-4.1
O	MICRO PRO INTL CORP	4	2	2.25	+0.3	+16.1
O	MICROSOFT CORP	36	26	29.00	+1.0	+3.6
O	NATIONAL DATA CORP	26	11	17.38	-1.0	-5.4
O	ON LINE SOFTWARE INT	16	6	11.75	-1.3	-9.6
O	ORACLE SYS CORP	29	17	17.75	-6.3	-26.0
N	PANSOPHIC SYS INC	36	18	27.25	-1.1	-4.0
N	PLANNING RESH CORP	24	14	17.25	-1.4	-7.4
O	POLICY MGMT SYS CORP	24	15	15.25	-2.0	-11.6
O	PROGRAMMING & SYS INC	11	5	8.63	-1.3	-12.7
O	REYNOLDS & REYNOLDS CO	36	18	30.00	-1.8	-5.5
O	SCIENTIFIC COMPUTERS INC	8	4	4.38	-0.1	-2.8
O	SEI CORP	28	18	16.00	-0.5	-3.0
O	SHARED MED SYS CORP	41	29	32.38	-0.6	-1.9
O	SOFTWARE AG SYSTEMS INC	22	13	17.38	-0.9	-4.8
O	SOFTWARE PUBG CORP	13	5	5.38	+0.1	+2.4
A	STERLING SOFTWARE INC	21	7	17.38	-1.3	-6.7
N	UCCEL CORP	23	13	20.00	+0.8	+3.9
N	URS CORP	18	10	16.25	+0.8	+4.8
O	VM SOFTWARE INC	32	17	26.00	+0.4	+1.5
	SEMICONDUCTORS					
N	ADVANCED MICRO DEV	34	14	14.50	-4.3	-22.7
N	ANALOG DEVICES INC	25	14	15.75	-1.1	-6.7
O	ANALOGIC CORP	16	11	11.13	-0.1	-1.1
N	APPLIED MAGNETICS CORP	20	12	15.25	-0.8	-4.7
O	AVANTEK INC	24	17	17.38	+0.3	+1.5
O	HADCO CORP	7	4	4.75	-0.4	-7.3
O	INTEL CORP	32	18	18.38	-3.1	-14.5
O	MICRO MASK INC	6	3	3.75	+0.3	+7.1
N	MOTOROLA INC	50	29	34.13	-3.0	-8.1
N	NATIONAL SEMICONDUCTOR	16	9	9.50	-1.6	-14.6
N	TERADYNE INC	30	17	19.13	-2.0	-9.5

EXCH		52-WEEK RANGE (1)		CLOSE JULY 16 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	PERIPHERALS & SUBSYSTEMS					
A	AM INTL INC	9	3	7.00	+0.1	+1.8
A	ANDERSON JACOBSON INC	3	2	2.13	+0.0	+0.0
O	AST RESH INC	33	11	11.50	-2.5	-17.9
O	AUTOTROL CORP	10	6	7.88	+0.3	+3.3
O	AVANT GRADE COMPUTING	10	3	3.75	+0.4	+11.1
O	BANCTEC INC	13	7	7.50	-0.5	-6.3
N	BOLT BERANEK & NEWMAN	48	27	40.00	2.0	-4.8
O	CAMBEX CORP	2	1	1.00	+0.0	+0.0
N	CENTRONICS DATA COMP	8	3	6.88	+0.3	+3.8
A	CETEC CORP	9	6	7.13	+0.0	+0.0
A	COGNITRONICS CORP	6	4	3.88	+0.0	+0.0
N	COMPUGRAPHIC CORP	30	19	19.13	-0.4	-1.9
N	COMPUTERVISION CORP	19	9	11.75	-2.0	-14.5
N	CONRAC CORP	18	11	14.75	-1.0	-6.3
A	DATAPRODUCTS CORP	18	11	14.63	-0.3	1.7
A	DATARAM CORP	18	4	7.13	-0.5	-6.6
O	DATA SWITCH CORP	9	4	6.50	+0.1	+2.0
O	DATUM INC	7	5	5.63	+0.3	+4.7
N	DECISION INDS CORP	15	10	11.13	-0.8	-6.3
O	ENDATA INC	8	3	6.13	-0.3	-3.9
O	EVANS & SUTHERLAND	27	15	20.38	-1.1	-5.2
N	FLOATING POINT SYS INC	46	23	33.88	-0.6	-1.8
O	GANDALF TECHNOLOGIES	8	5	6.31	-0.1	-1.0
N	GENERAL DATACOMM IND	15	8	10.75	+0.0	+0.0
N	HAZELTINE CORP	30	16	19.50	+1.0	+5.4
O	ICOT CORP	13	6	9.75	-0.4	-3.7
O	INFORMATION INTL INC	18	10	16.25	+0.3	+1.6
O	INTECOM INC	7	3	4.56	-0.1	-2.7
O	INTERLEAF INC	15	10	10.00	-1.6	-14.0
O	MEGADATA CORP	5	3	3.63	+0.0	+0.0
A	MSI DATA CORP	14	8	11.00	-0.5	-4.3
N	NASHUA CORP	28	12	22.88	-1.3	-5.2
O	NETWORK SYS CORP	27	10	11.00	-1.1	-9.3
N	NORTH AMERN PHILIPS CORP	48	32	39.13	-3.3	-7.7
N	NORTHERN TELECOM LTD	40	25	27.38	-1.5	-5.2
O	NOVELL INC	21	9	18.50	-1.3	-6.3
O	OMEX	1	0	0.63	+0.0	+0.0
N	PARADYNE CORP	13	6	6.88	-0.9	-11.3
A	PENRIL CORP	10	6	5.75	-0.3	-4.2
N	PLESSEY PLC	38	19	31.88	-1.4	-4.1
O	PRINTRONIX INC	15	10	12.00	-1.0	-7.7
O	QMS INC	16	6	13.13	-0.4	-2.8
O	RAMTEK CORP	7	2	5.13	-0.4	-6.8
N	RECOGNITION EQUIP INC	17	9	11.25	-0.3	-2.2
N	SANDERS ASSOC INC	63	29	59.50	+2.8	+4.8
O	SCAN TRON CORP	24	12	17.75	2.3	-11.3
N	SCIENTIFIC ATLANTA INC	15	9	9.50	-0.5	-5.0
O	SEAGATE TECHNOLOGY	14	5	11.38	+0.5	+4.6
N	STORAGE TECHNOLOGY	7	1	2.88	-0.6	-17.9
O	SUN MICROSYSTEM INC	20	12	13.13	-1.1	-7.9
A	T-BAR INC	7	5	5.25	-0.1	-2.3
A	TAB PRODS CO	15	10	13.75	+0.5	+3.8
O	TANDON CORP	8	3	5.00	-1.1	-18.0
A	TEC INC	11	4	4.13	-0.1	-2.9
N	TEKTRONIX INC	66	47	56.75	-2.4	-4.0
O	TELEVIDEO SYS INC	4	2	3.25	+0.4	+13.0
N	TELEX CORP	60	40	52.75	-3.0	-5.4
N	TIMEPLEX INC	24	14	15.88	-0.1	-0.8
N	TITAN CORP	12	5	9.00	+0.1	+1.4
O	VISUAL TECHNOLOGY INC	2	0	0.50	+0.0	-5.8
O	WYSE TECH	19	7	13.75	-1.3	-8.3
	LEASING COMPANIES					
N	COMDISCO INC	25	10	18.25	-1.8	-8.8
N	CONTINENTAL INFO SYS	12	5	9.50	-1.1	-10.6
O	FINALCO GROUP INC	5	3	3.25	-0.3	-7.1
O	PHOENIX AMERN INC	6	2	3.75	-0.1	-3.2
O	SELECTERM INC	12	6	6.50	-0.3	-3.7
N	U.S. LEASING	46	32	40.00	-2.0	-4.8

EXCH: N—NEW YORK; A—AMERICAN; P—PACIFIC; B—BOSTON; L—NATIONAL; M—MIDWEST; O—OVER-THE-COUNTER

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COMPUTER INDUSTRY

INSIDE

After a year of layoffs and financial losses, Walker Interactive Products appears to be resurfacing/87

Strong opposition emerges to Sen. Robert Dole's proposal for deregulating the regional holding companies/90

Management Science America reports a 25% revenue increase for the second quarter/116

INSTANT ANALYSIS

"I am gratified that senior management from both companies have started to work together as partners."

— Burroughs Corp. Chairman W. Michael Blumenthal commenting on the efforts to merge Burroughs and Sperry Corp.

IBM earnings slide again

Blue second-quarter net drops 7.7% from '85 level

By Alan Alper

NEW YORK — Despite registering a modest increase in revenue, IBM last week reported that second-quarter earnings declined from the year-earlier period. The company said the situation was caused by persistently weak demand in North America for computer equipment and extreme profit margin pressure.

The net profit for the quarter, which decreased 7.7% to $1.3 billion, or $2.12 a share, from the comparable period in 1985, was slightly below analysts' expectations. The second-quarter shortfall caused the first-half net to decline by 3.2% to $2.32 billion, or $3.77 a share.

Second-quarter revenue increased 7.3% to $12.26 billion and by 5.6% for the first half to $22.39 billion. IBM's rental revenue fell by 36.1% in the quarter to $680 million, in line with its strategy of steering customers toward outright product purchases.

Although analysts were not expecting much improvement from the first quarter's subpar results when equipment sales dipped slightly [CW, April 14], many were still disappointed with the second-quarter earnings performance.

"Clearly, product mix and volume, price cuts and their fixed cost structure hurt them," noted Michael Geran, an analyst with E. F. Hutton & Co.

Despite the revenue increase, Geran and other analysts maintain that IBM had not done enough to lower costs, a suggestion borne out by sagging profits.

In the second quarter, cost of sales, services, rentals and expenses increased by 13.8% to $10.34 billion, widening first-half expenditures to $18.91 billion, up 11% from the year-earlier period.

See IBM page 88

Semiconductor woes continue

By Maura McEnaney

SUNNYVALE, Calif. — Advanced Micro Devices, Inc. (AMD) led off the list of bad news from the semiconductor industry last week, announcing first-quarter losses of $28 million. Sales for the quarter were flat at approximately $153.9 million.

The massive loss prompted some speculation that AMD, which has a long-standing no-layoff policy, is considering implementing a four-day work week sometime this summer.

Despite a beefed up marketing program and analysts' anticipation of an industry turnaround this year, AMD's losses climbed from $16 million during the previous quarter on sales of $153.3 million. Sales were up only slightly over year-ago totals of $153 million.

Some analysts said the loss is due in part to a sales force exodus that has been occurring at AMD over past several months. "AMD has had a remarkable losing streak," said Steve Szirom, president of HTE Management, Inc. Although the company has been known for its strong sales and marketing force, many top-level managers went to start-up companies after they saw evidence of flat sales, Szirom said.

While losses at commodity chip vendors such as AMD are climbing, vendors of application-specific integrated circuits are registering increased revenues, but at somewhat slower rates.

Application-specific integrated circuit manufacturer LSI Logic Corp. of Milpitas, Calif., reported income of two cents a share, or $768,000, on $47.9 million in revenue for the second quarter ending in June. Revenue was up 45% over year-ago

See SEMICONDUCTOR page 116

INDUSTRY INSIGHT
Clint Wilder

Hit list: Top 10 cliches

Researching the computer industry's 10 greatest marketing and corporate cliches does not take a lot of effort. That should come as no surprise to MIS directors who must endure more vendors' dog-and-pony shows than all trade press reporters combined. Cutting through all the puffery is a skill learned by months of experience with buzzwords, hype and empty promises. And, if anything, the industry slump has made it worse.

With that preface, following is the 1986 Top 10, in no particular order, with appropriate explanations, comments or antidotes.

1. "We offer solutions, not just products." This statement is meant to imply a contrast with the rest of the industry, but just try to find a vendor that says the opposite. If this were really true, one suspects, the industry would not be in the slump it is in today.

2. The expenses strategy justification. In this two-part entry for vendors experiencing financial difficulty, the vendor simply picks the justification that suits the company's course of action.

If the company is losing money because expenses are outpacing income, then the vendor is "maintaining its strong investment in research and development, maintenance and customer support to ensure its long-term ability

See HIT page 92

Wilder is Computerworld's senior editor, computer industry.

Hardware vendors' reports reflect sluggish domestic demand

Burroughs and NCR fly in face of slump

By Alan Alper

NEW YORK — Most large-system and communications hardware vendors are still reeling from prolonged, lackluster domestic demand for their products.

Led by IBM, the flurry of financial reports released last week continued to cite softness in domestic capital expenditures for revenue and earnings woes. While Honeywell, Inc. and others spoke of persistent sluggish demand, there were notable exceptions. NCR Corp., for the fourth consecutive quarter, chalked up record earnings and revenues, and Burroughs Corp. reported an improving business outlook.

The industrywide problem, according to Frank Gens, an analyst at International Data Corp. of Framingham, Mass., is multidimensional. "If you look at it, some of it relates to the soft economy, some of it can be blamed on budgetary cutbacks and some of it is the inability of organizations to absorb automation," he said.

Leading companies reporting results for the quarter ended in June were the following:

Honeywell. Chairman . Edson Spencer cited ongoing weak domestic capital expendures as the cause of drastically lower earnings in Honeywell's Information Systems unit. While U.S. orders in the second quarter exceeded the previous period, they "lagged" behind the year-earlier quarter, Spencer added.

The firm's 31.2% drop in second-quarter income to $36.1 million, or 80 cents a share, was in line with analysts' expectations. "It looks like it will be a depressed year for them with earnings down 10% from last year's already depressed levels," not-

See VENDORS page 116

Company	Net Income April-June, 1986 (thousands of dollars)	Percent Change From 1985	Revenue April-June, 1986 (thousands of dollars)	Percent Change From 1985
Apollo	1,041	-85	88,382	+1
Computer Consoles	(886)	**	33,085	-5
IBM	1,305,000	-7.7	12,268,000	+7.3
Micom Systems	1,662	-69	46,092	-1
Oracle	2,580	+76	20,835	+146

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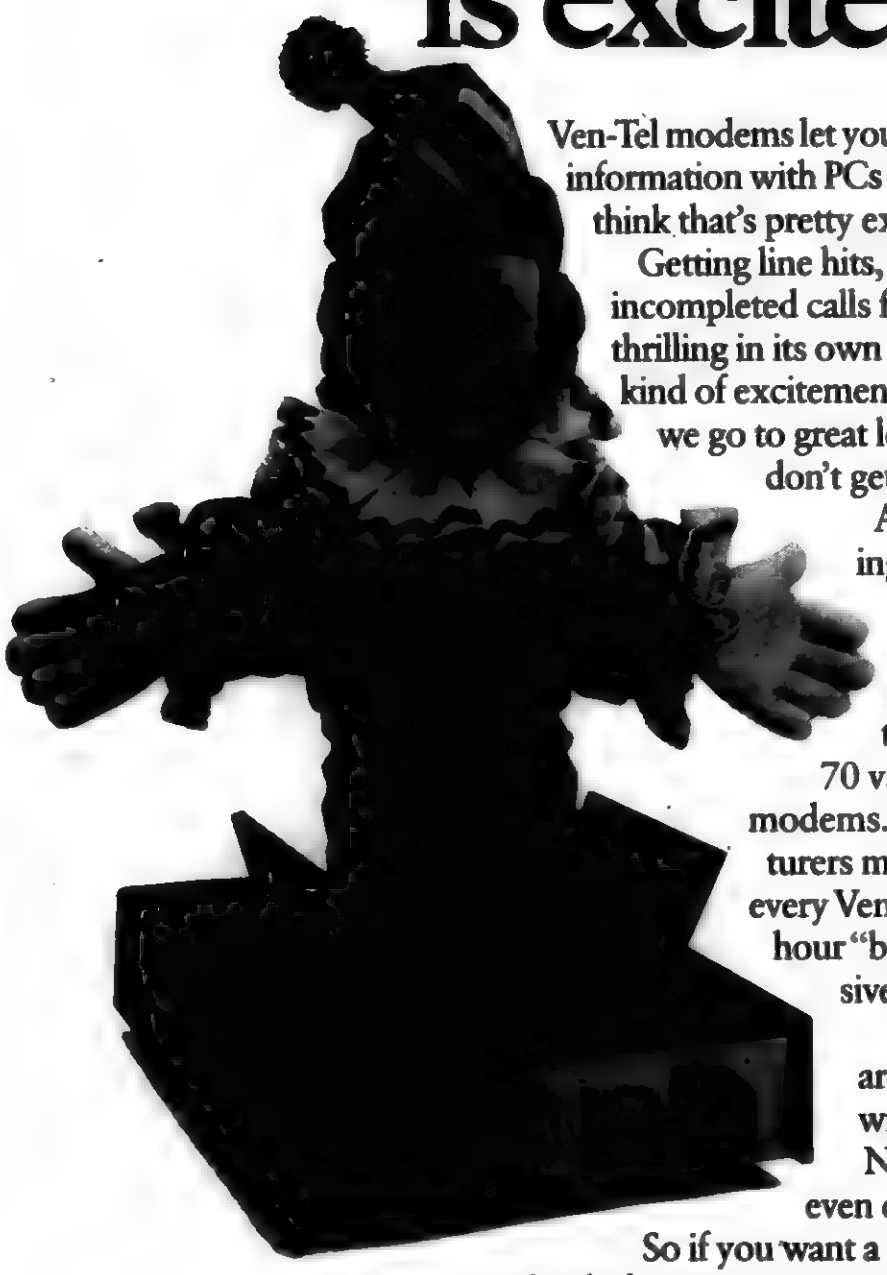


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Management training for MIS begins to get the attention it deserves/**43**

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NEWSPAPER

TOP OF THE NEWS

In antitrust charges filed against DEC, a third-party vendor claims it is being locked out of selling compatible equipment. **Page 12.**

■

MIS departments to be a tough sell for Lotus's micro-mainframe products. **Page 2.**

■

Ford announces negotiations with IBM for a corporatewide systems contract. **Page 4.**

■

Burroughs rolls out a low-end mainframe offering twice the power of its 2-year-old A 3. **Page 35.**

■

The computer industry slump will continue into the second half of 1987, economists predict. **Page 6.**

■

Software Publishing aims for corporate sales with a more powerful software lineup and site licensing options. **Page 13.**

■

Software to convert handwriting into ASCII characters expected to debut late this year. **Page 23.**

■

Norton Co. sends executives and factory floor workers to CAMP. **Page 65.**

■

DEC's scheduled announcement Aug. 5 is expected to either fill out superminicomputer lineup with a VAX 8700 general-purpose system, comparable to the high-end VAX 8800 scientific machine, or boost the performance of the current high-end general-business systems, the VAX 8600 and 8650, with the addition of the BI bus. The anticipated Vaxmate, an IBM PC AT challenger, reportedly will be coming at a later date.

■

Industry sources say Symbolic tomorrow will introduce two systems, the 3620 and 3650, in a move to tighten its product line. Both systems are expected to incorporate Symbolics' proprietary gate-array, very large-scale integrated technology, which was introduced in April

See **NEWS** page 10

Chip triggers software race

VM functions, AI packages promised for Intel 80386

By David Bright

SANTA CLARA, Calif. — Software vendors are rushing to exploit the powerful 80386 32-bit architecture now that chip manufacturer Intel Corp. has begun shipment of the long-awaited microprocessor.

Last week, Softguard Systems, Inc., based in Santa Clara, announced that it is developing a microcomputer operating system for the 80386 that is patterned after IBM's mainframe VM operating system.

Next week, Intel is expected to announce agreements with six artificial intelligence software vendors to port their Lisp and Prolog languages to the 80386.

See **CHIP** page 12

OSI substitute lures net users

By Elisabeth Horwitt

Business users eager to implement multivendor networks are increasingly turning to an alternative that already offers much of the networking versatility only promised by Open Systems Interconnect protocols from the International Standards Organization.

According to user and industry sources, the alternative, called Transmission Control Protocol/Interconnect Protocol or TCP/IP, provides an array of low-level networking functions for more than 50 vendors' systems. Among these functions are transport, routing, end-to-end reliabili-

See **OSI** page 8

Big 8 firm, politics tied to 4GL snafu

By Charles Babcock

TRENTON, N.J. — A state agency's monumental systems logjam, which attracted nationwide attention last year, stemmed from the misuse of a fourth-generation language, according to the New Jersey State Commission of Investigation. A recent commission report charged that the fourth-generation language misuse was compounded by election-year political considerations.

The commission reserved its harshest criticism for Price Waterhouse & Co., the Big Eight accounting firm whose expertise was enlisted to totally redo the Department of Motor Vehicles' systems. One goal of the project, in addition to developing more efficient systems, was to build more flexibility into the department's information retrieval system, so high-risk drivers could be isolated for insurance purposes.

Price Waterhouse, which served as the state's $6.5 million consultant on the project, used a fourth-generation language to speed up development of the DMV systems.

The firm was directed by state officials to complete the planned five-year project in less than two years so that incumbent Gov. Thomas Kean could take credit for the improvements when he ran for re-election, the report said.

Price Waterhouse was selected after state computer experts were frozen out of responsibility for the new system, according to the report. Price Waterhouse obtained the contract on a hurry-up basis without competitive bidding, a practice the commission criticized harshly.

Price Waterhouse Director of Marketing Bernard R. Cammarata in New York denied the report's conclusion and said the firm was dismayed by the findings. "We

See **BIG** page 4

CW SPECIAL REPORT

Downsizing: Cox shifts DP from mainframes to remote minis

By James A. Martin

ATLANTA — The cable television division of communications conglomerate Cox Enterprises, Inc. is completing a radical reorganization of its information systems resources. In a dramatic instance of MIS downsizing, the division is dumping its IBM mainframe in favor of an IBM System/38, slashing its central MIS staff by 90% and distributing information processing responsibilities to 25 cable TV operations around the country.

Diverging from the trend toward bigger and bigger processors, Atlanta-based Cox is instead distributing information systems responsibility among the business managers at its cable companies. The remote units increasingly rely on the technical expertise of turnkey systems vendors for programming and support services.

As a result, the DP staff at headquarters has been dramatically reduced, from 155 last year to about 60 today and a projected 15 to 16 for next year. Only about four or five headquarters DP staff members went to new jobs at remote sites.

"I realize this project is totally unorthodox from the DP perspective, where unplugging a mainframe is a sin," says L. Roy Prater, vice-president of MIS for Cox Cable Communications, a subsidiary of Cox Enterprises. "But it is totally suitable and absolutely practical from a business perspective."



Cox's Prater

Specifically, the division's IBM 3081 Model K mainframe, which at one time supported more than 1,200 remote IBM 3180 and 3278 terminals and some 500,000 remote interactive TV converters, is being replaced by an IBM System/38 as the main processor. Cox Cable's 25 cable firms, scattered from Cranston, R.I., to Spokane, Wash., are trading in remote terminals for either IBM System/36 Models B23 through B26, System/38s or Tandem Corp. Nonstop and TXP models.

See **DOWNSIZING** page 71

Lotus faces tough MIS market for micro-mainframe package

Data exchange tool to ship next month

By Douglas Barney

CAMBRIDGE, Mass. — Lotus Development Corp. is entering a hotly competitive market by selling micro-to-mainframe data extraction software directly to a hard-to-please DP/MIS community.

The firm, noted for its dominance of the microcomputer spreadsheet market, is pitting itself against a sometimes skeptical DP/MIS community, current products from more than 200 vendors and future products expected from IBM or written to IBM specifications.

The Application Connection (TAC), Lotus's solution to micro and mainframe data exchange, is set to ship next month and will compete with a variety of micro-to-mainframe communications packages such as Answer/DB from Informatics General Corp., Interactive PC Link from McCormack & Dodge Corp., Infogate from Cullinet Software, Inc. and a slew of IBM 3270 terminal emulation packages. The TAC line is an enhanced version of the Ilink products acquired by Lotus earlier this year from Infocenter Software, Inc.

TAC is a combination of micro and mainframe software that allows users to extract data from a variety of host applications and translates the data into PC file formats. The data can then be retranslated and sent back to the host. "There are a whole lot of people who are having problems getting data from applications such as Focus and Nomad into their spreadsheets," explains Mussie Shore, product manager for TAC.

Users divided

Potential users, however, are divided on whether Lotus will be successful in this market. "I am skeptical. It won't deal with [Cullinet Software's] IDMS, so we would at least need that product. Our files and the information on them are complex enough that users of the data wouldn't be able to comb through and get the data they need. We would need someone between the user and the files," says Ronald Jenks, partner and director of information services for Touche Ross & Co. "We have pretty massive files. I haven't been able to find a product that will cut across all those."

One potential user, however, is impressed with TAC. "I am impressed by the way the product looks. It has a lot of potential," says Merv Adrian, chairman of the micro-to-mainframe special interest group of the New York PC Users Group. "What I saw was impressive, and their business strategy is good," according to Adrian.

Fortunately for Lotus, the market for products that exchange data between micros and mainframes is large and growing, which may enable the company to buck critics. According to Framingham, Mass.-based International Data Corp., the market for micro-to-mainframe links will reach $1.3 billion next year, up from $450 million this year.

"It is a very good market, but the key is the mainframe piece and how you get at the mainframe data base. It has been a very confused market because there are so many of these products," notes Frank Dodge, president of McCormack & Dodge, which markets Interactive PC Link, a product that also extracts data from host applications and translates the data in PC formats. According to Dodge, there are at least 150 programs that transfer files between PCs and mainframes, but these products don't solve the problem of easy access and translation of data.

"It is definitely a growing market. Most PCs in corporate environments are either stand alone or doing just simple terminal emulation," says David Ferris, chairman of Ferrin Corp., a PC consultancy based in San Francisco. The current need is to make PCs an intelligent part of larger systems, he adds.

Biggest challenge

Perhaps the biggest challenge will come next year when IBM makes its Server-Requester Programming Interface (SRPI) fully available to applications developers. This interface provides a standard format for the development of micro-to-mainframe communications packages and could result in a host of hooks into mainframe applications that will compete with TAC.

ANALYSIS

SRPI "is a combination of software and hardware adapter cards that allow the end user on a PC to go into the host's data base without needing to use the host's data base format. It is an expensive link but a very comprehensive link," says Clare Fleig, director of systems research for International Technology Group of Los Gatos, Calif.

"There is going to have to be some rewriting of data and recapitulation of some of the mainframe packages. It is going to be a long-term transition, but it is the direction that IBM is definitely going in," Fleig says. "IBM says you are going to basically be able to tap into all of the major mainframe applications at some point."

Not a threat

The IBM strategy does not pose a threat to Lotus's offering, argues Lotus's Shore. "They are proposing to attack the problem of how to get data from IBM's DB2 to PCs but nothing about other data base management systems on the host," Shore claims. "They are moving in the right direction, but it is not competitive at this point because they are protecting DB2."

Others also voice skepticism about SRPI. "SRPI falls short of the kinds of things Ilink was doing," Ferris says. The primary focus of SRPI is to query live DB2 data bases. For other host applications, programmers must extract data bases for users to access. "It is not clear that IBM will succeed with the software," Ferris observes.

Although some elements of SRPI will be available this quarter, other key aspects will not ship until late next year, Ferris says.

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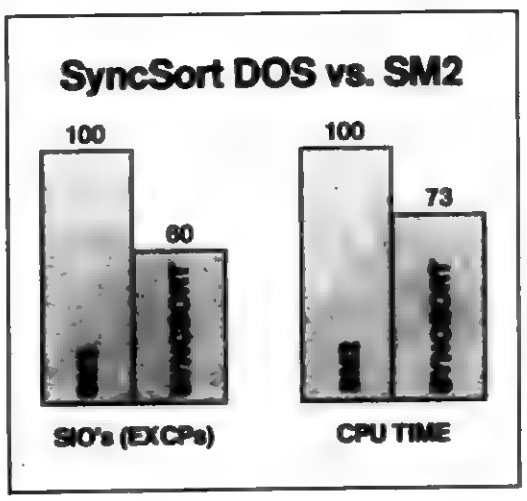
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Ford looks to IBM for OA systems cohesion

Compatibility cited in single-vendor approach

By Alan Alper

NEW YORK — Ford Motor Co. late last week confirmed that it has chosen IBM, over Digital Equipment Corp. and Wang Laboratories, Inc., to devise a comprehensive office automation strategy for its North American operations.

In a prepared statement, Ford said that after several months of consideration, the No. 2 auto maker concluded that it "would benefit substantially" from having only one vendor supply its office automation needs. Sources close to the bidding have said that over time, Ford has purchased mainframe computers from IBM and Burroughs Corp. and departmental minicomputers from Wang. The firm is also believed to have purchased engineering systems from DEC.

By selecting a single vendor, Ford said, it would be able to take full advantage of "leading-edge technology without the problem of coping with incompatible equipment."

Ford spokesman Jim Trainor pointed out that while the automotive concern has appointed IBM as its designated supplier, a contract has not yet been awarded. "We're continuing to negotiate with them," Trainor said.

Trainor did say that Ford intends to purchase between $300 million and $400 million worth of office automation equipment and services during the next five years, including approximately 30,000 workstations.

Sources said that, given IBM's mediocre financial results for the first half of the year [CW, July 21] and lost momentum in the minicomputer area, the firm pulled out all stops to secure Ford's business.

"Ford was very important to IBM," one source close to the bidding said. "They wanted to win this contract to serve notice that they don't intend to lose anymore business to DEC."

In a related matter, *Computerworld* learned that Ford is also seeking bids from software developers to devise a corporatewide programming methodology to be used by Ford's 20 systems organizations.

Big 8 firm tied to 4GL snafu

From page 1

feel the commission ignored a great deal of what we submitted."

For its part, Price Waterhouse blamed much of the DMV snafu on the fourth-generation language it selected, Ideal, from Applied Data Research, Inc. (ADR). According to the report, Price Waterhouse found Ideal to be "replete with software bugs."

Since its initial October 1983 release, two additional versions of Ideal have been issued that are geared to improving performance and eliminating glitches, ADR officials said.

At the start of the DMV project, Ideal was used exclusively in applications, despite a series of warnings cautioning that its use was inappropriate. According to the report, state computer experts' tests indicated Ideal would run too slowly for DMV applications. Tests conducted by Price Waterhouse itself showed Ideal ran more slowly than Cobol. And ADR executives warned Price Waterhouse that Ideal was being used inappropriately.

At a Sept. 25, 1984, meeting, Joseph W. Farrelly, ADR's vice-president for research and development, told Price Waterhouse representatives that Ideal should not be used exclusively, according to the investigators. ADR subsequently arranged training in Cobol programming for Price Waterhouse personnel so the DMV systems could be built with Cobol components, the report stated.

Farrelly told *Computerworld* he found little to disagree with in the portrayal of ADR in the report.

Price Waterhouse managers did not begin incorporating Cobol components into new systems until late in the project's history. As each new system was brought on-line, the runtimes of the earlier Ideal systems increased, and by the July 1, 1985, completion date, the DMV found it did not have enough time during the night to update data bases with the number of transactions conducted during the day, the report said.

As a backlog of 1.4 million automobile registrations built up, police had to be ordered to stop arresting people for driving unregistered cars. Car owners found that their automatic registration renewal forms listed the wrong vehicle, and police departments found their cruisers were registered to another town, according to *Computerworld* reports at the time.

In addition, while the system was supposedly being built for 1,000 terminals, it had been bogged down with 220 terminals. The Price Waterhouse contract specified only a satisfactory response time for terminals, which, according to DMV officials, meant three to five seconds. Actual response times were in the five- to eight-second range at best and frequently were one to two minutes, the report said.

Each DMV clerk actually found it necessary to use two terminals. With logon procedures requiring from 10 minutes to one hour, they found it difficult to sign off one system and sign on to another, the report said.

In its initial release in October 1983, Ideal was estimated to be 25% to 30% slower than Cobol in an on-line test program and 15% to 20% slower in batch processing, according to a test run by Price Waterhouse.

But the new DMV systems were bogged down in difficulties that slowed the system to times beyond these percentages, the report said. Ideal provided a method of retrieving data under compound conditions, "a very nice feature," said Price Waterhouse principal Norman Statland."

But compound Boolean selection, as it was called, ate up machine resources and proved "a very delaying feature," the report quoted Statland as saying. Price Waterhouse did not discover how to circumvent the problem with Cobol programs until a month before its July 1 deadline.

In addition to technical problems, Price Waterhouse experienced a high rate of turnover among the "recent hires" that the commission said the firm used on the project. The position of data base administrator, a key post in the project, turned over seven times "due to circumstances beyond our control," Price Waterhouse officials told the commission.

Price Waterhouse committed itself to correcting the DMV system problems, primarily by rewriting transaction processing parts in Cobol. That process is largely completed, Cammarata said. The rewrite process has caused Price Waterhouse expenses to run "far past the amount of the contract," he said.

New Jersey officials have not indicated whether they will invoke penalty clauses for late completion of the project.

The state attorney general's office has indicated it is considering seeking redress for added state expenses in a civil suit. In addition to spending $1 million for extra personnel and consulting personnel time, the state had to purchase an additional $3 million CPU beyond estimated CPU upgrades to supply enough processing power.

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Computerworld International News Service
Susan Blakeney, Director
Edward Warner, Editor

Main Editorial Office
Box 9171 375 Cochituate Road,
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ADAPSO warms to Big Eight rivals, welcomes two to group

Disputes remain, but cooperation stressed

By Clinton Wilder

Although the critical issues of their dispute have not been resolved, the computer software and services industry and the accounting industry are changing their relationship from confrontational to cooperative.

Service industry organization ADAPSO, long critical of the role of Big Eight accounting firms in computer services, has welcomed Price Waterhouse & Co. as a member and will soon add Arthur Andersen & Co. to its membership roster. While some traditional ADAPSO members still say there is a conflict of interest in auditing firms offering MIS services, ADAPSO has officially acknowledged the firms' legitimacy in the computer services market.

"Some wounds have healed on both sides," says ADAPSO Chairman George Raymond, president of Automatic Business Centers, Inc. in Morristown, N.J. "Our feeling is that, if in fact they are in professional services, they are entitled to be members of ADAPSO."

ADAPSO had long argued that auditing firms contracted by clients to advise on software or services decisions would recommend services offered by the auditing firms themselves [CW, Oct. 22, 1984]. ADAPSO's legal counsel attempted to bring a case to prove that accusation, but ADAPSO has tempered its position after the legal effort met with little success, according to Raymond.

'Fair competition'

"We never found a case that our legal adviser felt was substantive enough," he says. "There doesn't seem to be that kind of scenario taking place any longer. Where the accounting firms do recommend their own software, they are honest and aboveboard about it. No one likes competition, but at least it's fair competition."

"There are still some legitimate concerns and differences of opinion," adds ADAPSO spokesman David Sturtevant. "But we believe those concerns will be better handled with Big Eight firms on the inside. We have also done better with AT&T and the divested Bell operating companies as members, even though we don't always agree on things."

Sturtevant confirms that Arthur Andersen is expected to finalize its ADAPSO membership in the near future. A long-standing target of ADAPSO accusations in the past [CW, June 25, 1984], Chicago-based Arthur Andersen has been the most aggressive Big Eight firm in developing and marketing MIS-related consultant and systems installation services.

ADAPSO Membership Director Miriam Wallman says that preliminary discussions about joining have been held with other Big Eight firms, but none are expected to join in the near future.

Pittsburgh-based Price Waterhouse joined ADAPSO in April 1985. Price Waterhouse's liaison to ADAPSO could not be reached for comment.

Illegal copying case dismissed

RIVERHEAD, N.Y. — A case against a Long Island, N.Y., man accused of copying a hospital's version of IBM's Patient Care System and selling parts of it to another hospital has been dismissed by a Suffolk County Supreme Court judge.

Frank Russo, 41, former director of systems analysis at University Hospital in Stony Brook, N.Y., was indicted early last year by a Suffolk County grand jury for allegedly making illegal use of secret scientific material.

Also charged in the case was Russo's consulting firm, Stony Brook Systems, located in nearby Hauppauge, N.Y., currently a division of Travenol Laboratories, Inc.

The indictment alleged that Russo, while with the hospital, had copied features of the $300,000 patient care system and later sold them to Albert Einstein Medical Center in Philadelphia [CW, Feb. 25, 1985].

Russo was indicted under a section of the state criminal code, "Theft, Other Offenses," which has been put on the books to provide legal recourse in cases involving the reproduction of proprietary material.

If convicted of the felony offense, Russo could have received up to four years in prison, and his consulting firm could have been fined $10,000.

Spokesmen for the Suffolk County Supreme Court and the New York State Deputy Attorney General's office said the case was dismissed on July 15. Both declined to say on what grounds it was dismissed.

The spokesman for the Deputy Attorney General said Judge John Copertino dismissed the case without comment after Russo's attorney made a motion for dismissal.

Russo could not be reached for comment.

— Alan Alper

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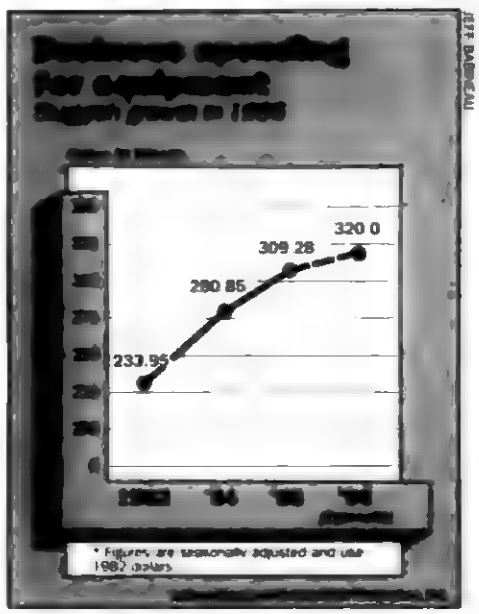
Economists predict industry slump will persist into 1987

By Mitch Betts

The economic boom that is supposed to help the computer industry out of its slump has been postponed until 1987.

Business economists are backing off their earlier predictions that the second half of 1986 would see moderate improvements in business profits and spending [CW, May 26], as the Department of Commerce reported last week that the U.S. economy grew at a sluggish annual rate of only 1.1% in the second quarter of 1986.

Lower inflation, lower oil prices and lower interest rates were all reportedly supposed to boost the economy in the second half of this year, but perplexed economists now say the beneficial effects will be delayed until 1987. A persistent trade deficit and a devastated energy industry are cited as reasons the predicted economic boom has not occurred.



The latest Commerce Department figures "point toward a second half that shows stronger growth than the second quarter, but we won't get a strong rebound because of the continued drag of weak capital spending and a huge trade deficit," says Jerry Jasinowski, chief economist of the National Association of Manufacturers in Washington, D.C.

Because of this weak economic growth, economists say, the increase in business capital spending — the key economic indicator for sales of computer systems — will be delayed until 1987. Business uncertainty over the economy's future and tax reform, which is likely to kill the investment tax credit and reduce depreciation benefits, are causing the weak growth in business investments, they say.

Nigel Gault, senior economist with Data Resources, Inc. in Lexington, Mass., says the growth rate for business investments in equipment is likely to drop to about 3.5% in 1986, from 20% in 1984 and 10% in 1985 (see chart below).

"This is to be expected at this point in the business cycle. In computers, it's a breather as companies take time to absorb all of the spending that has been done over the last few years," Gault says. He predicts a modest increase in equipment investments in 1987, assuming an improvement in the trade deficit fuels U.S. economic growth next year.

"My guess is that capital spending will continue to be sluggish for at least the next couple of quarters, maybe picking up slightly toward the end of the year, with a very mild recovery next year," says Robert A. Kavesh, economics professor at New York University's Graduate School of Business Administration.

Because computer investments are discretionary, the computer industry's recovery may lag behind that of the general economy's by a quarter or two, Kavesh adds. "Unless profits improve more than I think they will, I think businesses will go slow on computer upgrading or capacity increases," he says.

IBM and Honeywell, Inc. recently blamed their depressed earnings reports on weak business spending in the North American economy, although Burroughs Corp. and Apple Computer, Inc. reported increasing sales [CW, July 21].

Industry analysts note that the soft economy is not the only reason for the computer slump. Excessive additions to computer capacity in 1983 and 1984, the lack of complete system integration and lengthy corporate acquisition procedures also have hurt sales, according to the July research report by Alex Brown & Sons of Baltimore.

The analysts say that these market factors should wane over the next six to 12 months, while the economic recovery begins in early 1987 and sets the stage for a pickup in capital spending.

800-343-6474

3Com rolls out Token-Ring products including Ethernet software links

By Peggy Watt

MOUNTAIN VIEW, Calif. — Staking its claim to the increasingly crowded token-ring local-area network market, 3Com Corp. today is expected to formally unveil its promised line of network products compatible with IBM's Token-Ring. The products include software to connect token-ring and Ethernet network systems.

While 3Com acknowledges it faces a challenge in a market already occupied by the standard-setting IBM configuration and by Novell Corp., whose software was recently endorsed by IBM, analysts and network consultants say that they welcome competition in the token-ring arena.

"It's not like IBM has a hold on all the organizations that are thinking about networks," says Gabe Kasperek, data communications consultant with Kazcom, Inc. in Park Ridge, Ill. "Right now, I don't know if it can get any more competitive in the Ethernet area. But there's still some room to grow in the token-ring market."

> ***'We're not saying token-ring is better. We intend to provide products with all kinds of media. We always want to offer an option.'***
>
> — Bridget McNiel, 3Com Corp.

For its part, 3Com is emphasizing that it is not abandoning Ethernet.

Through 3+ Netconnect software, scheduled to ship in September, and Token Connection for 3Server, 3Com will offer a bridge between several token-ring networks or a token-ring and an Ethernet system, says Bridget McNiel, product manager.

It includes two serial ports and an Appletalk connector to also link Apple Computer, Inc. Macintosh systems into the network.

Tokenplus products

3Com's Tokenplus products, which meet IBM and IEEE 802.5 standards for token-ring configurations, include the $1,095 Tokenlink Plus adapter card for an IBM Personal Computer or compatible, the $1,295 Token Connection expansion card for 3Com's existing 3Server Ethernet file server, a cabling system that features Ringtap connections, varied-length shielded twisted-pair cable, connectors and links to the IBM cabling system.

Versions of 3+ Netconnect software, due out in September and priced at $1,250, will support the 3Com 3Server running Ethernet as well as IBM's PC Server. The server software can also run on an IBM Personal Computer AT, McNiel said.

The company used Texas Instruments, Inc. TMS 380 chip set to ensure IBM Token-Ring compatibility, McNiel added.

The Tokenlink Plus adapter has an Intel Corp. 80186 10-MHz microprocessor and 256K bytes of random-access memory.

The product currently supports 3Com's network operating system 3+, which runs most applications written for the IBM PC Network program Netbios.

By year's end, 3Com will offer a full Netbios implementation in 3+ and as a separate product, according to Douglas Pollack, 3Com director of marketing.

A Tokenplus Starter Kit is available for $3,755 and includes three Tokenlink Plus adapters, three Ringtaps and cabling accessories and the Network Administrator's Guide for the Tokenplus network (sold separately for $50).

3Com's token-ring uses an external bus topology for easier connection, but retains the ring operations.

Through the Ringtap connection, the server or an individual workstation can connect to the token-ring media.

Token-Ring requirements

IBM's Token-Ring configuration requires cables running from the workstation to the wiring closet and then back to the next workstation.

3Com's package includes trunk cables of varied lengths, extension cables and loopback plugs for each end of the network. 3Com and IBM token-ring networks can be connected via a 3Com-supplied cable link to IBM's Multistation Access Unit.

McNiel said 3Com will promote its cabling system as a less expensive configuration than IBM's, which comes with eight connections and only becomes cost-effective as more of them are used.

The 3Com system requires a $95 Ringtap connection for each unit, so that they can be added as needed.

McNiel said the token-ring system will complement, not compete with, 3Com's established Ethernet system.

"We're not saying token-ring is better," she explains. "We intend to provide products with all kinds of media. We always want to offer an option."

IBM endorsement

Pollack said he is not worried about IBM's endorsement of Novell's Advanced Netware, pointing out that the recent bundling agreement covers resale only by IBM's educational products division.

"That's rather a specific application market and not 3Com's," he said. "People choose different systems for different reasons. We can offer a strong partnership for all network products." He expects that some dealers may choose to mix and match components from different vendors.

But 3Com will have to hit the ground running, especially considering that the Ethernet-to-token-ring connection will not become available until fall, says Ronald Kopeck, president of the consulting group, Edgetech Associates in San Francisco.

"I think they've got some catch-up to do," he says. "3Com had to come out with a token-ring if it's going to be a main player. But Novell is being very aggressive. 3Com has to beef up its image in the market."

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OSI substitute lures net users

From page 1

ity as well as file exchange capabilities.

TCP/IP was originally developed for the U.S. military's Arpanet network and is a prerequisite for all government and military contracts.

"We're aware of what's going on in the OSI world, but the protocols are just not a reality for the kinds of computer applications we're doing," says Tom Jacobson, director of communications for Minneapolis timesharing firm Minnesota Supercomputer Center, Inc. "In terms of functionality, OSI is currently where TCP/IP was in 1980."

TCP/IP is used as a transport vehicle between Minnesota Supercomputer's Cray Research, Inc. supercomputers and a wide variety of user systems from Data General Corp., Digital Equipment Corp., Sun Microsystems, Inc., Pyramid Technology Corp., Apollo Computer, Inc., Calcomp, IBM and Silicon Graphics, Inc., Jacobson reports.

All of the vendors except IBM provide their own TCP/IP support; the IBM mainframe connection is provided through a channel interface from Fibronics International, Inc. subsidiary Spartacus Computers, Inc.

TCP/IP protocols have been commercially available for more than a decade. "The only advantage to OSI is greater vendor support; the computer companies support TCP/IP grudgingly, while OSI is mainline for them," Jacobson says.

Still, computer and network industry support for TCP/IP continues to grow and with it the range of multivendor systems that can use the protocol to communicate over either a long-distance or local-area network. TCP/IP is becoming the common interface between a growing number of network applications and computer systems: most recently, the IBM Personal Computer.

Once TCP/IP is linked with Netbios — software that enables IBM PC software applications to transmit over an IBM PC Network or Token-Ring — the wide range of applications written for Netbios will also be able to run on a TCP/IP network.

"You'll be able to take a Lotus spreadsheet, and use TCP/IP to transmit it anywhere on a local or wide-area network," says Harvey Freeman, vice-president of Minneapolis consulting firm Architecture Technology, Inc.

Through Netbios, TCP/IP will also be able to interface with networking software such as 3Com Corp.'s 3+/Share and Novell, Inc.'s Netware.

"I recently got into an argument with a National Bureau of Standards representative who said that OSI will supersede TCP/IP," Freeman says. "Given the rate at which manufacturers are shipping TCP/IP, by the time OSI arrives, there will be a lot of people who will decide they don't need it. They won't drop a de facto standard just because the 'real' standard is here."

> ***'We're aware of what's going on in the OSI world, but the protocols are just not a reality for the kinds of computer applications we're doing.'***
>
> — Tom Jacobson
> Minnesota Supercomputer Center, Inc.

Freeman predicts that TCP/IP and OSI will coexist, with networks supporting the two protocols linked via a gateway "just as Systems Network Architecture and OSI will coexist. Just as SNA is too entrenched for people to change now, TCP/IP has an extensive installed base in the commercial market. Plus, it has all those Department of Defense users. It would take 10 or 15 years for them to agree to change anything," Freeman says.

"People thought that TCP/IP would fade and die when OSI was ready; instead, the protocols have gained even wider acceptance this year," says William Carrico, president of network vendor Bridge Communications, Inc. Eighteen months after they were first introduced, TCP/IP products currently make up a third of Bridge's shipments, he notes.

The recent burgeoning of the TCP/IP market has fostered a new round of TCP/IP product introductions that are likely to accelerate the protocol's acceptance still further. Chief among these are interfaces that enable other popular communications protocols — and therefore the computers and applications that support these protocols — to use TCP/IP as a common transport vehicle.

One such protocol is Network File System (NFS), a communications program that Sun Microsystems designed to work with TCP/IP. A computer running NFS can exchange files with any other system that supports the program. NFS is currently supported by more than 30 hardware and software vendors.

The other major link will be to Netbios. Currently, Netbios-TCP/IP links are few. Network vendor Excelan, Inc. offers one. Univation, Inc. and Bridge both recently announced products that implement TCP/IP on an IBM Personal Computer but offer no connection to Netbios. Their offerings thus enable PCs to use either the TCP/IP file transfer program or Netbios-based file transfer programs — but do not allow Netbios-based applications to access files on another system via the TCP/IP link.

Software interfaces such as the ones mentioned above are a key element in Minnesota Supercomputer's distributed processing strategy, in which applications are broken up into modules "that run on the system they're most suited for — whether it's a Cray or an IBM PC," says executive vice-president Robert Williams.

The company already is using an internally developed software program that allows users to perform graphics functions on an IBM PC, using data that is being edited on a Cray supercomputer. The graphics and editing applications communicate through TCP/IP.

The Netbios-TCP/IP Interface Specification Forum, to be held in Monterey, Calif., on Aug. 25-27, holds out hope for users such as Minnesota Supercomputer. Vendors and users are scheduled to discuss a proposed draft of a standard for interfacing the two protocols.

Ungermann-Bass, Inc., Bridge, Excelan, Communications Machinery Corp., Mitre Corp. and Sun Microsystems, Inc. are among the TCP/IP network vendors sending representatives to the meeting.

"Standardizing the interface would guarantee interoperability between computers equipped with different implementations of Netbios on top of TCP/IP," Mitre spokesman Paul Brusil says.

Excelan product manager Jay Weihl reports that a number of the vendor's customers "have raised the issue of linking TCP/IP and Netbios." Excelan is willing to modify its current product to conform to the standard, he adds. "We want very much to promote the standard. Right now, our product and someone else's Netbios-TCP/IP solution won't communicate."

Minnesota Supercomputer's Jacobson will be among the users attending the conference. "We're in favor of any move towards standardization," he says, adding that he expects when OSI finally comes along, "migration from TCP/IP will be an easy, transparent job. In about three more years, we envision running OSI and TCP/IP protocols side by side on the same system."



Cullinet buys into VAX DBMS mart

By Charles Babcock

WESTWOOD, Mass. — Cullinet Software, Inc. is making a bid to become a supplier of data base management systems for Digital Equipment Corp.'s VAX line and will supply products to that line with its own version of IBM's SQL.

Cullinet is moving into the DEC arena through the $8.4 million acquisition of Esvel Co. of San Jose, Calif., which produces a DBMS for DEC VAX systems that is sold through OEMs. A Cullinet spokesman said Esvel President Kapoli Eswaran is a relational technology expert who worked on IBM's System R project, the predecessor to IBM's DB2 relational DBMS.

"We have bought both the product and the expertise of the company. It will function as a development organization," said James G. Blake, vice-president of communications at Cullinet.

Cullinet officials added that their long-range goal is to become a vendor of minicomputer as well as mainframe DBMS. Once this is achieved, officials said last week, Cullinet can pursue cooperative processing strategies using applications that work together while running on different machines.

Future possibility

Robert Robinson, director of systems and computer services for DuPont of Canada in Quebec said his company uses DEC VAX systems at manufacturing sites that are independent from the mainframes at the corporate data processing center. At present, there is no need to implement cooperative processing between the two, Robinson said, but company officials have discussed it as a future possibility. "The future is regarded as being six months out," he said.

Esvel also develops DBMS for the IBM Personal Computer, prompting industry observers to note the possibility that Cullinet may someday offer products allowing PC users to access data on departmental and mainframe systems.

Cullinet is not the first mainframe software supplier to move in this direction, but it is potentially the largest one. Cincom Systems, Inc. in Cincinnati has found a growing market for its manufacturing and accounting software that runs on the VAX line, and Information Builders, Inc. in New York has ported its Focus fourth-generation language and DBMS to the VAX and the IBM PC.

But Cullinet is a larger player than these companies, and its marketing prowess is respected. Its 125-person direct sales force is six times the size of Esvel's total roster.

The acquisition also underscores Cullinet's growing commitment to SQL. It will announce this fall a version of its mainframe DBMS, IDMS/R, that will support SQL, and later announcements will outline support in Ads/Online, its application development language, and in its Data Manipulation Language Cobol for SQL, Blake said.

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NBI laser printer aimed at desktop publishing opportunity

Offers Postscript fonts, networking capabilities

By Eddy Goldberg

BOULDER, Colo. — NBI, Inc., in a stepped-up effort to expand its presence in the growing electronic publishing industry, will begin marketing its own laser printer early in the fourth quarter of this year.

The NBI 908, an 8 page/min desktop laser printer, will be priced at $6,995 and support the use of Postscript, an emerging font standard from Adobe Systems, Inc.

The NBI 908 is targeted for use with NBI's Integrated Workstation (IWS) in desktop publishing environments that require the integration of text and graphics with near-typeset-quality output.

IWSs linked via Peripheral Connection

Multiple IWSs will be connected to the 908 through NBI's Peripheral Connection, which allows a data transfer rate of 1M bit/sec. over a standard twisted-pair telephone wire network.

Devices linked through Peripheral Connection can be up to 1,000 feet apart. Peripheral Connection boards, which are installed in each IWS, will cost $1,000 each.

The NBI 908 is based on the Ricoh Corp. 4080 printer engine, and it uses a proprietary raster image processor that allows printing of a full 8 page/min through the Postscript interface, according to Mary Coleman, director of the Office Systems Division of NBI.

NBI's proprietary raster image processor uses an MC68000 processor from Motorola, Inc. with 2.5M bytes of random-access memory, which is enough storage for two full 8½- by 11-in. pages at 300 dot/in., Coleman said.

Concurrent page building

This capability allows a second page to be built up in the Postscript page description language while the first is being dumped to the printer, resulting in a full 8 page/min., Coleman said. In addition, dedicated direct memory access chips are used to off-load I/O tasks from the 68000 chip, resulting in improved data transfer between the processor and memory.

Coleman said the increased memory capability plus the direct memory access chips make the NBI 908 significantly faster than competitive laser printers.

Other features of the printer include a recommended duty cycle of 5,000 pages per month and a printer life of 600,000 impressions.

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TOP OF THE NEWS

NEWS from page 1

in the 3610AE and scheduled for October availability. The new systems could be available by year's end.

The 3620 is expected to be priced between the 3610AE and 3640, which sell for about $40,000 and $60,000, respectively. The 3650 will sit between the 3645 and 3670, which sell for approximately $70,000 and $110,000. Price cuts on existing systems are also expected and so is, perhaps, an improved link to standard architecture machines.

■

Javelin Software last week removed copy protection from Javelin 1.1, the latest version of its $695 microcomputer business analysis and reporting software package. A copy-protected version of the software for firms concerned about employee software piracy will be made available through Javelin's corporate software licensing program.

■

Sperry is currently developing four different CMOS chip sets that will employ its full 1100 series architecture on a single board. Future products from this technology will be the Swift system, operating at up to 3.6 million instructions per second (MIPS); the Liberty I and II, operating at speeds from 1.3 to 8.5 MIPS; and the Saturn, at 5 to 18 MIPS. Sperry's plans call for current 1100/60 to 1100/70 users to migrate to Liberty and then to Saturn.

For current 1100/90 users, the planned growth path leads to the custom bipolar chip-based Mercury. Mercury is targeted to operate at 25 MIPS in a single processor, with up to six processors configurable at a site.

■

Apollo Computer, which has never sold third-party software directly to its customers, plans to market the latest version of Interleaf, Inc. electronic publishing software, WPS.C, because "it is a key product and best offered that way," a company spokesman said.

"We've been working on this contract for nine months now," an Apollo spokeswoman said. Interleaf's WPS is sold by a number of hardware vendors, including IBM and DEC.

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Ad hoc relational queries frequently request that data be grouped, ordered or otherwise sorted. V5's internal sort facility performs aggregation and elimination early, faster than previously thought possible.

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Third-party supplier charges DEC with antitrust violations

Suit claims DEC fosters illegal tie-in policies

By Donna Raimondi

Increasing resentment over Digital Equipment Corp.'s closed architecture and bundling policies boiled over last week when the company was charged with antitrust policies by a third-party supplier of DEC-compatible products.

System Industries, Inc., a Milpitas, Calif., manufacturer of disk and tape storage subsystems and clustering schemes for DEC VAXes, filed charges of federal and California antitrust violations in the San Jose, Calif., U.S. District Court on Wednesday.

The suit claims DEC fosters illegal tie-in arrangements that force DEC computer buyers to purchase peripherals only from DEC. The effect of the tie-in arrangements, System Industries claimed, is to deprive DEC customers of equipment available at lower cost from the claimant and other independent suppliers.

The suit does not appear destined for success, one analyst said. "It is DEC's box, and they can do what they want with it," said John McCarthy, research manager at Forrester Research, Inc. in Cambridge, Mass.

The suit reflects DEC's desire to keep business in a tightening market. "When the vendors were growing at 30% a year, it wasn't a problem to have so many OEMs and third parties. But now people are tripping over each other to get sales," he said.

"We have not been served with the papers," a DEC spokesman said last week, "but System Industries' allegations in the suit are a complaint about Digital's policy to enforce vigorously its patent rights. The key issue for Digital is that System Industries has infringed some of our patents. We have a patent suit against System Industries filed in 1980 in Boston Federal Court that should come to trial in 1987. As part of that suit, System Industries filed typical antitrust counterclaims."

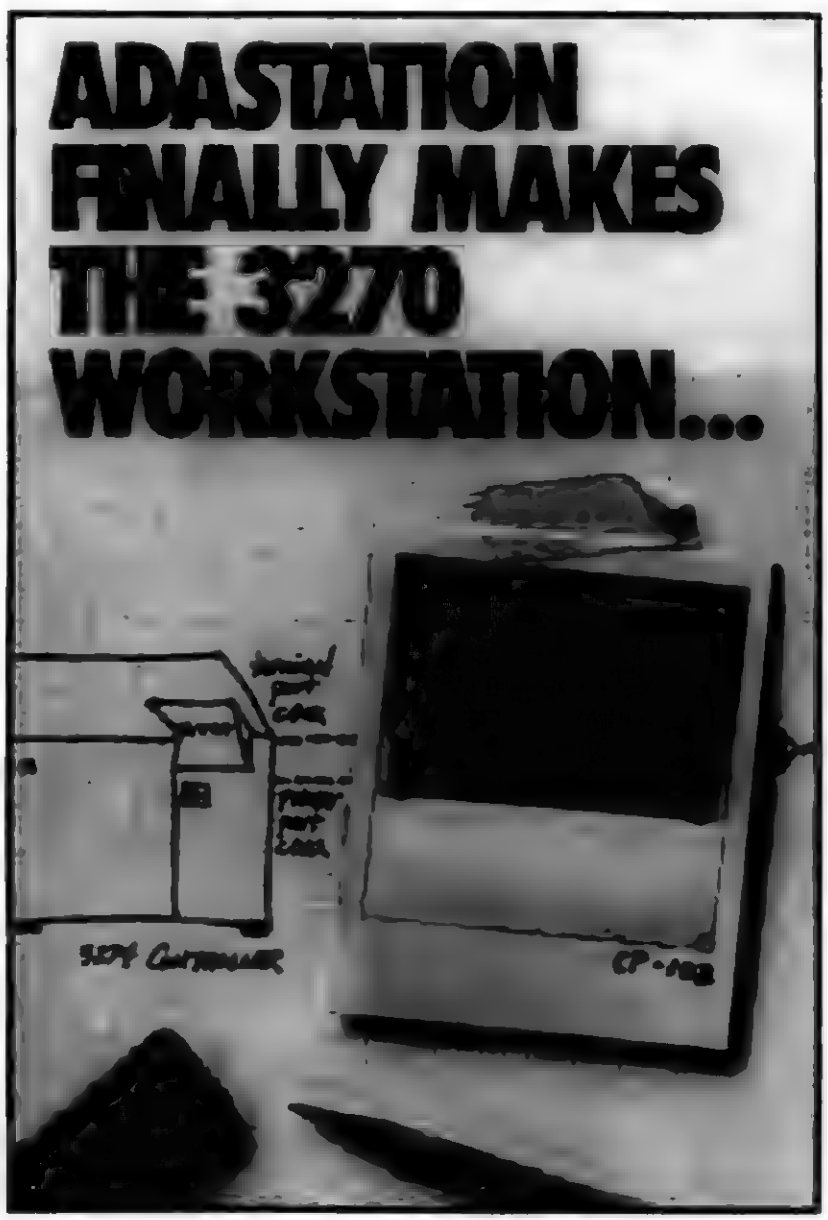
Third-party vendors were split as to whether or not DEC's practices are unfair. "We have claimed that DEC engages in blatant violation of antitrust laws. We feel that DEC uses illegal equipment tie-ins, whereas they will only sell their CPUs if the customer agrees to buy their storage equipment," said Michael Lewis, chief financial officer at Emulex Corp., which manufactures storage subsystems and controllers for DEC equipment and other markets.

Emulex has antitrust suits pending against DEC. The suits, filed in September 1985, are in response to litigation from DEC against Emulex for patent infringement.

"We also feel that DEC is dealing in bad faith with misuse of patents. DEC obtains patents just to eliminate competition, and not when there is technological innovation. DEC is using the legal system to ensure market penetration, and we don't think that is what the system is for," Lewis charged. "The key issue with both Emulex and System Industries is that our patents have been infringed," the DEC spokesman said. "We are using the legal system to protect our patents."

Forrester's McCarthy noted that while DEC probably will not be hurt by the various lawsuits, it may be unfortunate that DEC is causing so much unhappiness in the OEM community. "You don't want to forsake the people who helped you get where you are," he said.

Robert Newton, vice-president of Peripheral Services, Inc., a Dallas systems integrator, said that DEC's policies do not impact third-party vendors in a harmful way. "We have customers who want pure DEC integrated systems, but we also have customers who want other third-party equipment, and we don't have any problem serving either of them," Newton said.



Chip triggers software race

From page 1

The vendors are Gold Hill Computers, Inc.; Franz, Inc.; Arity, Lucid, Inc.; Quintus Computer Systems, Inc.; and Teknowledge, Inc. The following week, Gold Hill Computers of Cambridge, Mass., should introduce for existing personal computers an 80386-based add-in board bundled with Lisp development software for producing and running large artificial intelligence applications.

Ultimately, the speed and power of the 80386 will permit vendors to produce IBM Personal Computer AT-compatible machines whose performance rivals that of superminicomputers. Among the new chip's most advanced features are a potential 20-MHz clock rate, the ability to address 4G bytes of main memory and on-chip memory management.

According to 80386 marketing manager Dana Krelle, Intel began shipping the 80386 in mid-July and plans to produce 100,000 of the chips this year.

Not available until 1987

However, most of the 80386-related products under development are not expected to be available until at least early 1987. Therefore, despite plenty of enthusiasm on the vendor side, some potential users contacted by *Computerworld* said they do not yet need the extra capability represented by 80386-based machines.

While Softguard's operating system is patterned after the VM operating system and code-named VM/386, it is not compatible with VM in any way. Rather, it functions as a host to other operating systems much like VM and incorporates VM-like features such as multitasking and virtual memory. This reportedly allows one 80386-based system to host several virtual machines, each of which can run a separate operating system without software modifications.

"We are providing established mainframe features to the 80386 users," claimed Joe Diodati, Softguard Systems' vice-president of marketing and sales. "The goal of VM/386 is to provide virtual memory and multitasking to the existing PC marketplace without requiring users to change anything."

According to Diodati, VM/386 supports multiple terminals and can also run with 80386-based file servers and 80386-based accelerator cards that plug into an IBM PC AT.

Because it allows multiple operating systems to run concurrently, VM/386 bears a resemblance to the AT&T Information Systems' Simul-Task operating system, which presently runs on 80286-based systems. Simul-Task's developer, Locus Computing Corp. of Santa Monica, Calif., is preparing a version of the operating system for 80386-based machines.

Simul-Task runs IBM's PC-DOS as a task under Unix. However, Diodati claimed that VM/386 is markedly different in that each operating system running under the environment is completely separate from the other.

'Risky venture'

Analyst Tim Bajarin of Creative Strategies in San Jose, Calif., cautioned that Softguard's venture may be risky, because IBM may be developing a VM-compatible operating system for PCs built around the 80386. Bajarin predicted IBM will be bringing out its new machine by late 1987.

Microcomputer users at Insurance Services Office, Inc. in New York currently have no need for a system utilizing the 80386's power, according to Thomas Lee, assistant manager of the data base services division. Proponents of 80386-based systems claim many power users need faster machines for applications such as the recalculation of large spreadsheets, but Lee said that is not the case at his company. Insurance Services Office currently uses a mix of IBM PCs, PC XTs and ATs.

However, some technical users should benefit from the 80386's increased power. "Anxiously awaiting" the arrival of the new class of PCs is L. David Roper. Roper is in charge of microcomputer purchasing in the physics department at Virginia Polytechnic Institute & State University in Blacksburg, Va.

While his department primarily runs Microsoft Corp. MS-DOS applications, Roper expects his department to become heavily involved in Unix on 80386-based systems and to take advantage of the multitasking capability for MS-DOS applications as well.

Softguard plans for VM/386 to be bundled with 80386-based systems and add-in boards by year's end or the first quarter of 1987. Diodati said a retail version of the operating system should be on the market in the second quarter of 1987 for approximately $170.

Gold Hill Computer's board, called the 386 Hummingboard, along with its GCLisp Developer and 6M bytes of random-access memory, will be priced at $7,000. The board is scheduled to be available in three months.

Revamped PFS line offers site licensing, file share options

Software Publishing keys on business users

By Peggy Watt

MOUNTAIN VIEW, Calif. — By announcing an enhanced line of its popular PFS products and a corporate site licensing program to help sell them, Software Publishing Corp. last week aimed straight for the corporate market and, it hopes, out of its financial doldrums.

The company says it is counting on the new line and the new market to pull it out of the financial slide that started in the past year, during which both profits and sales fell. Most recently, President Fred Gibbons warned shareholders that a $2.5 to $3 million pretax loss may come in the third fiscal quarter, which ended in June.

The PFS:Professional series introduced last week includes PFS:Professional Write, PFS:Professional File and PFS:Professional Plan, as well as PFS:Professional Network, which allows file sharing and other networking features among the new applications.

At Wells Fargo Bank in San Francisco, some 250 users are eager to jump from the PFS line they've used for years to the PFS:Professional products they've been testing, said Kingsley Mar, manager of research and development for the bank's systems resource management group.

"The PFS products were perfect to get people up and running, but as their expertise grew, their needs for power were increasing," Mar said. Because of similarities between the older and new products, he said, little retraining is required.

The site licensing policy allows unlimited disk duplication and reproduction of the manual for $75,000 for any single PFS-brand product and $100,000 for either of Software Publishing's existing high-end Harvard series products, Harvard Presentation Graphics and Harvard Total Project Manager, said Janelle Bedke, vice-president and general manager.

Licensees also receive a year of technical support, notes and information and eight hours of training for the corporate training staff. Upgrades of 10 or more copies of a program will be available through a central exchange, either from dealers or directly through Software Publishing, and at a standing 40% discount of the standard upgrade price.

Businessland, Inc. Chairman David Norman said his retail stores expect a good market for the enhanced PFS line.

"The packages from Software Publishing are dead on," he said. "Many middle managers do not need all this power, but they do need to be computerized." He said the ready networking capabilities are also welcome, estimating his stores install 100 local-area networks every month.

Available immediately are PFS:Professional Write, priced at $199, and PFS:Professional File for $249. The other two products are scheduled to be available before the end of the year, according to Software Publishing. PFS:Professional Plan will be priced at $249, and the network adapter that handles up to five users of a single PFS application is priced at $499.

The site licensing plan would not be economically advantageous unless a corporation wanted at least 301 copies of the $249 packages or 377 copies of the cheapest, the $199 PFS:Professional Write. Several industry observers noted the PFS:Professional Network terms were too stringent in forcing customers to buy another copy of Network for each application program they wanted to run.

Getting the most from the mart

"To make the three products run multiuser among five users, you have to spend $1,500 just for the networking software," said Amanda Hixon, software analyst and editor of "P.C. Review," a Felton, Calif., software evaluation newsletter. "It almost seemed that with the networking feature, they were saying, 'We've got a new market, let's see what we can get.' "

The PFS:Professional line products can read files from Lotus Development Corp.'s 1-2-3 and Ashton-Tate's Dbase III Plus, as well as exchange data under the IBM Document Content Architecture and ASCII format for micro-to-mainframe communications.

All the programs reside on a single disk and run on a dual-floppy IBM Personal Computer or compatible system. None are copy protected. The programs also run under both Microsoft Corp.'s Windows and IBM's Topview.

By introducing a $149, low-end integrated package also based on the PFS line, called PFS:First Choice, Software Publishing hopes to retain and expand the entry-level, low-cost audience it cultivated so successfully with the original PFS products. First Choice includes a word processing program with spelling checker, file management and report writing system, spreadsheet and communications capabilites. It is scheduled to ship in August.

PFS:Professional Write includes a spelling checker and thesaurus; an internal address book for mail-merge functions; a limited, line-drawing graphics feature; and block editing. PFS:Professional File uses memory caching, cross-tab report functions and a mailing label printing program. PFS:Professional Plan includes analytical graphics, a recalculation feature and 94 key word search functions.



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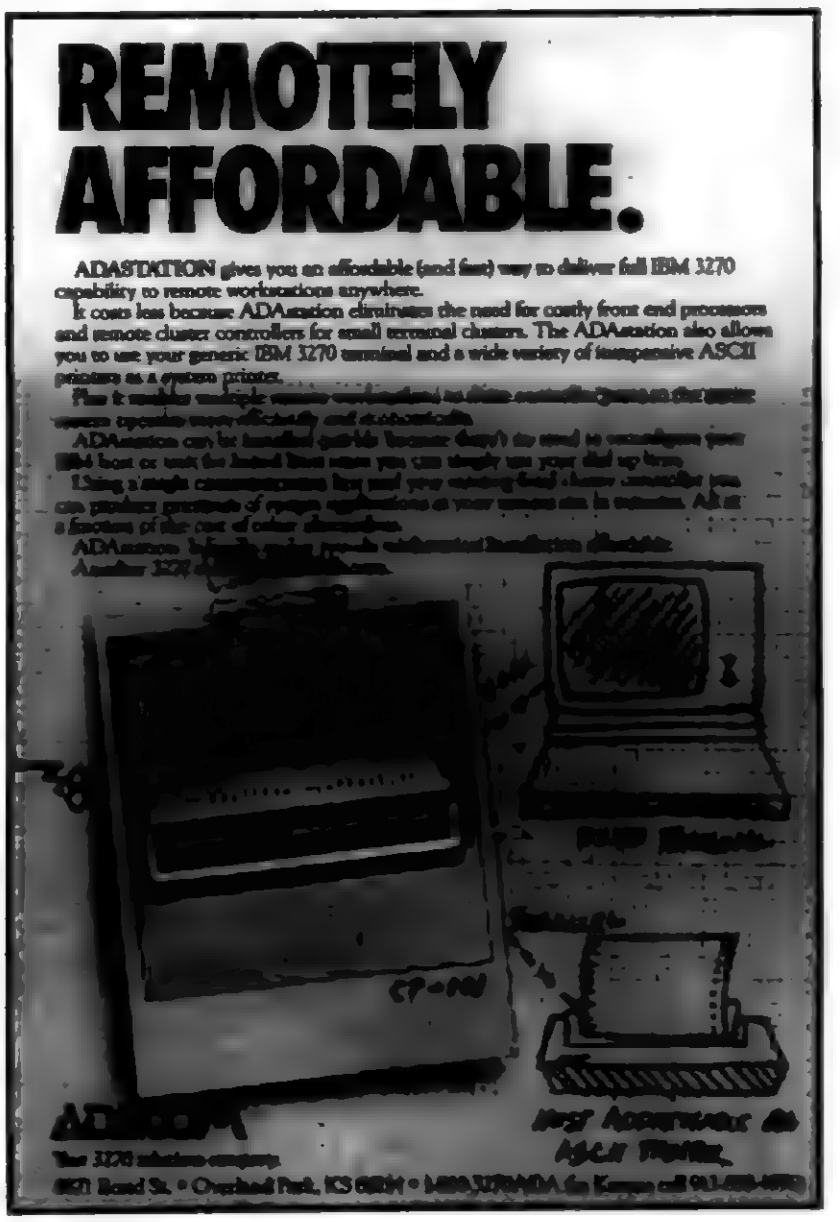
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Copyright suit: Violations or sour grapes?

By Edward Warner

NEW ORLEANS — The complexity of the software copy protection issue was illustrated recently when an expert witness in a copyright suit claimed he could easily undo Vault Corp.'s copy protection scheme.

Vault's protective code is based on a small scrape made in a specific place in the diskette's media. With needle in hand, the expert tried repeatedly to imitate that scrape, but none of his punctures landed in just the right place, much to the relief of Vault's President W. Krag Brotby.

Brotby is suing Quaid Software Ltd. of Toronto for $100 million on the grounds that Quaid's Copywrite software violates the copyright on Vault's Prolock program.

Software manufacturers use programs such as Prolock to protect their software against illegal copying — a practice that costs the industry between $600 million and $800 million annually, according to a Future Computing, Inc. study.

Prolock protects software by not permitting a copy to be made unless a small scrape is detected, which the software vendor has placed on the surface of each program diskette according to Vault's specifications. Copywrite, however, makes Prolock sense a nonexistent scrape, allowing users to make as many copies as they want.

The suit, brought under the state of Louisiana's stringent software protection laws, has dragged on for a year and a half but may soon reach a conclusion.

The situation has changed a great deal since 1984 when Prolock was used by several major software vendors, including Ashton-Tate which used the product to secure its software from piracy.

The exception rather than the rule

Software copy protection is now the exception rather than the rule: Many software vendors, including Microsoft Corp. and Software Publishing Corp., have dropped their copy protection schemes because of user complaints that copy-protected programs could not easily be installed on hard-disk-equipped personal computers.

Vault, meanwhile, has sought protection under Chapter 11 of the Federal Bankruptcy Code, a situation that Brotby said he blames on the impact of programs such as Copywrite. Vendors, according to Brotby, lost their desire to license copy protection software for use in their own programs when they saw how easily the code could be broken.

The use of copy protection declined also because customers wanted to make backup copies in case their original copy was lost or destroyed. According to Quaid Software President Robert McQuaid, Copywrite is used largely by law-abiding customers making backups; when Copywrite has been used by pirates, McQuaid said, he has never failed to inform the police.

The issue at hand

Brotby, however, argued that software licenses do not permit the making of backups. Furthermore, he contended, it is copyright violation — not software piracy — that is at issue. According to Brotby, a portion of Copywrite, called Ramkey, copies and modifies some of the Prolock program in order to defeat it. "Every time a Ramkey is used, it modifies Prolock code" and violates Vault's copyright, Brotby claimed.

McQuaid, however, contended the offending program was taken off the market two years ago and that the latest version of Copywrite only simulates the Vault copy protection method. "Our Copywrite software doesn't contain his code," McQuaid said.

In broader terms, though, Brotby said he believes the suit will decide the fate of copy protection in the U.S., and, if copy protection disappears, then investors will no longer want to pour money into small software start-ups, and the U.S. software industry will be crippled. "With the gatekeeping technology and the intellectual innovation in jeopardy, it won't be long before the complete technological package, as well as the industry that supports it, will be in jeopardy," he charged.

McQuaid, though, claimed the suit is nothing more than sour grapes on Brotby's part. According to McQuaid, Vault lost its lucrative contract with Ashton-Tate six months after Copywrite's arrival in mid-1984. "Brotby thinks I cost him his $60 million business," McQuaid said.

World Digest

Star Wars foes strike

TOKYO — "1,600 researchers say 'no' to Star Wars plan," read a headline in the July 5 issue of the *Japan Times*. Those who said "no," the article explained, work in Tsukuba, Japan, the "Science City," located some 60 kilometers northeast of Tokyo. They signed a petition against Japanese involvement in U.S.' Strategic Defense Initiative, or Star Wars.

Those who signed the petition included some 1,200 people from nine research institutes of the Governmental Agency of Industrial Science and Technology and others who worked in local businesses. The petition said that Star Wars was nothing more than a disguised program for arms expansion.

Super weather forecast

TAIPEI, Taiwan — To be better prepared for the devastation wrought by hurricanes, Taiwan's Central Weather Bureau reportedly plans to buy a Control Data Corp. CD 205 supercomputer. Delivery is slated for the beginning of next year. In March, the weather bureau bought a CD 840 mainframe, which is currently being tested and is scheduled to go into full operation with the arrival of the supercomputer. Chinese-language software is being developed by the government's Institute for the Information Industry.

Information compiled from the Computerworld International News Service.



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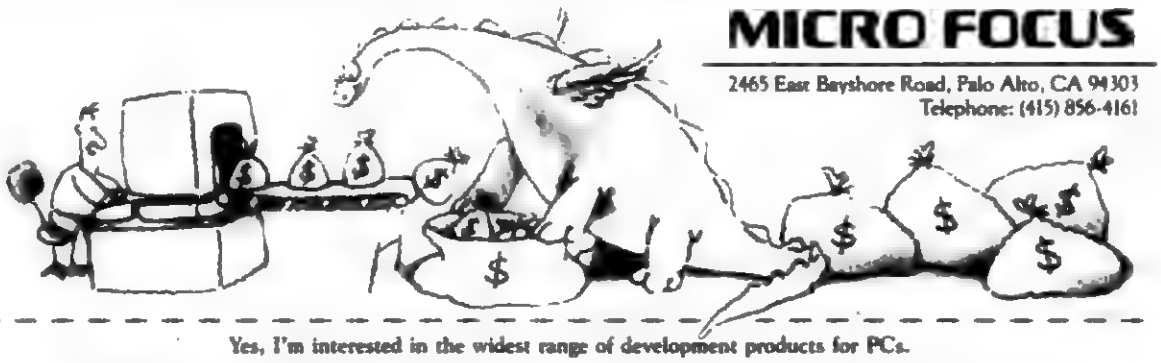
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Empire State Games tracks Olympic competitors on-line

Coordinates results with Prime network

By Donna Raimondi

BUFFALO, N.Y. — The Empire State Games, started in 1978 to improve amateur sports in New York state, have become an important pre-Olympic training ground. When this year's games begin Aug. 6, a networked system of computers will be in place to coordinate data on thousands of participants and to accurately report game results. Initially, a single volunteer with a Tandy Corp. personal computer tracked the up-to-6,000 game participants per year — competitors who need to keep motivated and in shape between Olympic competitions.

By 1985, the growing games needed an automation chairman. "Nobody really knew what that meant, but my boss volunteered for it," says Ken Latt, vice-president in charge of technical services at Goldome bank in Buffalo and the man in charge of this year's automation efforts.

Latt is overseeing a loaned, networked system of Prime Computer, Inc. systems that includes two 2655 superminicomputers, 20 PT 200 terminals, four Tally impact printers, two laser printers and seven Prime personal computers. He works closely with programmers donated by Prime and the Computer Task Group, a Buffalo concern that has volunteered to write software for the games for the past two years. The programmers are using Prime Information, a Pick Systems Pick-based software system that makes it easy to create the menus needed by the games' data entry volunteers, he says.

Nationwide program

The competitions became so successful that New York went into the 1984 Summer Olympics with a disproportionate share of Olympic contenders, says Michael Abernathy, executive director of the Empire State Games. That success led to Olympic Committee recognition and the beginning of a nationwide program that so far includes 30 states.

Just as the games grew state by state, the technology to enhance the games in New York expanded past the one person, one personal computer of two years ago. Last year, AT&T donated two of its 3B2 minicomputers to track participants and game results. But for the 1986 games, services will go beyond simple record keeping. Local and statewide news services have requested results in formats that are usable to newspapers, and the automation committee says it believes it will get more press coverage if it can provide those results.

The Prime system, housed initially at the Goldome bank and scheduled to be moved by July 30 to the Center for Tomorrow at the University of Buffalo — the games' media center — is connected via the Prime Link networking software to the six Prime PCs that are in each of six regional games offices.

The regional directors keep track of data on game participants, including names, addresses, emergency telephone numbers and the sport or sports in which each participates. That information is transmitted to the central computer.

Gain in time

"The system, which we have had since April, gives us a tremendous gain in time," Abernathy says. "It gives us time to get out promotional material on who is qualified for what and to organize the housing, which is a major task for 6,000 participants. To get each and every one of them into a bed and assigned to a dining cafeteria is a major task."

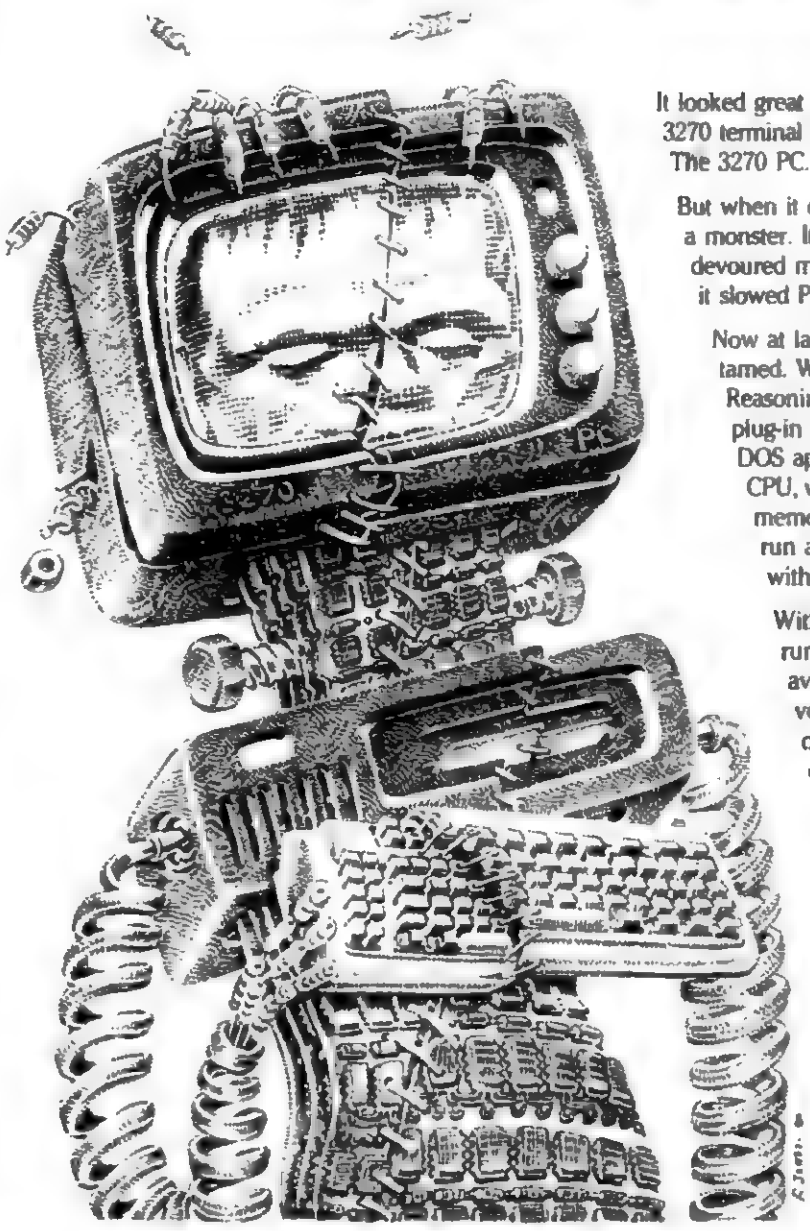
When the games start, AT&T facsimile machines will transmit results from the game sites to the center for the five days of events. Auditors will check the data for accuracy and give it to the volunteer data entry people for inputting. At this point, reporters at the center can query terminals for information on any participant or any of the 27 represented sports. Printers will be hooked up so that reporters can get paper copy of whatever results they want.

Display stations will put out both official and unofficial results at all times, "sort of like airline departure/arrival terminals," says Theron Howard, manager of technical training at Goldome and the games' training director.

The information given to newspaper reports will be in agate-type format, Howard said. "We try to give the Buffalo press, Associated Press and United Press International their data in the best possible format that is acceptable to them. There is a stylebook out for all sports that we are going by."

To make this system possible, Latt had to arrange for donations from a number of vendors. Digital Equipment Corp. and Computerland Corp. loaned printers for the PCs; IBM donated two duplicating machines; Xerox Corp. donated copiers at five different sites; AT&T lent the facsimile machines; New York Telephone Co. provided telephone services and CSC Advanced Systems in Buffalo donated the modems. "And we keep it all running," Latt adds.

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VIEWPOINT

EDITORIAL

We'll manage

The worst thing you can do, says one MIS executive, is take a good technician and force him to become a crummy manager.

We agree. But we also believe that the time has arrived for MIS professionals to realize that even the highest management positions are not beyond their skills or reach. In fact, the opportunity for managers with solid technical backgrounds has never been better. As corporations recognize MIS as an important and even favored business function, they are apt to look more and more to MIS as a pipeline to the top.

What this means for those systems people with an eye to the future is that the time is right to develop management credentials. Major corporations, from Avis to Zenith, are spending millions on in-house management training for their technical people. This week's Executive Report explores how such companies are tackling head-on the well-worn stereotype that says it is impossible to teach people skills to technicians.

IBM, for example, spends more than $900 million annually on in-house training for its employees and has required courses for every level of MIS management, both new and experienced, which focus strictly on management skills. Manufacturers Hanover Trust Co. sends technical people to such renowned institutions as Harvard and Stanford universities for extended management training courses.

These technicians were saddled with the same cliched personality traits as anyone else in MIS — too analytical, lacking in social skills, inept communicator — and are making the transition into management with success. The newest generation of technologists will have no such transition; many take management courses as part of their computer science degree program. They enter the field believing that management is a brass ring to be grabbed, not a torture to be avoided.

Those already in the field should adopt a similar philosophy. Granted, managing others is not for everyone. We heartily applaud companies with the insight to invest in dual career tracks for valuable systems people who simply do not want to be leaders. But we also encourage those in MIS to look upon management as an opportunity, not a liability, a chance to leverage vital technical skills into a first step up a once-inaccessible corporate ladder.

Notes & observations

Speaking of the new generation of computer professionals, those at Harvard are purported to find the life of a computer major "pretty gray." This is the word from the *Confidential Guide* to Harvard courses, an unofficial but highly authoritative annual tome. The "Confi" guide elaborates by noting that "because of the high-paying jobs readily available in the computer field — some don't even require graduate study — few computer scientists are attracted to teaching positions, and the College must rely on undergraduates to fill the teaching fellow posts." The positive side to this, the guide says, is that "when you graduate, it is likely that you'll have more than one invitation to move out to Silicon Valley." Computer types are invited to "start counting your chips now."



LETTERS TO THE EDITOR

Software quality data distorted

The article by David Bendel Hertz, "SDI demands trillions of instructions, 99.9999999% reliability" [CW, June 2], somewhat distorts my software quality data, if it is my data Hertz refers to.

A typical software system will accumulate a total number of from 30 to 50 defects per 1,000 source lines as the sum from all error sources: requirement defects, design defects, code defects, document defects and others.

Of this total, normal predelivery reviews, inspections and tests will usually find from 90% to 97% of the defects. Therefore, when a system is first delivered to its users, from fewer than one to about five defects per 1,000 source lines would be typical.

I have seen one product that did accumulate a total of 300 defects per 1,000 source lines over its life cycle, but even for this one, about 90% of the defects were detected prior to delivery.

Capers Jones
Chairman, Software Productivity Research, Inc.
Cambridge, Mass.

Waiting for the information czar

Regarding Ron Schneiderman's article, "Government computing: Costly, incompatible and obsolete" [CW, June 30], a national information technology advisor could not possibly promote standards that would be useful across the entire spectrum of government computer applications and would be likely to create more problems than he would solve. To illustrate, consider the following situation, with which I am familiar.

The U.S. Navy decides it needs a new headquarters budgeting system. It selects a single contractor to provide more than 50 mainframes and minicomputers, complete with modern development software, to more than 30 Navy departments. Naturally, this process takes several more years than originally planned.

In the meantime, the departments that should have received these systems have immediate information processing needs that are not being met, yet they are not allowed to "waste" funds on interim systems because they should be receiving brand-new, compatible systems "real soon now."

This example deals with just one tiny area of government computing but illustrates what could happen if a federal computer czar was given the power to "analyze, monitor, oversee and propose federal information systems." Government computing would grind to a halt while everyone waited for the czar to design some wonderful master plan that would fit everyone's needs. The result would be a Procrustean bed into which everyone's needs must fit or else.

Mark Crosby
Arlington, Va.

Productive coexistence: Cobol, 4GLs

Articles in recent issues of *Computerworld* have presented various opinions regarding fourth-generation languages' effectiveness and efficiency, risk ("Buying a 4GL: Be forewarned" [CW, June 9]) and coexistence with Cobol ("Social security down under" [CW, June 23]).

Having developing a fourth-generation language that produces Cobol source code, we remain firmly convinced that these languages and Cobol can and should coexist.

In the hands of a trained user, a fourth-generation language will provide substantial productivity gains over traditional Cobol programming techniques. However, the language may offset these gains at execution time by requiring substantially more computer resources to do the same job.

Our method of having our cake and eating it too is the fourth-generation language-to-Cobol cross-compiler, two of which we have already developed. We recommend that a fourth-generation language be used for all development and maintenance, with the cross-compiler providing the option of migrating to Cobol once the application is ready for production.

This eliminates being locked in to one language or the other and allows the DP professional to take advantage of both the productivity of the language and the proven efficiency of Cobol.

We agree with the warnings in the column [CW, June 9] that a fourth-generation language is not a substitute for Cobol when it comes to processing large volumes of data. The balanced approach described in the second article [CW, June 23] is closer to our approach, although we think the user can increase productivity further by doing all development in a fourth-generation language while having a fallback to Cobol available with the cross-compiler to ensure efficient use of resources.

Kim O. Jones
President, Forecross Corp.

VIEWPOINT

Making programs 'as simple as possible but not simpler'

"It is a simulation of the New York subway system: More than 300 stations, 20 subway lines, expresses and locals, correct transfer points, even the problems — sticky doors, track fires and occasional unsavory characters."

Bernie was describing a program he had designed to determine efficient messenger routings. "Sounds neat," his friend Jake said.

"It's great fun. You can play it like a game. But the real power of the program is in its versatility, its ability to represent practically any kind of transportation or communication system with intersecting nodes."

Jake, a systems analyst at a major government agency, reflected a moment. "I suppose you wrote it in Basic," he said.

"Sure did. And it works like a champ. The core program is less than 80 lines long. What would you have used?"

"Oh, probably C or APL, maybe Pascal — anything but Basic. The only thing good about Basic is that lots of people know it."

Days later, Bernie reflected on the discussion. He was familiar with five languages, Pascal and APL among them. He could have used one of these and picked up a few microseconds in execution speed. But he had chosen Basic for a reason, just the reason that Jake mentioned in passing: Lots of people know it.

That meant that the program could be easily used and modified, if necessary, by other people. Moreover, writing the program in a structured way with the liberal use of comment statements made it practically self-documenting. Also, the whole job including documentation and presentation to the client took just a week to complete.

Bernie does not consider himself a professional programmer. He works for a small consultant, and programming is only an incidental part of his job of solving clients' problems. Hence, in writing programs, his major concern is solving a problem effectively and expeditiously.



By DAVID H. AHL

But in many respects, Bernie is a master programmer. Consider his subway simulation program: Not only did it solve the problem, but it could be easily maintained, modified and converted to other applications. Even more important, these functions could be performed by someone other than Bernie. In a sense, the program was a supersolution because it became a new tool with which Bernie and other people could solve other problems in the future.

In contrast to Bernie, Jake works in a large programming environment consisting of many layers of programmers, analysts, mathematicians, administrators and managers. His agency, like many other government agencies and companies, sponsors professional development seminars and courses for its employees. It has a committee studying various programming productivity measurement techniques. The programming department, quite correctly, considers itself a progressive and professional shop.

Jake's agency could easily have written the messenger routing program. The client, say, a manager elsewhere in the agency, would have had to initiate the request and describe the problem completely in writing. One or more programming department managers would then determine if the program could be written in-house and, if so, when it could be scheduled. The request would then go to a technical review committee that would determine what language it should be written in, approximately how long it should take and how many programmers, analysts and writers should be assigned to the job. The job would then be scheduled.

Next, a systems analyst would look over the request in detail, conferring with the client if necessary, and hammer out an overall framework. Then, alone or with the programmer assigned to the job, the analyst would come up with a detailed approach for solving the problem and testing the solution. The program would then be written.

Another person would test it for bugs (the agency had learned long ago that programmers generally do a poor job of testing their own programs). Next, a documentation writer would work with the programmer and analyst to write the user instruction and documentation. The completed program would then work its way back up through the analyst, evaluation committee, scheduler and department management, whence it would be turned over to the client.

In summary, total elapsed time for a three-day programming job: 12 weeks. Total manpower expended: nine days. Does the program solve the problem? Yes. Is the program easy to use? Yes. Is it easy to maintain? Maybe. Is the program a generalized solution that could be used in the future? Not unless the original client request specified that it be so.

Think about your company for a moment. Is it more like Bernie's consulting firm or Jake's government agency?

Victims of dogma

Today, all too often, managers, systems analysts and programmers become victims of organization and dogma — APL is best for solving complex mathematical problems, or Pascal is better than Basic because it forces logical structure — and lose sight of the overall picture.

And the big picture is almost always the same whether it is viewed at a major government agency with 10 layers of management or a tiny consulting firm: Identify the problem, solve it in a timely way, keep the solution simple and, if possible, create a generalized tool to give you a running start in solving similar problems in the future.

Obviously, these tenets can be overdone. As Einstein said, "Everything should be made as simple as possible but not simpler." But for the most part, by keeping the big picture in sight and not getting distracted by red tape, dogma and other extraneous concerns, anyone can become a master programmer — even if he writes programs in Basic.

Ahl founded Creative Computing Magazine *and is the author of more than 20 books on recreational, educational and professional computer applications.*

Limited technology must take blame for current PC slump

READER'S PLATFORM

By PETER KAPSALES

Personal computer sales went down 7% in 1985 after a 12% increase in 1984 and a 96% increase in 1983, according to Future Computing, Inc. figures. Why? Analysts cite the following reasons:

- The data processing industry was in a slump.
- The market was saturated.
- Customers were waiting for prices to drop.
- Customers were waiting for new technology.

While these reasons may have validity, none of them explains the underlying issue for weak personal computer sales.

The issue is that PC technology is too limited to meet the needs of potential users. Users are more sophisticated today than they were in past years. Technology is not providing users with what they need for the right price; therefore, it is not selling. That is why the performance of the personal computer market was far below industry expectations.

What do PC users really need? According to Newton-Evans Research Co. in Ellicott City, Md., the nonmanufacturing applications most often implemented on micros are spreadsheet packages, 78%; word processing software, 70%; accounting, 46%; business graphics, 43%; information retrieval, 29%; personnel data, 22%; and electronic mail, 15%.

Is a PC the most effective and cost-efficient tool for each user to gain access to these functions?

Not really. The same could easily be accomplished using a multiuser system (a supermicro and/or local-area network) with four to 10 workstations. A multiuser system allows information to be shared among users, rather than isolated on a hard disk of a personal computer. Data bases, spreadsheets, and word processing documents are then accessible by many users, providing significant productivity and cost benefits. Trying to share this information using stand-alone PCs would be very costly in time and dollars.

Simultaneous access to data can be invaluable to users. Productivity improvements are often achieved when data is available only to the single user of a personal computer. But these improvements can be increased many times over when more than one user can access the information and programs. Data bases and programs are much more important to a business if they can be shared.

Many users upload and download data from mainframes or minicomputers to personal computers. The same data is often downloaded by many PC users. This occurs only once in a multiuser environment. System and user resources are much better utilized.

The multiuser system is much less costly than having many personal computers. Only one copy of a software product is needed for multiuser systems, reducing costs and maintenance. One large hard disk is shared by users, eliminating the common practice of each PC user having his own 10M-byte hard disk (which is usually underutilized by up to 80%).

Yes, personal computers are useful, but the marketplace has stated that they are not completely filling the computing needs of the office environment. In his address at Comdex/Fall '85, Hewlett-Packard Co. President and Chief Executive Officer John A. Young said, "Customers do not want a PC. They want the gains in personal and organizational productivity that it makes possible. The PC isn't an end in itself; it's a means to an end."

Users are looking for productivity gains beyond those that the PC provides. They are starting to find these gains with multiuser systems. In the multiuser environment, the microcomputer becomes more effective as an integral part of office automation rather than a personal tool.

Future Computing reports that the number of multiuser micros installed increased 51% in 1985, and they will be more popular when additional software is available.

The personal computer market may not rebound from its performance of recent years, but a strong market for automated tools to improve office productivity still exists. Many multiuser systems are starting to evolve to meet the needs of this marketplace, and the introduction of new technology will add to the viability of multiuser systems.

Kapsales is an MIS manager and former Big Eight consultant who lives in Red Bank, N.J.

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SOFTWARE & SERVICES

SOFTALK
Charles Babcock

A tale of two IBM DBMS

The first wave of DB2 acceptance appears to have crested, and doubts once more are appearing that it will be everything IBM promises.

If it runs only with MVS/XA, then many shops are going to have to overcome the obstacles to conversion before they can implement DB2. MVS/XA and DB2 run best on an IBM 3090 mainframe, so the price of entry for some DB2 users will be a $4.5 million 3090 Model 200. And what is a devoted IMS user to do with his production data bases? Trust them to future performance improvements in DB2?

The answer, says Paul Hessinger, vice-president of research at Computer Task Group, Inc., is a qualified yes. Hessinger, a frequent lecturer on IBM software strategy, spoke recently at a Digital Consulting Associates, Inc. conference in Burlington, Mass.

Many people think that IBM's commitment to improving the performance of DB2 will gradually become the death knell of IMS. Given the advantages of a relational data base management system, DB2 will quickly overpower its aging predecessor once it has shown it can handle volume transaction processing, or so many observers think.

At this point, Hessinger's qualifications begin to surface. IBM is spending $40 million this year on IMS development and $22 million on IMS-related development. Sound like a written-off product to you?

IBM is also spending heavily to develop DB2 further. In addition to the performance improvements announced in February, IBM is working on three new releases of DB2, and it will try to compress the period between releases from 18 months into 12 months, Hessinger said.

"That means three more releases be-

See TALE page 22

Babcock is Computerworld's senior editor, software & services.

MVS network tool enhanced

Provides SNA functions, file-to-file data transfer

By Charles Babcock

This Thursday, IBM is scheduled to offer Version 2 of its MVS/Bulk Data Transfer program for moving data sets between installations on an MVS/Bulk Data Transfer network.

The transfer is effected via the file-to-file function without copying data to intermediate storage. Transfer may take place between systems at one installation or between installations on the network, according to IBM's programming announcement.

Version 2 expands the basic network functions of Version 1 to provide Systems Network Architecture (SNA) functions to JES3 Network Job Entry. A JES3 network couples independent processors together via channel-to-channel adapters and a shared direct-access storage device.

Version 2 is composed of three parts that may be ordered separately. These consist of the base function that provides interactive and transaction queuing support, a file-to-file function and JES3 SNA Network Job Entry support.

Version 2 allows a JES3 Network Job Entry site to send or receive jobs over an SNA network to another Network Job Entry site. It may also exchange commands and messages, IBM spokesmen said.

MVS/Bulk Data Transfer also provides JES2/JES3 file-to-file transmission capability using Advanced Communication Function/VTAM, data transfer checkpointing to allow interrupted file-to-file requests to be rescheduled and resumed and library capability for frequently used data transfer requests, spokesmen said.

MVS/Bulk Data Transfer will be available at a monthly fee of $800 for the base program, $575 for file-to-file and $486 for JES3 SNA Network Job Entry.

IBM has also announced Version 3 Release 1.1 of Advanced Communications Function/VTAM (ACF/VTAM) for users of MVS/370 and MVS/XA. It replaces ACF/VTAM Version 3.

ACF/VTAM Version 3 Release 1.1 offers support of Netview, a network manage-

See MVS page 22

SOFTWARE NOTES

Intel to market Verdix Ada system

Intel Corp. agreed to license an Ada development system from **Verdix Corp.**, a Chantilly, Va., producer of Ada compilers, debuggers, program library utilities and programming tools. Intel will market an Ada development system based on its 80286 and 80386 microprocessors.

■

Cullinet Software, Inc. has acquired a package of accounting, budgeting, forecasting and reporting facilities in the **International General Ledger System** for marketing to its overseas customers, said Vic Morris, senior vice-president of international operations.

■

Burroughs Corp. is encouraging its bank customers to switch from **Florida Software Services, Inc.** to Burroughs'

See NOTES page 20

Ramis II enlists in crime search

By Eddy Goldberg

CHICAGO — When the call came in reporting a car theft, the police operator queried a computer data base, asking where similarly valued cars stolen in the same area had turned up.

The system projected a possible neighborhood, and 15 minutes later, police found the car parked with the motor running. The driver had fled, Chicago police detective Charles Padgurskis recalled.

In the past, detectives had been hampered by a lack of quick access to crime records, particularly those located outside of their own precincts. Ramis II is the data base management system from Martin Marietta Data Systems of Princeton, N.J., that is helping the Detective Division of the Chicago Police Department overcome that problem.

"Ramis is very easy for a detective to use. With limited experience, he can take information and massage it into any meaningful form he wants," Padgurskis said.

See RAMIS page 20

INSIDE

IBM makes a special offer to encourage customers to convert to MVS/XA/**20**

NEW THIS WEEK

- Treehouse Software releases Trim Version 3.0
- Mentor Graphics offers workstation-based development tool

For more on these and other new products, see pp. 75-79.

INSTANT ANALYSIS

"I fully believe IBM strategy is a single DBMS, and that DBMS is DB2."

— **Paul Hessinger, vice-president of research, Computer Task Group, Inc.**



Ramis II enlists in crime search

From page 19

The department has compiled a data base of more than three million crime records, with approximately two million added each year. Approximately 1,000 detectives use Ramis II to access the data base.

In addition to using the system to find suspects, detectives also use Ramis II after a suspect is apprehended to see if a physical description or other evidence can provide connections to earlier, unsolved crimes.

Police Lt. John Glynn, commanding officer in the Detective Division's administrative section, described how the modus operandi used by a burglary suspect was once used to search for similar burglaries committed in the area of his arrest.

When confronted with a Ramis II printout, the suspect agreed to sign his initials to the crimes he had committed. The cases were added to the one for which he had originally been apprehended and were presented in court the next morning. After seeing the list, the judge set a higher bail.

Such success stories sparked detectives' interest, and the department formed its own Ramis II users group, Glynn said.

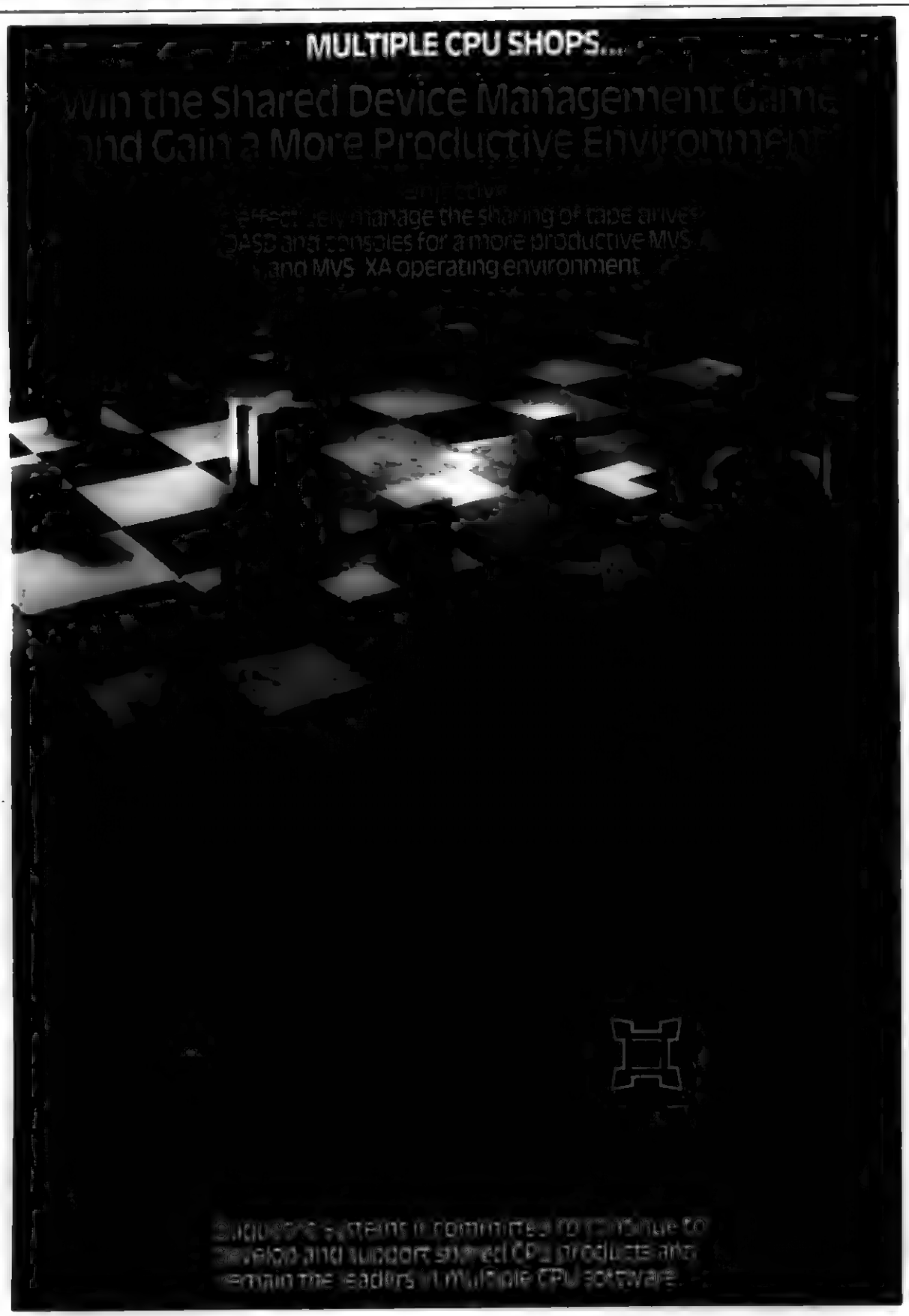
In another case, Padgurskis spotted a pattern in a series of burglaries. When a suspect was apprehended for a burglary that seemed to match the pattern, a set of variables was entered into the Ramis II for a search by the system. Sixty-five previously unsolved cases were found.

In each case, the suspect had delivered a pizza to the site of the burglary as a pretext for inspecting the premises. Then he gave the addresses of the most promising residences to two associates who would commit the crime when no one was home.

When shown a Ramis II-generated printout of the sites, the delivery man admitted to his involvement in all of the incidents and agreed to cooperate with the police.

Another way the system is used is to search for suspects using partial clues or witness descriptions in order to generate photographs.

Padgurskis said Ramis II is not necessarily the first tool that is used in each case, but its use is catching on. "We're making the transition from a system where everything was done by hand and hash marks to a computerized department," he said.



IBM offers free MVS/XA in conversion plan

By Charles Babcock

WHITE PLAINS, N.Y. — IBM is trying to make its strategic operating system, MVS/XA, more attractive to customers by offering it on special terms: eight months for free followed by 12 months at half price.

Customers accepting the offer must convert from a non-MVS operating system, such as VS1, DOS/VSE or VM, and pay the initial license charges at the end of the eight-month period — $12,840. But Martin H. Tillinger, president of a consulting firm that specializes in conversions, MHT Services of Hackensack, N.J., predicted, "It will get the conversion market moving faster."

IBM estimated that the offer is good for a savings of $170,000. Tillinger's estimate was higher, at $220,000.

The typical DOS/VSE shop pays $5,000 to $9,000 a month per CPU in operating system and related software charges, Tillinger said. Converting to MVS/XA will increase those charges to $20,000 to $25,000, and moving suddenly to that higher payment schedule is an obstacle for many DOS shops.

The eight-months-free offer shortens the time during which a customer would pay for two operating systems while effecting the conversion, according to Tillinger.

IBM said in a letter to customers that the offer was to encourage "direct migration to MVS/XA" and "to significantly reduce the initial expense of a non-MVS customer."

In addition, the offer is good for 15 MVS/XA-related programs, including TSO extensions, Resource Management Facility and Advanced Communications Function/VTAM.

Tillinger noted that IBM did not make the offer on any program that had direct third-party competition, such as its security package, RACF.

An MVS/SP 1.3 user, who is not eligible for the conversion offer, said most shops that wanted to convert had already done so. "This will get the fence sitters, but there aren't very many of them," he said.

Tillinger noted that IBM is making the offer not only to gain sales of higher revenue software products but also to encourage upgrades to larger mainframes. MVS/XA runs on the largest members of the 370 family, the 3083, 3081, 3084 and 3090.

Notes: DB2 users group forming

From page 19

Global Financial System by using a set of conversion tools from **Price Waterhouse & Co.**

■

A DB2 users group, called the Delaware Valley DB2-SQL/DS Users Group, is forming in the Philadelphia area. Its inaugural meeting will be at 1 p.m., Aug. 7, at the Holiday Inn on 18th and Market Streets, Philadelphia.

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Tale of two IBM DBMS

From page 19

fore the end of the decade. DB2 is maturing rapidly," he said.

With the new releases will come performance improvements that will allow DB2 to assume a greater role in production systems. And while Wall Street seems to think that such growth will come at the expense of independent DBMS vendors such as Cullinet Software, Inc., Hessinger says it will initially come at the expense of IMS.

There are currently about 5,000 IMS users and 600 to 800 DB2 users, depending on whose estimate you accept. From July 1985 to January 1986, about 100 organizations joined the ranks of DB2 users, and 25 to 50 of them are using it as a replacement in some fashion for IMS. The majority are using it as a complement to IMS, Hessinger said.

At the moment, DB2 is either an information center or other specialized DBMS, with IMS handling the bulk of production work. As DB2 performance improves, Hessinger expects the two systems to swap places. DB2 will become more and more the workhorse, and IMS will retreat into special-purpose processing.

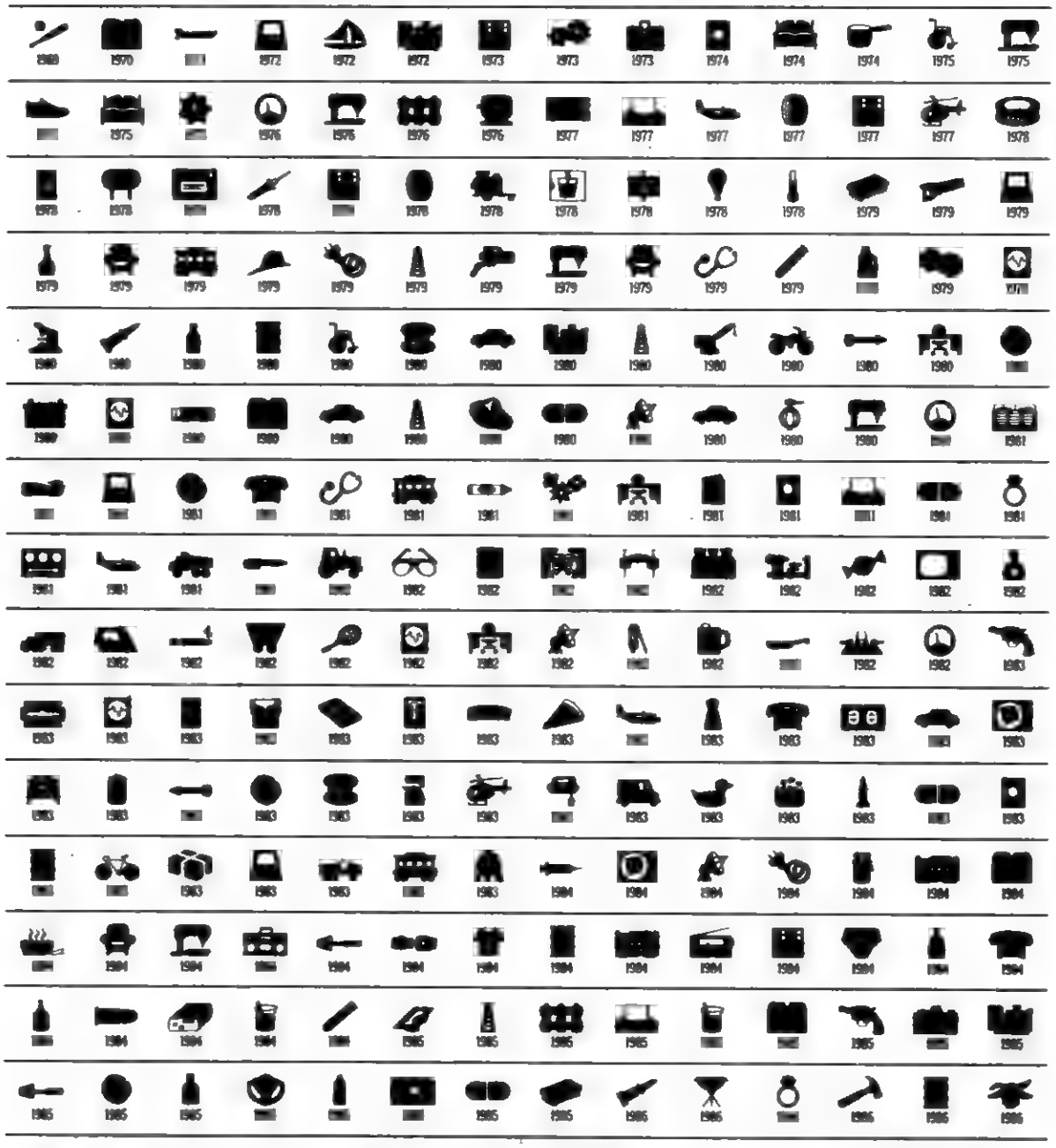
This is not the same as a dual data base strategy, although an element of that stopgap thinking remains. Hessinger said, "I fully believe IBM strategy is a single DBMS, and that DBMS is DB2. It is worthy of it."

The push behind DB2 does not mean that independent vendors will suddenly stop selling systems, he added. As noted above, DB2 is not now a good choice for smaller shops or mid-range users. Nor is it a good choice for those who need development tools and integrated applications right now.

The independents have highly competitive products in these areas, and it will be at least two to three years before IBM will be able to confront that competition.

But IBM is bent on converting 80% of its IMS user base to DB2 by 1990, Hessinger said. If it succeeds, DB2 will be the standard at large IBM sites and a potent engine waiting to be pushed downward.

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MVS net tool enhanced

From page 19

ment program. Netview, among other things, provides support to IBM's Token-Ring network. ACF/VTAM is available now at a monthly charge of $1,710 to $2,085.

Also unveiled was ACF/Network Control Program Version 4 Release 2 for IBM 3725 and 3720 comunications controllers for MVS and MVS/XA customers. It is available at a monthly charge of $695.

Also announced was Version 3 Release 2 of ACF/System Support Program for 3705, 3720 and 3725 communications controllers. It carries a $535 monthly fee.

The immediate availability of Release 3 of the Network Routing Facility for a monthly fee of $1,175 was also announced.

MVS test tool out

By Eddy Goldberg

SUNNYVALE, Calif. — Boole & Babbage, Inc. has announced XPF/Assembler, which it says is the first full-screen test and debugging tool for assembly language programmers working in IBM's MVS and MVS/XA environments.

The product competes with TSO Test, a utility provided by IBM to help debug assembly language programs.

James Turner, Boole & Babbage senior software engineer, said XPF/Assembler's full-screen display improves on TSO Test, which displays a few lines at a time.

XPF/Assembler is scrollable in either direction and allows programmers to split the screen. The product is compatible with XPF/Cobol, another Boole & Babbage test and debugging tool.

Available immediately, XPF/Assembler costs $20,000 as a stand-alone product or $7,000 as an upgrade to XPF/Cobol.

MICROCOMPUTERS

MICROBITS
David Bright

Voice-activated writer's block

At this very moment, scientists in both business and academia are racing to produce the ultimate user-friendly machine: a voice-activated typewriter. It's going to be wonderful — instead of bothering with a keyboard, or even a mouse, we'll be able to both run a computer and create complex documents simply by speaking in a natural voice.

From a historical point of view, the invention of such a machine may rank right up there beside ENIAC (the first electronic computer), the telephone and the phonograph. For a few years now, some vendors have been claiming that the first voice-activated typewriter is just around the corner — always six or nine months away.

But despite their ambitious efforts, the current state of the technology indicates that we won't see anything close to a voice-activated system usable in a real office this decade or perhaps even this century. It's time for these vendors to stop misleading us.

A leader in this race to grab a place in history is Kurzweil Applied Intelligence, Inc. Its founder, Raymond Kurzweil, has an impressive track record. So far, he has developed one machine that reads text to the blind and another that is perhaps the most advanced music synthesizer in the world.

In addition to making office automation more efficient, Kurzweil's proposed machine would also enable deaf people to read spoken communications from other people.

See VOICE page 28

Bright is a Computerworld senior writer.

Nestor software translates handwriting to ASCII code

By David Bright

PROVIDENCE, R.I. — By the fourth quarter of this year, Nestor, Inc. plans to begin marketing its first product: a software package that reportedly converts any type of handwriting into ASCII characters.

The system, as yet unnamed, is based on brain model research conducted over the past ten years by two Brown University physics professors.

Intended for vertical markets that use a lot of forms, such as the insurance industry, the software requires an IBM Personal Computer AT and a digitizing tablet.

A special pen connects to the tablet, and the tablet, in turn, connects to the computer's RS-232 port.

Nestor's technical support manager David Ward stressed that Nestor's product is not meant to be a replacement for the keyboard.

However, in situations where a form is filled out by hand and then manually entered into a computer, the latter step can be eliminated, he said.

The software also allows corrections to be made by hand.

An adaptive system

According to Nestor officials, the software system is adaptive, while other products that digitize handwriting, such as those from Pencept, Inc., are not.

"The learning system comes to know the handwriting of its users like a personal secretary," Leon Cooper claimed.

Cooper, a 1972 Nobel Prize laureate for his work in superconductivity, conceived

See NESTOR page 26



IBM ups speed of graphics PCs

By Douglas Barney

IBM earlier this month announced versions of its 3270 Personal Computer AT/G and 3270 AT/GX, which offer increased speed and larger hard disk capacity.

Both products, which are 3270 PC ATs designed for graphics-intensive work, will be available next month, and each costs $7,510.

"These machines now run at 8 MHz, rather than at 6 MHz," said Cary Ziter, an IBM spokeswoman.

Graphics boost

The performance increase will boost the machines' ability to create, display and manipulate graphics, Ziter said. Available colors and resolution, however, are unchanged from the earlier versions.

"They still work on the same display units as we had with the earlier AT/Gs

See IBM page 25

NEW THIS WEEK

- West End Film releases CA-D2ART conversion package for IBM PC and compatibles
- Norton-Lambert offers remote communications system for PCs

For more on these and other new products, see pp. 75-79.

INSTANT ANALYSIS

"The leap from 80286 to 80386 technology is going to be about as significant as was the jump from CP/M to MS-DOS."

— Michael K. Crosno, vice-president of marketing, Computer Associates, Inc., Micro Products Division

Oracle's SQL★Calc makes a relational DBMS as easy as 1-2-3.

Oracle Corporation has developed a Lotus 1-2-3 compatible spreadsheet and integrated it with its ORACLE® relational database management system (DBMS). The new product, SQL★Calc,® is the first to combine a mainframe-class relational DBMS with an easy-to-learn and familiar PC spreadsheet user interface.

Spreadsheet

SQL★Calc is designed for 1-2-3 users who've run out of memory, flexibility and patience. SQL★Calc allows you to put SQL database commands into spreadsheet cells... just like formulas. This permits you to access large amounts of data directly from your spreadsheet.

Like all Oracle Corporation products, SQL★Calc runs identically on mainframes, minicomputers and PCs.

SQL★Calc's foundation is the ORACLE relational DBMS, which provides users with a complete set of SQL commands through which they can create, retrieve, modify and otherwise control their data. SQL is the industry standard database command language for large computers. The SQL commands available in ORACLE are identical to the SQL commands in IBM's premier mainframe relational DBMS products, SQL/DS and DB2.

Relational DBMS

Built on this powerful DBMS foundation is a Lotus 1-2-3 compatible spreadsheet that allows users to put SQL commands into spreadsheet cells in the same way as they enter formulas. When a SQL command for data retrieval is entered into a spreadsheet cell, information is automatically retrieved from the database and placed into the spreadsheet. SQL★Calc also permits users to modify the database–and even create new database tables–directly from the spreadsheet.

SQL★Calc is easy to learn because its menu and command structure are compatible with those of Lotus 1-2-3. And SQL★Calc's ORACLE DBMS requires no supplement: It is vastly more powerful than the database components of 1-2-3, Symphony, Framework, dBase II, dBase III, or any other PC DBMS.

SQL★Calc is available immediately for IBM PC/XTs and ATs for $995.* SQL★Calc will soon be available on a wide variety of systems, including IBM mainframes, DEC, DG, and other superminis, and most UNIX systems.

For further information, or to order your copy of SQL★Calc, call 1-800-345-DBMS. Or write Oracle Corporation, Dept. CS, 20 Davis Drive, Belmont, CA 94002.

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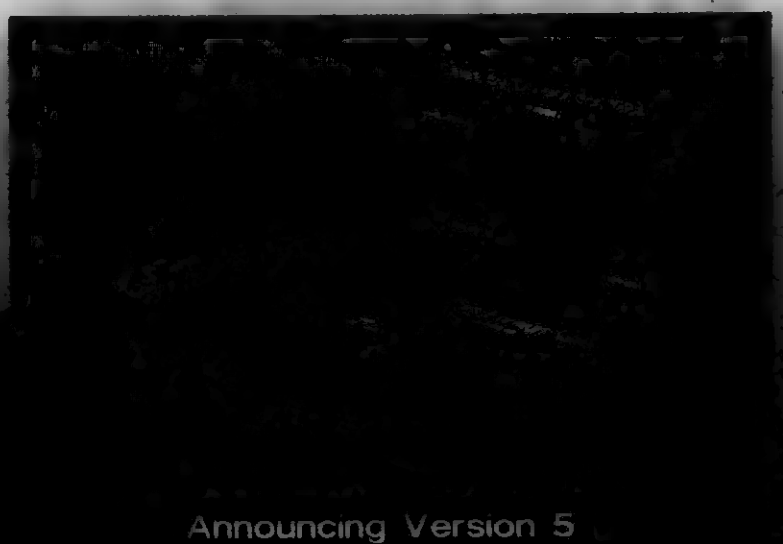
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Nestor tool translates

From page 23

the idea for the system with Charles Elbaum. "It learns from experience, working much as a child would learn to read," Cooper said. "We think it mimics certain brain-like functions."

The first user of the Nestor system is expected to be l'Union des Assurances de Paris, a large insurance agency in France, where agents will use the system to enter handwritten forms directly into the computers.

Initially, Nestor will sell the system directly to end users. Later in the year, it should be available on a retail basis, Ward said. Pricing has not yet been determined.

The software of the system has two parts, Ward explained: a kernel comprising the basic instructions and a memory segment that stores the learned information.

Because of the software's ability to adapt to varied input, it could be used to build voice recognition systems, Ward added.

The system reportedly has been trained to recognize thousands of complex Japanese Kanji characters.

Nestor also has under development an optical character recognition system that uses a video camera to read handwritten checks.

IBM speeds graphics PCs

From page 23

and AT/GXs," Ziter said.

The 3270 AT/G and 3270 AT/GX originally came with the choice of a 10M-byte or 20M-byte hard disk drive.

Users reportedly can choose between the 20M-byte or 30M-byte hard disk drive, according to Ziter.

Users contacted by *Computerworld* debated the merits of IBM 3270 PCs and ATs vs. personal computers that use 3270 terminal emulation and are equipped with products such as Digital Communications Associates, Inc.'s Irma boards.

User likes emulation

"Emulation is as good as the 3270 itself," said Lonny Bass, MIS director for Kershaw Manufacturing Co., which uses Irma-equipped PCs.

But Sue Nara, senior micro analyst with Uniroyal, Inc.'s Tire Division, argued that IBM 3270 PCs and 3270 PC ATs are preferable. "The interaction with the host on any 3270 is far superior to an Irma card," Nara said.

Although Uniroyal has a number of IBM 3270 PCs and 3270 PC ATs, the firm has not opted for the 3270 PC AT/G or GXs. "We didn't need the intensive graphics," she said.

> ***'You can use IBM AT/G and AT/GX as graphics displays, stand-alone graphics workstations or personal computers.'***
>
> — Cary Ziter
> IBM

Ziter stressed the versatility of the 3270 PC AT/G and GXs when equipped with various options. "You can use IBM AT/G and AT/GX as graphics displays, stand-alone graphics workstations or personal computers," Ziter said.

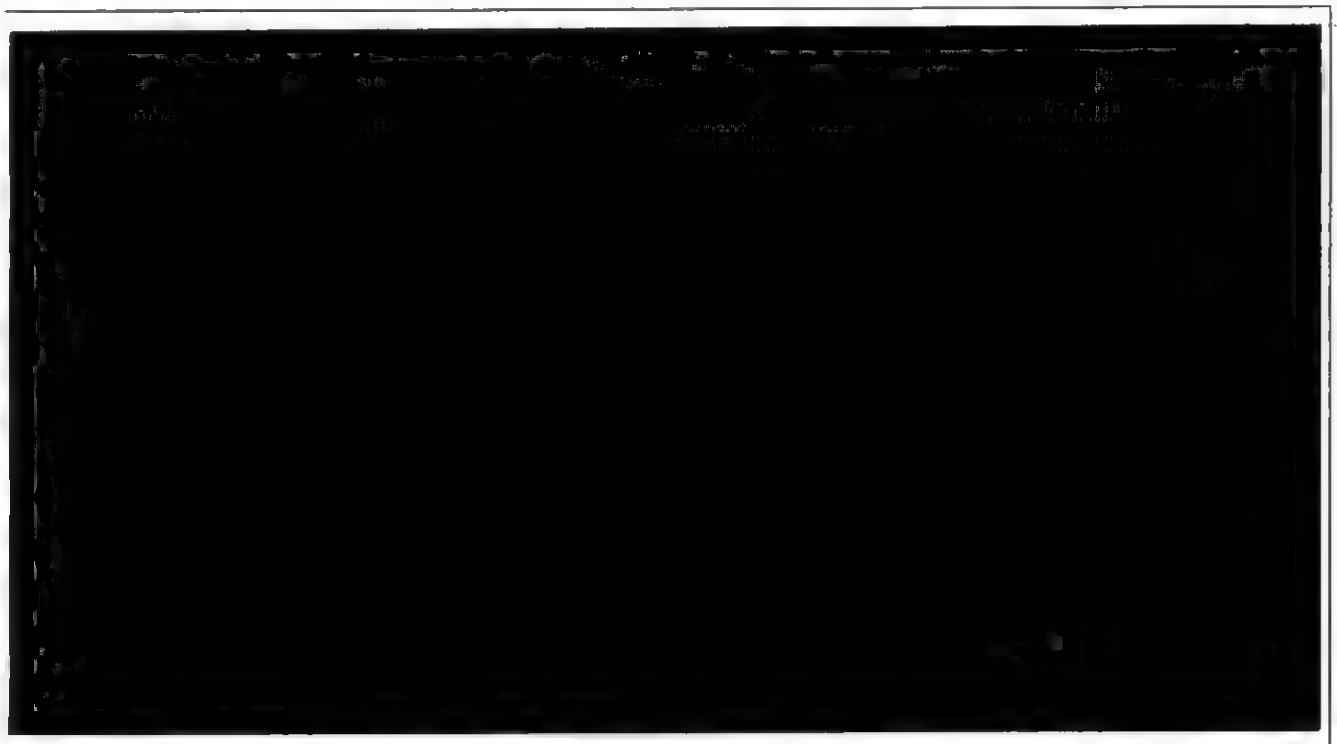
Available as options

IBM also announced that the 3270 PC AT/G and AT/GX graphics displays are available as options for the IBM PC AT 5170 (the standard IBM AT) for $770.

This allows users of standard IBM ATs to attach IBM 5279 color displays, IBM 5379 color or monochrome displays, the 5277 mouse or 5083 Model 2 tablet.

The machines will be sold by IBM value-added dealers and IBM marketing divisions.

The systems are said to be compatible with existing version of the IBM 3270 PC ATs.



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Voice-activated writer's block

From page 23

Now Kurzweil claims that by year's end it will have available a $30,000 system capable of recognizing as many as 10,000 words. However, a similar machine was expected from Kurzweil last year — and the year before. But Kurzweil should not be faulted for its efforts, only for its unrealistic claims.

Researchers at MIT are much more modest. For commercial benefit, the current voice recognition technology is "limited, fragile and not readily extendable to more complex tasks," according to Professor Victor Zue.

The MIT project centers around the interpretation of voice waves printed out on a spectrogram. So far, researchers trained in spectrogram reading have been able to transcribe unknown sentences with an accuracy rate of 85%.

Trick is to improve accuracy

The trick will be to greatly improve the accuracy rate and transfer the learned techniques to an expert system. Zue maintains that it will be many years before a successful voice recognition system is developed by MIT or anybody else.

It's good to see that Votan, a leader in the fledgling voice recognition market, is looking at things realistically.

"The technology is just not there for the voice-activated typewriter," says Bob Russo, vice-president of sales and marketing. Although Votan has its own voice-activated typewriter project in progress, Russo stresses that in the near future, voice products will be best suited to more specific, limited applications. So far, the most popular voice recognition applications are telephony (credit card validation, for example) and factory data entry.

Influx of voice products predicted

Russo predicts that the next 14 to 15 months will bring a major influx of voice products into the office automation market. These will include telephony products, but many will be voice store-and-forward-related (not really voice recognition) products such as voice messaging and annotation.

Russo says increased — although limited — use of voice recognition products in the office is a definite possibility. According to a Votan survey, 87% of office workers require only 45 words or less to run their typical applications.

Since Votan's add-in boards for the IBM Personal Computer can recognize about 150 words at a time, they are well suited for applications such as Lotus Development Corp.'s 1-2-3, Russo notes.

But he adds that voice recognition is not really going to catch on in the office until minicomputer and microcomputer vendors integrate voice as an option with their products.

While the systems vendors haven't yet heavily pushed any voice options, some are involved in the quest for a voice-activated typewriter. Possibly as a response to Kurzweil's recent high visibility, IBM for the past year or so has been publicizing its own voice recognition efforts.

Not to be outdone by the brash young Kurzweil (which is partially financed by two competitors — Wang Laboratories, Inc. and Xerox Corp.), IBM claims its experimental system is the most advanced voice recognition system in the world.

Developed at the Thomas J. Watson Research Center in Yorktown Heights, N.Y., IBM's experimental desktop system reportedly transcribes sentences from a 5,000-word vocabulary with an accuracy rate exceeding 95%.

> ***"So far, researchers trained in spectrogram reading have been able to transcribe unknown sentences with an accuracy rate of 85%."***

Although the system is based on an IBM Personal Computer AT, it contains six custom-built, digital-signal processing boards representing probably $1 million worth of mainframe computing power.

Keep in mind that this is strictly research — IBM currently has no plans to commercially market such a system. While a demonstration of the experimental system at last month's 1986 National Computer Conference was impressive, it was easy to see why a true voice-activated typewriter remains far in the future.

The demonstration was conducted by a man ensconced in a glass booth who was speaking slowly in a monotone with short pauses between words.

An idea of how far the technology has come — and how far it has yet to go — can be heard by calling market leader Votan's voice recognition demonstration number.

For example, a mock airline reservation system asks whether you want to go to New York or San Francisco. If you answer correctly, the system responds with remarkable speed and accuracy, but if you say New Jersey or Chicago instead of New York, you are likely to get booked on the next flight to San Francisco.

Let's hope the "voice-activated typewriter" vendors aren't sending us in the wrong direction.

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COMMUNICATIONS

DATA STREAM
Dan Minoli

Analyze your network dollar

The following observation was true when it was made by a major communications authority a few years ago and is even more applicable now: "A great deal has been published on the scientific and technical aspects of telecommunications — very little on the engineering economics of the subject. The development of a [data communications network] is continuous, and long-term planning extending far into the future is essential; always the best use must be made of presently available capital and always in complex relationship with operating and maintenance costs, interest, depreciation and revenue."

Financial sanity is especially important during the development and implementation of private satellite-based or optical-fiber networks, which, unlike carrier-based services, require major up-front monetary outlays by the customer.

Carrier services can always be discontinued; expensive feasibility studies and expenditures for hardware usually cannot be recovered. Another advantage to using a network service is that you can usually rely on the carrier to have performed major economic studies to ensure resource efficiency and to be tracking technology in order to employ the latest and the best.

In contrast, a business installing its own network must pay for its own eco-

See ANALYZE page 31

Minoli is a lecturer with New York University's Information Technology Institute as well as a full-time data communications researcher and strategic planner.

Bell packet networks stalled

Potential competitors want equal access, costs

By Elisabeth Horwitt

A recent rash of packet-switching tariff filings by the divested Bell operating companies have run up against objections from vendors who are concerned that the new offerings will compete unfairly with their own network services.

According to product manager Michael Delaney, network vendors' intervention could delay Southwestern Bell Telephone Co.'s recently filed packet-switching tariff for as long as six months.

"I have not opposed the divested Bell operating companies getting into packet switching," Telenet Communications Corp. President David Hann told *Computerworld* earlier this year. "What Telenet has spoken out against is the subsidization approach." In order to win approval for packet-switching tariffs that include enhanced services such as protocol conversion, divested local carriers must submit plans to the Federal Communications Commission describing how they will keep separate their regulated and deregulated communications services.

Network vendors like Telenet review these plans to ensure that the new services will not receive subsidization or preferential treatment from the local telephone monopolies. "All we're asking is that they offer us the same access at the same basic costs that they pay for their own lines. Let them compete with us head-on," Hann said.

Packet-switching vendors' objections are at least partly to blame for delayed FCC approval of Nynex Corp.'s Infopath packet-switching service, announced in April. Telenet filed with the FCC its reservations about Nynex's ability to make good on its guarantee of equal access, according to Director of Regulatory Affairs Michael Hirsch. "The problem is that Nynex customers are being offered data-over-voice links to the packet-switching

See BELL page 33

U.S. Sprint cuts rates up to 48% to compete with AT&T, MCI

By Elisabeth Horwitt

SHAWNEE MISSION, Kan. — The first tariff filing by the recently formed U.S. Sprint Communications Co. will result in rate cuts of up to 48%, the company announced recently. The reductions, which will take effect on Aug. 1, are part of the company's strategy to maintain lower prices than its two primary competitors, AT&T and MCI Communications Corp., said U.S. Sprint Senior Vice-President of Sales and Marketing, Edward Carter.

The cuts will reportedly save U.S. Sprint customers up to 35%, compared with what they would spend with AT&T. The new WATS rates are up to 17% lower than AT&T's rates, and volume discounts

See U.S. page 30

PC, Unix united via Ethernet

By Stanley Gibson

MILPITAS, Calif. — Lanscape, an IBM Personal Computer Ethernet system recently introduced by Univation, Inc. enables IBM Personal Computers and Unix systems to communicate over an Ethernet local-area network (LAN), the company claimed. A network server also provides a gateway to the IBM Token-Ring network.

"We are connecting the Unix and PC worlds," said Inder Singh, an independent consultant who helped develop Lanscape.

The Lanscape family includes network boards, a server and several network software packages. The NC 516 Network Interface Card interfaces IBM PCs, Personal Computer XTs or ATs and compatibles to an IEEE 802.3-compatible LAN. The Intel Corp. 80286-based FS 2000 series file serv-

See PC page 30

NEW THIS WEEK

- Racal-Vadic announces a 1200VP asynchronous modem
- Telenetics Corp. unveils its MNP modem error control module
- For more on these and other new products, see pp. 75-79.

INSTANT ANALYSIS

"We feel that the FCC has drawn an artificial distinction between 'basic' packet switching and 'enhanced' offerings such as protocol conversion. Protocol conversion is an intrinsic part of packet-switching services, which are used by the public to enable disparate systems to talk to the same host."

— Michael Hirsch, director, regulatory affairs, Telenet Communications Corp.

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PC, Unix united

From page 29

er supports up to 100 workstations on Ethernet or the IBM Token-Ring.

"We feel that LANs will continue to develop along both Ethernet and Token-Ring lines. And no matter which one becomes dominant, Lanscape will be able to integrate both," Andy Khanna, Univation president said, explaining his company's marketing strategy.

Lanscape network operating system software includes versions of Novell's Advanced Netware 2.0 operating system for either the FS 2000 or for an IBM PC or AT-based server.

Univation is currently working on a version of Netware that will be "more user-friendly and provide better application integration," Singh said.

IBM PCs and ATs running Univation's Unix Transmission Control Protocol/Internet Protocol (TCP/IP) can communicate on the network with Unix systems that are also using the TCP/IP. Ethernet boards for the Unix systems must be obtained from other vendors, Singh said. IBM PCs can exchange files with a Unix system or communicate in terminal-to-host mode.

The current version of Lanscape does not enable Unix systems to initiate file transfers with PCs, Singh said. "The Unix system functions basically as a server."

Personal Computers equipped with Univation's Netbios Emulator can run applications software written for IBM PC Network's Netbios communications software. Univation also provides an electronic mail system for use with Lanscape.

Dick Tobey, Univation's senior vice-president in charge of engineering, said that Lanscape gains speed from its "flexible multiple packet" buffering scheme that allows its node cards to receive up to 32 packets in rapid succession without intervention from the CPU. This speeds up the network by eliminating the retransmission of lost packets, Tobey said.

The buffer can also hold up to 10 maximum-length packets, which enables requests to a node to be received and executed in order, rather than the requests having to go around through the network again if the node is busy, Tobey added.

A five-user system including file server and software costs $12,260, with the cost per user decreasing as the number of users increases. A 24-user system costs $21,665. A five-user system without a file server is $4,665.

U.S. Sprint cuts rates

From page 29

are 50% greater than MCI's volume discounts, U.S. Sprint claimed.

"MCI and U.S. Sprint are trying to stay 15% under AT&T in order to hold on to their market share, but I don't see how they can keep on cutting their rates like this," said Daniel Rosenbaum, of the Morristown, N.J., consulting company Winston/Smith Associates.

He pointed out that now that other communications carriers are being given equal access to local telephone company central offices, they will no longer receive a 55% price break on access charges.

The advent of equal access has been "a gradual thing that we've been dealing with for some time," U.S. Sprint spokesman Syd Courson said. He added that the cuts have been possible because GTE Sprint and U.S. Telecom, the two partners in the recent merger, "don't do a lot of leasing of other carriers' lines."

"We don't figure on losing any money on the current cuts, because they will help us fill our current network capacity with new customers. And when our optical-fiber network is fully installed over the next two years, we'll get off AT&T lines completely," Courson said.

In the near term, the optical-fiber network will cost the company approximately $2 billion, Courson said. But he added that U.S. Sprint will realize savings, since optical fiber "is much more cost-efficient than either copper-based or microwave links."

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Analyze your network costs

From page 29

nomic modeling and risk analysis. But this should not deter the network manager from undertaking these tasks.

In fact, when a company is buying its own network equipment, it is especially crucial to weigh the risks and advantages of new technologies, since a miscalculation will cost the company hard dollars.

This column discusses some basic decision support tools and principles that can aid data communications planners and practitioners in effectively evaluating alternatives during the private network planning process.

To help the practitioner make sound decisions, a collection of disciplines generally referred to as decision theory or engineering economy has evolved. Decision theory draws on the following areas:

- Financial analysis (including forecasting).
- Probability and statistical analysis.
- Risk analysis.
- Optimization theory (linear programming in particular).
- Game theory (decision analysis when there are conflicting goals — departments competing for funding, or a customer negotiating with a vendor for better service, for example).

The above are very powerful data communications resource management tools. Although decision models have been available for several decades, they have been used primarily by common carriers and other sophisticated network users.

While the total monetary value of network installations remained small and the useful life of the equipment was long, the general user community had less need of decision modeling.

Today, however, with communications equipment budgets growing, system life cycles are shortening and fewer and fewer businesses can afford to make crucial buying decisions without performing preliminary analysis.

Based on economic realities

Communications-related decisions should not be based on the elegance and novelty of the latest technological breakthroughs, but on economic realities after contrasting all available options, including mature technologies.

Several of the following points are evident soon after one starts a serious analysis process:

- A practitioner should not subscribe to a technology or solution based on the amount of media coverage it has been given. Old technologies like multiplexing and circuit switching are still very useful and cost-effective.
- A risk analysis that takes into account the random nature of the business environment is always a good idea, but rarely done.

As a result, most companies' solutions are "probabilistically optimal," "optimize the expected value" or represent the "maximum likelihood."

This means that, given a specific case, even a solution that is optimal will lead to an undesirable result.

- When analyzing a problem, the manager must explicitly take into account *all* cost and risk factors, not just the most ostensible or convenient.
- The solution to any given problem depends on how a company prioritizes its objectives. Some of the possible goals are to minimize cost, maximize the cost-benefit ratio (getting the most network for the buck), maximize corporate strategy (build a network that makes the company more competitive; enable it to enter new markets), maximize security, maximize reliability, maximize quality of service, maximize growth opportunities and maximize prestige of the firm (buy state-of-the-art equipment in order to impress investors, competitors, public, boss and so on).

Clearly, not all of these criteria are compatible with one another. A network built to minimize cost will most likely not maximize reliability and quality of service, for instance.

At the risk of stating the obvious — the network manager needs to have a clear idea of his company's communications needs, before he can determine which network solution will best serve them.

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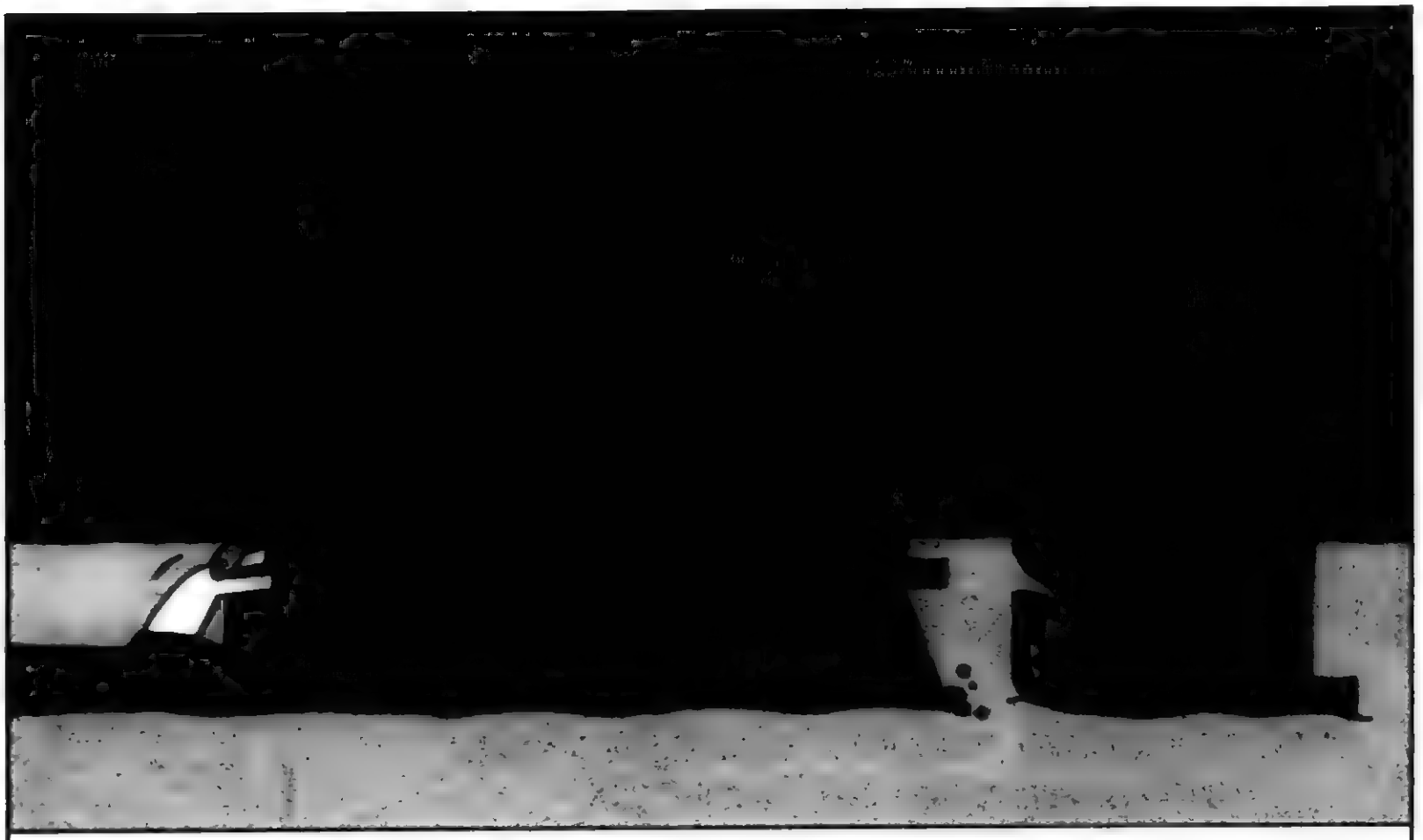
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Bell packet networks stalled

From page 29

service," Hirsch explains. "They promise to provide us with the same type of link at comparable costs, but we don't see how that's possible, since they have many more central offices than we have nodes in their region, and are likely to be much closer to a customer's site."

U.S. West is the only regional holding company that has not yet filed a packet-switching tariff offering with the FCC. Tariffs proposed by divested operating companies within Nynex, Southwestern Bell Corp. and Pacific Telesis Group still await FCC approval. Divested operating companies within Bell Atlantic Corp., Ameritech and Bell South Corp. and independent telephone company Southern New England Telephone Co. currently offer packet-switching services.

In its comments on several filings, Telenet has accused divested Bell companies of suggesting unrealistically low tariffs for packet-switching services. "Rates have to be based on future demand, which we think they're overestimating," Hirsch says. President Hann painted a scenario in which local carriers would first undersell their competitors, then subsidize the resulting net loss with profits from their telephone subsidiaries.

The FCC has responded to the vendors by having AT&T and Bell Atlantic report the volume of use of their packet-switching services. Bell Atlantic's tariff only went into effect in June, so no numbers are available yet. AT&T's figures are reportedly lower than its projections.

Amy Francis, a senior analyst at Boston-based consulting firm The Yankee Group, is pessimistic about future growth of the divested companies' packet-switching customer base because "there have been no real breakthroughs in the search for intra-local access and transport areas (LATA) packet-switching applications."

An early customer of Southern Bell Telephone and Telegraph Co.'s Pulselink, Knight-Ridder Newspapers, Inc., hoped to use the packet-switching service to support its videotex services. But the offering never got off the ground, according to Francis.

"The only real application for local packet-switching services is as a gateway to the interstate networks like Tymnet," she says.

Compuserve, Inc. has adopted the gateway concept on a grand scale, extending its own private packet-switching network with service offerings from the divested Bell operating companies and with major carriers such as ITT, RCA Corp., Tymnet, Inc., Telenet and Canadian packet-switching service Datapac International.

The data base and electronic mail service company welcomed the advent of local-carrier packet-switching services as a way to provide more local access for its customers, according to Vice-President of Network Operations William Duvall. "We have 240 packet-switching nodes in major cities, but people in remote locations are paying $5 to $18 to access our nearest node," he notes.

"Through local-carrier networks we can provide more customers with local service without having to put more nodes in ourselves. That just isn't cost-effective when you're only reaching six or seven users," Duvall adds. Compuserve already has entered a service agreement with Southern New England Telephone and New Jersey Bell and is working on similar arrangements with other regional companies.

But Compuserve is one of the few exceptions to the predominantly low demand for intra-LATA packet switching, according to Paul J. Bell, president of New York consulting firm The 23K Group, Inc.

In order to network the sites of a nationwide company, a group of regional operating companies would have to link their networks, he points out. "You'd have to go through half a dozen central-office switches to connect all your sites. With or without enhanced services, the local companies just can't compete with interstate companies like Tymnet," Bell says.

IBM opts out of cable sales

By Elisabeth Horwitt

RYE BROOK, N.Y. — Customers will no longer be able to order the IBM Cabling System for the Token-Ring network directly from IBM, the company announced recently. The cable will be available through five authorized electronics supply houses: Graybar Electric Co., Anixter Bros., Inc., Vertex Peripheral Corp., North Supply Co. and General Electric Supply Co.

"When we introduced the cabling system two years ago, we decided to sell it directly because there were not many outlets available then, and we wanted to ensure that the cable was readily available," an IBM spokeswoman said. Now that third-party distribution channels and certification facilities are established, IBM's participation is no longer needed, she claimed. In April, IBM turned over administration of the Network Cable Certification Program to ETL Testing Laboratories, Inc. of Cortland, N.Y.

Customers can find out the name of the nearest authorized cable outlet from their IBM customer representatives, who will continue to market the cabling system, IBM said.

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SYSTEMS & PERIPHERALS

HARD TALK
James Connolly

Looking for a revolution?

It may be true that familiarity breeds contempt. If so, maybe IBM can look to that old saying as an explanation for the growing criticism of the company's new models of the System/36 and System/38 and of the other products introduced last month.

If one thinks back to June 16, the day IBM introduced 125 products at the National Computer Conference, one will recall that the reaction from users and analysts was almost all positive. The three System/36 models, six System/38s, disk drives and communication products were praised for their promised performance and lauded as steps in the right direction.

A little more than a month has passed since the announcements were made, and it is interesting to see how the comments — particularly those of analysts — have changed.

One analyst recently opined that IBM's introductions merely added to the confusion surrounding the company's mid-range line, rather than clarifying its strategy.

Others point to the System/36 and proclaim that it is still underpowered when compared with minicomputers such as the Digital Equipment Corp. Microvax II.

Another observer writes that the new System/38 models are just "old wine in new bottles."

Contrast those comments with one of the first-day analyses that said the introductions indicate "an aggressive

See LOOKING page 37

Connolly is Computerworld's *senior editor, systems & peripherals.*

Burroughs fills power gap; A 5 bolsters low-end line

By James Connolly

DETROIT — Attempting to fill what company officials considered a performance gap, Burroughs Corp. last week added a third system to the low end of its A series of mainframes.

The A 5 reportedly offers more than twice the power of the nearly 2-year-old A 3 system, which can be upgraded to the new A 5.

"We are stressing the fact that you can upgrade from the A 2 to the A 3 and to the A 5 within the same cabinet," said Bill Petti, Burroughs's program manager for the A 3 and future products. The A 2 was introduced in March.

Fred A. Meier, vice-president of Burroughs's Corporate Program Management, added, "The A 5 is an attractive option for customers who want more processing power than is available from the A 3, but who don't require a large mainframe."

Petti noted that the A 5 is intended in part as a competitive answer to IBM's February announcement of models for its 4381 line of small mainframes.

Many similar features

He reported that the cabinet, memory and basic processor are the same for the A 2, A 3 and A 5, but that the A 5's processor is enhanced to provide more power.

The single-processor A 3F can be upgraded to the A 5F for $98,500 through replacement of six boards and power supplies.

Dual-processor A 3Ks cannot be upgraded, although Petti said more announcements are expected to ease any concerns on the part of A 3K users.

Petti said that Burroughs, which does not provide performance ratings based on millions of instructions per second (MIPS), rated the A 5 2.23 times more powerful than the A 3.

See BURROUGHS page 36

HARDWARE NOTES

Optical storage displays show-stealers

It was noticeable at the 1985 National Computer Conference, and it stood out again at NCC '86 last month. Some of the most popular exhibits on show floors continue to be the **optical storage displays**, even at a thinly attended show such as this year's NCC. It appears that even if DP managers are not looking to buy optical storage for general-purpose use, they are interested in it for narrow applications or as a technology that is worth following.

■

One traditional magnetic storage media vendor that is trying out the optical market is **BASF Group AG** of West Germany, parent company of BASF Corp. BASF, which claims to be Europe's leading manufacturer and supplier of magnetic storage media for audio, video and DP applications, reports it is bypassing first-generation, write-once disks. Instead, the company says it will concentrate on media-based organic layers of dye for once-recordable disks, and on magneto-optic layered disks for repeatedly recordable disks. BASF officials claim that optical storage technology is more likely to replace filing systems based on paper and microfilm than magnetic media. BASF's goal is to have samples available in 1987.

■

Shipments of **Burroughs Corp.**'s V 310 mainframe began a little earlier than

See NOTES page 36

NEW THIS WEEK

- Emulex Corp. introduces its MD23 and MD24 disk controllers
- Roland DG releases a CAMM-3 three-dimensional plotter

For more on these and other new products, see pp. 75-79.

INSTANT ANALYSIS

"Within five years, the departmental computer, which is going to be a 32-bit minicomputer, . . . is going to have very few terminals attached to it. Rather, it will be a PC servant."

— **George Colony,** president of Forrester Research, Inc.

DATA VIEW

Top 10 general-purpose computer systems: IBM holds first five positions
Based on the dollar value of shipments to U.S. customers

Manufacturer and System	Rank	Installed Systems	Typical Price (dollars in thousands)	Total Purchase Price (dollars in millions)
IBM 3084	2	627	6,500	4,076
IBM 3083	4	1,729	2,000	3,458
Digital Equipment Corp. VAX 11/780	6	16,766	200	3,353
IBM System/38	8	8,956	240	2,149
Hewlett-Packard Co. 3000	10	13,924	100	1,392

IBM cautiously testing parallel processor waters

By Dorma Raimondi

While dozens of vendors release parallel processors into the marketplace, IBM scientists are slaving away at creating a parallel processor that will not hit the market for years, if at all. What will determine its fate is whether or not Big Blue can solve the very real problems inherent in parallelization.

Begun in 1981, the Research Parallel Processing Project, known as RP3, is not connected to any product program at IBM, a project scientist says. "We won't make many, so we didn't make it cheap or small or use any novel technology in it," adds the scientist, who asked to remain anonymous, during a recent briefing on IBM's Yorktown Heights, N.Y., research projects.

"It has all standard component technology, even some obsolete technology," he says. The system is big and clumsy, but if IBM decides to redesign, it could reportedly easily reduce the machine to a fraction of its present size.

The reason IBM is so casual in presenting the RP3 project is the firm's unique position in the industry, says Francis R. Gens, vice-president of IBM services at market research firm International Data Corp. (IDC) of Framingham, Mass. "The parallel architecture has the poten-

See IBM page 79

Notes: DEC memory deal

From page 35

scheduled last month. The first V 310s, which carried a third-quarter delivery date when announced in March, were shipped to **John Hancock Savings and Loan, Inc.** in Washington, D.C., and to **Super Valu Stores, Inc.** of Minneapolis.

A Burroughs spokesman said the early shipments were made possible by the rapid qualification of the system.

■

Digital Equipment Corp. recently announced a program to encourage users of its VAX 8600 and VAX 8650 superminicomputers to increase their memory configurations.

The program includes price reductions on 16M-byte memory arrays, a trade-up program for 4M-byte memory arrays and free on-site service for add-on memory.

■

In another announcement, **Digital Equipment Corp.** and **The Foxboro Co.** of Foxboro, Mass., have signed an OEM agreement.

Foxboro will market industrial process and manufacturing control systems using DEC's VAX 8200, Microvax II and Micro/PDP-11 computers.

DEC also signed an agreement with **Aptec Computer Systems, Inc.** of Portland, Ore. Aptec manufactures an I/O computer that manages data flow between high-speed peripherals on DEC's VAX computers under the VMS operating system.

The pact calls for the two companies to share nonproprietary sales, marketing, technical and user information and to coordinate joint sales activities and product training seminars.

■

On the downside for **Digital Equipment Corp.**, its ranking in **Computer Intelligence Corp.**'s (CI) top 10 list of general-purpose computer systems slipped from No. 2 to No. 6 in less than a year.

DEC's sole system in the top 10, ranked on the basis of total purchase price for all installed systems, is the VAX-11/780, which has an installed base of 16,765.

CI's May figures showed **IBM** dominating the top 10 with its 3081, 3084, 4381, 3083 and 3090 systems, ranking from one to five and priced at $1 million or more by CI estimates.

Following were the VAX 11-780, the IBM System/36, with 39,947 installations, IBM's System/38 and 4341 and the Hewlett-Packard Co. HP 3000.

CI officials noted that the 3081's top position is jeopardized by the 3090's climb from its unranked and undelivered position a year ago to the No. 5 spot.

■

National Semiconductor Corp. recently said it is now producing samples of a 15-MHz version of its NS32332. The 15-MHz parts are being targeted initially at the real-time market.

Burroughs fills power gap

From page 35

Industry observers had previously rated the A 3 at about 0.7 MIPS, which would give the A 5 a rating of about 1.6 MIPS and make it comparable with the IBM 4381 Model 11.

The A 5 features a memory range of 6M bytes to 24M bytes and supports up to 10G bytes of disk storage. The base memory can be expanded in 3M-byte increments, using 256M-bit chips, at a cost of $6,000 per 1M byte.

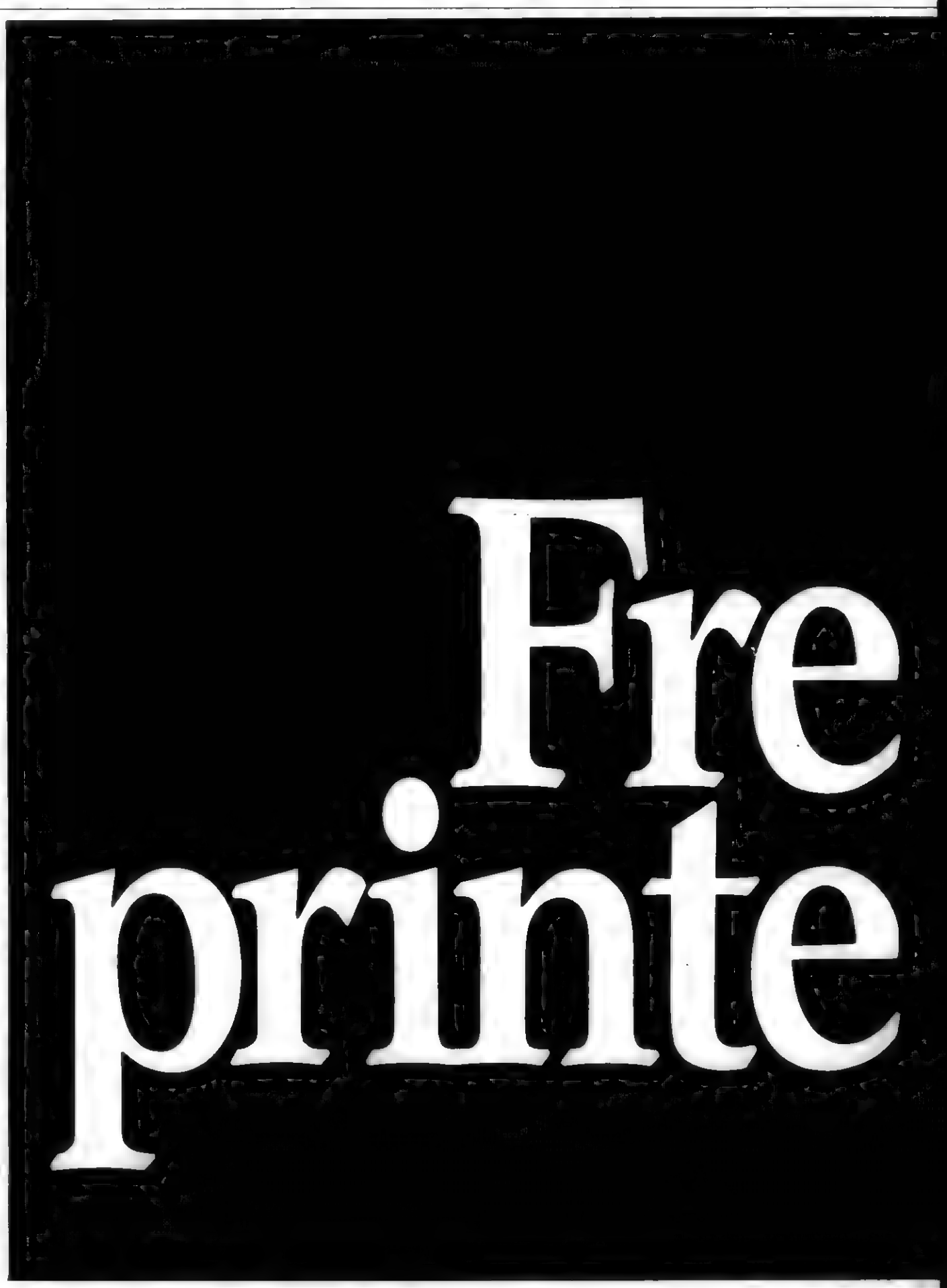
The system runs Burroughs' MCP/AS operating system, which was introduced as an option for the A 3 in October.

An A 5 will run software based on the most recent versions of Burroughs' earlier MCP operating system without recompilation, according to Petti. The A 5 costs $224,000 and will be available in September.

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Looking for a revolution

From page 35

new IBM is now on the street."

So the question to be addressed is whether the new IBM products are actual gains or just the same old same-old. The question cannot be answered until the new machines are delivered and move into production at user sites, with the first sites likely to be those in which customers are most desperate for more power.

One should remember that judgment day is still between a month and several months away for most of the products. It may sound as if some IBM critics can never be appeased; it is more likely that those critics are making the mistake of looking for a revolution in a world that grows through evolution.

There seems little doubt that the System/36 has inadequacies, particularly in terms of raw power. Any quick survey of randomly selected users — whether they are office automation or general business users — illustrates that. The June 16 announcements are unlikely to overcome all of those complaints. All the user can hope for is some solid progress.

However, it should be remembered that in an evolutionary process, breakthroughs are few, and that much of the history of the computer industry — not just the IBM mid-range line's history — has been an evolution. Only in retrospect do events such as the growth of the personal computer market seem revolutionary. Developments such as that one required the better part of a decade filled with false starts and false promises before solidifying.

When was the last revolutionary development in the mainframe market? It may have been the introduction of the IBM 360 more than 20 years ago. It certainly was not the IBM 3090 or IBM's MVS/XA, both of which are fighting for market share.

Even the Microvax, with which the System/36 is so often compared, may not qualify as revolutionary. That DEC system is three years old and is still subject to user complaints and promises of new and improved versions.

What managers have to keep in mind is that for all of the speculation and vendor promises about revolutionary systems, those so-called revolutions actually evolve over the course of years, and that most products in all areas of the computer industry will continue on their comparatively slow and sometimes troubled courses.

The best the manager can hope for is to gain a little bit here and a little there and to make the most of what he can get today.

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SYSTEMS & PERIPHERALS

IBM tests the waters

From page 35

tial of negative impact on IBM's established hold on the industry," he says.

When IBM talks about systems in development, it is a sure sign that the project is not close to maturity, says Jeffry Canin, supercomputer analyst at the Hambrecht & Quist investment firm in San Francisco. "Parallel processing is still in its very early stages. It will be a major breakthrough in the '90s, not in the '80s," he says.

IBM talks about the project because it does not want to be viewed as being in technological backwaters or as holding back progress in the industry, Gens says. But Big Blue probably will not release a strictly parallel system for at least four or five years, he adds.

Not until other parallel vendors pose a serious competitive threat or until IBM can figure out a way to gain great profit margins with parallelism, will IBM introduce such a system, Gens says.

Canin says the threat would have to come from somebody like Digital Equipment Corp. or the Japanese vendors. "There are viable entries in the parallel field today, but most machines are in pure research environments."

Impressive power

The projected RP3's power is impressive by today's standards. The 512-node system (each node has a reduced instruction set processor with floating-point unit) is expected to have 2G bytes of main memory and a peak performance figure of 1,300 million instructions per second (MIPS).

Sustained performance will be 1,000 MIPS or 800 million floating-point operations per second (Mflops). The I/O rate should be 192M byte/sec. with an interconnection network operating at 13G byte/sec.

As it stands now, the system "is one-eighth of a 512-processor system, not a 64-processor machine," IBM says. The vendor expects to demonstrate the present configuration's functionality in the first half of 1987.

The RP3's operating system is AT&T Unix-based, so "anyone able to use Unix will be right at home," IBM says. Memory will be globally or locally shared, or both, at the discretion of the system's programmers.

RP3 is one of the projects under way at the Thomas J. Watson Research Center in Yorktown Heights, where about 8% of IBM's staggering $3.5 billion research and development budget is spent. IBM participates in several university and government laboratory parallelization software and hardware studies — most importantly with New York University's Courant Institute of Mathematical Sciences — in order to get all the help it can in creating this machine, the IBM scientist says. The company foresees a future for the RP3 in applications as diverse as artificial intelligence, design automation, scientific computation, simulation, graphics, image processing, expert systems and data base.

"IBM's most powerful traditional systems, like the 3090, could continue to be developed for the applications that parallel systems can do," Gens says. "They are serial processors, but a lot of those applications lend themselves to parallelism."

But there are major problems that must be worked out first — problems that IBM says any large parallel system's networking scheme will experience as the number of processors grows into the hundreds.

RP3 researchers found "hot spots" — memory locations to which all the data paths in the network were more likely to go for data — that caused data buffers to jam "like a backed-up sewer system," the scientist says. "We found that if you deviate even one-eighth from uniform distribution of data flow, you lose one-half of your bandwidth time."

The scientist maintains that all switching methods have this problem, "regardless of whether you use shared memory or message passing." A single hot spot can wipe out the whole system, he says, or to put it another way, one user can "mess up the system for everybody else."

The combining solution

IBM has discovered that "combining" can deal with the problem, but it slows down the processing considerably. Combining is a process said to look at messages being passed through the switch. If there is a duplicate message, combining sends just one of those messages along. It will then look at returning messages and make as many duplicates of the response as needed. "Doing this makes the net cost of the system from six to 24 times higher — that is a real problem," the IBM scientist says.

There are other problems with parallel architecture that are more severe than memory contention, IDC's Gens says. Application development tools and programmer retraining are serious issues. "It is unlikely that the optimal language to write a parallel application in is Fortran — very unlikely."

"What we will find out with this machine is whether you actually can get parallelism — it might be a huge success," the IBM scientist says. But so far, the research team has a mandate to build only the one-eighth unit. After that, nobody knows whether the 512-node unit will be built. "It is research, not a product," IBM says.

In the meantime, the company has used the RP3 project to learn more about parallelism. It uses proprietary parallel systems internally to design processors, and the RP3 project people have discovered a way to run parallel code on the IBM 370, which IBM says has always been a parallel system although it is not generally used that way.

"We have done 19 real applications, mostly with hundreds of lines of code, and some thousands of lines of code with hundreds of subroutines," the scientist says.

Gens points out that IBM's parallel push is in two directions. "One is a concentrated focused effort on the RP3 parallel processor. The other is parallel extensions to current products. This RP3 is just one of IBM's efforts in parallelism."

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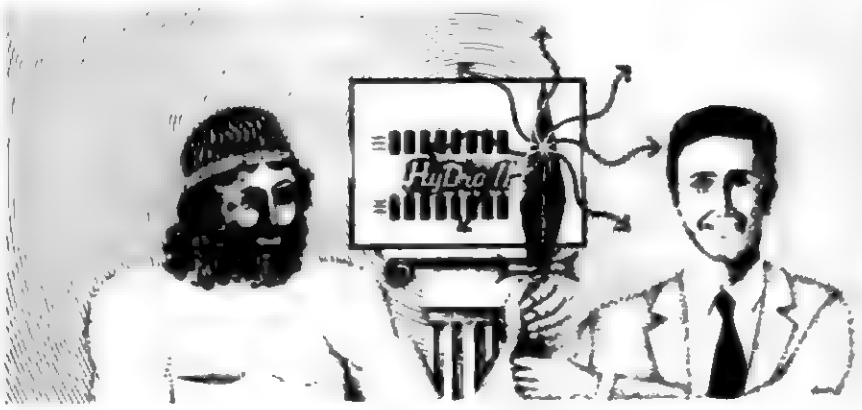
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Executive Report



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Training for MIS

You can turn a technician into a manager

By GLENN RIFKIN

At Manufacturers Hanover Trust Co. in New York, selected systems people may spend up to 13 weeks at Harvard University, Stanford University or other prestigious business schools learning management skills.

At Pepsico, Inc. in Purchase, N.Y., the MIS department sends senior analysts and project managers to extensive management training courses involving 25 to 30 other corporations in which issues such as "managing technical people" are examined in a roundtable setting.

Aetna Life & Casualty Co. in Hartford, Conn., long ago instituted an intensive in-house program for systems people who study a full curriculum of management training courses for up to 10 weeks.

IBM, which spends nearly $1 billion annually on internal training for its employees, offers multifaceted programs for teaching technical people management skills. New and veteran managers are required to take a minimum of 40 hours per year of management training and refresher courses. This type of training is, says an IBM spokesman, fundamental to IBM's philosophy.

No, these Fortune 500 companies are not attempting to change the unchangeable. It is, contrary to popular belief, possible to train technical people to be managers.

As end-user computing pervades the offices of corporate America and as information systems become a pipeline to strategic advantage, the need for more and better MIS managers is clear.

What is not clear, however, is how to find or perhaps create this new breed of manager. Courses, seminars, training programs and best-selling books aside, it is no easy task to change the spots on the technical leopard, as MIS executives and consultants attest.

As MIS becomes a pipeline to strategic advantage, the need for more and better MIS managers is clear. What is not clear is how to find or perhaps create this new breed of manager.

DP/MIS people continue, whether fairly or unfairly, to earn the reputation for being too oriented to technology to manage people; the very qualities that make them good at their jobs supposedly make them bad managers. The assumption is that these highly intelligent, highly analytical, lone-wolf types speak in acronyms, cannot communicate their ideas to corporate users and are more difficult to train as managers than others in the corporate environment.

"Managing is leveraging the knowledge you have and others have, and it takes technical

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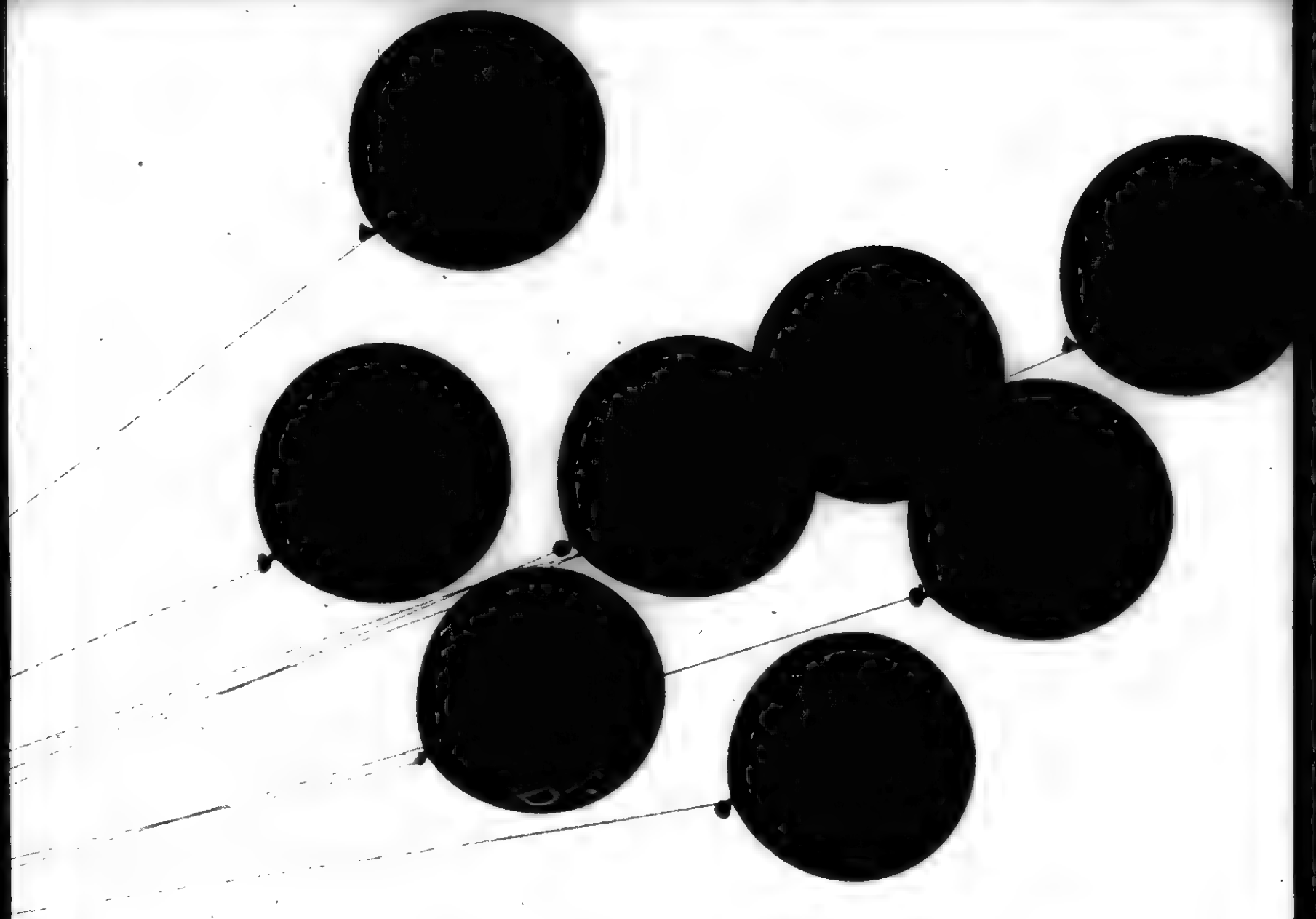
Rifkin is a Computerworld *senior editor.*

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NETWORKING

Good technicians may become bad managers without special attention

Continued from page 43

people a while to learn how to do that," according to Mel Bergstein, managing director of technical practices for Arthur Andersen & Co. in Chicago.

"Systems people are criticized for being too careful, but for 20 years they were taught to be careful," adds Walter Popper, a principle at Index Systems, Inc., a Cambridge, Mass., consulting firm. "They had one set of expectations — which were once appropriate, but they may not be appropriate today."

Managing itself is simply antithetical to what may be the inbred qualities of a top-notch technician. According to Bonnie Johnson, director of corporate technical planning at Aetna, systems people have traditionally been rewarded for making the equipment work, often a task of analysis and thought done best alone. "Management is getting a commitment to ideas, making requests heard as requirements. Systems people don't often think in terms of 'Who needs to be involved in this decision, and how can I couch this message to persuade them that it is necessary?' "

Thomas Quick, executive director of Resource Strategies Institute, a New York consulting firm, says this discussion is not new at all. Before computer people were targeted as tough management projects, there were engineers, scientists and financial people. "All of those types are oriented to formulas and analysis; people constantly get in the way," Quick says. "Most people don't make good managers at first. It's unfair to say technical types are worse at it than others."

Nonetheless, some, like Citicorp Investment Bank Assistant Vice-President Richard Lefkon, believe that when training technical people in management skills, the mountain must be brought to Mohammed. "Rules are of vital importance in educating the technical specialist to work broadly with people," Lefkon states. "As much as we say, 'Do as I do' or 'Pay attention to this,' a firm, observable rule or caution has a special appeal and clarity to a systems person. It's easier to concentrate on particular procedures or proverbs than to try and get people-oriented."

With that in mind, Lefkon offers approaches in managing staff, end users and people in other departments (see chart this page). Although he acknowledges that there is more to managing people than a list of rules, Lefkon points to the practicality of his ideas as a framework for building a manager.

"A broad concept may not seem vague to me, but it may be pure cotton to a technician I am trying to develop into a manager," he says. Lefkon drew on his years as a college professor and administrator in creating his suggestions.

Besides Lefkon's specific rules, a new systems manager should keep in mind a list compiled by Frank Stanley of the Computer Task Group, an Independence, Ohio, consulting firm. Stanley, in a report on DP personnel for Auerbach Publishers, Inc., points out that a few key practices make the difference between a successful and unsuccessful manager in an MIS setting:

- **Being a good leader.** A strong, confident leader provides employees with a feeling of security and an example that they can follow; a manager who expresses doubt and demonstrates a weak will can only generate uncertainty.
- **Acknowledging noteworthy performance.** Recognition of effort makes employees feel that their work is important and worthwhile. An employee will never mistake lack of criticism for recognition. Credit or recognition can be a simple pat on the back or a promotion, letter of recognition, salary increase or public acknowledgment.
- **Delegating authority and maintaining control.** Nothing fosters employee self-confidence better than properly delegated responsibility. Authority must be delegated carefully, so employees know what management's expectations are.
- **Getting to know employees.** People respond positively to those who take a sincere, personal interest in them. By taking time to get to know an employee, a manager can motivate while building close relationships and loyalty.
- **Letting people grow.** Although managers must always provide guidance, they should encourage employees who know the objectives and who can figure out methods for attaining them to do so.
- **Practicing participative management.** Employees quickly develop a personal interest in their jobs and in the organization when asked to participate in traditionally managerial functions such as setting standards or solving problems.
- **Providing challenging work.** Employees should be constantly challenged; they should be hired so that they can grow into their positions and eventually into positions with more responsibility.
- **Communicating.** Managers should invest in training for themselves in topics such as effective listening and verbal and nonverbal communication. Effective communication can increase a manager's perception and greatly enhance his ability to successfully implement motivational practices.

> ***'Most people don't make good managers at first. It's unfair to say technical types are worse at it.'***
>
> — Thomas Quick
> Resource Strategies Institute

Where to begin: Start at the top

Not surprisingly, the companies most successful at training MIS people to be managers are those in which senior management provides the most support to that end. Training across all departmental borders has long been a corporate fair-weather friend: there when times are good, gone when times are tough.

In the cacophony of competition, training is often the first to be overlooked. "Most companies don't do a good job at making anyone a manager," Quick says. "It's a lot of lip service. When I hear senior management say, 'People are our best assets,' I just want to run and hide. It never filters down from the top. The company might send someone off to school, and he comes back with lots of new ideas. The first thing he hears is, 'We don't do it that way here.' "

Greg Sherwood, director of training management for Advanced Systems, Inc., an Arlington Heights, Ill., training business, concurs. Companies do not have time to train, but the managers cannot become more productive unless they do, he says. "Training is the thing that never gets rescheduled after it's canceled," he adds. "If it is not tied in some way to the learner's career development or job performance, training doesn't happen. The cost of that absence of training is difficult to quantify, but it is a tremendous cost."

Companies such as IBM or Arthur Andersen, which take training very seriously, feel strongly that the investment pays off. According to Bergstein, "We spend $5,300 per person annually on training. A technical person joining Arthur Andersen receives more than 1,100 hours of training in the first five years. They receive technical and design training but also learn to administer projects, create work programs, interview and motivate others. It's a very task-oriented environment."

Bergstein says that it takes four or five years before someone is ready to step into a supervisory role, but to be an effective manager can take even longer. "There are a lot of things that go into managing, and it can take 10 or 15 years before someone really knows how to do it."

The technical staff faces other training burdens as well. Simply keeping abreast of changing technical advancements is a full-time worry. The "soft" issues surrounding management training often take second place. According to Sherwood, the successful company must clearly define the technical manager's role within that organization. The root of the problem in many places, he points out, is that candidates for supervisory positions are never offered a clear profile of what the company wants its managers to do. "People can learn leadership, but what does it mean within your organization?" Sherwood asks. "It must be defined."

Ken Hamilton, vice-president of MIS for Manufacturers Hanover Trust Co., agrees. "The biggest problem is teaching new managers how things are done in our culture, how to work within the firm's environment. It's one thing to teach someone how

Continued on page 48

A TRAINER'S TIPS ON HOW TO MANAGE

Richard Lefkon, assistant vice-president of Citicorp Investment Bank, says that a few clear tips and proverbs can be invaluable tools for training technical people to be managers.

Managing Your Department

1. Don't wait for perfection; if it works, hand it in.
2. Test the program as you go; don't wait until you finish.
3. With two people on a keyboard, one is learning; admit it.
4. Don't get stuck in interesting puzzles; ask your neighbor.
5. You can argue with your boss if the door is closed.
6. Always ask a favor; admit it and make someone feel good.
7. Your people's success is yours; detail praise by name.
8. Break down programming to less-than-a-week milestones.
9. Avoid surprises; prepare your boss so there won't be any.
10. If your pet project is axed, smile and ask what's next.
11. Negotiate and fix assignments at your weekly meeting.
12. In the end, one opinion counts most: Your boss's.

Managing Users

1. Hand the new report to the user in person.
2. Don't circumvent your service request process.
3. Schedule "changes to changes" separately as Phase II.
4. Get acceptance conditions in writing before starting work.
5. Never deny a program flaw; schedule the fix.
6. Publish the details of user service requests weekly.
7. Convey what the user needs to know; don't overelaborate.
8. Stick up for your team and boss; hurting them hurts you.
9. Make sure all hardware is working before it is needed.
10. When you have no recourse, grin your broadest and say yes.
11. Avoid butting into contests among users.
12. If the user is satisfied, you be too.

Working with Other Departments

1. Don't do somebody a favor unless it is valued as a favor.
2. Avoid memo wars if possible; covering yourself doesn't.
3. If called at 2 a.m., ask, "Did you look in the Run Book?"
4. Let programmers help out for half an hour without authorization; then you take the flak.
5. Preplan all important meetings and calls; role-play some.
6. Instead of no, say, "Let me check with my management."
7. "Closure" is golden; you can't finish a task without it.
8. To find a cause, get all the finger pointers in one room.
9. Consider your team your family and act accordingly.
10. If someone is never reasonable, his boss wants it so.
11. If a big shot picks a fight, be nice but alert your boss.
12. Make sure official minutes appear after negotiations.

FROM THE DESK OF MARIO M. MORINO

To: Advertising

Re: New Datapro TSO/MON report (attached)

Order several thousand reprints and offer them in an ad. Make sure to point out that our installed user base is now over 700 and that we've indexed the documentation.

You might want to highlight some of the quotes -- especially the one about TSO/MON having no competition. And the one about our fine reputation! (I've circled them.)

Give me a call if you have any questions.

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Morino Associates, Inc.

TSO/MON

problem determination. However, these are general ...ons not designed for TSO only; they simply provide ...O information on demand as part of the overall system.

...without saying that IBM is targeting its operating ...efforts for the large mainframe user base toward ... and its extensions. It is, however, widely acknowl... that the MVS environment is the hardest to control ... as performance is concerned. There are myriad ... that must be taken into consideration when trying ...ptimize the performance of an MVS system, not the ... of which is the TSO monitor's effect on the system. ...er than having lost its appeal because of its age, TSO ... been rejuvenated and is realizing more popularity than ... before. TSO/MON is one of the few monitoring ...ducts that address the entire TSO environment, includ... interfacing applications, interacting systems software, ...d networking implications brought about by the imple... ...mentation of remote TSO networks in most large MVS ...ogies.

...no Associates is, and has been for many years, one of ... leaders in large IBM operating system performance ...agement products. Many of its earlier development ...orts were, and still are, being imitated by other compa... in the performance software industry, but with the ...duction of TSO/MON, Morino struck out on its own. ...oncentrating solely on the MVS marketplace, the vendor ...has acquired a high degree of respect from that user community.

Morino's products usually are comprehensive, and the vendor has a fine reputation for responding to user requests for product improvements. In the latest release of TSO/MON, for example, Morino Associates not only significantly improved the online capabilities of TSO/MON, but also improved system performance and resolved some of the limitations for which the product had been criticized in the past.

As previously stated, there is a noticeable growth in the popularity of TSO in the MVS environment, and this marriage carries with it many problems that adversely affect MVS performance. It is important, especially in the online environment, for large data centers to get to the heart of these problems quickly and resolve any apparent bottlenecks. To that end TSO/MON and the TSO/MON options are dedicated. Every MVS/TSO user owes it to himself or herself to evaluate the degree to which his or her shop can use this monitor to improve operational performance.

...can be selected by the user when the system is implemented. The reports produced by the system are derived from a standard list of reports, but users can incorporate optional reports through a user exit routine. The monitor operates as an integral part of the operating system environment and interfaces with the SRM and SMF facilities of the operating system as they, in turn, interface with the TSO communications facility. For users with the IBM SPF or ISPF program products, an SPF/ISPF Interface option is available; it monitors TSO/SPF/ISPF activities and reports on SPF/ISPF split-screen operations, as well as on command and user activities. A TSO/MON ONLINE option provides realtime control for MVS/TSO users.

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TSO/MON has no direct competition because it is the only performance measurement system dedicated solely to TSO performance measurement. There are several other ... that provide TSO ... as part of ... Computer

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Continued from page 48
to organize their time, how to plan, how to communicate better. But how does that fit into this environment?"

Although most Fortune 500 companies have instituted management training courses, those programs are often offered companywide and do not make any specific provisions for MIS. Boeing Computer Services Co. instituted a series of premanagement courses for management-bound employees. Employees must be recommended by their department heads to be eligible.

In addition, Boeing offers one-week "Managing for Excellence" seminars for senior managers and a series of courses on effective presentation, writing and speaking. Jim Church, Boeing's general manager in charge of the education training division, points out that all the courses are corporatewide despite the fact that "we find that DP needs these skills more than most."

Church says there is no inherent reason for technical people to be more difficult to train. They get in trouble, he explains, when they start to talk in jargon, forgetting the people they are speaking with come from dissimilar backgrounds. Technical people tend not to tolerate well those who do not know technology.

Looking outside for a training solution

As any human resources administrator can attest, there is no lack of courses, programs and seminars on management training or consultants to administer them (see list page 58). Often that cornucopia of offerings presents a problem in itself. Who decides which courses are best suited to the particular MIS department, and how can one measure the value of a specific course or seminar?

Index Systems, under Popper's guidance, this month began its Index Institute, a monthly series of seminars focusing on the management and strategic uses of information technology. The institute is sponsored by 12 large corporate clients of Index.

"We found that these companies have a lot of technical people with educational needs that are not being met," Popper says, "especially how to be a more effective manager and create a more effective business function."

The target student, Popper says, is the middle-level manager — the head of the information center, project leader or systems analyst — who lives at the boundary between MIS and the users.

"There is a real need there for good training," he says.

Some companies, such as Sherwood's Advanced Systems, will go in and run the entire training program for the MIS department.

This arrangement can cause friction with corporate personnel, but Sherwood insists that it can be advantageous because MIS tends to trust consultants more than corporate personnel.

While the plethora of day- or week-long courses offered by consultants or trade groups such as the American Management Association provide valuable insight and training opportunities, it is clear that such training is simply not enough.

"I get companies asking me to change these people in one to three days after a lifetime of conditioning," Quick says.

Universities are slowly realizing that MIS is a worthy discipline and several have instituted wide-ranging curricula tied in with either computer science or business degree programs.

At Boston University, the master of science in MIS degree program focuses extensively on management training with a concentration on data management. "Our contention is that technical knowledge alone just isn't going to solve business problems," says Michael Lawson, director of the university's MIS degree program.

To that end, this program requires that students, in addition to technical MIS training, learn applications orientation and develop management skills. Students must participate in semester-long internships within corporate MIS departments and produce finished MIS-related projects to receive their degree.

Within the management training portion, Lawson points out that stress is placed on MIS as a strategic function. "We want them to understand that MIS can no longer just be reactionary," Lawson says. "It must have a mission for itself and links to the rest of the organization. If they don't create a long-range organizational plan, they tend to get jerked around a little."

Lawson also emphasizes the importance of the technical skills as partners with management abilities. "Organizations will not be able to put vanilla-flavored managers in MIS roles. They must have the technical skills, because technical issues can kill you," he insists.

With that combination, Lawson is confident that the next wave of senior management in certain industries will come directly from MIS.

Selecting the right management candidates

The crucial first step in training technical people to be managers comes in choosing the right candidates. Disaster stories abound about technicians who, having reached the highest level they can achieve, are pushed into management slots and

Continued on page 51

[redacted]

On September 24 we're covering DEC and you can be part of it.

Announcing the Computerworld Extra on Digital Equipment Corporation.

For several decades, no one has posed a serious threat to IBM's stronghold as the number-one computer manufacturer. But, in the last few years, the company from Maynard, MA, has been quietly consolidating and revamping its product lines, its strategies, its entire organization. And they've set their sights on some very big targets.

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70 Medical/Legal/Accounting/Mgmt
80 Educator/Journalist/Librarian/Student
90 Other _____

3 COMPUTER INVOLVEMENT (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor or consultant
A. Mainframes/Supermins
B. Minicomputers/Small Business Computers
C. Microcomputers/Desktops
D. Communications Systems
E. Office Automation Systems

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Interview

For management training, Avis tries harder

When it comes to training technical people to be managers, few firms try harder than Avis Rent a Car System, Inc. The Garden City, N.Y.-based company, under the direction of David McNicholas, senior vice-president of systems marketing and development, has implemented a series of programs aimed at creating better technical managers and more business-oriented systems people. Computerworld Senior Editor Glenn Rifkin spoke with McNicholas about Avis's approach and philosophy.

What programs do you have in place to train technical people to be managers?

We have a checklist and a set of reviews. We are lucky because we are such a service-oriented company with so many people that we have a very strong training department. Worldwide training ranks very high in the organization. So lots of capability has been developed over the years to teach people how to interview, to appraise, to motivate. And we use a lot of these internal company courses and programs for introductory supervisory skills.

The key thing we do is go to our first-line supervisors and have them take someone who has been a technician and make him a project manager or supervisor for part of the technical staff. The first-line supervisor then spends time with that person and attempts to get them to look at things from the opposite side of the desk. People who are being appraised or interviewed have some clear idea of what the process is, but they don't tend to think about what it looks like from the other side.

Are these programs set up specifically for MIS or are they part of corporatewide management training?

These are Avis management training programs, not specifically set up for DP.

Is there anything in-house set up just for MIS?

We have technical courses but not for supervision, not for moving people from being a contributor to being a supervisor.

Would that be necessary?

No. As a matter of fact, I'd be inclined against it, because our objective is to make people think in terms of their career being within the company, not within the profession. We think that the large turnover issue comes from the fact that MIS people tend to think of themselves as part of the profession — "I need to work on the bigger machine, the new software" — and that whole attitude that says "My growth as an individual is a function of how I grow within the DP profession." We think there's an advantage to having them think, "My growth as an individual is a function of how I grow within the company."

Do the people doing the supervisory training over say that it is more difficult to train the technical people than others in the organization?

I've never heard anything about that. DP people are sometimes considered to be a little different, particularly since they tend to be bright and overly rational. They tend to be overly analytical.

Sometimes loners, sometimes self-motivated, not interested in working in groups?

Sometimes those characteristics are there, but the kind of people you select for supervision have shown some interest in dealing with people, or else why select them?

How do you select them?

We try to select people who are developing the kind of attitudes we are interested in. We are looking for people who are able to deal through other people, because we do recognize that supervision is different from being a good technician. About seven or eight years ago we developed, with the encouragement of personnel, a career path that allows you to make a lot of money without being a supervisor.

The problem we ran into was people who wanted to be the boss, because that was how you got the money, the car and the bonus. If that's what you want, but you really don't like working with people, we don't want to force a situation where the only way you are going to get those nice things is to take a supervisory job. So we built a career path that allows you to advance pretty far up the organization without having people working for you.

So you advocate a dual career path.

You just have to recognize that some people want the reward and are very valuable to the company. And you don't want to put them in a situation where the only way they are going to get ahead is to do something they are not good at and don't like doing.

How do you encourage people to try to develop managers from within?

The annual reviews of those in the management structure have three components: What projects you are working on, what you are going to do to develop your own skills and what you are doing to do to develop the people who work for you. They are relatively equally weighted. So if you are not doing things to develop your staff, you are going to have troubles in your appraisal even if you are doing well with your projects, because developing people is one of our major roles.

Do you have success stories in which you turned a technician into a top-notch supervisor?

Yes, in fact, most of the people who are in supervision came up through the organization. Neither the head of computer operations nor the head of systems had any interest in being in supervision when I came here eight years ago. They were actually negative on the idea.



Avis's McNicholas

Neither the head of computer operations nor the head of systems had any interest in being in supervision when I came here eight years ago.

What turned them around?

You come to a point in time where you tell your people, "Either you take the job or I'm going to have to hire someone to take the job who will tell you what to do. Now which would you rather have?" That starts them thinking about it. They think, "I'd rather decide how things are getting done rather than have somebody come in and tell me how to do it." You start people thinking they have the capability.

How has training people to be managers changed in the last 10 years? Is it more focused on the need to be more part of the business?

Yes, particularly at Avis. I've been here for eight years, and when I came the tendency was to hire from outside. You had people who became the manager or the director and their objective was to build their resume so they could go to another company. It made for a lot of turmoil and turnover.

Now we very seldom hire from without at the higher levels. We train from within. We consciously develop an attitude of being part of Avis, and we try not to have high turnover. We're comfortable with the number of success stories we have in the projects and operations.

How do you teach technical people to be part of the business?

That scares a lot of people. You have an inherent value in being a good technician. You can always go get a job. But they are afraid that when they become identified with a company function, they'll lose something in terms of that technical qualification. One of the things we do is to make sure they understand that whatever they've learned before, they'll get credit for as they go forward. I don't think the fear is warranted.

More specifically, we have a one-week corporate course that teaches station managers about fleet accounting, how you sell, what the daily duties are, what the various departments do and how to use them. We took that course and adapted it slightly to the technical services group. We send them to this course to learn how to rent cars, how the fleet is financed, how we do accounting for the fleet, how we sell the cars and how the sales department operates. Second, we send people to a course on how to rent cars at the counter and how to use the computer system. Avis is one of the most heavily computerized companies you are going to run across, and so one of the basic things to understand is what goes on at the counter. Because while the programmers are thinking in terms of what a computer terminal does, when you actually go out there and rent a car and there is a customer who wants a set of keys and instructions and has a charge card, it's intimidating as hell.

They don't object to that?

It's scary. But they all come back saying, "My god, all the things I learned, I really understand so much more." Most people don't want to do it, but when it's over they think it's been valuable.

We are constantly asking people, especially those who buy equipment and make proposals for major systems, "If you owned the company, would you do this? Does this make sense?" We try to move their thinking to look at it from a businessman's standpoint, not a technical standpoint. "Does this rent cars? Why do we want to do this?"

We'll send people out to the sales offices, on sales leads. And we will send people to presentations to the sales team, we'll send them to customer calls. It works wonders. There's nothing like calling on a customer like United Airlines or American Airlines to really change technicians' attitudes. They start to realize what it's all about in terms of renting cars.

Will all this training be a route to senior management?

That is something we are working toward. There are only three senior vice-presidents in the company, and I am one of them. So they see that there is a chance for them to grow to a very high level within the organization. But in the company I worked for before, the manager of accounts payable was the guy who developed the accounts payable system. And we haven't done as much of that here. We'd like to have a number of people who were project managers working as managers in the company. We haven't been as successful with that as we'd like to be. ■

Competency planning leads managers through tough terrain

By STEWART STOKES

Several years ago, a best-selling book satirized the manager's climb into the corporate hierarchy in rather disturbing terms: "Managers get promoted up to the level of their incompetence." The author described the phenomenon of managers being promoted into jobs one level above the position they are most competent to perform. When this happens, the author suggested, organizations are managed on all levels by incompetents; performance erodes, customers and markets vanish and the business begins to self-destruct.

This thought-provoking theme brought the author fame and fortune; it brought others a forum for the consideration of competency as it applies to managing an enterprise, department or group of individuals. MIS is a business within a business. It is a staff and service function with a mission to produce information that will enable line managers to administer, manage and lead their departments in a more efficient, effective and profitable manner. MIS operates in a fishbowl and sometimes seems like everyone's favorite whipping boy. The MIS manager is like the point man in combat: exposed to enemy fire from the front, friendly fire from the rear and all while trying to negotiate ground that is unfamiliar and — occasionally — threatening.

Forgive the analogy; I don't mean that the MIS manager is an embattled species. I do suggest, however, that the MIS manager has a tough and thankless job to do. He must lead, manage and coordinate at the same time, and he must do it all while trying to solve problems he probably does not fully understand.

The "map" that guides MIS managers through difficult terrain includes an understanding of competency. Competency is defined as what they need to know, understand and be able to do to be successful in their organizational culture and environment — and what attitudes and values are appropriate for managing in their environment.

Competency is not — or should not be — a concept that is overly theoretical, obtuse and arcane. It is — or should be — a concept that is practical, usable and easily understood and applied. When I refer to "competency development," I don't mean training and education in the abstract — that is, gathering bits and pieces of information that someday may be useful. It is the mastery of specific, career-related knowledge, understanding and skill that will enable the MIS manager to do his job better, perform essential tasks more effectively, master the subtle political processes more readily — all while making a continuing contribution to accomplishing business objectives and fulfilling corporate mission and purpose.

Visualize your job and responsibilities as you answer the following questions:

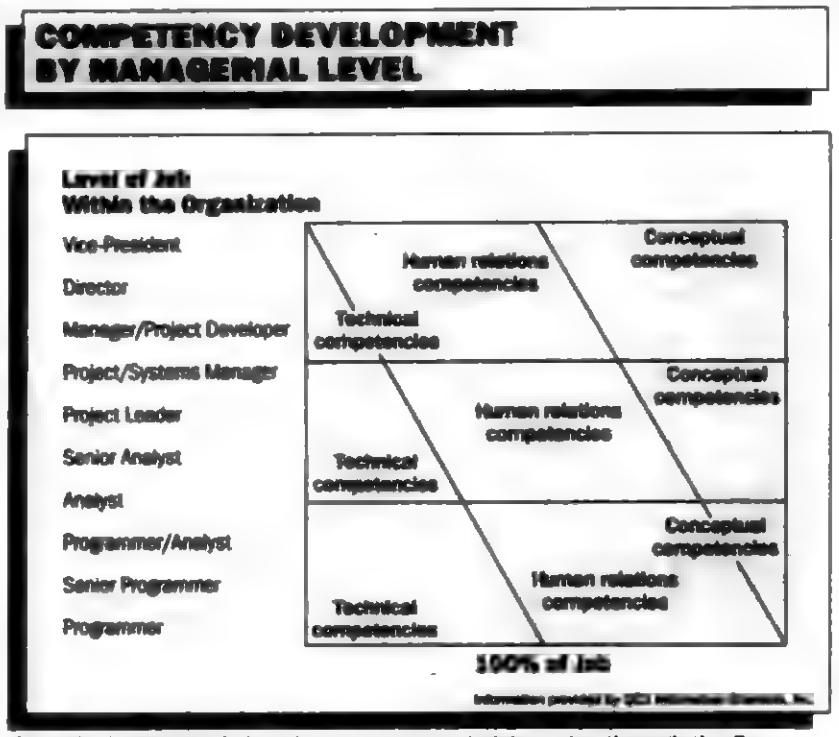
1. How has your organization's DP/MIS activity changed during the past three years?
2. In what ways is your job changing?
3. What is the most important knowledge requirement for success in MIS management in your organization?
4. What is the most important skill (or behavioral requirement) for success in MIS management in your organization?
5. What important trends do you see developing that will affect MIS, your organization and your career?

The diagram (see chart this page) is of particular importance to MIS managers as they place their personal competency requirements in perspective. It is based on Robert L. Katz's classic *Harvard Business Review* article, "Skills of an Effective Administrator" (September-October 1974). The diagram suggests that all jobs on every level within a unit, department and organization consist of three distinct levels of competency or skill: technical, human relations (or interpersonal) and conceptual. The higher that one climbs on the professional or managerial ladder, the less important are the technical skills and the more important become the conceptual competencies. The human relations or interpersonal competencies are important on all levels, but the mix and complexity change.

The technical competencies are those "doing" activities and specialized knowledge and skills that are a large part of every job. The problem they pose for the developing MIS manager is that they are what the manager is most comfortable with and likes to do best. Hence they tend to take up a disproportionate amount of his time. The manager often justifies this expenditure of time and energy by rationalizing, "I can do this better and faster than anyone else on my staff, so I will continue to do it." The problems encountered when trying to do everything soon become overwhelming.

Human relations competency refers to the critical people issues present in every job — and I'm not referring to the tired "getting along with people" cliche. I mean knowledge, understanding and skill in organizing individuals into a team, creating a climate for self-motivation, establishing realistic goals and objectives and acting as internal consultant and change agent.

Conceptual competency refers to the role of MIS as a business within a business. Thinking this way sets the tone for understanding the significance of projects to the various internal clients and why clients behave as they do when surrounded by system issues. Business is dynamic and just does not stand still long enough for MIS to get its desired fix on the problems. The more conceptual knowledge MIS managers have about their clients or customers, the more effective they and their staff will be.



Technical expertise is less important as technicians rise through the firm.

Stokes is vice-president of education programs for QED Information Sciences, Inc. in Wellesley, Mass.

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Critical conceptual competencies include understanding the company's products, markets, strengths and weaknesses, strategic thrust and long-range planning — and the notion of using information as a strategic resource.

This model also becomes the basis for understanding the key managerial competency of delegation. The developing MIS manager cannot continue to do all that he would like to do technically, but organizations are filled with managers who cannot give up doing the familiar technical assignments for which they are responsible. The result? Frustration, demotivated subordinates, burnout.

The solution? First of all, recognize that you cannot do everything, and everything is not worth doing. Focus on your job essentials — those relatively few tasks and processes that will give you 80% of the results you want. What technical aspects of your job should you delegate or disregard? What new interpersonal skills — effective speaking, conflict resolution, influencing, listening, negotiating, internal consulting, managing change and so on — do you need to develop? And what conceptual understanding do you need?

Negotiate with your manager regarding the essential expectations you both have about your responsibilities and accountabilities. What do you and your manager feel are most important and least important?

Plan your own training, education and professional development in a more purposeful manner by focusing your activities on the three

> ***The developing MIS manager cannot continue to do all that he would like to do technically.***

levels of competency and determining what combination of competencies is right for you at this stage in your career. Ask yourself how your job is evolving, how the company is changing and what new needs are affecting the strategic, managerial and operational aspects of the organization as a whole and the MIS function in particular.

Also, remember your distinctive corporate and MIS department cultures and determine the attitudes and values most appropriate for survival within these cultures. Plan with a purpose.

In other words, when it comes to your own professional development, be a proactive MIS manager. ■

Continued from page 42

find themselves unhappy and forced to leave the company. According to Hamilton, "The worst thing you can do is force a valuable technical person into management, because you then lose a great technician and gain a crummy manager."

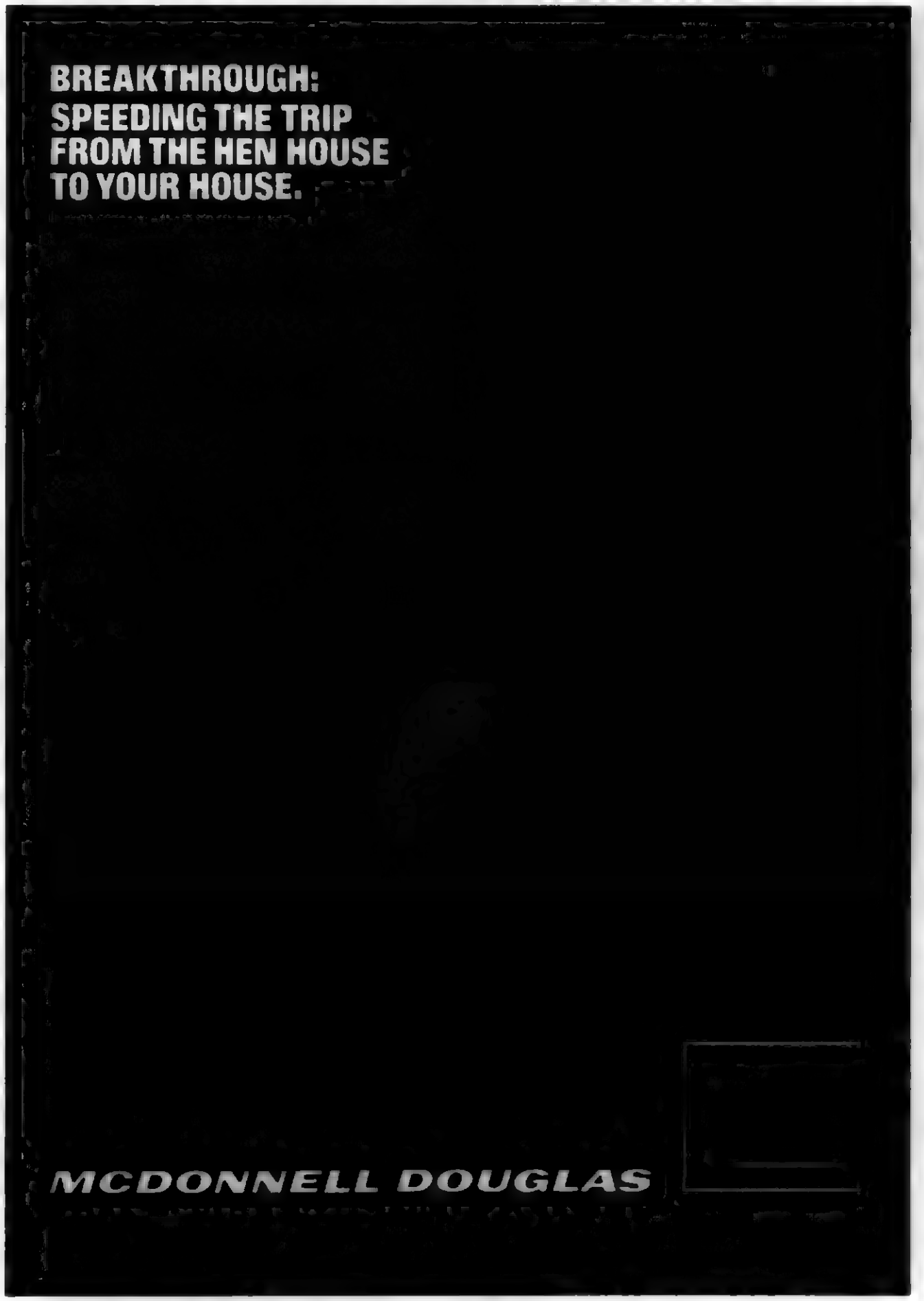
Unfortunately, most corporations have yet to address this sticky issue. Some enlightened organizations have instituted a dual career path, so that technical people can grow into higher salaries along the corporate ladder without managing others. Yet that solution may not be adequate in certain types of businesses.

In the banking industry, for example, Hamilton points out that there remain certain prerequisites, including managing a given number of people, to achieving certain levels.

"Someone who knows the technical area cold is invaluable to the company and should be able to be a vice-president without being a leader of other systems programmers," he says. "There should be a niche for those kind of people. I'd like to see them do away with bank titles and give good fundamental titles here. But titles like 'vice-president' are still coveted."

As information systems become more integrated and integral to the business function of a company, it is becoming easier to identify potential managers. The profile of systems people entering the professional ranks has changed, and resumes with business or liberal arts degrees are sprinkling into technical strongholds. The next generation of MIS management appears to be inclined to view itself as a business rather than as a

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Creating a management development program for MIS

By MADELINE WEISS

"Managers are born, not made." Based upon the paucity of effective management development programs, one could assume that this quotation indeed embodies the operating belief in many MIS organizations today.

In my work with MIS organizations, I frequently hear complaints from MIS professionals concerning their managers' inability to meet their needs as systems professionals. One complaint is that their managers do not provide adequate guidance in planning and controlling projects. A second complaint is that MIS managers do not provide the models of effective management that this crop of future leaders needs. Third, their managers do not provide the feedback on job performance and support needed to develop their skills, perform at the high levels expected of them and maintain reasonable levels of stress.

In a view from the top, MIS executives voice similar complaints about the managers in their departments and include additional ones: The managers do not have the political, marketing and communication skills required to work successfully in today's changing MIS environment; they do not adequately appreciate the significance of understanding the organization's business and therefore do not communicate that significance to their staff; they do not run their work units as businesses; they do not provide an environment that keeps top MIS professionals from leaving; and they do not creatively search for new opportunities to serve their customers.

Experience convinces me that the reason for the lack of effective management development programs is not quite as simple as saying that managers cannot be developed. The reasons are much broader. The ongoing demands of business allow managers little time for days away from their offices for training.

Moreover, technical training frequently takes precedence over management subjects, which are often considered common sense anyway. Past experience attending management training seminars that did not address management issues specific to MIS or that did not relate concepts to practical situations have also caused MIS organizations to curtail management training. Still another cause of inadequate programs is the lack of reward given to managers for developing the managers and professionals who report to them. With little direct incentive, managers have no trouble finding reasons for not sending supervisors who report to them to these seminars.

As the pressures on MIS organizations rise, the need for effective MIS managers increases as well. Despite the reasons for past lack of success, I have been working with MIS organizations to implement effective management development programs. The programs often have several components:

- Formal in-house management training program.
- Informal one-on-one coaching.
- Planning and problem-solving sessions with the manager's work unit.
- Follow-up informal workshops for managers.
- Ongoing program of short seminars on subjects of interest.

Formal training programs. The formal training element is based upon the concept that effective management in an MIS environ-

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Weiss is president of Weiss Associates, Inc., a consulting firm in Bethesda, Md., that specializes in management and organization development for MIS departments.

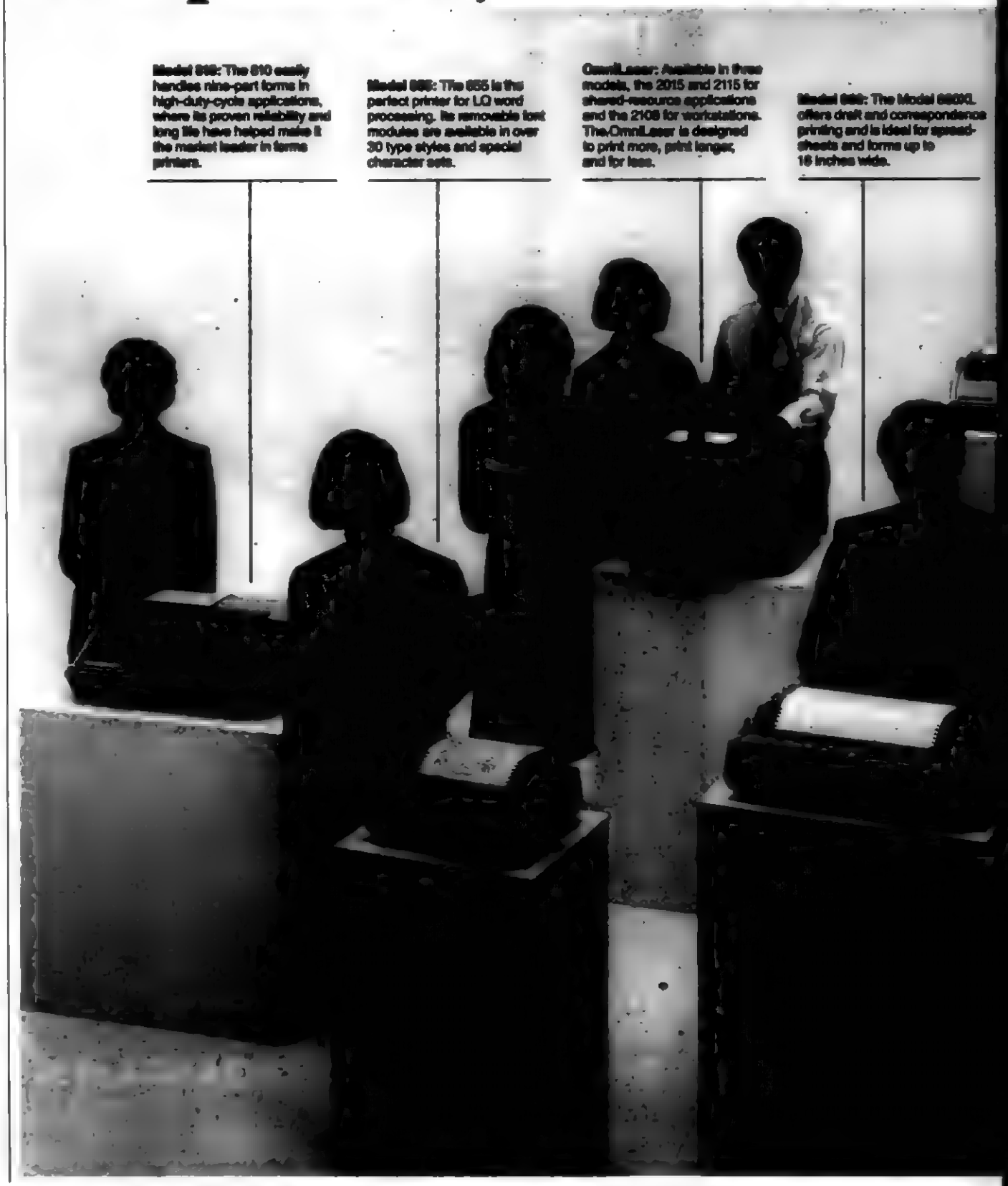
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ment requires understanding of the dynamic interrelationships among the manager, the managers or professionals who report to him and the organization. Understanding these interactions involves exploring the components of each of these three elements separately and the impacts of each on the others.

In setting up a program, the first training modules should focus on the MIS manager as an individual, highlighting the effects of one's values, assumptions and preferences on organizational performance.

The next modules should center on the manager-subordinate relationship, emphasizing behaviors and skills that are critical to effective management.

The final modules should explore the organizational context and its effect on the behaviors of managers and their subordinates.

All of the program's components should rely heavily on experiential learning, because I strongly believe that adults learn most successfully by direct involvement — by trying out new skills as they are presented and discussed. The exercises are designed to relate skills and concepts to specific job-related situations in the managers' organization.

One-on-one coaching. This component serves to augment the formal management training program when managers are having trouble dealing with difficult subordinates. Managers sometimes find it awkward to discuss such situations in the training setting since other participants may know the subordinate in question, yet they find an objective perspective helpful in analyzing the situation and developing strategies to improve it.

Planning and problem-solving session with the manager's work unit. While one of the modules in a typical formal program focuses on planning, I have found that planning is internalized most effectively throughout the process of creating plans in the work unit. Working with the manager and his work unit, sessions are conducted in which the group plans together. Through the process, managers come to appreciate the value of participative planning and problem solving and learn how to use them effectively.

Follow-up informal workshops for managers. While participating in the series of modules, the managers often become quite close, in effect becoming a support group for each other. In follow-up informal workshops, they have the opportunity to continue the learning process together, helping each other as problems and issues arise.

Ongoing program of short seminars on subjects of interest. New subjects of interest to MIS managers are always arising. These subjects can be presented in short seminars to which all managers are invited. One client MIS organization invites leaders in the management field to conduct seminars based on books of particular interest to its managers. I attribute the success of this program to several factors.

> ***Managers have no trouble finding reasons for not sending supervisors who report to them to training seminars.***

First, the executive who heads the organization participates actively in the seminars, thereby demonstrating his commitment to management learning and growth. Second, the seminars are not simply lectures summarizing the contents of the books selected. They take a book's premise and turn it into an action-oriented exercise for the group.

Creating a management development program such as the one described requires active commitment on the part of MIS executives. Managers quickly pick up the signals as to whether or not developing first-rate MIS managers is a high priority to senior management.

In my experience, when that commitment exists and an effective program is implemented, the return on investment is excellent and the impact on the organization is far reaching. ■

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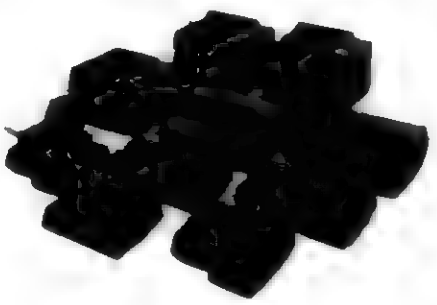
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Continued from page 81

technical function, and interest in management positions will be strong in this group.

For the current generation, the lines are more clearly drawn between technical and nontechnical types, and thus leadership qualities are more difficult to discern. Aetna's Johnson adds that the difficulty is exacerbated by the current changes swirling around MIS. "It requires a different mind-set than in the past. Management skills are much more important when you are in the midst of change," Johnson explains.

At Pepsico, the personnel department instituted a "success profile" for potential managers that identifies a list of 35 management skills — such as giving feedback, planning, motivating others, leadership, delegation, conflict management and oral and written presentation capabilities — that emerge during a candidate's career.

"We like to see a person exhibit those skills before becoming a manager," says Joanne Coviello, director of information systems at Pepsico. "We stress a person's ability to deal with the business function."

Pepsico also invests heavily in succession and career planning with individuals, Coviello points out. A systems person can direct the path of his own career, and his supervisor must ensure that he is given the proper experience to prepare him for the next step.

"The main thing to remember is that there aren't hoards of management positions open. You only need a few," Coviello says.

> ***'The worst thing you can do is force a valuable technical person into management; you then lose a great technician and gain a crummy manager.'***
>
> — Ken Hamilton
> Manufacturers Hanover Trust Co.

The consultants believe that finding even those few is tough. Arthur Andersen's Bergstein suggests that companies that turn out a lot of managers need a structured evaluation process tied to the company's compensation program. "It needs teeth to it," he says. "If the message is consistent, people will get it."

Index's Popper suggests that technical people should "self-select" whether to be a manager or not. A systems person is aware of whether he has the potential to be a good manager. Popper also recommends management skill building through not only courses and seminars but through such techniques as job rotation and apprenticeships. "Maybe the best way to determine if someone is qualified is to put them in a new role for six months," he suggests.

Unfortunately, it is the rare MIS department that can afford to let anybody, let alone its best people, shift jobs or leave for extended course work for any length of time. Even week-long seminars burden the MIS department that is straining to meet user demands.

Also, despite the validity and good intentions of management training and prescreening, many continue to believe that only stripes earned in battle truly create the good manager. On-the-job training, they say, has no substitute. "It's hard to teach managers how to manage in a university setting," Johnson says.

"The challenge is not turning a technical person into a manager, but getting good managers at all," Coviello adds. The question remains, Is managing an inherent skill or can it be taught?

Realistic expectations: Accepting the risks

"Many people," Sherwood says, "don't consider the benefits or the risks of becoming a manager." This, he points out, is a mistake, because there are clearly greater risks in being a manager than in being a technician. "Technical people are not taught to accept risks. They sort of feel that if they make a mistake, they'll be banished to maintenance. Not a lot of people will want to be a manager if they see one of their friends being torn to pieces for a mistake."

In addition, expectations for what managing will be like are often far from reality. As Quick puts it, "The principles of management are easy; the practice is difficult. In reality, if you have 20 people reporting to you, there will be 20 different sets of motivating factors. Technical people have to learn that managing people is a one-on-one, difficult and complex thing to do. That may be why technical types don't manage well. There is so much uncertainty."

In fact, perhaps the most difficult transition a new manager must make is learning to give up the hands-on work and gain satisfaction through the achievements of others. "For a technologist, there is always the temptation to do the work himself," Popper says. "He thinks, 'I can do it myself in six hours.' It's a matter of letting go of your own technical expertise and taking up management technique, being proud of what you've managed rather than what you do yourself."

Continued on page 88

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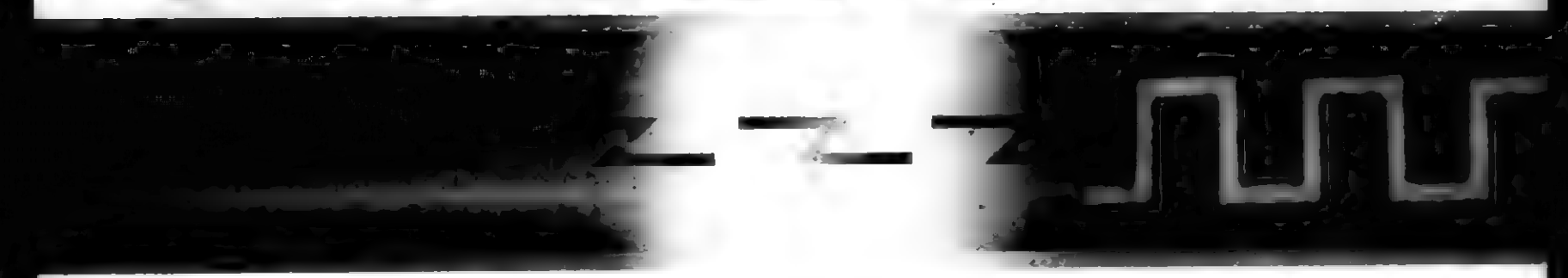
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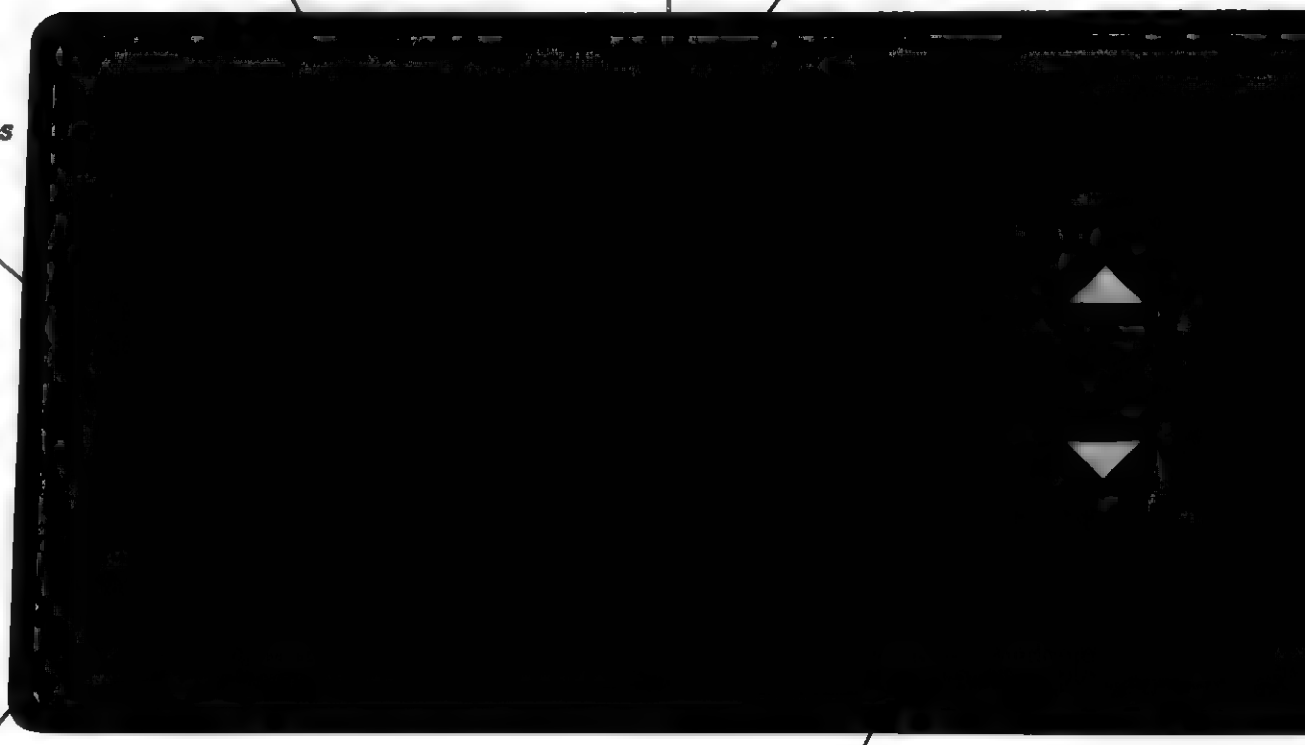
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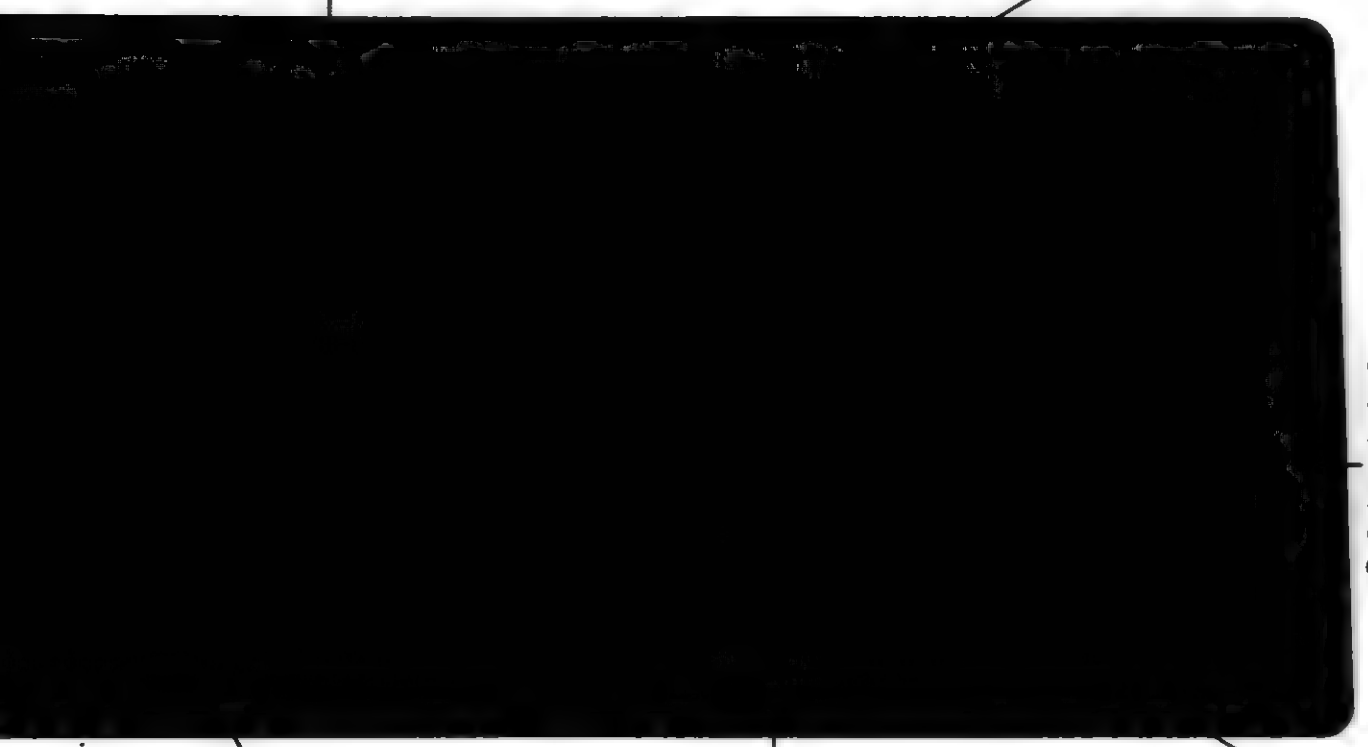
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Continued from page 54

"For a new technical manager, the source of well-being was in the work he used to do," Sherwood adds. "As a supervisor, he may go back and mess with people's work because he needs an anchor."

Keeping his own staff happy is just a fraction of the new manager's job. As Lefkon points out, a manager must also interact with end users and other departments within the company. That role may require the manager to take on the function of being the bad guy, Lefkon says.

"You must establish some rules that allow your team to be perceived as cooperative, but at the same time, you are not getting resources stolen without chargeback," he explains.

"For example, let your people work for another group for half an hour and then have them say, 'My boss won't let me help out more than that without a charge.' This lets your subordinates off the hook."

In fact, consultants like Sherwood say that the increased interaction between MIS and the end user has mandated that training be the result of a coordinated effort between the two groups. To create the right curriculum, Sherwood says, "We're encouraging MIS to use user departments for training. You sit down with the user to work out a course.

"Users want a partner to take an active role in the overall concept of the business plan," he adds. "If a DP supervisor asks a user, 'What does your boss want from you?' or 'How is your business going to change?'

that's very impressive. That is what may draw more people toward management."

As MIS continues to grow in stature within the corporate world, the need for competent technical managers will increase. Despite the attention paid to this need up until now, it is clear that business can and must do a better job in training technical people for interpersonal interaction.

This void creates tremendous opportunity for young technicians. "Young people should realize that there is a great opportunity here," Bergstein says. "And business should realize that if you hire people off-campus, spend a lot of money training them, you can do your best development in-house. You tend to create a culture, and this makes the ability to manage even better." ■

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A training sampler

The following sampling illustrates the range of opportunities available for both general management training and training specific to systems people.

Stanford Executive Program — An eight-week program for top executives with 10 to 15 years of experience; runs from third week in June through mid-August.. Contact: Penny Brommer, assistant director, Stanford Executive Program, Graduate School of Business, Stanford, Calif. 94305.

Harvard Program for Management Development — A 13-week residential program run twice each year for middle- and upper level managers who have been promoted or have taken on new responsibilities. Managers must have 10 to 15 years of experience. Contact: Harvard Business School, PMD Program, Glass Hall, Soldiers Field Road, Boston, Mass. 02163.

Boston University's Master of Science in MIS program — A full-year 12-course program through Boston University's School of Management intended for graduates of management programs. The curriculum includes several courses that focus on managing the information systems function. Contact: Boston University, School of Management, MSMIS Program, 621 Commonwealth Ave., Boston, Mass. 02215.

American Management Association — Offers a wide variety of management training courses, including specific programs for training technical and systems people to be managers. Contact: Ellie McKenney, American Management Association, Extension Institute, 135 W. 50th St., New York, N.Y. 10124.

The Index Institute — Monthly three-day seminars focusing on management training and strategic use of information for information systems professionals. Contact: Index Systems, Inc., Five Cambridge Center, Cambridge, Mass. 02142.

Advanced Systems, Inc. — A technology training resource company that offers three- to five-day on-site seminars for technical people in management training as well as end-user computing, manufacturing and engineering. Contact: Advanced Systems, 155 E. Algonquin Road, Arlington Heights, Ill. 60005.

QED Information Sciences, Inc. — Specializes in computer-related professional development, educational training and publishing. Offers 125 different instructor-led training and instruction seminars on technical and management training. Contact: QED, P.O. Box 181, Wellesley, Mass. 02181.

Weiss Associates, Inc. — A consulting firm that specializes in management and organization development for MIS departments. Contact: Weiss Associates, 5711 West Branch Road, Bethesda, Md. 20816.

In Depth

Technology: Invader or protector of privacy?



CW PHOTO BY O'CONNELL/LADOUCEUR

Everyday DP decisions can unwittingly invite invasions of privacy. • MIS will be publicly held responsible for major violations. • Top employee concern: work monitoring.

About the authors

Sherizen is a Natick, Mass.-based information and computer crime prevention consultant. Marx is an MIT professor specializing in the social impact of communications and surveillance technology. The two recently completed a report on work monitoring for the U.S. Office of Technology Assessment.

By SANFORD SHERIZEN and GARY MARX

Business executives seldom consider privacy a pressing issue. If they pay attention to it at all, they view privacy as a matter of protecting corporate proprietary information. Less often, executives consider the right of employees, customers and clients to be free from the collection of unwarranted personal information.

In truth, we may live with less privacy today than we did in the symbolic year 1984. Technological advances that George Orwell could not have foreseen have opened up new opportunities for highly intrusive, inconspicuous invasion of privacy. What today's commentators have not sufficiently explored is the idea that technology can also be used to protect privacy.

Corporations have generally not taken forceful action to protect either corporate or personal information. Now privacy has once again become a matter of congressional and public interest. How technology is ultimately used will depend largely on how corporate and government leaders make decisions. Action with respect to the privacy issue rests on the awareness and concern of nontechnical upper level executives.

Insidious threat

Privacy is one of those intangible concepts that is easy to support in the abstract but difficult to make workable in concrete terms. The best understood threats to our privacy — misuses of credit or health data and government snooping on individual citizens — are easy to see. The less well understood threats are in some ways more threatening; the public may not know about them, but they slowly chip away at what we assume is inviolate protection of privacy and freedom.

For MIS and DP management, it is important to understand that many normally accepted processes have the potential to allow invasion of personal privacy. Apart from purposeful decisions to invade privacy, everyday data processing decisions can also create privacy problems. Such operating decisions may appropriately be based on strategic or efficiency grounds. Yet without consideration of the privacy implications, the rights of individuals can be negatively affected.

Consider the following examples of how information has become more exposed, requiring active corporate protection of privacy and adequate security for confidential data files:

- Because of increases in employer contributions to worker health plans, programs to control the cost of corporate contributions have led to increased corporate collection and use of employees' highly sensitive medical and mental health information.
- In an attempt to increase productivity, corporations have increased the monitoring of computer and telecommunications usage by employees. At times this results in private communications being reviewed.
- To protect corporate proprietary information, some employees are required to sign a waiver of their right to work for a

competing firm for a specified period after leaving the corporation, and the corporation may carry out surveillance to determine whether these conditions are met.

These examples suggest that finding the right balance between corporate practices and privacy rights is a complex task. In the process of seeking security, strategic advantage or cost containment, corporations may be violating legitimate privacy expectations. The failure to pay adequate attention to privacy questions can mean the violation of individual rights and expectations, employee dissatisfaction, lawsuits and negative mass media coverage.

> ***In the process of seeking security, strategic advantage or cost containment, corporations may be violating legitimate privacy expectations. The failure to pay adequate attention to privacy questions can mean the violation of individual rights and expectations, employee dissatisfaction, lawsuits and negative mass media coverage.***

The Privacy Act of 1974

The Privacy Act of 1974 is the major federal legislation affecting individuals. The legislation, passed during the turbulent era of Watergate and Vietnam, was written to protect citizens against government misuse of private information.

The act sets down very basic requirements for the government to establish mandatory standards concerning the dissemination of private information. It also allows individuals to check accuracy of information about themselves.

The framers of the legislation clearly assumed certain technical and social conditions. This was the era of batch processing — government agencies and large corporations were the major users of computers. The telecommunications industry was regulated and highly structured; its development and functioning were largely separate from computer systems.

The act failed to make adequate provision for the technological changes that have taken place during the last 12 years. One example is the increase in modem capabilities nationwide. The U.S. National Security Agency estimates that all the modems purchased in the U.S. in 1972 could together transmit about 600,000 characters per second. In 1984, a sufficient number of modems was purchased to transmit 220 million characters per second.

The speed of communications has also changed. According to the Office of Technology Assessment (OTA), with the increased communications capacity made possible by fiber-optic technology, it is possible to transmit at a rate of 100 average-length pages per second. This could permit the creation of centralized libraries with universal access.

Confidentiality considerations

Since passage of the privacy act, we have seen more widespread use of personal computers, network developments, merging of computers and telecommunications systems, deregulation and competition in information services, centralization and integration of data bases, increased speed and storage capabilities, greater system complexities and increased societal dependence upon system reliability.

According to a recent OTA report, "Automation of America's Offices," assessing confidentiality in an organization with new decentralized or networked office technologies requires consideration of a number of new factors:

- Low- or no-security physical environments in offices.
- An increased amount of finished and refined information in office automation systems.
- The mobility of microcomputers and their data storage media.
- Less sophisticated office automation users.
- Relatively or totally uncontrolled channels of data communications.
- A wide-ranging ability to add information to, copy or extract information from corporate data bases.
- Little or no hardware or software security protections.
- No assurance of how employees will use technical capabilities.

Consider the extent of interconnectivity in the case of one major corporation. IBM's W. H. Murray, in a speech before the 11th Annual Computer Security Conference, noted:

"In IBM, we now have a worldwide network of more than 1,500 mainframes and 200,000 terminals. Any user at any terminal can send a message or a file to any other user. A user can connect to any application in any of those 1,500 systems.

"Programs and even entire applications spread spontaneously through the network, usually without management direction or intent and often without management understanding or knowledge. Employees can access the network from their homes. Some vendors and contractors use it. . . .

"DP management did not plan it. They bought it and built it, but they

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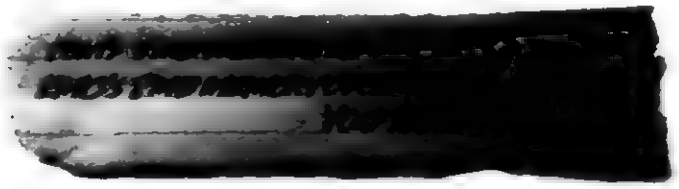
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Taken over by technology

In essence, the privacy act has been overtaken by technology. While the act froze, technology continued to grow. The computer and DP industries rushed to develop new products and to find new market opportunities. The problem of privacy protection fell silently upon the shoulders of MIS and DP managers, who had many other tasks that generally took priority.

Today, the act is no longer adequate for the challenges. Other privacy protections are needed. There has been little to replace or to resuscitate privacy protections. State laws in general are not doing it, worker and consumer groups are not able to do it, and management for the most part does not seem to be interested in doing it.

Many technical solutions to privacy protection suffer from some of the same difficulties that information security does — namely, negative performance impacts, user resistance and avoidance, complex operating environments and lack of product robustness. It is time to rethink privacy protection.

> ***In a world filled with uncertainty, it is easy to assume that more data is always better. From a privacy perspective, that clearly is not the case.***

Implications for DP management

Privacy is not generally considered a priority area of data processing. The lack of discussion or concern on the part of top corporate management is one indication of this. When was the last time corporate executives asked an MIS or DP manager about the adequacy of the organization's privacy protection? Information security is increasingly being put into organizations, but this security is directed mainly toward protecting corporate information rather than, or in addition to, employee privacy.

Information security methods often mention privacy, but insufficient implementation is the rule. In fact, computer security monitoring and DP auditing may increase the collection of information about individuals, crossing some lines of demarcation that traditionally protected privacy.

It is also well to note that the privacy issues involving computer data are nestled within a broader set of concerns involving employers and employees. This involves the corporation's desire for continually more information about employees. Consider, for example, current controversies:

- Drug testing.
- Medical screening that may result in excluding healthy workers who have a higher than average probability of developing serious

Continued on page 84

Do your automated reports report on you?

By ASHLEY GRAYSON

Word processing simplifies the official channel of business communications without affecting the human one. Total office automation intrudes into the unofficial personal communications space. To achieve its deserved impact, it should allow for human nature.

With all of us hoping for speedy acceptance of office automation, the paperless office and electronic mail, I wonder if adequate thought has been given to the psychological pressures of such a workplace.

These little-discussed aspects of electronically enhanced communications have already demonstrated some unusual side effects. In addition to drawing our attention to the ways in which people respond to technology, these odd aspects of automation represent opportunities — if they can be overcome.

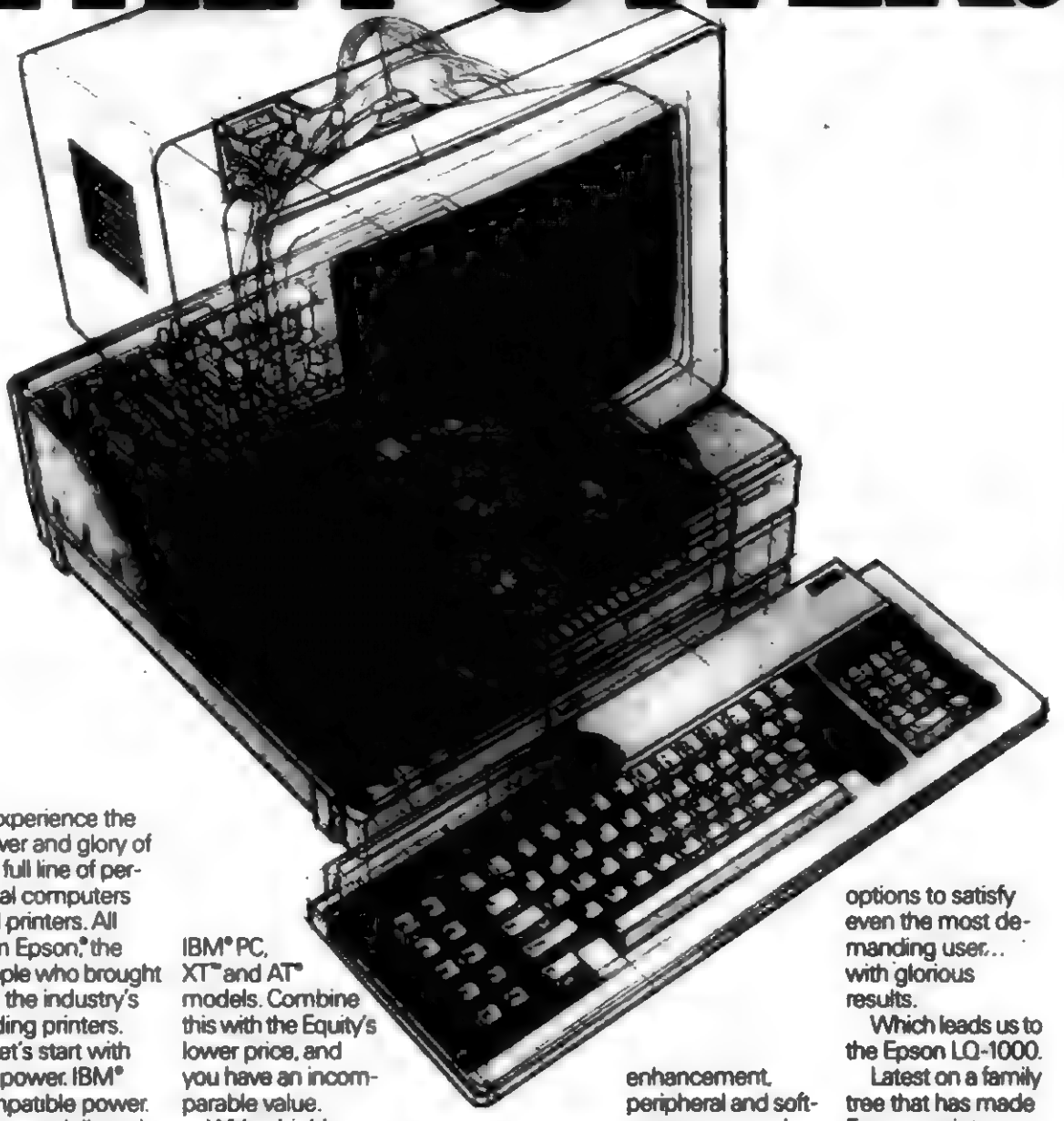
Grayson is the founder of ADG, a high-technology writing services company in San Pedro, Calif. He served for 11 years in marketing for Digital Equipment Corp.

Built-in disaster modes

The advantages of the automated workplace are clear: less concern for the mechanics of getting words on paper, easier rewrites and changes to boilerplate documentation, fewer cases of "telephone tag" and swifter communication in general. With the arrival of optical disk storage, even the task of archiving appears as if it will become trivial: low in cost, ultimately reliable and undemanding of floor space. What can go wrong?

Several things can, and I think they must be resolved before full office automation can really boom. First, consider how much business communication occurs in informal interactions. If your divisional vice-president bumps into you in the cafeteria line and asks, "Whaddaya think of that new OA company?" you may reply in an equally offhand manner, "Remember Viatron," and

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that's that. But if you get an electronic mail memo from the same vice-president asking the same question, you may call in your whole group and produce a 50-page report: lots of hours spent answering a question that was not a serious question.

Thus you can appreciate the first psychological problem of office automation: It couches the idle query in the mold of a call for results. Like the little boy who cried wolf, electronic mail will get prompt responses until people wear out.

Notice that word processing does not have this problem; it simply provides better tools to forge the classic paper document. So an organization with a successful history of word processing may be in for a few surprises when it automates the entire office.

If the sensitive manager foresees this and does not send the electronic query, he is depriving himself of your opinion and you of the opportunity to contribute. A solution might be to flag hierarchical levels of communication with keywords or different colors of background indicating the sender's level of urgency, but this has built-in disaster modes also. No one will voluntarily flag his correspondence as unimportant. Not only would he never get replies, but the sender's management would ask why he is bothering the troops with unimportant messages.

Thus in a hierarchical scheme, everyone's message would always be marked "top priority."

Phony meeting syndrome

This brings up the next problem with office automation systems. The phony meeting syndrome was discovered by one of the first companies to implement a broad-based office automation system. It not only allowed participants to send and receive electronic mail and operated a personal task reminder file for each individual, it scheduled meetings automatically. If you wanted to call a meeting of a particular group, the computer would compare everyone's calendars and schedule the meeting when all were free.

The company discovered that managers were blocking out chunks of their own calendars with phony meetings so as to appear more in demand than their peers. This is just one example of how a system designed to make better use of people gets subverted by its beneficiaries.

I suspect this perversion of the meeting planner occurred because of the users' insensitivity to lying to a machine, and possibly because of a belief that there were no checks built into the system to uncover their duplicity. Conversely, some automated systems stumble because the users fear that the new system will be used to report on them.

Big computer is watching you

A few years ago, when data entry was still the rage, clerks became terrified when they discovered that key entry systems were programmed to record the keystrokes per minute and the error rate of each typist.

How wonderful, I thought at the time, to track this information accurately. The typists with above-average entry speed and low error rates could be rewarded with higher hourly pay to reflect their efficiency. Poor performers could be moved to jobs that required different skills, or if necessary, be let go for the good of the company.

> ***When data entry was all the rage, systems were programmed to record keystrokes and error rates. How wonderful, I thought. But people do not want to be judged so fairly.***

The point I was missing was that people do not want to be judged so constantly or so fairly. Ask any soldier whether he would rather be inspected by a career sergeant or by a fresh lieutenant who has memorized the book and who sticks by the rules.

The computer, alas, sticks by the rules. While telephone conversations are recorded only by direct human action, the automated office records everything. A communications system should help people look their best and not be used to spy on them.

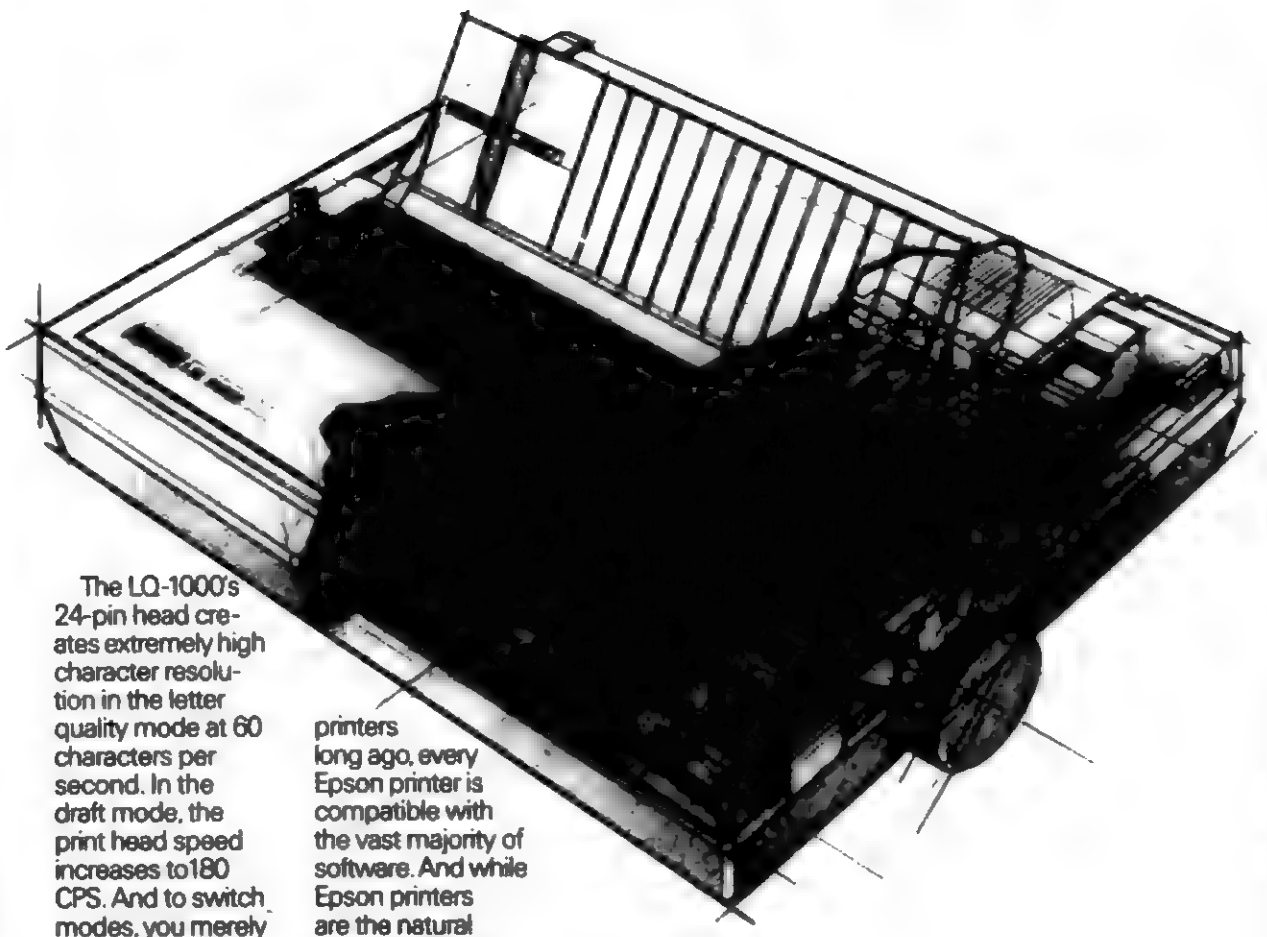
False friends

On the other hand, users cannot depend on the system to make them look good all the time. Look what an office automation system does for you. You can type your own memo and the spell checker will correct your spelling — but neither will counsel you on the content. Only your secretary can read your memo and tell you that "Mr. Biggley's wife is from Minnesota and she never played football."

The system will deliver your message without fail, time-stamp when the recipient read it and return any reply to you immediately. As a sender, you are encouraged to fire off your first — and perhaps not best — response. As a receiver, you lose excuses such as "I never received it," "We misfiled it" and so on. Sometimes you need more time to consider a point than the questioner wants to give you.

None of this should lead you to believe that the old system was the right way to do things, only to recognize that people know how to perform within it. Something as potentially wonderful and supportive of human effort as a totally automated office deserves some attention to the question of how people can get the most from it. ■

THE GLORY.



The LQ-1000's 24-pin head creates extremely high character resolution in the letter quality mode at 60 characters per second. In the draft mode, the print head speed increases to180 CPS. And to switch modes, you merely press a button.

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For more information about the Epson line of personal computers and printers, call (800) 421-5426, or (213) 539-9140 in California.

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EPSON
COMPUTERS
PRINTERS

Continued from page 82

illnesses in the future.

- Access to previous employment and arrest records.
- The acquisition of information from companies maintaining data bases on employees' health and lifestyles.
- Video monitoring in restrooms and lounges to check for drug use.

In some situations, the justifications for these are clear. Yet it is important to be aware that there is an expansionary trend toward collecting and accessing personnel information. In a world filled with uncertainty, it is easy to assume that more data is always better. From a privacy as well as an efficiency perspective, that clearly is not the case.

Difficult to protect, easy to lose

Privacy is difficult to protect and easy to lose. MIS and DP managers play a crucial role in protecting privacy and in creating a reasonable balance of interests. If you are convinced that privacy is important and that something needs to be done, you now face some difficult questions.

Who is in charge of privacy in the organization? MIS or DP may, by default, be in charge of privacy, but that is not always evident to anyone in the organization. In fact, this may not be the best place to locate privacy responsibilities, given a conflict with productivity pressures. The definition of explicit privacy responsibilities are required, and adequate resources for maintaining these responsibilities are necessary.

What should and should not be kept private? There are few clear-cut standards that indicate what should be privacy-protected. Some organizations simply use a form of information classification (company secret, company confidential, personnel private and so on) as a shorthand to indicate levels of protection required, but that usually is not an adequate guide. Different standards for data on individuals may require different standards from those for protecting organizational data.

What are the liabilities involved in failing to protect privacy? Liability concerns gain instant attention today. Even with the weakness of the privacy act, there are legal ways to challenge privacy violations. Along with sexual harrassment and civil rights violations, privacy violation cases generate media interest and can have serious implications for corporate as well as individual reputations.

What are the technical difficulties in ensuring privacy protection? Many of these are data base issues having to do with data and system integrity requirements. Integrity constraints must be explicit in data models so that information rules can be defined and maintained. Access rules need to be established and mechanisms put in place to support their operations.

As system linkages further develop, privacy issues will gain increased attention. One way to think about these issues is to develop an organizational privacy protection scorecard. This will provide management with a review of how well privacy is being understood and how much more is required.

View from the public

MIS and DP managers have been assigned key roles in protecting the privacy of the corporation and its employees. Increasingly, these managers will be held publicly responsible in the event that there are major violations.

> ***If protecting privacy is to become standard operating procedure for data processing, explicit policies and procedures are required. It is not sufficient to simply state in an employee handbook that privacy is important. Privacy must be specific to the unique needs of the corporate culture.***

There is increased public concern about individual privacy. Unions, women's groups and civil liberty advocates are raising concerns about corporate and government uses of data. Work monitoring is becoming a symbol for a variety of problems affecting employees on the assembly line and in the office.

Two types of data protection needs are going to have to be addressed. The first is corporate information. This includes certain rights of corporations to be protected from their competitors.

Protecting proprietary information is a leading example. Competitive business intelligence is a growing field, providing firms with tools and techniques to learn about their rivals. Government law enforcement emphasis on financial manipulations has also created new worries for many businesses.

The second kind of data protection to be addressed is employee and customer/client privacy rights. From a corporate perspective, this may be considered a less pressing issue than corporate information protection. However, a lack of attention to employee and customer/client privacy concerns may result in the loss of competitive edge, public reputation and product acceptability.

Consider whether your company is adequately protecting human resource files, creating information flow constraints, limiting browsing through client files, restricting updating capabilities and isolating critical data. More specifically, several activities should be undertaken to guarantee both of these data protection needs. These activities should be integrated into an overall information resource management program under which privacy becomes an essential aspect of corporate policy.

- **Make security and privacy standard operating procedures for data processing.** Computer and telecommunications security continues to be treated as a voluntary activity in many corporations. Yet laws, professional guidelines, insurance requirements and similar pressures stand to make corporate information security mandatory rather than voluntary. Most organizations soon will have no choice but to secure their data resources.

In the same fashion, privacy is going to become a highly charged public issue again, and corporations as well as government will be examined quite closely. Already, Congress is considering questions about privacy protection, and there are indications that additional privacy legislation will be introduced.

- **Establish a privacy protection policy and a set of standards.** If protecting privacy is to become standard operating procedure for data processing, explicit policies and procedures are required. It is not sufficient to simply state in an employee handbook that privacy is important. Privacy must be specific to the unique needs of the corporate culture. Policies and procedures should be individualized to cover the unique needs of end users, their managers, human resource managers and corporate planners.
- **Review the privacy implications of technology.** A cost-benefit perspective emphasizes the measurement of the most efficient and effective use of technology. However, privacy cannot be measured in the same way and is therefore easy to ignore. Only when a formal mandate to consider privacy is established will privacy be considered in corporate decisions regarding the use of technology.

Corporate policy, for example, can require that a privacy impact statement be written periodically or prior to the installation of major technological changes. These statements would spell out how the privacy of the corporation, its employees and customers could be affected and measures taken to maximize privacy protections.

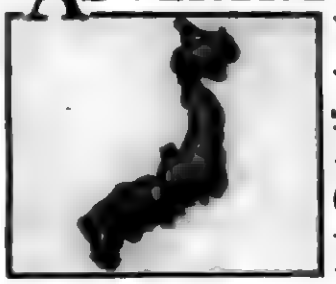
These privacy impact statements would serve as an audit trail of privacy efforts, providing legal as well as ethical reports for the record. A good starting point for this type of required statement might be to ascertain how privacy can be affected by office automation developments.

- **Coordinate MIS/DP management, corporate counsel and data security perspectives and efforts.** MIS and DP managers may be held responsible for privacy, but there are many others who have insights and associated concerns. Ask corporate counsel about the legal aspects of privacy and basic standards for protecting the corporation from unnecessary liabilities. Work with data security experts to determine the best ways of using technology to prevent privacy and security problems. Integrate their efforts with other efforts in order to establish a sophisticated program.

Live up to the spirit of the U.S. Constitution, soon celebrating its bicentennial, by undertaking a self-review of how well your organization is doing in protecting privacy. Become a public advocate for privacy.

Consider your role in helping privacy to continue as a basic underpinning of our society. Let's make privacy less of a private and more of a public issue. ■

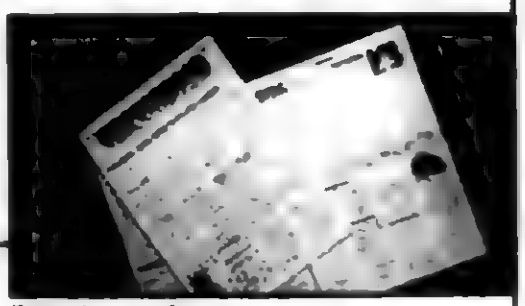
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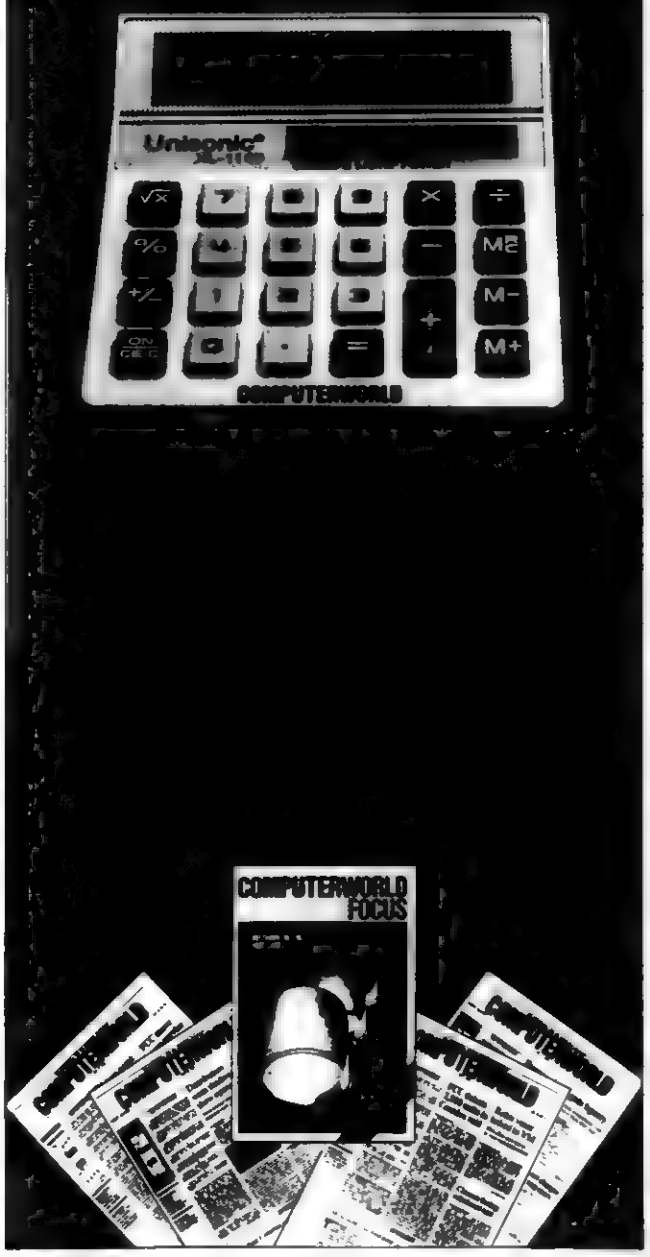
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MANAGEMENT



TAKING CHARGE
Eric K. Clemons

When does DP give the edge?

There has been a recent upsurge in the attention being paid to the strategic potential of information technology. The popular business press has been featuring articles on information power and on electronic distribution systems to keep customers "happy captives."

What does all this mean? Surely much of it is media hype, or self-serving pursuit of a current business fad. Much of it, however, is significant: Information systems can alter a product, can strengthen a firm's position in its marketplace and can radically restructure the entire marketplace by altering relationships with suppliers or customers. What does the director of MIS need to know about this phenomenon? How can your company — and you — benefit?

I begin with a pair of observations and then turn to the conditions necessary for systems to provide a sustainable competitive advantage.

The first observation is from a recent work on competitive strategy by Prof. Michael Porter of the Harvard Business School.

Porter presents three generic strategies. These, he believes, form the basis of any successful, specific business strategy. The strategies are: differentiation, cost leadership and focused niche playing. The differentiation strategy relies on providing superior value. Cost leadership depends upon competing on the basis of price. And niche playing

See WHEN page 70

Clemons is associate professor of Decision Sciences at the University of Pennsylvania's Wharton School.

Norton staff goes to CAMP

Off-site computer training program builds awareness

By Eddy Goldberg

WORCESTER, Mass. — The worldwide headquarters of the 101-year-old, $1.2 billion Norton Co. is a sprawling complex with large, smoky, red-brick buildings filled with the dust and noise of men and machinery manufacturing grinding wheels and abrasives products. The contrast between the heavy industry and the quiet, air-conditioned offices of its Information Systems & Services (IS&S) points up one of the problems faced every day by the Corporate Information Center.



Norton's Smith

"We've had a real problem with workers calling us 'the ivory tower,' " concedes Janice M. Smith, supervisor of the Information Center, over the thumping of a packaging machine a few floors below. But she and her coworkers in IS&S have devised an innovative solution to the problem of training factory floor workers as well as vice-presidents to boost their productivity through computer technology: Send them all to CAMP.

CAMP, which stands for Computing, Awareness, Motivation & Perspectives, is an intensive two-day, off-site training program in computing concepts and skills.

The program started a year and a half ago, when Norton's Administrative Services group set up a computer literacy program for 100 people. After meetings between Administrative Services and IS&S, a training program was hammered out. With an outside consultant to lead the CAMP seminars, 121 people from Administrative Services graduated from the CAMP program in its first year.

It has been so well received, Smith says, that other divisions have requested training, and IS&S has begun offering CAMP programs on its own. There have been three this year, and four more are planned. Each CAMP is different and evolves out of the needs of the specific group attending. Average class size is 20 to 24.

Through the program, workers learn what IS&S has to offer them, according to Smith. "CAMP is a communications and

See NORTON page 70

Cigna farms out policy DP work

By David Bright

LOS ANGELES — In what one analyst terms a revolutionary move, Cigna Corp. of Philadelphia has contracted with a Los Angeles service bureau to provide complete data processing for a new life insurance program.

Under a multiyear contract valued at a minimum of $1.5 million, Cybertek Computer Products, Inc. is to integrate personal computers with mainframes for Cigna's venture into the group universal life insurance market.

The agreement calls for Cybertek to provide data processing intended to speed both the sales and administration of policies. Cigna's agents are to use personal computers to prepare custom policies for clients. The micros will tie in with Cybertek's IBM mainframes where the policies are to be be screened and issued by Cypros/AP, Cybertek's real-time insurance processing system.

While some insurance companies hire outside vendors to do data processing, this is the first time one has delegated total facilities management for a product to a vendor, said investment analyst Mary Barrett of Barrett & Co. of Yardley, Pa.

"The revolutionary thing about this sale to Cigna is that Cybertek is essentially providing the administration and marketing support for this one product," Barrett said. "Never before has a company such as Cybertek taken over the total management of a product for a company."

By contracting out the work instead of

See CIGNA page 67

INSIDE

Calendar: shows, conferences, seminars/67

INSTANT ANALYSIS

"Information services people are fairly cautious. Deep down they'd prefer to stick to their already-full plate, rather than reach for a broader charter."

— George Hairston, president, AI Services Co., New Haven, Conn., on information systems managers' reluctance to develop artificial intelligence

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The recruitment staff of Bozell, Jacobs, Kenyon & Eckhardt has over 65 years experience in recruitment advertising. And they all share Janet's feeling. *"It's unanimous here. Computerworld is recognized as an essential medium for recruiting in the data processing arena. And it will continue to be a primary recommendation in the future."*

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A PUBLICATION OF CW COMMUNICATIONS

Cigna farms out DP work

From page 65

handling it in-house, Cigna stands to realize substantial cost and time savings, analysts said.

Analyzing vendors' hardware and software and bringing the systems in-house could take several months or even years, whereas Cybertek's implementation is expected to take only three months, according to sources close to the company.

By turning to Cybertek, Cigna also lessens its financial commitment while gaining use of current technology, analysts said.

Cigna, which is in a labor-intensive industry facing a shrinking pool of workers, can also cut labor costs by farming out data processing, said David Butterworth, an analyst with Wedbush, Noble, Cooke, Inc. of Los Angeles.

Generating further savings, Cybertek will issue certificates instead of bulky policies, also a departure from the norm, Barrett said.

Cigna officials declined comment until the system is fully operational.

Cybertek has provided services and products to the insurance and finance industries for 17 years. Its integration of personal computers and mainframes for processing the sale and administration of insurance policies is a first, said Forest Majors, Cybertek's senior vice-president of sales and marketing.

Compaq Computer Corp. portable computers will be used in the project, sources said.

CALENDAR

AUGUST 3-9

Contemporary Data Communication Networks: Planning, Management and Computer-Based Design. Ann Arbor, Mich., August 4-8 — Contact: Engineering Summer Conferences, 300 Chrysler Center/N. Campus, Ann Arbor, Mich. 48109.

Topics in Manufacturing Systems Engineering. Fort Collins, Colo., August 4-8 — Contact: National Technological University, P.O. Box 700, 601 S. Howes St., Fort Collins, Colo. 80522.

Data Communications: Fundamentals and Beyond. Anchorage, Alaska, August 6-8 — Contact: The American Institute, Carnegie Building, 55 Main St., Madison, N.J. 07940.

1986 Urban & Regional Information Systems Association (URISA) Conference. Denver, August 9-14 — Contact: URISA, 319 C St. S.E., Washington, D.C. 20003.

AUGUST 10-16

AM/FM International Ninth Annual Conference. Snowmass, Colo., August 11-14 — Contact: AM/FM International, Suite 820, 8775 E. Orchard Road, Englewood, Colo. 80111.

AAAI-86 Fifth National Conference on Artificial Intelligence. Philadelphia, August 11-15 — Contact: The American Association for Artificial Intelligence, 445 Burgess Drive, Menlo Park, Calif. 94025.

Buying and Selling Rights to Software, Hardware and Services. Atlanta, August 14 — Contact: Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015.

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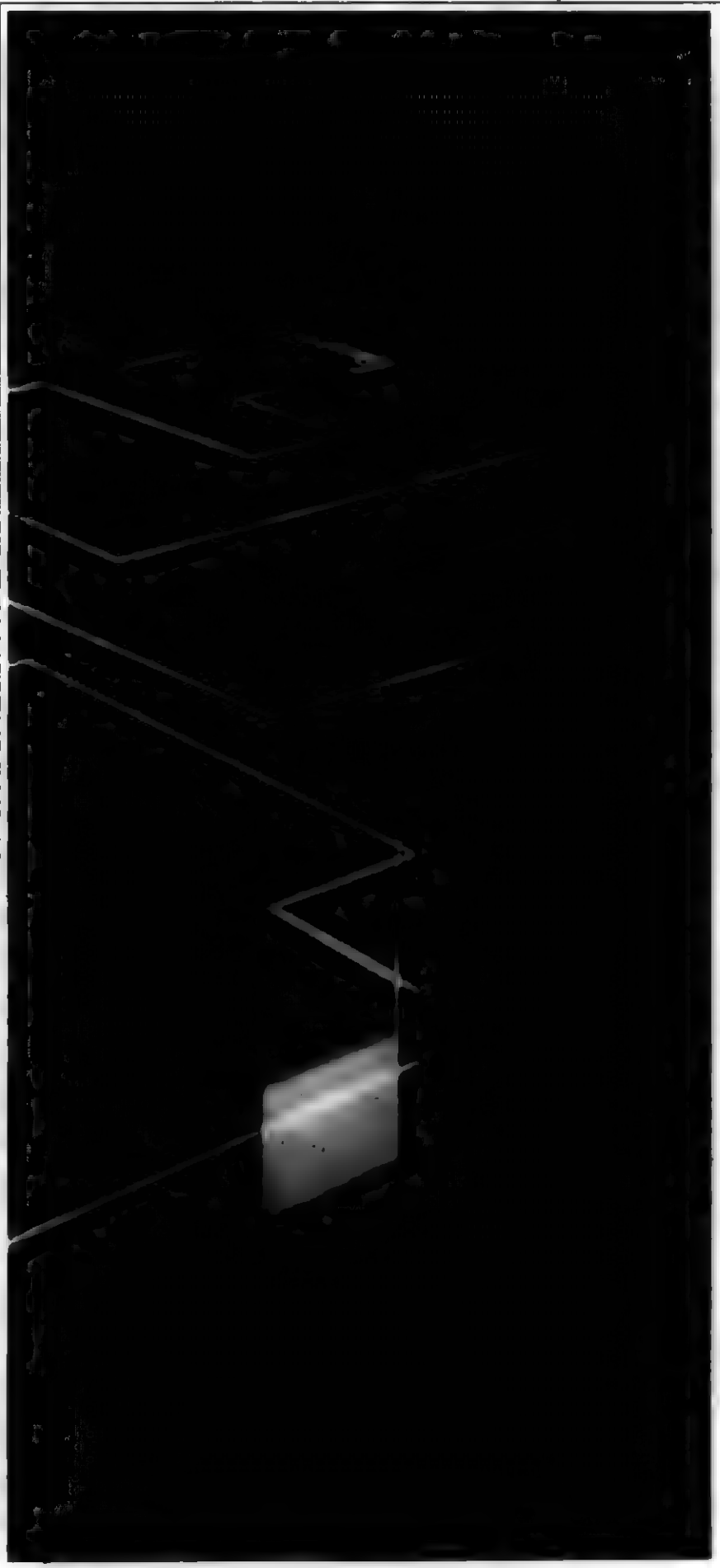
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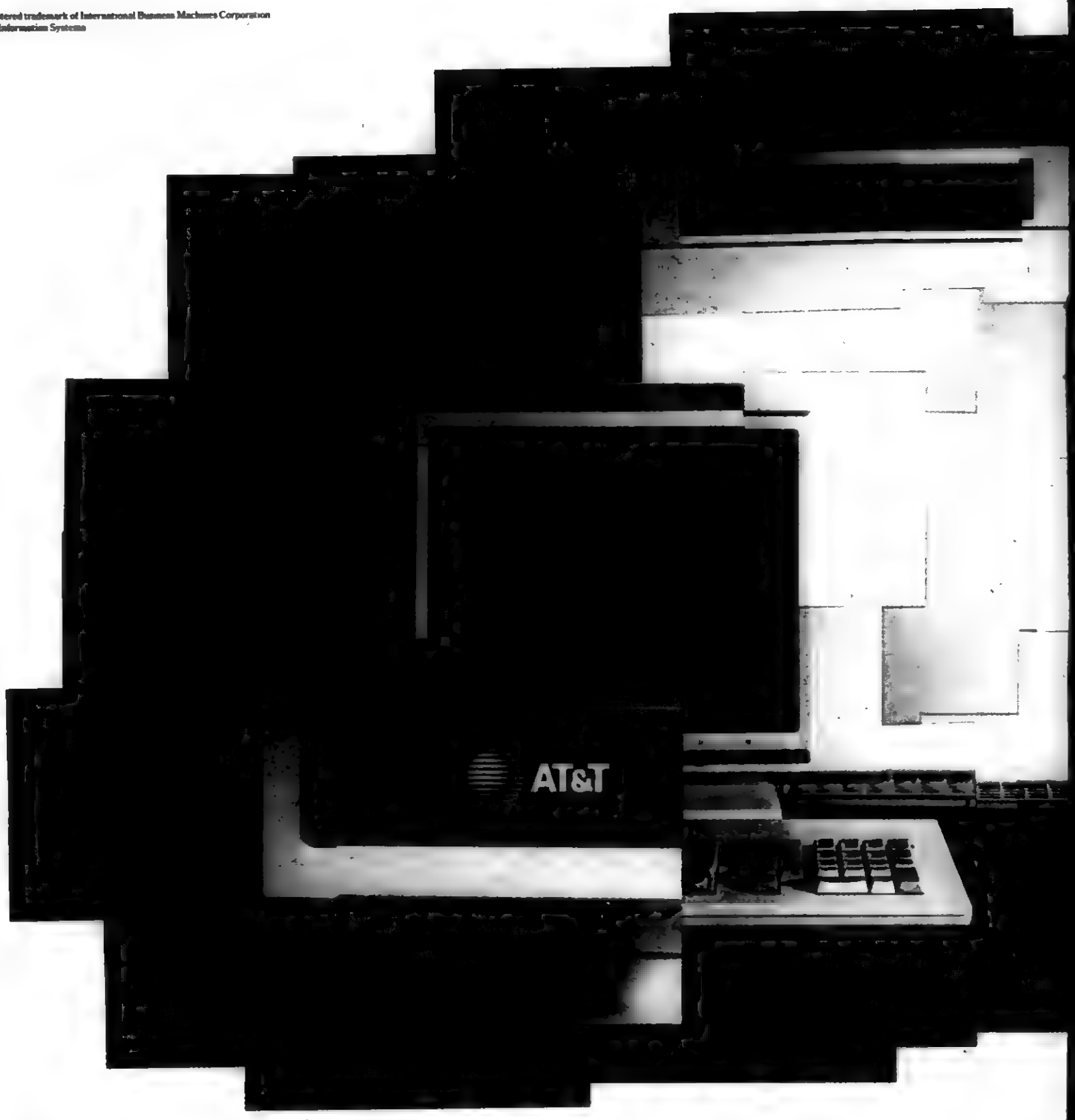
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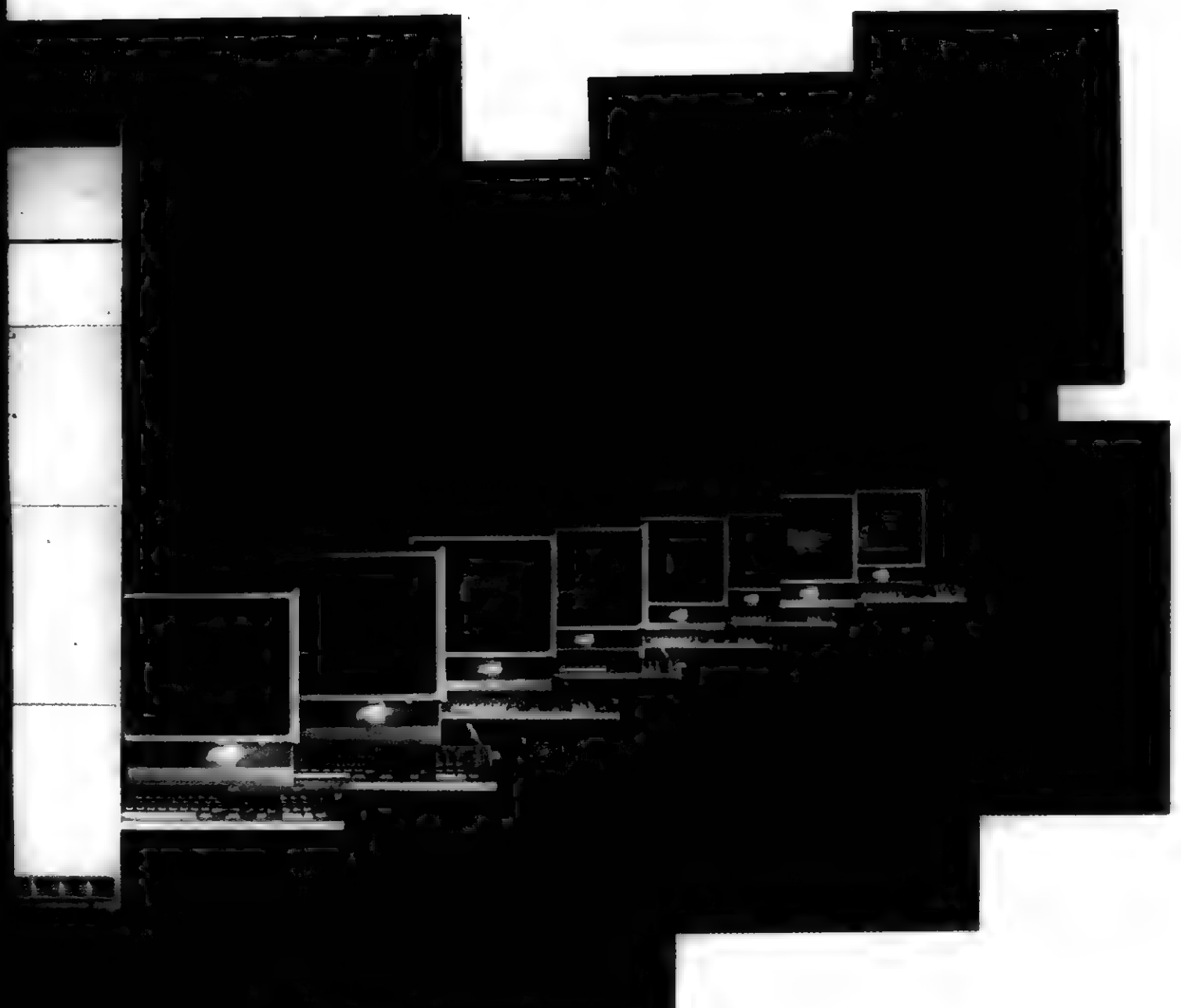
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Norton staff goes to CAMP

From page 65

awareness vehicle that allows us to know many users, and, more important, it allows them to know us — who to call for help, who to go to for consulting and technical assistance and what training classes we provide. While this is an education class for them, it's also a way for them to get to know who we are and to come back to us," she explains.

The first day is usually devoted to personal computers and the second to learning about the tools available on the company's mainframe. Attendees use about 10 PCs hooked to the mainframe over phone lines to allow practice on the mainframe tools.

Group activities such as volleyball, an evening cookout and the option of sleeping over at the mansion where the CAMP program is held contribute to the relaxed atmosphere and team spirit, Smith says. "It's team building," she adds.


Gaudette

Fred Gibb, a project administrator in Administrative Services who attended CAMP in May, says holding CAMP in an informal, off-site location is a good idea. "It takes people out of the work environment, from demands that cause their minds to go back to the job, so they can concentrate on the experience of learning," he says.

While the CAMP program was originally conducted over three days, it has been reduced to two. "What we're really up against is the fact that people want to do more than they did yesterday but want just to be quickly shown how to do it and get on to doing it," says Edward F. Gaudette, manager of end-user computing and office automation in IS&S.

Training factory floor workers who may never have touched a keyboard to use computer technology poses unique challenges. "That's a tough thing for them. They think they're going to lose production when they have to stop to key something in," says Kris Barr, a data analyst for one of Norton's plants. "But you have to get that change in thinking."

The idea of sitting in a classroom can intimidate people who never graduated from high school or who last attended school 20 years ago, Smith says. Carol Williams, a plant training coordinator and facilitator, says that many new trainees are afraid of the unknown, of the threat computers represent. She says people immediately wonder, " 'Is it going to take over my job?' People have that feeling about robots, too," she adds.

Yet workers often push for computer training. Smith says that when a department superviser resisted suggestions that automating a factory floor would boost productivity, the workers who found out about the idea continued to push for it.

"I think a lot of times the technology is embraced by the worker first and then brought up level by level," Smith says. "It's seldom that technology comes in from the top, at least not in our experience. That's why it's so valuable to get people into the classes."

Smith also says she believes that bringing management into the CAMP program is a good idea, if only to show the factory workers that computers can be intimidating to management as well. "If higher management would come into some of these classes and risk being human, they would gain a lot," Smith says.

IS&S still faces training problems with employees who have been through CAMP, Gaudette says. "How do you get people beyond the simple, the easy, the friendly so that they utilize the applications that they're running to their fullest and thus improve their productivity?" he asks.

There are many more employees to train, particularly with the company automating production and order information as part of a major shop-floor control project. Nevertheless, Smith is undaunted. "My goal in life is to educate everybody at Norton," she smiles.

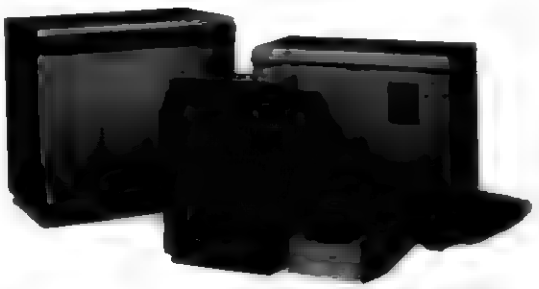
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When can DP give the edge?

From page 65

depends on finding a small specialty market in which to operate.

The other observation is that not all innovative uses of information technology have equal rates of success.

All major metropolitan banks now offer automatic teller machines but few, if any, can point to real cost reductions or market share advantage resulting from the ATMs' introduction.

Electronic home banking and videotex shopping in the U.S. have been disastrously unprofitable, at least in the short run, for all who have attempted to popularize them.

Now, how can we characterize promising uses of information technology?

First, we make a distinction between internally focused and externally focused applications. Internally focused systems are generally used within a firm for cost reductions or quality improvement; they do not have an interface with suppliers, customers or the outside world. Externally focused systems, by contrast, are used principally by customers, clients or suppliers and are

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Downsizing DP

From page 1

Savings in response time and communication line costs are two advantages realized by Cox Cable Communications' largest system — some 270,000 subscribers — in San Diego. That system went on-line with a Tandem TXP in June and receives its support and programming from Cable Data of Sacramento, Calif., its Tandem supplier.

"From a staff point of view, the system has created some jobs here, and everyone is fairly positive," Bill Robinson, DP manager says.

Robinson reported "no problems out of the ordinary" with the conversion. "For 2½ weeks we were not on any system, so we had a lot of catching up to do. And the new release of some application software is taking some time to debug. We're using entirely different software now, which in some ways is an improvement, and in others it isn't. It's just a totally different system, and it will take some time to get used to it."

The bottom line for Prater is to improve efficiency, data integrity and savings on operating costs. The conversion program, which began in late 1984 and is to be completed by first-quarter 1987, was designed to provide each cable system with the autonomy and flexibility needed to better serve its customers. "We wanted to instill within each system an entrepreneurial spirit," Prater explains.

In September 1985, Cox Communications, Inc., with broadcasting, cable and auto auction subsidiaries, merged with Cox Enterprises, Inc., which owns a chain of newspapers, including the *Atlanta Journal and Constitution*. The new company, Cox Enterprises, is privately held with newspapers, cable television, auto auction and broadcasting as subsidiaries.

After the merger, it was decided that Cox Enterprises would decentralize many of the decision-making processes and responsibilities of each division from headquarters to field offices. The cable DP conversion project had already begun when the merger was announced, so Prater's philosophy seemed a perfect fit.

The minicomputer market has become much more competitive than the mainframe market, resulting in improved minicomputer price/performance, which is attractive to companies that could use either type of system. As a result, some DP shops are beginning to downsize from mainframes to multiple minicomputer environments, and more are likely to join the ranks within the next few years, according to Frank Gens, vice-president of IBM services at International Data Corp., a Framingham, Mass.-based market research firm.

"You can't expect the lion's share of IBM mainframe users to start replacing them with networks of minis, but those customers at the entry point of a mainframe are going to be looking more and more at multiple networked minicomputers as an option," Gens says.

By discontinuing the use of the 3081, along with an Amdahl Corp. 470V/7B used mainly for statistical analysis applications, there was no need to maintain a large support staff, Prater says. Although each cable system has hired from one to three DP staff members of its own, they will rely mainly upon turnkey vendors for installation, training, programming, support and maintenance.

Management at each remote site has inherited duties formerly performed by the DP staff at headquarters. "There was an absorption of function by general managers, customer service managers, collection managers and administrative managers who would collectively take over the equivalent of a DP manager in the home office," Prater says.

There have been considerable savings in operating costs as well as in personnel, but they are intangible and difficult to tabulate, Prater says. "We're saving some funny money, if you will, in the sense that we had a corporate DP department that took up over 20,000 square feet along with a large staff. That's a lot of overhead when you compare that, today, we are down to 5,000 square feet. And the field offices always have some little nook or cranny to put a small machine, so there's no increase needed there."

Other savings have been realized on software and communications costs, Prater adds. "The software on the new machines is basically purchased, so when you take that cost and compare it to the ongoing rental of mainframe software, the savings are tremendous. The savings with running a network was the most dramatic. But the real savings, altogether, are the intangibles — improvements from customer service, more flexibility and satisfaction all around."

Previously, remote sites were connected to headquarters with a combination of broadband coaxial cable local-area networks (LAN), network controllers, modems and satellites. All files and data bases were housed on the 3081, and each site had to download for the purposes of billing and preparing financial reports, in an interactive environment.

This created a "tremendous volume of traffic," according to Prater. With the new system, each site has its own data base and uploads a summary of its financial reports and billing on a weekly and monthly basis.

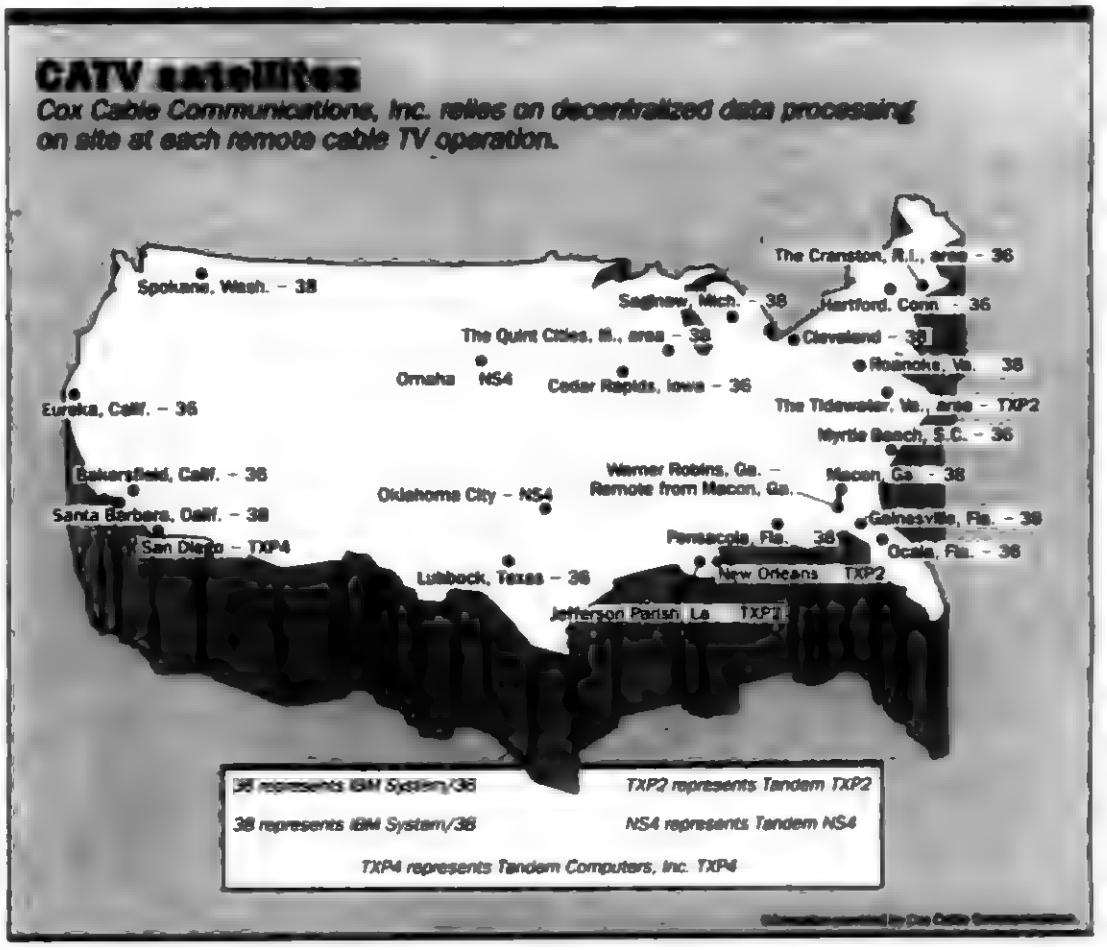
Under the system, LANs at remote sites tie together the terminals with a standalone CPU at the terminals' own sites. In turn, each LAN is connected to a national IBM Synchronous Data Link Control point-to-point and multidrop network that is controlled in Atlanta.

Prater's plan sounds interesting to Reuben Villanueva, director of computer services for American Television and Communications, Inc. (ATC), which operates 100 Cablevision systems throughout the country. But security and additional operating expenses would be major concerns for Denver-based ATC in such an environment.

"It sounds like he has created a lot of powerful nodes, and none of us has a real big travel budget, so I don't know how they would go about enforcing security or disaster recovery," Villanueva says. "Security is an important issue with billing systems, which means revenues, and you almost need a centralized effort to control it."

Prater agrees that, in theory, the system has a greater potential for security and disaster risks, but he adds, "We've actually seen an improvement in security, and we think the new system has solved a lot of disaster recovery problems."

A security administrator has been appointed at each site to maintain local passwords and controls, and additional security measures have been installed at division headquarters, he says. In addition, off-site locations for storage and tape cycling have been established for each site in the event of disaster. Data backup is performed daily.



Not without problems

The switch from a large mainframe shop to a smaller mini-based operation was not without its management problems. To implement the conversion of both software and hardware, Cox Cable Communications looked to Information Systems Development (ISD) of Coral Springs, Fla., which markets turnkey solutions for IBM systems.

But the financial and billing applications software offered by ISD did not address many of the requirements previously met by the applications developed by Cox Cable Communications programmers.

"The package had to be elaborately redeveloped to suit our needs," Prater says. "At that time, I had a staff of CICS and Cobol programmers who didn't relish the idea of stepping back to System/36 programming.

"So, I had to go out and hire some System/36 and 38 specialists, but they didn't know the cable industry or the applications. Meanwhile, they coexisted with the long-term people, who could see the end was coming. Finally, we decided it just wouldn't work, that programmers are very expensive and the technology changes too fast.

"We decided: Why not get rid of all the programmers and rely on the vendors to do the programming we need? We retained five senior development types to coordinate with the vendor developers, so when I need something from ISD, I have a key person that has been here for 17 years and can tell them what we want."

There are drawbacks to the new system, Prater admits. Cox Cable Communications now has a significant investment in System/36, 38 and TXP technology and in programming and support from both ISD and Cable Data. He says, "If these vendors don't supply the functional requirements I need in the future, what do I do? And the technology we have invested in could become obsolete virtually overnight. But these companies want our business, and they will generally respond to what we want, although maybe not in as timely a fashion as we would like."

By operating its own System/38 with support from

See DOWNSIZING page 73

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When can DP give the edge?

From page 70

intended to add value.

Of the two, externally focused applications have received most of the recent press coverage. By their very nature, they are visible, and when they work, they are dramatic. Successful innovations here are characterized by the following:

- There is real benefit to the customer — value added — to bring him in.
- There is real benefit to the firm — growth in market share, increasing profit margins — consistent with the firm's strategy.
- There is time for the innovator to harvest the benefits before competitors' actions erode gains from the new system.

This last point is quite important, since, if there were no way to defend the resulting gains, the information systems innovation would change the cost structure of the industry but would not prove to be strategic.

Most of the successful applications that have been reported have relied upon customers' switching costs to defend gains. A travel agency changing its reservation system or a retail pharmacy changing its supplier write off their training and experience. Data files, maintained as account histories, may also be lost. When customers' adoption is rapid and switching costs significant, the initial developer may enjoy real first-mover effects.

By definition, internally focused systems do not offer the possibility of customer switching costs to defend gains. When then can we expect such a system to prove strategic?

Again, we require that the system provide benefits to the firm, consistent with the firm's strategy. And again we require time to harvest these benefits. In this case, though, time is likely to be provided by barriers that prevent competitors from duplicating the application. They could be a size advantage that makes the application unfeasible for a smaller competitor, superior skills in information systems development or a management willing to innovate and change organizational structure to exploit innovation.

A final note: If an information systems innovation is likely to develop into a commodity and this development is recognized sufficiently early, there may still be considerable value in being the provider of that commodity. An example is a bank that seeks competitive advantage by serving as a service bureau for banks too small to process their own ATM transactions.

Downsizing DP

From page 71

ISD, Macon, Ga.-based Cox Cable Communications' system has experienced a sizeable decrease in downtime and a higher data integrity, according to Vikki Jordan, DP coordinator. But software problems and the long hours involved in running a computer system have made the new system something of a toss-up in the popularity polls.

"Most people favor this system as far as the hardware and the increased uptime are concerned," Jordan says. "But as far as the software, there are a lot of problems with the new billing package that sometimes makes us wish we could go back to the old system."

Overall, Prater says he believes the cable division had no other feasible choice than to shrink from a mainframe to a mini. "To downsize a well-oiled machine and a department with 155 long-term, competent employees is . . . well, a lot of people won't bite that bullet, and they should," he says.

"There is an awful lot of flexible, canned software out there, and I think, as a result, in-house programming as we know it today could be passe. The money spent on developing, when compared to what's already available, is surprising. Programmers are often status symbols for a company, to show how big they are. So I suppose what we are doing is unorthodox from that standpoint.

"You have to get out of the DP mode and be a businessman once in a while, but many DP people will not cross that bridge."

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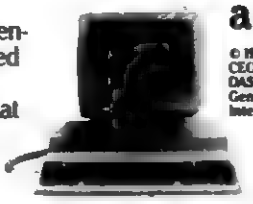
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NEW PRODUCTS

Software to analyze PC disk drives

Xidex Corp. of Santa Clara, Calif., has announced its diagnostic software package called the Investigator. The software is said to allow personal computer users to test the performance of their flexible disk drives.

The Investigator works by prompting the user through a setup procedure. Once the user has done his part, the Investigator then performs seven tests of the disk drive in approximately one minute, a company spokesperson said. Users receive a pass/fail report, or they can command a more detailed analysis with exact numerical results by pushing two command keys.

The comprehensive test profile checks the following: read-and-write accuracy, spindle speed, static head alignment, timing of the index to data, azimuth head rotation, dynamic head alignment and disk centering. A printout of the results can be produced after the user inputs a specific command.

The Investigator drive performance analyzer is said to be relatively easy to use and offers more precise analysis than comparable diagnostic tools. The Investigator costs $34.95.

The drive performance analyzer reportedly can test the flexible drives of more than 20 IBM Personal Computers and compatibles. The Investigator, said to be based on the same technology as the Dysan Corp. Interrogator, is a sophisticated disk drive test package that includes two diskettes, combining both the program and test tracks on one diskette.

According to the Xidex spokesperson, instead of waiting until a disk drive fails, the Investigator allows PC users to spot problems before they get worse and damage valuable software data. The Investigator also helps users decide if the problem is with the diskette or the drive as well as allowing users to check that their drive is getting proper service, the spokesperson added. If the problem is in the drive, a user will be able to pinpoint the problem for a service technician.

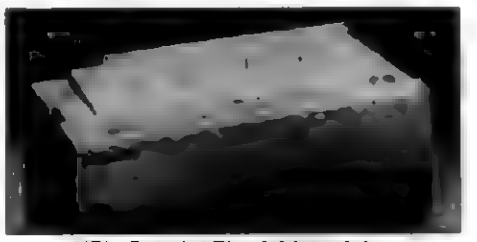
Xidex Corp. manufactures a range of flexible disk drive alignment and diagnostic test products. These include the Analog Alignment Diskette, the Digital Diagnostic Diskette and the Performance and Alignment Test.

HP rolls out quiet printer

Intended for graphics, spreadsheet generation

The Quietjet Plus inkjet printer is the latest printer to be introduced by Hewlett-Packard Co., based in Palo Alto, Calif.

The wide-carriage unit, featuring quiet operation and near-letter-quality printing, is said to be designed for users who perform business applications from word processing to graphics and spreadsheet generation.



HP's Quietjet Plus inkjet printer

The Quietjet Plus, priced at $799, offers two print qualities and flexible, user-convenient, paper-handling features, according to the vendor. It handles tractor-fed and cut-sheet paper in widths from 5 in. to 15 in., for labels, memos, letters and spreadsheets. Quietjet Plus also has a paper advance knob and a true platen, enabling the user to insert and retrieve cut-sheet paper.

The printer offers three print speeds: 40 char./sec. for near-letter-quality output, such as letters and reports, 160 char./sec 10-pitch printing and 192 char./sec. 12-pitch printing for draft-quality output including memos, first drafts and listings. Common functions such as underline, bold, subscript and superscript are standard.

The Quietjet Plus supports three different graphics resolutions including 96 by 96 dot/in., 192 by 96 dot/in. and 192 by 192 dot/in. Fonts and special characters can be downloaded from host computers or optional random-access memory or read-only memory can be added to support other customized needs.

The printer features both the RS-232-C serial and parallel I/O interfaces and supports most popular personal computers such as IBM Personal Computers and compatibles as well as the Apple Computer, Inc. Apple II series and Macintosh computers. HP terminals are also supported.

The Quietjet Plus supports a host of software including Lotus Development Corp. 1-2-3 and Micropro International Corp. Wordstar. Other general business software for general ledger, accounts payable and receivable and payroll applications that require wide carriage printing are also supported.

According to the vendor, inkjet technology, whereby characters are formed on paper by spraying ink through tiny holes in the printhead, is responsible for the quiet 48db operation of the Quietjet Plus, compared with 58db to 62db for regular dot-matrix printers.

According to HP, Jetseries supplies for the Quietjet Plus printer are available including 8½-in. by 11 in. and A-4-size paper, wide spreadsheet paper, mail labels and black, blue, red and green single-color ink cartridges.

Tool makes two PCs act as one

Norton-Lambert Corp. of Santa Barbara, Calif., has introduced a remote software package called Close-Up for use with the IBM Personal Computer, Personal Computer AT, XT and compatibles.

According to the vendor, Close-Up is a remote communications system that allows two computers in different locations to operate simultaneously as if they were one computer, leaving the host computer free to operate normally. Close-Up allows full control and viewing of each computer from the other. Computers, screens and keyboards are linked as one.

Close-Up is said to include such features as remote printing, graphics support, error protection, a movable chart window that allows users to carry on a dialog whenever there is a need to communicate as well as time and billing capabilities.

Close-Up is able to save a specific session by taking snapshots of the individual screen and storing them for later recall.

Close-Up works with Lotus Development Corp.'s Symphony and 1-2-3, Ashton-Tate's Dbase III Plus and word processing programs.

There are two sides to the Close-Up system: Close-Up Support costs $245; Close-Up Customer costs $195.

Speed not sacrificed to windowing in emulation package

Asher Technologies, Inc., the communications product division of the Quadram Corp., has announced an IBM Personal Computer-to-minicomputer emulation package designed around the 16-bit Motorola, Inc. M68000 microprocessor and said to offer the ability to run seven concurrent sessions.

With the Motorola chip built into the emulation board for the IBM System/34, 36 and 38, the Asher Minilink reportedly enables windowing of seven concurrent sessions without sacrificing speed.

Users are able to print documents, transfer files and run minicomputer programs simultaneously.

Windowed sessions can also be cut and pasted into different windows.

Menu-driven interface

The emulation software is said to offer a menu-driven interface with easy-to-use features.

The Asher Minilink package consists of a board that emulates and addresses IBM 5251-11, 5291 and 5292-1 display terminals for the IBM System/34, 36, 38 minicomputer series, along with emulation, concurrent file transfer software packages and coaxial cable connections.

The package, available now, is priced at $895.

Can be used as LAN gateway

With a software upgrade, the Minilink can be used as a gateway to the majority of standard local-area-networks (LAN), according to Charles Copeland, manager of software engineering and support.

A single Minilink board installed inside a microcomputer can simultaneously connect up to seven micros to one minicomputer.

The upgrade, available for $1,395, supports Quadram's Quadnet VI and IX LANs, which are based on the Novell, Inc. 2.0A communications software that provides an interface to IBM's Token-Ring and PC Networks, among others.

The demand for multifunction PCs that can access the host minicomputer is growing rapidly, claimed a company spokesman.

The Minilink was designed to provide the flexibility of a multifunction workstation by allowing the PC user to access the host minicomputer while retaining standard PC functions, he added.

INSIDE

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SOFTWARE & SERVICES

Systems software

Treehouse Software, Inc. has announced **Trim Version 3.0**, a release of its Software AG of North America, Inc. Adabas/Natural performance monitor.

Trim Version 3.0 includes an enhanced real-time monitor with extensive Adabas session statistics, queue information and worst-user trapping. It can suppress inefficient commands and perform security checks.

Trim Version 3.0 for OS/VS1, MVS and VM sites costs $12,000, and DOS/VSE is priced at $10,500.

Treehouse Software, 603 Beaver St., Sewickley, Pa. 15143.

■

Program Accountability & Evaluation, Inc. has upgraded its **Librarian/38** software for IBM System/38 computers.

Librarian/38 includes a command processing management system that allows users to manage any commands available to them. Parameters can be predefined for a command and then loaded into a file. The tape and diskette data base and spool file management system have been updated, and label printing is available.

Librarian/38 costs $1,055.

Program Accountability & Evaluation, 7 Riverway Road, Salem, Mass. 01970.

Applications packages

Soft Pro Systems has introduced **Project Management System** and **Mailing List Management System**, software products for Wang Laboratories, Inc.'s VS computer.

The Project Management System features include online task maintenance and project schedule report by work day.

The Mailing List Management System can sort, select, match and combine any fields and lists in the data base to produce output or create new lists.

Project Management System costs $7,000, and the Mailing List Management System is priced from $10,000.

Soft Pro, 3718 MacDonald Ave., Richmond, Calif. 94805.

Utilities

Interlink Computer Sciences, Inc. has introduced a **VT100/220** and **3278 terminal emulation** package as an option to its 3711 and 3711S Gateway.

With VT100/220 emulation, an IBM 3278 terminal user can log on to a Digital Equipment Corp. VAX system or RSX system, accessing most applications in full-screen mode.

With the 3278 option, a DEC VT100/220 terminal user can connect to Systems Network Architecture applications in the IBM mainframe environment.

The VT100/220 and 3278 full-screen terminal emulation package costs $9,950 for single-direction access and $14,950 for bidirectional access.

Interlink Computer, 39055 Hastings St., Fremont, Calif. 94538.

■

Mentor Graphics Corp. has introduced **Development Station**, a workstation-based set of development tools.

The Development Station is said to allow users to build and maintain applications on the Mentor Graphics Compute Engine global accelerator. Tools included are C, Fortran and Pascal optimizing compilers; a linker; a symbolic debugger; and two librarians.

One librarian is used to organize and maintain related groups of compiled modules, and the other librarian organizes and maintains execution-time dynamic binding environments.

Available in October, Development Station prices start at $29,900.

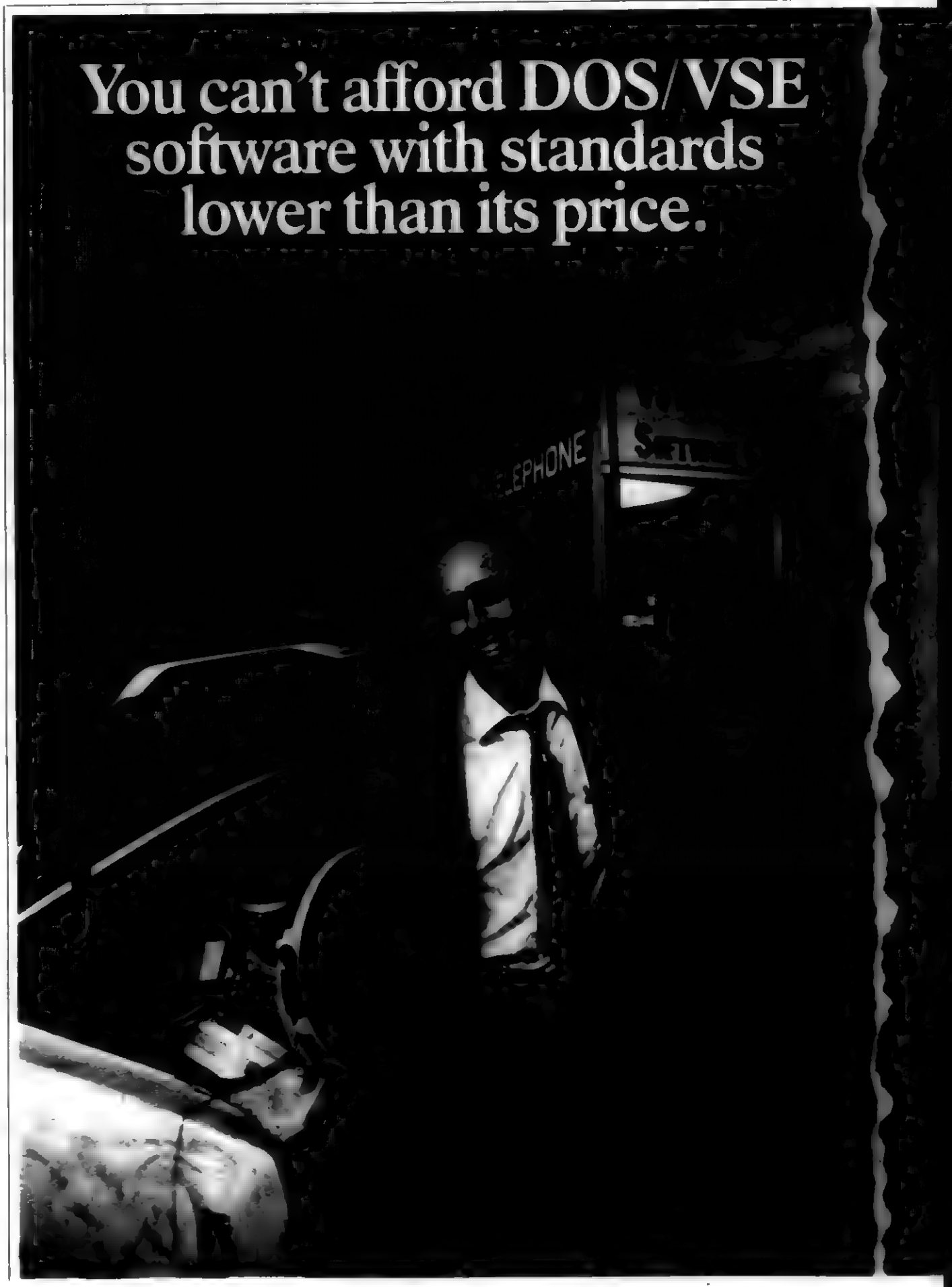
Mentor Graphics, 8500 S.W. Creekside Place, Beaverton, Ore. 97005.

MICROS

Systems

Tasvir Corp. has recently enhanced its **Personal Supercads**, which is a personal computer-based mechanical computer-aided design system.

Some enhancements include increased speed; cross-view geometry manipulation that allows simultaneous access of up to 16 on-screen



NEW PRODUCTS/MICROCOMPUTERS

three-dimensional model views for design modification. The ability to simultaneously highlight, in all views, geometry segments identified for design modification and the ability to instantaneously update 11 views on the screen as changes are made to the 3-D model are also included.

Personal Supercads costs $18,900 for a 13-in. monitor and software kit.

Tasvir, 1091 Stierlin Road, Mountain View, Calif. 94043.

Software applications packages

West End Film, Inc. has released its **CAD2ART** Autocad-to-Artwork conversion package for IBM Personal Computers and compatible machines.

According to the vendor, CAD2ART allows users of Autodesk, Inc.'s Autocad program to bring drawings into Artwork for further editing and rendering.

According to the vendor, CAD2ART also provides access to many of the 4,000-line film recorders and laser and thermal printers that Artwork supports. CAD-2ART is also said to convert the DXF files saved by Autocad into CEL files so Artwork can read them.

The CAD2ART software costs from $750 to $2,500, depending on the color card and package involved.

West End Film, 1825 Q St. N.W., Washington, D.C., 20009.

Software utilities

Addison-Wesley Publishing Co. has introduced **DVI Laser/HP**, a software utility said to enable Hewlett-Packard Co.'s Laserjet Plus to print text produced with Addison-Wesley's Microtex personal typesetting software.

DVI Laser/HP works by translating Microtex files into a language understood by the Laserjet Plus. Microtex is a typesetting program that gives the user complete control over how a document will look, from the size and spacing of the letters to the page layout.

DVI Laser/HP costs $250.

Addison-Wesley, Reading, Mass. 01867.

Software enhancements

Digital Communications Associates, Inc. has improved its **Smart Alec** emulation software.

Said to be compatible with IBM's Application Program Interface, Smart Alec enables the user to run host software programs such as PC Support 36. It now also supports IBM's Enhanced Graphics Adapter and permits an IBM PC to run seven host sessions simultaneously.

The Smart Alec add-on board with Version 1.03 of the software costs $895 including the basic file transfer software. Enhanced File Transfer costs $1,295.

Digital Communciations Associates, 1000 Alderman Drive, Alpharetta, Ga. 30201.

Communications

Hayes Microcomputer Products, Inc. has released **Smartcom II V2.2** for the Apple Computer, Inc. Macintosh.

Smartcom II V2.2 supports the Macintosh Plus hard disk hierarchical file system. It is also compatible with earlier versions of the Macintosh. It now supports Macintosh hard disk subdirectories, so users can get subdirectory files to transmit over a modem.

Smartcom supports data transfer rates ranging from 300 bit/sec. to 19.2K bit/sec. It works with Hayes and compatible modems and costs $149.

Hayes Microcomputer Products, 705 Westech Drive, Norcross, Ga. 30092.

COMMUNICATIONS

Software

Software Results Corp. has introduced its **400 series** of **Comboard** front-end communications processors for Digital Equipment Corp. Unibus computers.

The 400 series hardware and software package was designed to provide DEC-to-IBM mainframe communications at speeds of up to 4.8K bit/sec.

The series is available for Houston Automatic Spooling Program (HASP), 3780 and Systems Network Architecture (SNA) remote job entry protocols. It features intelligent Motorola, Inc. 6800-based hardware.

The 400 series is priced at $6,500 for HASP and the 3780 and $8,000 for SNA.

Software Results, 2887 Silver Drive, Columbus, Ohio 43211.





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NEW PRODUCTS/COMMUNICATIONS

Tycho Research Associates, Inc. has announced **Tycho/Haspnet** and **Tycho/Hasp** communications software.

Tycho/Haspnet reportedly supports communications between all Digital Equipment Corp. VAX/VMS nodes in a Decnet network and one or more IBM mainframes. Tycho/Hasp is said to enable VAX/VMS systems to support a shareable remote batch job entry data link to an IBM mainframe.

According to the vendor, Tycho Hasp is also supported on Microvax II under the MicroVMS operating system.

Tycho/Haspnet communications software costs from $3,000, and Tycho/Hasp costs $4,500.

Tycho Research Associates, 995 Waterloo St., London, Ont. Canada N6A 3X4.

Multiplexers/Modems

Racal-Vadic has introduced the **1200VP**, a 1,200 bit/sec. asynchronous modem.

The 1200VP is said to feature an enhanced set of Racal-Vadic's AT-2Plus dialing commands, eight LED indicators, four function switches and an automatic voice-to-data switching circuit.

The four function switches allow users to select between data or voice mode, high or low speed, manual or autoanswer and analog or digital loopback testing, according to the vendor.

The 1200VP is AT&T 212 and 103 compatible and fits under a standard telephone.

The 1200VP costs $350.

Racal-Vadic, 1525 McCarthy Blvd., Milpitas, Calif. 95035.

■

Telenetics Corp. has introduced **MNP**, a modem error-control module.

According to the vendor, the MNP module utilizes an asynchronous error-correction protocol that upgrades existing stand-alone, dial-up modems.

In its plug-in card version, the MNP module uses the Telenetics 1,200 and 2,400 bit/sec. models.

The module is said to enable data to be transferred error free between a wide range of computers, from low-end microprocessors to large mainframes.

The MNP plug-in module is priced at $100 as a field add-on option.

Telenetics, 895 E. Yorba Linda Blvd., Placentia, Calif. 92670.

Local-area networks

Invisible Software, Inc. has introduced its **Invisible Network** local-area network for use with IBM Personal Computers and compatibles.

The Invisible Network is said to connect up to 45 computers at a maximum distance of 1,300 ft. It performs data transfer at a rate of 700K bit/sec. Each computer in the network has an interface card with an on-board, read-only memory program. The computers are connected with double twisted-pair wire.

Features include compatibility with IBM's Netbios and PC-DOS 3.1 or higher and the ability to run the IBM PC Network program.

Each interface card is priced at $249.95.

Invisible Software, 481 47th Ave., San Francisco, Calif. 94121.

SYSTEMS & PERIPHERALS

Data storage

Emulex Corp. has introduced the **MD23** and the **MD24** disk controllers, designed to connect up to four 5¼-in. Winchester disks that have an enhanced small disk interface (ESDI) to the small computer system interface bus.

With the MD23, the single-end model, the controller and the host can be placed up to 20 ft apart. With the MD24, the differential version, the controller and host can be up to 80 ft apart.

Both disk controllers feature the ESDI drive interfaces with disk transfers up to 15M bit/sec.

The MD23 costs $435, and the MD24 costs $515.

Emulex, P.O. Box 6725, 3545 Harbor Blvd., Costa Mesa, Calif. 92626.

Terminals

Perfect Terminal, Inc. has introduced **P411**, an emulation of Data General Corp.'s D410 and D411 terminals.

The P411 terminal features horizontal scrolling and windowing capabilities. The horizontal scrolling feature is said to give users the opportunity to view 162-char. lines on its 14-in. green or amber screen.

The P411 also has a total of 38 programmable function keys. The P411 offers an optional 20 mA current loop communications interface.

The P411 is priced at $795.

Perfect Terminal, 3319 Seldon Court, Fremont, Calif. 94538.

Printers/Plotters

Roland DG has announced **CAMM-3**, a three-dimensional plotter for use with computer-aided design and manufacturing systems.

The plotter is said to allow users to try out ideas in 3-D form with the same data and programs used for drawing plans on an X-Y plotter.

According to the vendor, the CAMM-3 features three-axis simultaneous movement, .00039-in. resolution, adjustable spindle speed and feed rate and the ability to use manual or computer control.

CAMM-3 works in a variety of materials such as aluminum, brass, wood, plastics and wax.

The CAMM-3 plotter is priced at $12,995.

Roland DG, 7200 Dominion Circle, Los Angeles, Calif. 90040.

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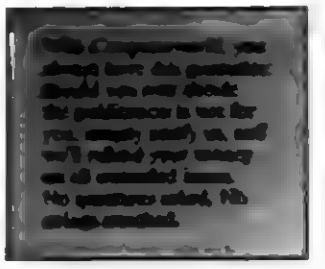


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COMPUTER INDUSTRY

Section begins on page 110

American Management Systems rebounds, plays on strength

Narrows focus to large users, vertical markets

By Mitch Betts

ARLINGTON, Va. — American Management Systems, Inc. (AMS), a software and services firm that hit rock bottom five years ago, has managed a dramatic recovery by exploiting its strength in government, financial and academic markets.

By its own admission, AMS ran into trouble by trying to mass market packaged software for minicomputers, a bad move for a firm whose strength had been in consulting and selling software to very large users. "Things started to go south in 1980 and 1981 when we ran into a lot of problems," AMS President and Chief Executive Officer Charles O. Rossotti said in a recent interview. "Our strategy was too unfocused, and we were involved in too many things."

In 1982, management reorganized AMS to focus on combining professional services with packaged software for large users in specific vertical markets. AMS jettisoned its minicomputer-oriented businesses, time-sharing operations and products for small businesses, Rossotti said.

Instead of mass marketing, AMS regrouped so it could concentrate on the vertical markets it already had penetrated. Typical products from AMS are credit management and automated credit application software systems for banks, financial management systems for government installations and administrative systems for colleges and universities.

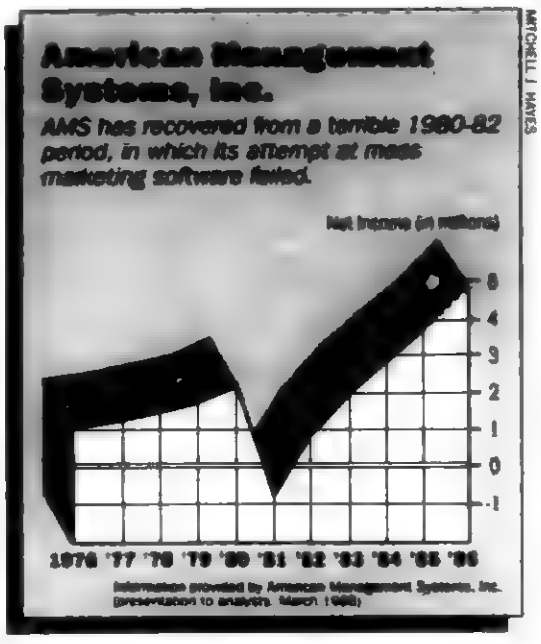
AMS is also starting to penetrate the telecommunications industry, with clients such as MCI Communications Corp. and with a new administrative package for order processing and billing.

"Their focus on applications software products, and building complementary services around those, is a good strategy," said Cato Carpenter, analyst with Alex Brown & Sons, Inc. "They've carved out expertise in some key markets with a market-segment strategy."

Consequently, Carpenter added, AMS is likely to achieve its goal of maintaining revenue growth of 15% to 20% annually.

"AMS has developed very sophisticated software packages that can be modified to meet the needs of specific institutions, so they go in with a complete solution," Carpenter said.

Just a few years ago, the idea of combining packaged software with professional services was considered crazy or unnecessary, CEO Rossotti said. "Now it's becoming an accepted movement, toward software with support services," he said.



One part of the firm's strategy is to contract with clients to share in the development of a specific software product. "If you can get a customer to help develop a product, you can be pretty sure there isn't an existing product that comes close to solving their problem," said Patrick W. Gross, chairman of the AMS executive committee.

Rossotti and Gross said their plan for the future is to do more of the same — to expand the product line in AMS's existing niches to solve user problems.

In the federal systems market, the tricky part of this strategy is that AMS must thread its way through changing government policies to win government contracts, which make up about one-third of its business.

On one hand, the White House Office of Management and Budget has ordered federal agencies to make greater use of packaged software to save on in-house development and maintenance costs. "This plays right into our hands," Rossotti said.

On the other hand, federal budget-cutting legislation could stall government computer projects. But AMS executives maintain that even with budget cuts, the federal information technology budget is likely to grow about 11% to more than $15 billion next year. "There will be individual nicks here and there. . . . but that's still an awful lot of money," Rossotti said.

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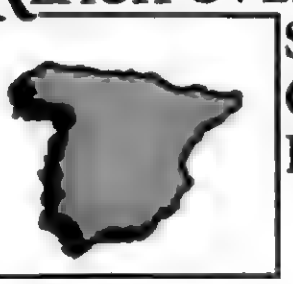
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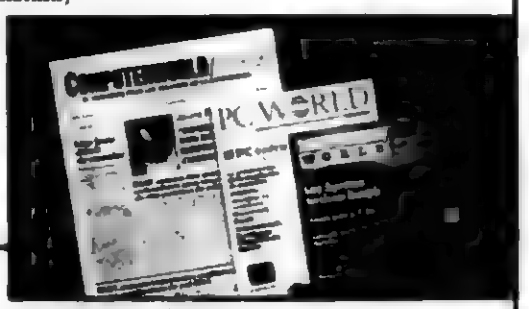
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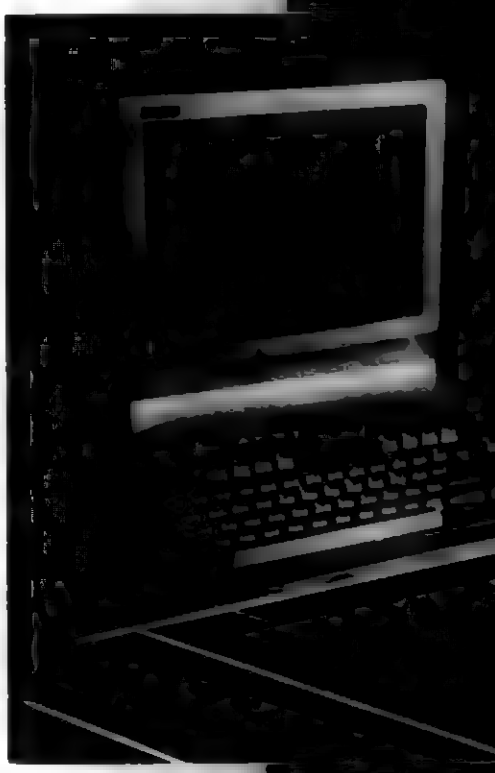
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Sperry director reassures UK users about Burroughs merger

Chairman's visit boosts morale

By Clinton Wilder

SAINT PAUL DE VENCE, France — There was a good deal of uneasiness at Sperry Ltd.'s corporate headquarters in London back in May. Management, employees and customers of Sperry Corp.'s UK subsidiary were almost completely in the dark about what the Sperry-Burroughs Corp. merger would mean for them.

"Morale was pretty low," said David Crofts, Sperry Ltd.'s managing director, during a recent interview at Sperry's annual UK press seminar held in southern France. "We were all thinking and hoping that it wouldn't happen, because we thought the Sperry product lines might be superseded. Our staff and customers expected me to know things that I simply did not, and that was frustrating."

Crofts coincidentally had a scheduled meeting with the UK's Sperry 1100 users group just a few days after the merger, which he said was a blessing in disguise.

'A pretty tense moment'

"It was a pretty tense moment, but it turned out to be rather valuable," Crofts said. "At this point, I think we've reduced the percentage of our users who doubt the future of their Sperry investments from 90% to 20%; there's no way you can eliminate all of that."

Crofts' challenge was eased earlier this month when Burroughs Chairman W. Michael Blumenthal and Sperry President Joseph Kroger made the UK their first stop on a two-week tour of critical user sites in Europe and Asia. Blumenthal visited UK users group Chairman David May as well as five UK Sperry users who are about to make 10-year information systems strategy decisions, Crofts said.

"Those pushing the limits of their computing power obviously need to know if our next-generation systems, such as Saturn and Mercury, are going to come along," Crofts said. "The answer is yes, and Blumenthal was the only guy who could really give the answer. In a sense, he is the only employee of the new company."

Crofts has not yet been told how much of Blumenthal's targeted $150 million in savings is slated to come from consolidations of Burroughs and Sperry's UK operations, but he doesn't expect much to change in the near term. "All the European subsidiaries are largely sales and service, and in that, the possible savings are limited," Crofts said.

Sperry is the sixth largest computer firm in the UK and a strong player in the British financial industry, a vertical market it has had little success penetrating in the U.S.

Crofts subscribes wholeheartedly to Blumenthal's "critical mass" theory, saying that Sperry Ltd.'s new partner will help it compete better with UK industry leaders IBM, International Computers, Ltd., Digital Equipment Corp. and Honeywell, Inc. Sperry's $225 million in UK sales last year were about half those of Burroughs, the No. 5 vendor.

"Sperry has no manufacturing in the UK, and the chances of getting a plant were slim, but we now have two Burroughs factories in Scotland," Crofts said. "That's an advantage in local selling. I don't think we would have ever passed the companies ahead of us in size, because most of them are growing as fast as we are."

Crofts, who worked for Honeywell when it acquired General Electric Co.'s mainframe line, admitted he had to overcome his own initial skepticism about the merger. "But it soon became clear that this was a very deeply considered move, not just an emergency move to save Burroughs," he said. "This is an industry of change, and we really must not look at change as a threat."



Sharp cancels VLSI chip project with RCA

By Takehisa Kondoh
Computerworld International News Service

OSAKA, Japan — Sharp Corp. has canceled a 1-year-old contract with RCA Corp. under which the two companies were to jointly produce very large-scale integration (VLSI) chips in the U.S.

Sharp said it acted in response to a request from General Electric Co., which acquired RCA in June. GE recently scrapped RCA's plans to construct a major facility in Camas, Wash., with Sharp.

The plant, which was to employ 650 people, had been hailed as a symbol of U.S.-Japanese cooperation in the trade-war-marred chip industry. GE said the venture would unnecessarily duplicate its own semiconductor plants in North Carolina.

The joint VLSI company that Sharp established with RCA in June 1985 was called RCA/Sharp Microelectronics, Inc. It was capitalized at $15.3 million in U.S. dollars, with 51% owned by RCA.

Liquidation of the joint company will cost Sharp its U.S. semiconductor manufacturing base. Sharp, which has become increasingly involved in semiconductors, is now seeking an alternative arrangement.

GE wanted to scrap the deal, a Sharp spokesman said, because GE needs semiconductors for such nonconsumer business sectors as the space program and defense.

IBM hopes to cut DEC gains

From page 110

IBM's System Products Division and the person believed to be masterminding IBM's mid-range product strategy, told a group of financial analysts two days after the IBM announcements that IBM is committed to offering several architectures because of diverse customer needs.

But as any astute market analyst knows, the roots of IBM's three major architectures in the mid-range have a lot more to do with the U.S. vs. IBM antitrust case than with "customer needs." Back in the 1972 to 1973 period, IBM thought that it would be broken up, and it formed the General Business Group to handle its non-370-compatible products.

If we strip away the Personal Computers and the 3090s, that still leaves three different IBM architectures in the intermediate systems range vs. DEC's one.

Schwartz reluctantly conceded that in the foreseeable future, some convergence may take place. "But, at a minimum, we will have two architectures in the mid-range," he said.

The survivors

Schwartz's pronouncement about maintaining at least two mid-range architectures in the foreseeable future introduces one element of certainty in IBM's strategy. But which two will survive? Certainly the 370 will, with the second surviving architecture probably being that of the System/38.

What about the System/36? A combination of the new migration aids and the new communications hardware and software products will try to increase the affinity between the System/36 and the System/38.

The battle lines between IBM and DEC have now been clearly drawn. One of the most exciting aspects of IBM's June announcements is the fact that the products will heighten the rate of competition in the office automation market. Who will be the winner in this battle between the industry's two top companies? The user will. And that's something really worth cheering.

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Altos purchases Communications Solutions from CDC

Altos Computer Systems, Inc. announced the acquisition of **Communications Solutions, Inc.** from **Control Data Corp.** for an undisclosed price. Altos, a San Jose, Calif.-based manufacturer of multiuser microcomputers, said Communications Solutions, also of San Jose, represents a key investment in the data communications market.

Communications Solutions manufactures IBM-compatible 3270 terminal emulation and office communications software products.

■

Disk drive manufacturer **Priam Corp.** laid off 175 workers from its San Jose, Calif., manufacturing facility recently, bringing the number of workers to 875. The layoffs apply to 100 permanent employees and 75 temporary employees. Priam is expected to post a loss for the quarter ended June 30.

■

Troubled by declining earnings, falling stock prices and shareholder suits, **Daisy Systems Corp.** announced the resignation of cofounder and Executive Vice-President David Stamm.

Stamm will continue to serve as a member of the board of directors. Taking over his responsibilities for Daisy's Electronic Design Automation Group is Andrew Wade, currently vice-president and general manager of Daisy's Digital Design Automation Division.

Speculation surrounding Stamm's resignation involved a reported dispute with Daisy President Aryeh Finegold.

■

Burroughs Corp. Chairman W. Michael Blumenthal wooed **Sperry Corp.** users in Hong Kong at a recent luncheon following the first official joint meeting of Burroughs and Sperry staff in that city. Sperry users expressed relief at Blumenthal's promise during the meeting to maintain Sperry's product lines. Sperry reportedly has five times as many installations in Hong Kong as Burroughs, although Burroughs is said to have more than twice as many units at user sites.

■

Tecmar, Inc., a Columbus, Ohio-based micro board maker, acknowledged that it is negotiating to be acquired by **Rexon, Inc.**, a San Francisco-based maker of computers and storage systems. If the acquisition is consummated, Tecmar President Marty Alpert will retain his job, but other layoffs may take place at Tecmar, according to Tecmar's investment bankers, Hambrecht & Quist.

■

GTE Corp. and **Siemens AG** recently decided to join forces in some international markets but will not merge their digital switch technologies in the U.S. as was expected.

Siemens will own 80% of the new joint venture company, which will be based in the U.S. and initially will sell transmission equipment only to telephone companies in Taiwan, Italy and Belgium. These sales will come from GTE's existing base of international sales. In a joint statement, the companies said, "Evaluation of our telecommunications specialists indicated that there were no advantages for merging the technologies of the Siemens EWSD and GTE GTD-5 digital switches into a single system for U.S. applications."

■

Financially troubled **Interdyne Co.** announced that it has agreed in principle to acquire **Peachtree Technology Co.** of Norcross, Ga., for an undisclosed stock offering.

Interdyne is a publicly held company known for the Megafloppy family of tape subsystems and drives for the IBM Personal Computer.

Peachtree manufactures modems and reel-tape backup systems for PCs. It also manufactures a 20M-byte hard disk drive for the Apple Computer, Inc. Macintosh.

■

Telephone systems distributor **USX Telecenters Corp.** of Sunnyvale, Calif., is suing **U.S. Steel Corp.** over its proposed name change to **USX Corp.**

Founded in 1985 by former executives from Rolm Corp. and Businessland, Inc., USX Telecenters is establishing a national franchise of telephone equipment stores.

■

Companies in the computer industry are realizing increased revenues with fewer employees, according to a statistical analysis recently released by the **Computer and Business Equipment Manufacturers Association** (CBEMA).

CBEMA reported that during 1985, revenues for the computer equipment industry were 10% higher than those in 1984, while employment in the industry dropped 8.6% between March 1985 and March 1986.

In the telecommunications industry, revenues increased 7.6% in 1985 while employment dropped 6.1%, CBEMA reported. Contrary to this trend, employment in the computer and data processing services industry rose by 13.3% in 1985, the trade association said, while revenues increased 15.5%.

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COMPUTER INDUSTRY

5¢ NICKELS & DIMES

Hogan Systems, Inc. reported a net profit of $994,000, or 7 cents per share, on revenue of $10.8 million for the first quarter ended June 30. This compares with a $3 million loss, or 23 cents per share, on revenue of $4.1 million for the like period a year ago.

■

Softech, Inc. announced revenue for the year ended May 31 of $45.1 million, compared with $36.4 million in the previous year. Profits for the year were $2.2 million, or 60 cents per share, compared with a loss of $1.2 million, or 49 cents per share, in the like period a year ago.

For the fourth quarter, revenue was $13.2 million, compared with $10.4 million in the same period a year ago. Profits for the fourth quarter were $635,862, or 18 cents per share, compared with a loss of $1.8 million, or 49 cents per share, in the previous year.

■

Seagate Technology reported revenue for the fourth quarter ended June 30 of $141.5 million, compared with $71.8 million reported for the comparable quarter one year ago. Profits were $16.4 million, or 34 cents per share, compared with $712,000, or 1 cent per share, in the previous year.

■

Rexon, Inc. announced revenue for the third quarter ended June 29 of $14.9 million, a 40% increase over $10.6 million reported in the third quarter a year ago. Profits were $887,000, or 12 cents per share, compared with $222,000, or 3 cents per share, in the comparable period one year ago.

■

Bridge Communications, Inc. reported revenue for the second quarter ended June 28 of $10.2 million, a 47% increase over $7 million reported in the second quarter last year. Profits were $1.1 million, or 13 cents per share, compared with $1.2 million, or 15 cents per share, reported in the previous year.

■

Computer Task Group, Inc. announced net income of $1.3 million, or 18 cents per share, on revenue of $35.5 million for the second quarter ended June 30. This compares with net income of $893,000, or 17 cents per share, on revenue of $28.2 million reported in the like period a year ago.

■

Iomega Corp. announced revenue for the second quarter ended June 30 of $29 million, compared with $27.6 million in the like period last year. Profits were $116,000, or 1 cent per share, compared with $3.2 million, or 11 cents per share, one year ago.

■

Dataproducts Corp. reported revenue for the first quarter ended June 28 of $84.4 million, compared with $86.3 million in the previous year. Net income was $2.5 million, or 12 cents per share, compared with a net loss of $19.4 million, or 93 cents per share, in the corresponding period last year.

■

Endata, Inc. announced revenue for the second quarter ended June 30 of $9.6 million, compared with $9.2 million in the previous year. Net income was $832,000, or 20 cents per share, compared with a net loss of $354,000, or 8 cents per share, in the like period a year ago.

■

Intellicorp announced net income of $4.9 million, or 75 cents per share, on revenue of $18.6 million for the year ended June 30. This compares with a net loss of $724,000, or 14 cents per share, on revenue of $8.7 million reported in the previous year.

Net income for the fourth quarter was $3.6 million, or 49 cents per share, on revenue of $5.4 million. This compares with a net income of $340,000, or 6 cents per share, on revenue of $3.4 million for the same period a year earlier.

■

Maxtor Corp. reported revenue for the first quarter ended June 29 of $32.3 million, a 75% increase over revenue of $18.5 million for the like quarter last year. Profits were $4.8 million, or 26 cents per share, up 161% over earnings of $1.8 million, or 16 cents per share, for the first quarter last year.

■

Comsat Corp. announced revenue for the quarter ended June 30 of $120.7 million, compared with $118.9 million in the corresponding period last year. Profits were $14 million, or 77 cents per share, compared with $19.7 million, or $1.08 per share, one year ago.

■

Nashua Corp. announced a 51% increase in net income for the second quarter ended June 27 to $5.8 million, or 60 cents per share, compared with $3.9 million, or 41 cents per share, for the same period last year. Revenue for the quarter was $177.1 million, compared with $153.9 million reported in the same period last year.

■

Pyramid Technology Corp. reported revenue for the third quarter of $10 million, compared with $9.3 million in the like period a year ago. The company reported a net loss of $2.1 million, or 27 cents per share, compared with a net income of $1 million, or 17 cents per share, in the previous year.

■

Applied Magnetics Corp. announced net income for the third quarter of $2.5 million, or 36 cents per share, on revenue of $33.7 million. This compares with net income of $2.6 million, or 39 cents per share, on revenue of $30.1 million reported in the like period a year ago.

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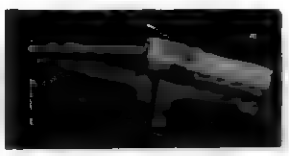
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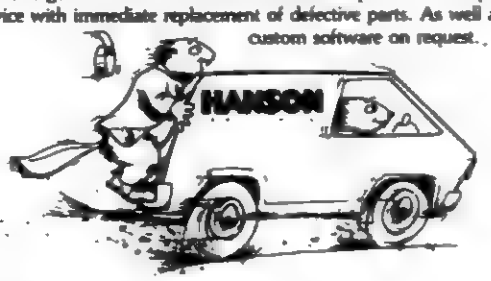
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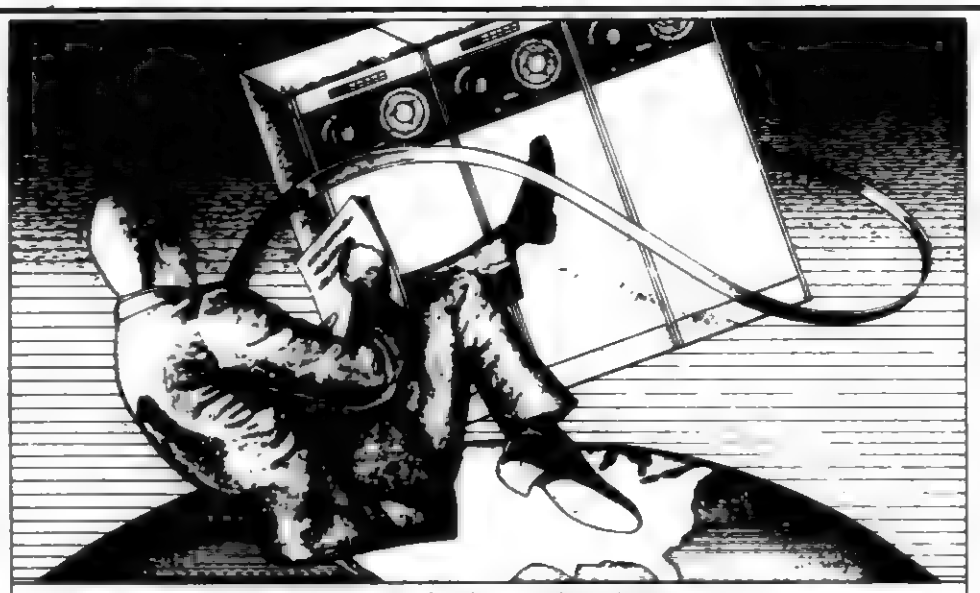
Advancements are constantly being made in the fast-paced computer industry. As a result, businesses are also progressing very rapidly. And many of them depend on **COMPUTERWORLD Classifieds** to keep them on top of their ever-changing needs. Broad coverage and quick solutions make **COMPUTERWORLD** the #1 computer trade newspaper in which to advertise. If you haven't already advertised in **COMPUTERWORLD**, why not become a part of our success and the success of many businesses like yours?

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POSITION ANNOUNCEMENTS



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CompuSearch provides the synergy that brings the right candidate together with the right job. CompuSearch Account Executives are data processing professionals in their own right. They've worked in the industry. They're active in trade organizations. They are in touch with the changes that make this field move.

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The successful candidate must have at least five years experience in assessing and interconnecting computing systems hardware and software for micro, mini and mainframe computers.

An exceptional ability to communicate and negotiate effectively and successfully with levels of management is required.

Ætna offers a competitive salary and generous benefits package. Please send your resume to Fred Traverne, Recruiting, D0520, Ætna Life & Casualty, 151 Farmington Avenue, Hartford, CT 06156. An equal opportunity/affirmative action employer.

Ætna

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We're interested in talking to Software Professionals with:

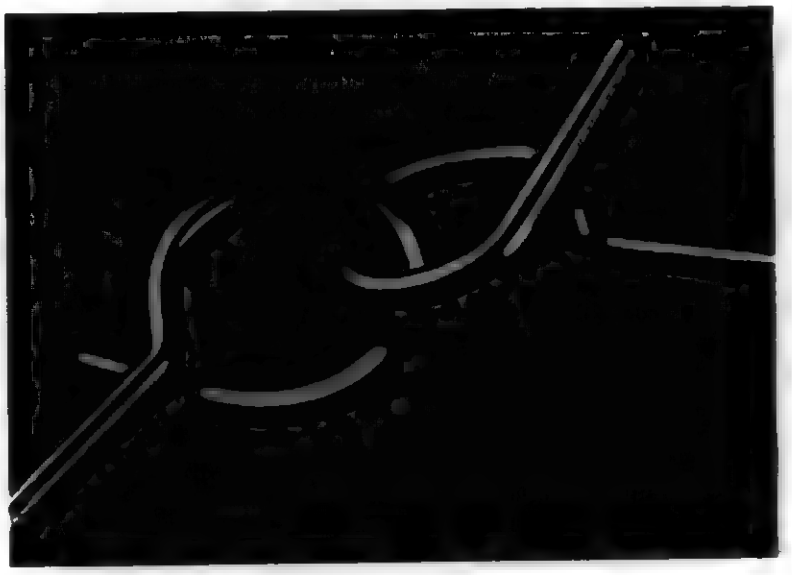
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OPERATING SYSTEMS INTERNALS

CIA ... where our environment challenges your creativity

The Central Intelligence Agency offers a unique opportunity to individuals who like to work with computer operating systems: the chance to use our extensive state-of-the-art resources to realize your ideas.

We are seeking highly talented, highly creative individuals to design and develop custom system software. Using our laboratory-like research facility, you will apply your skills, enhance your systems programming expertise, and develop creative solutions to unique problems.

These one-of-a-kind challenges require the ability to create, install, enhance, and maintain sophisticated computer operating systems and networks.

You must have a degree in Computer Science, Mathematics, or Engineering, assembly language experience, and in-depth knowledge of one or more of the following areas:

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- CDC Network Operating Systems (NOS, NOS/VE)
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In exchange for your contribution, you will receive a competitive salary based on your qualifications, excellent benefits, opportunity for foreign travel, and the satisfaction that comes from contributing to efforts of vital national importance. In addition, you will enjoy living and working in the Washington, D.C. area with its array of cultural, athletic, and historic attractions.

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Written inquiries only. We will respond within 30 days to those judged to be of further interest.

Central Intelligence Agency

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SYSTEMS PROGRAMMING AND TELECOMMUNICATIONS with significant experience working with the internals of one or more of the following products:

MVS, CICS, VTAM, NCP

If you have the necessary experience, the drive to provide leadership to a team of recognized professionals, and seek compensation which recognizes your expertise, please send your résumé or a letter of introduction to **Allen Kirkpatrick, Office of Government Services, Price Waterhouse, 1801 K Street, NW, Department 161, Washington, DC 20006.**

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Be part of critical Internal Database Performance team

As part of Management's commitment to continually upgrade and enhance our Information Systems, The Franklin Mint is looking for a highly proficient technical consultant to join our emerging state-of-the-art large systems database environment.

This position, which reports to the Director of the Data Center, will provide technical consulting for the design and development of FOCUS—based systems. The consulting will include design reviews to ensure excellent service levels in response and batch run times, as well as recoverability and database integrity.

The highly experienced consultant we select will have an 8-10 year background in large computer systems and performance, 2 years of which must have been working with FOCUS. A Bachelor's degree in computer science or equivalent work experience is essential.

Located in a beautiful suburban Philadelphia setting, The Franklin Mint, a $350 + million consumer products company, provides excellent salaries and benefits, along with relocation assistance. Please forward resume, indicating salary history to: **Executive Recruiter, Dept. JTC 728, The Franklin Mint, Franklin Center, PA. 19091.** Equal opportunity employer.



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DEC

- DEC VAX. Banking environment. Applications Prog'rs w/VAX BASIC. 3-5 yrs exp.

Call 212-308-6601
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ROBERT HALF
DATA PROFESSIONALS
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Minneapolis, MN 55402

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Pocatello, Idaho

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Opening for an engineer with experience in layered communications architectures and protocols to develop communications networks. This position will have the responsibility of adapting products to eighteen foreign Public Data Networks, and completion of the plans and implementation of added support for additional versions. Also includes continuing to upgrade and support the released versions.

Requires Bachelors degree in Electrical Engineering or Computer Science. Requires 5 years experience with data communications, including UNIX, DCA, SNA, OSI protocols, layered structures, ISO Standards, CCITT Recommendations, Telcon, CMS, OS1100, VTAM, and Local Area Network hardware and software implementations, and experience with public data networks. Salary $4,166.66 per month.

Submit resumes to: Utah Job Service, #58823, 1234 S. Main Street, Salt Lake City, Utah 84101.

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Senior Hardware Specialists
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Systems and Programming Resources has grown into a top national consulting firm by creating a team of bright and talented people like yourself who have escaped the limited careers of programming. You became a programmer to demonstrate your skills and unique abilities in a variety of professional environments. At SPR, customers and clients come to you for expertise and direction. Why else would we be a leading consulting firm today?

In Chicago, St. Louis, Milwaukee, Tulsa and Dallas, countless MIS shops have found out what calling on SPR and its team of professionals can do for them. If you have at least 2-3 years experience in programming including IBM mainframe business applications and outstanding communication skills, find out what SPR can do for you.

It's not a dull moment too soon to find out more about an exciting consulting career. Call the SPR office nearest you, or send resume in strict confidence to:

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Responsible for design, documentation, testing, training and implementation of complex business systems. Must develop detailed system and program specifications based upon user requirements.

Requires experience in problem definition, business systems design, project management, data base design, coding methods, documentation and systems testing.

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Responsible for designing detailed programming specifications, program development and documentation. Demonstrated analytical skills are required to develop new programs and to modify existing systems. Requires experience with business applications.

Computer Science degree or equivalent experience required. Hardware and software — IBM4361, DOS/VSE with CICS and COBOL. Environment includes personal computers.

We offer competitive salaries with an excellent benefit package, including medical, dental, tuition refund and profit sharing. If you wish to join a growth oriented company, please send your resume and salary history to.

Personnel Manager
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Software Engineering Consultant

COMPUTERPEOPLE DATA SERVICES has an immediate need for a Software Engineering Consultant to join our staff in Columbus, Ohio. The qualified candidate will possess 5+ years of professional experience in:

- C UNIX development environment
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- Software tools and techniques
- Software development methodologies
- Software development life cycles
- Software testing and quality assurance
- Productivity analysis

We require a minimum of a master's degree. PhD preferred. For consideration contact Technical Service Manager, (614) 433-0133, or send your resume including GPA to COMPUTERPEOPLE DATA SERVICES, 50 Northwoods Blvd., Suite B, Worthington, OH 43085. An equal opportunity employer.

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EOE

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The position of Computer Specialist is available in our modern computer center located in lower Manhattan. The successful candidate must have extensive experience in DEC PDP 11/70 and knowledge of MACRO 11 and RXS 11M+. Must be interested in working in assembler code, doing operating system modification, design and frequent design work.

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We offer a competitive salary and benefits package. Please send resume with salary history to.

Box CW 1410
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If you wish to reserve space, or would like more information, call us at 1-800-343-6474 or (in Mass.) 617-879-0700. All materials should be sent to:

COMPUTERWORLD Classifieds
Box 9171
Framingham, MA 01701-9171

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UNIVERSITY OF WISCONSIN-PLATTEVILLE
Coordinator of Academic Computing

The UWP University Computing Services is searching for an academic computer specialist to serve as the Coordinator of Academic Services. The position is in direct support of all university computing activities. The environment for academic computing, supported by a DEC LAN composed of an 11/780 and two 8300's, an IBM 4361, several microcomputer laboratories, and word processing laboratories utilizing DECmate WPS, requires an individual who is innovative and one who welcomes a challenge.

Minimum qualifications include a Bachelor's degree in Computer Science, Engineering, Mathematics, or related fields, and a knowledge of networking. A Masters degree with a minimum of two years experience programming in BASIC or COBOL, and a knowledge of microcomputing, in particular IBM pc's is desired. Effective oral and written communication skills are essential.

For consideration for the position, please submit a current resume, salary requirements, and names and addresses of three references to the Search and Screening Committee, c/o Jeanne E. Johnson, Director of University Computing, University of Wisconsin-Platteville, 1 University Plaza, Platteville, WI 53818. Information should be postmarked no later than August 1, 1986. Position availability is September 1, 1986 or as soon as possible.

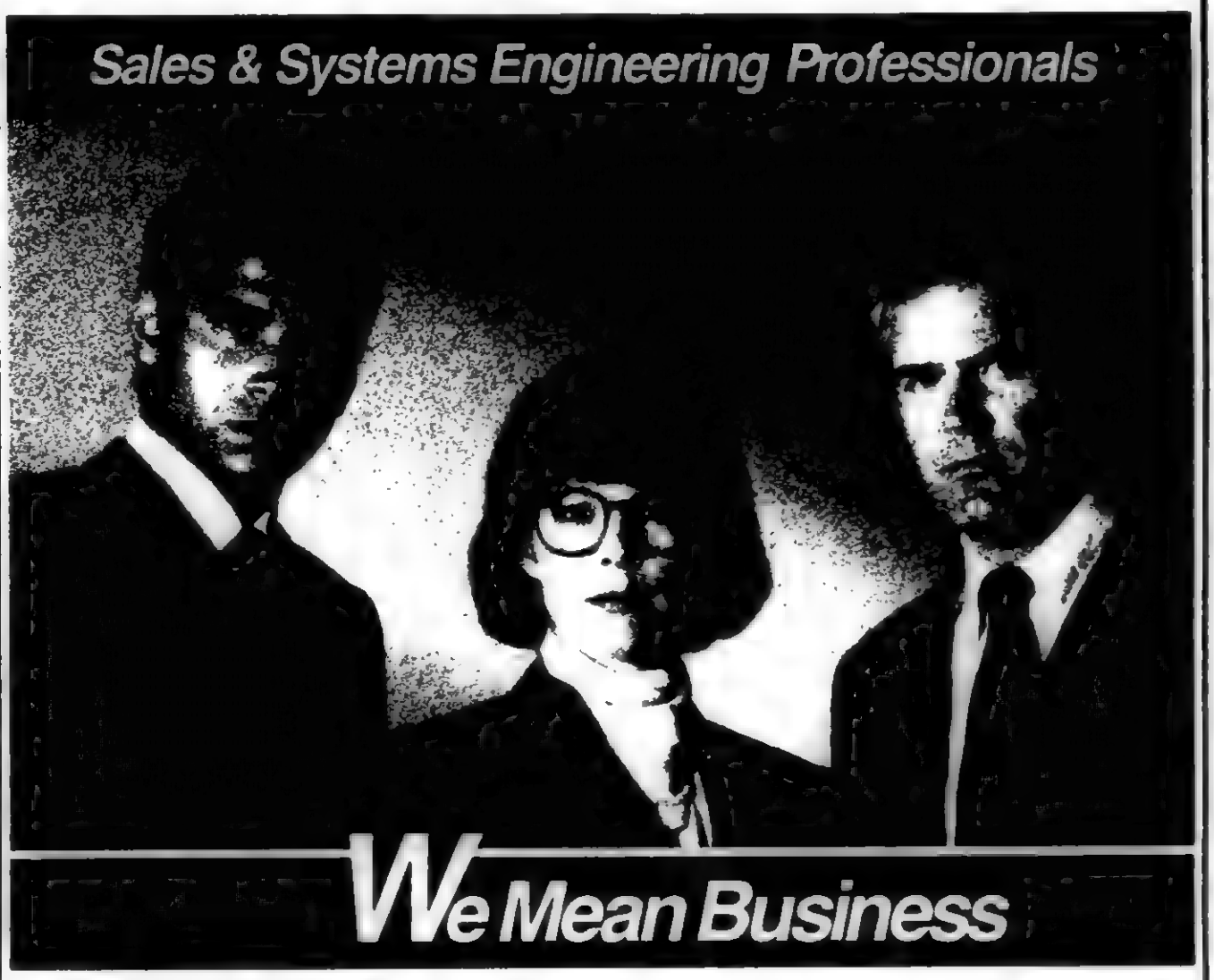
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Rapidly growing, Cincinnati-based turnkey systems supplier to the Computer Integrated Manufacturing (CIM) market requires a talented data communications specialist. The successful candidate will design and develop integrated hardware/software solutions to interconnect a wide range of systems in the automated factory environment. BS-EE or Computer Science degree required. A strong background in data communications (IBM, DEC, HP, MAP, etc.) and "C" or assembler programming is required. UNIX experience is a plus. A proven track record of high-quality work will be your key to success in this challenging environment. We are a subsidiary of one of the Silicon Valley's most successful companies. Please respond with resume to

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7209 Dixie Highway
Fairfield, OH 45014

Senior Software Design Engineer. 40 hrs./wk. (8:30 - 5:30). Duties are: Provide a B20/B25 micro to B6000/7000/A series mainframe host integration design involving DMSII Host Database access and usage capabilities to B20/B25 workstations, Burroughs Large systems Disk and Tape Input-Output capabilities/ access to B20/B25 micro users, Burroughs Mainframe System information (Operator Display Terminal) access capabilities at the micro workstation, access to Burroughs Office Automation systems (OMSII) from the B20/B25 micro; interface B20/B25 workstations to B6000/7000/A series hosts with Bi-sync, Poll/select, Group poll and Poll/contention protocols; modify protocols to improve response time and low level error recovery mechanisms, manage a project team of software design engineers in design, implementation and installation of micro to mainframe bridge software. Must have B.S. in telecommunications engineering, 3 yrs. experience as Systems Engineer or Specialist, including work with Burroughs large systems and B20/B25 communications software; work with Burroughs B6000/7000/A series systems software in network (NDL/MCP), database (MDS II) and systems software (MCP) areas; work with Burroughs communications software (BNA/t, MTEmulator, DTS) on Burroughs B20/B25 workstations; design work with protocols (Bisync, Burroughs Poll/select, Group poll and Poll/contention) for computer to computer interconnection and terminal to computer interfacing; work with B20/B25 to B6000/7000/A series micro to mainframe bridges, and; work as project manager leading project teams in development of online/real time systems and in design, implementation, and management of large mainframe networks. Salary $42,000 per year. Employer paid ad. Send resume to 7310 Woodward Avenue, Room 415, Detroit, Michigan 48202. Reference No. 41188.



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We're adding significant numbers of Sales Representatives and Systems Engineers because we mean business. And we're adding more Engineers than Representatives because the best salesperson is only as good as their product and the support people who can solve their customers' problems.

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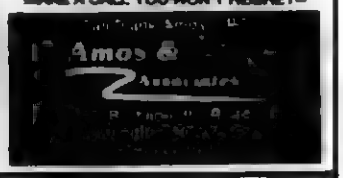
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Responsibilities include systems analysis and design, data base design and implementation. Requirements include: B.S. degree or equivalent; excellent communication skills; four years of practical work experience, at least two years of experience must have been as a programmer/analyst, experience in a University environment designing student and financial information systems is highly desirable.

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APR

SENIOR PROGRAMMER ANALYST

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Qualified candidates will possess a bachelor's degree in business, computer science, finance or related field and eight years of progressively responsible experience in information systems development and implementation. At least two years experience in a hospital setting strongly preferred. Experience with IBM hardware and software highly desirable.

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SULTANATE OF OMAN

The Royal Oman Police are a large national force. In addition to law enforcement functions they are also responsible for Customs, Immigration and Vehicle/Driver Licensing. Hardware includes a dual 4361 configuration running MVS/JES2/IMS/CICS, and Wang VS equipment. The Directorate of Computers is housed in a prestigeous new purpose-built computer centre. In order to maintain its position as one of the top Gulf installations, dynamic and dedicated professionals are required as follows:

1. **APPLICATIONS DEVELOPMENT MANAGER (US$35,100 p.a.)**
Minimum of eight years in a large IBM applications environment. Must lead by example, having managed at least one major IMS-/CICS project from start to finish. Thorough working knowledge of CICS, IMS 1.3, MVS/SP, COBOL, PL/I and MVS JCL. Commitment to standards, documentation and meeting timescales.

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3. **SENIOR SYSTEMS PROGRAMMER (US$25,775 p.a.)**
At least five years IBM systems programming experience of which the last three must have been in an MVS/CICS/IMS environment. Expert knowledge of CICS 1.6 internals and IMS 1.3 with DBRC required, as is fluency in Assembler and Command and Macro Level CICS.

4. **OPERATIONS SUPERVISOR (US$25,775 p.a.)**
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5. **SENIOR ANALYST/PROGRAMMER (US$25,775 p.a.)**
At least five years IBM applications experience, of which the last three must have been in an online MVS installation. Thorough experience in developing COBOL and/or PL/I applications in an IMS-/CICS realtime environment. Able to undertake analyse work with a minimum of supervision, and work to strict implementation and documentation standards.

6. **DEVELOPMENT CO-ORDINATOR (US$25,775 p.a.)**
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Applications with detailed curriculum vitae attached and contact telephone number (s) should be mailed so as to arrive not later than 15. August 1986.

Address applications to:

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ATTN. ASSISTANT INSPECTOR GENERAL (DGP),
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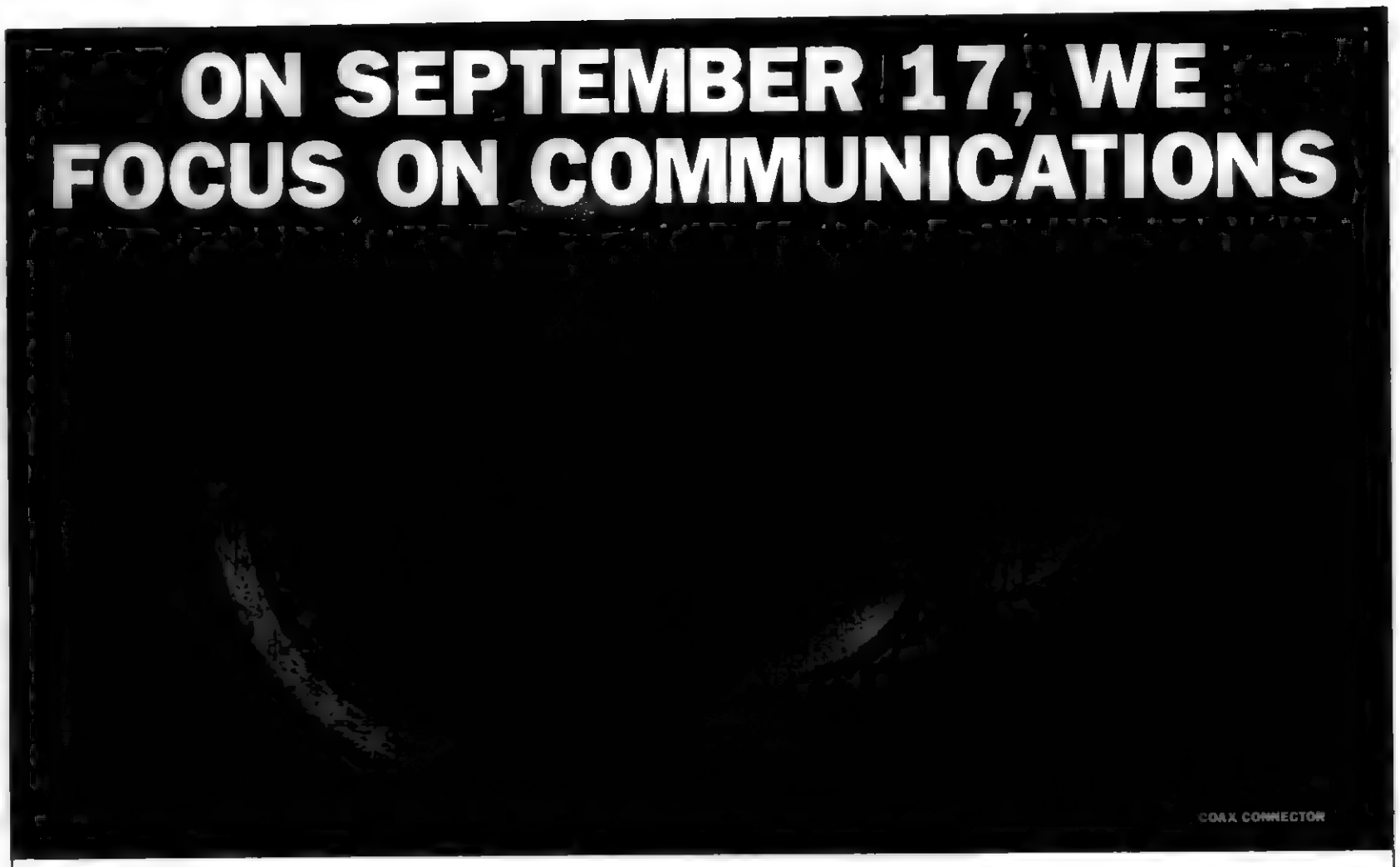
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We'll discuss Lans and the most effective implementations. And we'll wrap up our special section with a look at issues like connectivity and compatability, and strategies for getting the most of existing equipment while planning for the future.

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High-end firms still in slump

From page 110

Analysts, however, were not as optimistic. "Some orders for the 5890 are drying up as customers purchase the 5880 on the assumption that they'll trade up at a later date," noted Louis Giglio of Bear Stearns Cos. "People who are looking for a big revenue kick in the fourth quarter might be in for a surprise."

Control Data. CDC narrowed its losses in the second quarter, posting a $7.8 million deficit after a loss of $21.4 million in the first quarter. A spokeswoman said CDC expects to reach the break-even point some time in 1986, although she said the firm was not predicting when it would report a quarterly profit.

The Minneapolis firm's computer business was responsible for a $16.4 million operating loss in the second quarter. Overall revenue declined 10% to $828.5 million from the like period last year.

Data General. Chairman Edson D. de Castro said DG's performance in its third fiscal quarter was consistent with the firm's expectations. The Westboro, Mass., firm recorded a net loss of $2 million on a 14% revenue increase to $325.3 million.

The firm reported an operating profit of $200,000 for the quarter, after taking an $11 million charge for estimated expenses incurred in closing its Hong Kong and Austin, Texas, manufacturing facilities.

Now 'just cautious'

A DG spokesman said the firm has not made a projection on when it would return to profitability. "While we once might have said we are cautiously optimistic, we're now saying we're just cautious," the spokesman said.

Wang. Lowell, Mass.-based Wang, which has been reeling from domestic order weakness and is cutting overhead, eked out an $800,000 profit in the quarter, which contributed to a fiscal 1986 net profit of $50.9 million on revenue of $2.6 billion.

But the quarterly profit resulted from accounting adjustments and the sale of a variety of items, including real estate, which increased net by $19 million and $14 million, respectively. The extraordinary gains were partially offset by a $10 million charge in connection with the company's "voluntary separation" and early retirement plans disclosed earlier this month.

Fourth-quarter performance was helped by a 32% increase in international revenue, owing to a weaker U.S. dollar. Domestic revenue was flat, the firm said.

Wang posted a $109 million net loss in the like quarter a year ago. In fiscal 1985, the firm earned $15.5 million on revenue of $2.3 billion.

Prime. Although the Natick, Mass., firm experienced a surge in orders that it was unable to ship before the end of the quarter, Chairman Joe M. Henson said it was unclear what that portends for the future. "The seasonally weak nature of the third quarter, the weak level of capital spending in the U.S. and the overall economic and industry uncertainty dictate that we remain cautious in our expectations."

In the second quarter, orders increased 22% from the year-earlier period. Orders for CAD/CAM software products increased 45% during the comparable period in 1985.

The strong second quarter boosted first-half revenue to $407.3 million, a 10% increase over the like period last year. Net income for the first half, however, was $20.6 million, down 17% from the same period in 1985.

Stratus. Marlboro, Mass.-based Stratus posted sales of $30 million in the second quarter, a 62% increase over the like period last year. First-half earnings nearly doubled to $6.3 million.

President William E. Foster said the fault-tolerant computer maker met its financial goals in the period.

Tandem. President James Treybig said the Cupertino, Calif., firm's strong third fiscal quarter, in which earnings increased 659% to $18.1 million on revenue of $200 million, resulted from the introduction of new products. He cited the Nonstop VLX system and improvements in Tandem's marketing organization.

Prospects for continued growth, however, are tied to an improvement in the general demand for computer equipment, Treybig said.

Convergent Technologies Corp. San Jose, Calif.-based Convergent continues to struggle in the aftermath of its aborted merger with 3Com Corp. and a decline in business from major OEM customer AT&T. The firm reported a second-quarter loss of $5.1 million, including a nonrecurring charge of $3.4 million, which Convergent said resulted from the resolution of a dispute with an OEM customer. That customer is believed to be AT&T.

The second quarter net loss created a first-half deficit of $3.2 million on revenue of $131.5 million. The firm earned $2.6 million in the comparable period last year on revenue of $193.7 million.

OEM channel won't sustain growth

"Their traditional OEM channel strategy, while successfully taking them to a high level of revenue, is not sufficient to sustain growth," noted Bruce Lupatkin, an analyst at Hambrecht & Quist. "The value-added reseller channel probably won't begin contributing significantly for another six months."

Electronic Data Systems Corp. EDS, the General Motors Corp. computer services subsidiary, turned in another strong performance resulting from increased business both within and outside of GM. Second-quarter profit rose 48% to $62.7 million, bringing first-half net to $118.3 million, up 47% from the comparable period in 1985.

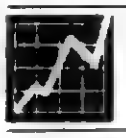
Revenue for the period increased to $1.07 billion, contributing to a first-half 43% revenue gain to $2.06 billion.

Among the factors contributing to the strong results were contracts with the Georgia Department of Medical Assistance, Guarantee Group, Inc., Ameritech Services and the Vermont Department of Social Welfare.

Intecom, Inc. The private branch exchange maker, which has agreed to be acquired by Wang, recorded a second-quarter loss of $19.8 million on a 13% revenue decline to $24.1 million.

The Allen, Texas, firm said $12.4 million of the loss resulted from a litigation settlement, lower revenue volume and legal expenses relating to the acquisition paid to ANI, Inc. of Portland, Ore.

CAD/CAM vendors' recovery slow but remains intact



ACTIVE ISSUES
Kathy Porteus

If one judged the recovery status of Daisy Systems Corp. (DAZY — 8) and Computervision Corp. (CVN — 10¾) on the basis of recent stock performance, it would seem these turnaround stories have dried up. But according to analysts, the recovery scenario for these companies remains intact despite frustrating industry conditions.

From a high of 30¼ in January, Daisy now trades under 10, reflecting internal problems in shipping new products and continued industry sluggishness. Enthusiasm for Computervision's long overdue workstation product carried the stock to a high of 18¼ in late April, but mixed product reviews and lower capital spending expectations have since pushed down the stock's price.

"For anyone in the engineering workstation business, the going is now generally tougher than it was perceived to be two or three months ago," says Jay Cooper, an analyst with Eberstadt Fleming, Inc. Thus the recovery for Computervision and Daisy is "proceeding a lot more slowly than expected," he says.

More than the capital spending outlook, internal developments have hampered Daisy's recovery, Cooper observes. According to Cooper, commercial deliveries of Daisy's Logician VX, the workstation product based on Digital Equipment Corp.'s Microvax II, are running four to five months behind schedule and probably will not begin until October or November. Beta-test units should be shipped during the current quarter.

Peter Schleider, analyst with L. F. Rothschild, Unterberg Towbin, says the departure two weeks ago of David Stamm, Daisy cofounder and executive vice-president, casts further doubt on the delivery date of Logician VX. "The last calendar quarter is as good a guess as any," Schleider says, "but with Dave's departure, it makes you feel less comfortable." Eberstadt's Cooper says Stamm's resignation provides little indication of Daisy's new product delivery status.

The interest in Daisy's new product deliveries stems from widespread belief that such products are key to the company's near-term recovery. The lack of consensus among analysts as to when Daisy begins commercial delivery is evidenced by the range of Wall Street earnings estimates. According to Zachs Investment Research of Chicago, the current spread of earnings estimates for Daisy's next fiscal year, ending Sept. 30, 1987, is 15 cents to $1.25 per share.

John Rohal, analyst with Alex Brown & Sons, recommends Daisy as a "speculative buy. Investors should be sensitive to the issues, but, on the other hand, I still think Daisy is one of the primary players in what is going to be a very attractive market," Rohal says. He says Computervision's recovery story still has too much "execution risk."

Although Rothschild's Schleider remains neutral on Computervision, he says he has changed his long-standing negative opinion about the company. Based on conversations with beta-site users, Schleider says Computervision is executing a strategy that will enable the company's CADDS 4X software to run on three different hardware platforms. The company's new Caddstation, based on a Sun Microsystems, Inc. workstation, is the first step in this long-term strategy.

Over a period of years, Schleider continues, Computervision will essentially become an applications software company. He says the market has elbowed out traditional computer-aided design and manufacturing turnkey business and adopted hardware standards of IBM and DEC. "Computervision is a good, long-term buy if purchased at 10 or 11," Schleider says.

Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

Software vendors up in downturn

From page 110

Jr. of Prudential-Bache Securities, Inc. "In an environment of severely restrained hardware spending and data center budgets, any product that allows the data center manager to extract more from his resources will sell well."

Software AG's profits nearly doubled in the fourth quarter ended May 31 on sales that grew 33%. For the fiscal year, Software AG said earnings grew 66% to $8.5 million, and sales grew 26% to $65.7 million.

Taylor said that while sales of Software AG's flagship data base product, Adabas, grew less than 10% in the past two quarters, sales of end-user applications such as electronic mail and decision support have doubled. "Their gains all have come from an intelligent move to start to diversify away from data base management in general," he said.

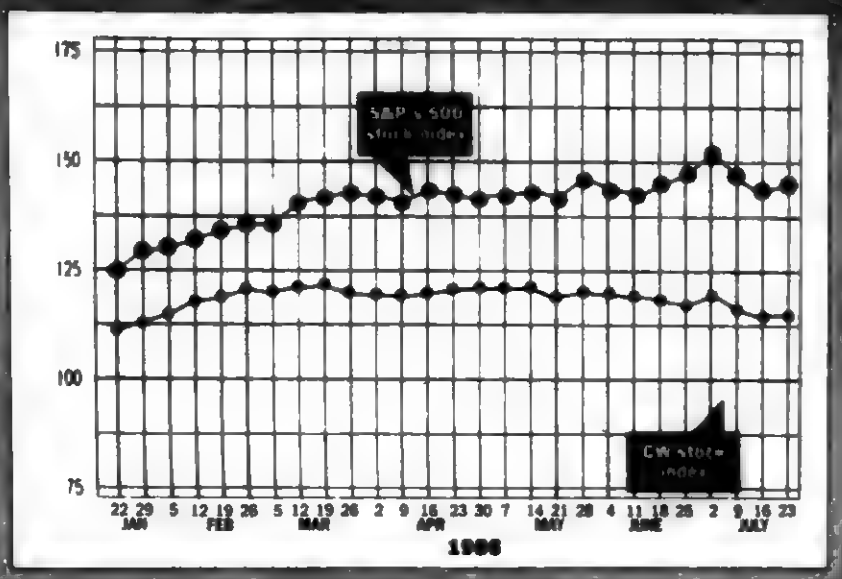
Separately, leading independent computer leasing firm Comdisco, Inc. reported a lower than usual 10% earnings gain on a 50% revenue increase. The results could signal lower margins in the leasing industry as leasing firms seek a competitive edge in a market squeezed by the expected repeal of the investment tax credit.

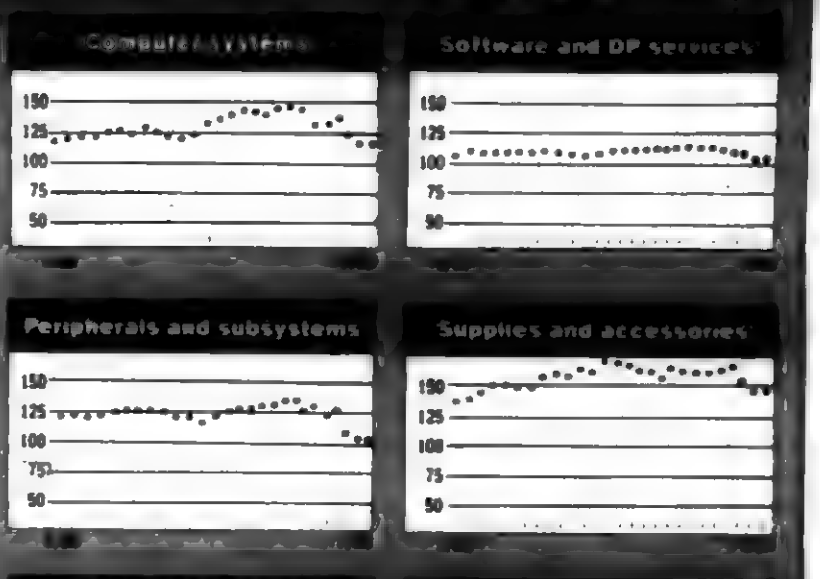
Comdisco reported third-quarter profits of $19.7 million, or 48 cents per share, on sales of $224.4 million.

COMPUTER INDUSTRY

MITCHELL J. HAYES

Computerworld stock trading index





	7/16/86	7/23/86
Computer systems	114.0	**114.8**
Software and DP services	101.1	**101.7**
Peripherals and subsystems	101.4	**101.1**
Supplies and accessories	145.2	**147.1**
Semiconductors	80.1	**80.5**
Leasing companies	97.3	**97.7**
CW stock index	112.6	**112.7**
Standard and Poor's 500 stock index	140.5	**142.7**

Computerworld stock trading summary

CLOSING PRICES WEDNESDAY, JULY 23, 1986

EXCH		52-WEEK RANGE (1)		CLOSE JULY 23 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS					
O	ALPHA MICROSYSTEMS	8	5	5.50	+0.1	+2.3
O	ALTOS COMPUTER SYS	19	10	13.63	+0.1	+0.9
A	AMDAHL CORP	19	10	17.25	+0.4	+2.2
O	APOLLO COMPUTER INC	23	9	10.88	+0.3	+2.4
O	APPLE COMPUTER INC	39	14	34.13	+0.6	+1.8
N	AT&T	26	20	23.75	-0.3	-1.0
N	BURROUGHS CORP	72	52	64.75	-2.3	-3.4
O	C P T CORP	7	4	4.25	+0.1	+3.0
N	COMPAQ COMPUTER CORP	18	8	12.75	+0.5	+4.1
A	COMPUTER CONSOLES INC	12	6	7.88	-0.1	-1.6
O	CONCURRENT COMP CORP	25	1	13.25	-0.5	-3.6
N	CONTROL DATA CORP DEL	28	15	22.13	-0.6	-2.7
O	CONVERGENT TECH	14	6	6.75	+0.0	+0.0
N	CRAY RESH INC	100	44	89.63	+3.3	+3.8
O	DAISY SYS CORP	32	8	8.38	+0.0	+0.0
N	DATA GEN CORP	50	31	33.00	+0.4	+1.1
N	DATAPOINT CORP	13	5	7.38	+0.4	+5.4
N	DIGITAL EQUIP CORP	94	49	87.00	+3.0	+3.6
N	ELECTRONIC ASSOC INC	7	4	4.25	+0.3	+6.3
N	FLOATING POINT SYS INC	46	18	18.50	-15.4	-45.4
N	GOULD INC	38	15	16.88	-1.0	-5.6
N	HARRIS CORP DEL	36	22	33.50	+0.1	+0.4
N	HEWLETT PACKARD CO	48	29	38.75	+2.4	+6.5
N	HONEYWELL INC	87	59	85.88	-3.1	-4.5
N	IBM	162	122	133.13	+0.0	+0.0
O	IPL SYS INC	4	1	3.00	+0.0	+0.0
N	ITT CORP	60	31	54.25	+1.3	+2.4
N	M A COM INC	23	13	14.25	-2.0	-12.3
N	MATSUSHITA ELEC INDL LTD	100	49	78.63	-2.9	-3.5
O	MENTOR GRAPHICS CORP	22	12	13.50	+1.1	+9.1
N	MODULAR COMPUTER SYS	9	6	8.88	+0.0	+0.0
N	MOHAWK DATA SCI CORP	4	1	2.25	-0.3	-10.0
N	NBI INC	20	10	10.88	-0.6	-5.4
N	NCR CORP	57	31	90.25	+0.1	+0.2
N	PRIME COMPUTER INC	28	15	18.63	+2.3	+13.7
N	SPERRY CORP	76	46	75.38	+0.1	+0.2
O	STRATUS COMPUTER	26	15	19.25	+0.5	+2.7
O	SYMBOLICS INC	16	7	7.63	+0.4	+5.2
O	TANDEM COMPUTERS INC	34	13	33.75	+5.0	+17.4
N	TANDY CORP	45	30	34.50	+1.1	+3.4
N	TEXAS INSTRS INC	148	88	104.63	-6.1	-5.5
A	ULTIMATE CORP	35	11	22.50	-0.1	-0.6
A	WANG LABS INC	23	12	13.50	+0.5	+3.8
A	WANG LABS INC	23	11	13.13	+0.1	+1.0
N	XEROX CORP	72	46	52.63	+1.8	+3.4
	SUPPLIES & ACCESSORIES					
N	AMER BUSINESS PRODS	37	25	32.38	-0.8	-2.3
N	BARRY WRIGHT CORP	25	17	18.38	+0.6	+3.5
A	DUPLEX PRODS INC	22	17	20.25	+1.4	+7.3
N	ENNIS BUSINESS FORMS INC	28	15	23.75	-0.3	-1.0
N	3M CO	115	74	110.38	+4.1	+3.9
N	MOORE LTD	28	18	25.13	-0.3	-1.0
O	STANDARD REGISTER CO	50	30	37.25	+0.3	+0.7
N	WALLACE COMPUTER SVCS	50	33	46.00	-0.3	-0.5

EXCH		52-WEEK RANGE (1)		CLOSE JULY 23 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & DP SERVICES					
O	ADVANCED COMP TECH	7	3	4.88	+0.0	+0.0
N	ADVANCED SYS INC	20	11	17.38	+0.8	+4.5
N	AGS COMPUTERS INC	25	14	17.88	+0.1	+0.7
O	AMERICAN MGMT SYS INC	20	7	16.75	+0.3	+1.5
O	AMERICAN SOFTWARE INC	15	9	12.38	+0.1	+1.0
N	ANACOMP INC	7	3	5.38	+0.4	+7.5
O	ANALYSTS INTL CORP	10	5	5.25	-0.3	-4.5
O	ASHTON TATE	34	10	23.75	-0.9	-3.6
O	ASK COMPUTER SYS INC	15	7	9.63	-0.3	-2.5
O	ASTRADYNE COMP IND	3	1	1.31	-0.1	-4.6
N	AUTOMATIC DATA PROC	38	18	33.38	+2.3	+7.2
O	COMPUTER ASSOC INTL INC	25	10	20.75	+0.8	+3.8
O	COMPUTER HORIZONS CORP	15	10	11.00	-0.3	-2.2
O	COMPUTER NETWORK TECH	10	2	6.56	-0.4	-5.4
N	COMPUTER SCIENCES CORP	40	19	34.00	+0.3	+0.7
O	COMPUTER TASK GROUP INC	19	11	12.75	+0.0	+0.0
O	COMPUTONE SYS INC	7	2	2.63	-0.1	-4.5
O	COMSHARE INC	13	9	12.00	+0.0	+0.0
N	CULLINET SOFTWARE INC	27	10	10.88	-0.4	-3.3
O	CYCARE SYS INC	17	10	12.13	+0.1	+1.0
O	DUQUESNE SYS INC	46	11	29.00	+2.3	+8.4
N	GENERAL ELEC CO	83	56	75.00	-0.5	-0.7
N	GENERAL MTRS CORP	50	33	43.63	+0.4	+0.9
N	GTE CORP	56	38	56.00	+0.3	+0.5
O	HOGAN SYS INC	12	4	10.50	-0.1	-1.2
O	INFORMATION SCIENCES INC	4	1	3.00	+0.0	+0.0
O	INFOTRON SYS CORP	23	12	12.00	-1.0	-7.7
O	KEANE INC	19	8	8.75	-5.3	-37.5
N	LOGICON INC	43	27	27.50	-0.8	-2.7
O	LOTUS DEV CORP	39	15	32.88	-2.6	-7.4
O	MANAGEMENT SCI AMER	16	8	14.25	+1.3	+9.6
O	MCI COMM CORP	13	8	9.63	-0.3	-2.5
O	MICOM SYS INC	23	11	11.25	-0.5	-4.3
O	MICRO PRO INTL CORP	4	2	2.38	+0.1	+5.6
O	MICROSOFT CORP	36	26	30.00	+1.0	+3.4
O	NATIONAL DATA CORP	26	11	18.88	+1.5	+8.6
O	ON LINE SOFTWARE INT	16	6	12.50	+0.8	+6.4
O	ORACLE SYS CORP	29	17	17.75	+0.0	+0.0
N	PANSOPHIC SYS INC	36	18	28.75	-0.5	-1.8
N	PLANNING RESH CORP	24	14	19.13	+1.9	+10.9
O	POLICY MGMT SYS CORP	24	15	16.25	+1.0	+6.6
O	PROGRAMMING & SYS INC	11	5	9.00	+0.4	+4.3
O	REYNOLDS & REYNOLDS CO	35	18	31.50	+1.5	+5.0
O	SCIENTIFIC COMPUTERS INC	8	4	4.44	+0.1	+1.4
O	SEI CORP	28	16	16.00	+0.0	+0.0
O	SHARED MED SYS CORP	41	29	32.63	+0.3	+0.8
O	SOFTWARE AG SYSTEMS INC	22	13	17.38	+0.0	+0.0
O	SOFTWARE PUBG CORP	12	5	8.50	+1.1	+20.9
A	STERLING SOFTWARE INC	21	7	17.75	+0.4	+2.2
N	UCCEL CORP	23	13	20.25	+0.3	+1.3
N	URS CORP	18	10	18.13	-0.1	-0.8
O	VM SOFTWARE INC	32	17	27.00	+1.0	+3.8
	SEMICONDUCTORS					
N	ADVANCED MICRO DEV	24	14	14.63	+0.1	+0.9
N	ANALOG DEVICES INC	25	14	16.75	+1.0	+6.3
O	ANALOGIC CORP	16	11	10.63	-0.5	-4.5
N	APPLIED MAGNETICS CORP	20	12	14.25	-1.0	-6.6
O	AVANTEK INC	24	17	17.25	-0.1	-0.7
O	HADCO CORP	7	4	4.50	-0.3	-5.3
O	INTEL CORP	32	17	18.00	-0.4	-2.0
O	MICRO MASK INC	8	3	4.25	+0.5	+13.3
N	MOTOROLA INC	50	28	36.75	+1.6	+4.6
N	NATIONAL SEMICONDUCTOR	16	9	9.25	-0.3	-2.6
N	TERADYNE INC	30	17	19.50	+0.4	+2.0

EXCH		52-WEEK RANGE (1)		CLOSE JULY 23 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	PERIPHERALS & SUBSYSTEMS					
A	AM INTL INC	9	3	6.63	-0.4	-5.4
A	ANDERSON JACOBSON INC	3	2	2.25	+0.1	+5.9
O	AST RESH INC	33	11	11.75	+0.3	+2.2
O	AUTOTROL CORP	10	6	7.25	-0.6	-7.9
O	AVANT GRADE COMPUTING	10	3	3.88	+0.1	+3.3
O	BANCTEC INC	13	7	8.38	+0.9	+11.7
N	BOLT BERANEK & NEWMAN	48	27	39.38	-0.6	-1.6
O	CAMBEX CORP	2	1	1.00	+0.0	+0.0
N	CENTRONICS DATA COMP	8	3	6.75	-0.1	-1.8
A	CETEC CORP	9	6	6.88	-0.3	-3.5
A	COGNITRONICS CORP	6	4	3.88	+0.0	+0.0
N	COMPUGRAPHIC CORP	30	19	19.13	+0.0	+0.0
N	COMPUTERVISION CORP	19	9	11.50	-0.3	-2.1
N	CONRAC CORP	18	11	15.25	+0.5	+3.4
A	DATAPRODUCTS CORP	18	11	14.00	-0.6	-4.3
A	DATARAM CORP	18	5	7.75	+0.6	+8.8
O	DATA SWITCH CORP	9	4	6.38	-0.1	-1.9
O	DATUM INC	7	5	5.75	+0.1	+2.2
N	DECISION INDS CORP	15	9	9.50	1.6	-14.6
O	EXIDATA INC	8	3	5.38	-0.8	-12.2
O	EVANS & SUTHERLAND	27	15	20.13	-0.3	-1.2
N	FLOATING POINT SYS INC	46	18	18.50	-15.4	-45.4
O	GANDALF TECHNOLOGIES	8	5	6.25	-0.1	-1.0
N	GENERAL DATACOMM IND	15	8	10.50	-0.3	-2.3
N	HAZELTINE CORP	30	16	17.50	-2.0	-10.3
O	ICOT CORP	13	6	9.63	-0.1	-1.3
O	INFORMATION INTL INC	18	10	16.25	+0.0	+0.0
O	INTECOM INC	7	3	4.69	+0.1	+2.7
O	INTERLEAF INC	15	9	10.00	+0.0	+0.0
O	MEGADATA CORP	5	3	3.44	-0.2	-5.2
A	MSI DATA CORP	14	8	11.38	+0.4	+3.4
N	NASHUA CORP	28	12	24.25	+1.4	+6.0
O	NETWORK SYS CORP	27	10	11.88	+0.9	+8.0
N	NORTH AMERN PHILIPS CORP	48	32	39.50	+0.4	+1.0
N	NORTHERN TELECOM LTD	39	25	27.75	+0.4	+1.4
O	NOVELL INC	21	9	18.00	-0.5	-2.7
O	OMEX	1	0	0.63	+0.0	+0.0
N	PARADYNE CORP	13	6	7.13	+0.3	+3.6
A	PENRIL CORP	10	5	5.50	-0.3	-4.3
N	PLESSEY PLC	38	19	32.00	+0.1	+0.4
O	PRINTRONIX INC	15	10	11.88	-0.1	-1.0
O	QMS INC	16	8	13.75	+0.6	+4.8
O	RAMTEK CORP	7	2	5.13	+0.0	+0.0
N	RECOGNITION EQUIP INC	17	8	12.00	+0.8	+8.7
N	SANDERS ASSOC INC	63	29	59.75	+0.3	+0.4
O	SCAN TRON CORP	24	12	17.75	+0.0	+0.0
N	SCIENTIFIC ATLANTA INC	15	9	9.00	-0.5	-5.3
O	SEAGATE TECHNOLOGY	14	5	11.75	+0.4	+3.3
N	STORAGE TECHNOLOGY	7	1	3.00	+0.1	+4.3
O	SUN MICROSYSTEM INC	20	12	15.25	+2.1	+16.2
A	T-BAR INC	7	5	5.75	+0.5	+9.5
A	TAB PRODS CO	15	10	13.75	+0.0	+0.0
O	TANDON CORP	8	3	4.75	-0.3	-5.0
A	TEC INC	11	4	4.50	+0.4	+9.1
N	TEKTRONIX INC	66	47	56.13	-0.6	-1.1
O	TELEVIDEO SYS INC	4	2	3.13	-0.1	-3.8
N	TELEX CORP	68	40	56.50	+3.8	+7.1
N	TIMEPLEX INC	24	14	15.38	-0.5	-3.1
N	TITAN CORP	12	8	8.13	-0.9	-9.7
O	VISUAL TECHNOLOGY INC	2	0	0.56	+0.1	+12.4
O	WYSE TECH	19	7	14.00	+0.3	+1.8
	LEASING COMPANIES					
N	COMDISCO INC	25	11	19.25	+1.0	+5.5
N	CONTINENTAL INFO SYS	12	5	9.75	+0.3	+2.6
O	FINALCO GROUP INC	5	3	3.25	+0.0	+0.0
O	PHOENIX AMERN INC	6	2	3.75	+0.0	+0.0
O	SELECTERM INC	12	6	6.31	-0.2	-2.9
N	U.S. LEASING	46	32	39.00	-1.0	-2.5

EXCH: N=NEW YORK; A=AMERICAN; P=PACIFIC; B=BOSTON; I=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER

O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

COMPUTER INDUSTRY

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INSTANT ANALYSIS

"We continue to believe that the industry is unlikely to get firmly back on its feet again much before the second half of 1987."

— Stephen K. Smith, Paine Webber, Inc.

High-end firms still in slump

Wang, Amdahl suffer in sluggish domestic market

By Alan Alper

NEW YORK — Following a trend set by IBM, Honeywell, Inc. and Sperry Corp. [CW, July 21], large computer hardware firms continued to report generally sluggish financial results last week.

High-end hardware seems to be suffering more than other sectors of the industry. Amdahl Corp. reported a small revenue gain and profits decline, and Control Data Corp., although narrowing its losses, still reported a decline in revenue, attributed in part to softer domestic demand for mainframe computers.

Mid-range computer makers, with the notable exceptions of Data General Corp. and Wang Laboratories, Inc., reported fairly strong results. Prime Computer, Inc., Stratus Computer, Inc. and Tandem Computers, Inc. showed revenue increases of anywhere from 12% to 62% for the quarter.

Stratus and Tandem, in particular, posted hefty profit gains, while Prime, citing continued investments in research and development, sales personnel and computer-aided design and manufacturing, reported a slight decline in earnings.

"These are companies doing well in niche markets," noted Donald Haback, a Great Neck, N.Y., independent consultant who was formerly with Smith Barney, Harris Upham & Co. "Prime, for instance, has emphasized CAD/CAM and has done a good job winning business in that area."

Leading companies reporting results for the quarter ended in June were the following:

Amdahl. President John C. Lewis said that although revenue growth was slight and earnings lower in the second quarter, results should turn stronger later this year when the firm's 5890 large-sale processor enters production.

See HIGH-END page 108

Software key in IBM/Fujitsu talks

By Edward Warner

ARMONK, N.Y. — IBM has confirmed that its current secret arbitration talks with Fujitsu Ltd. center only on Fujitsu's alleged copying of IBM's MVS/XA software, putting to rest worries of vendors planning to market Fujitsu mainframes. No Fujitsu hardware is involved in the dispute, an IBM spokesman confirmed.

Both Siemens AG of West Germany and Amdahl Corp. of Sunnyvale, Calif., are said to be considering the addition of the Fujitsu M-780 mainframe to their product lines. Siemens has had talks with Fujitsu regarding the machine, and Amdahl, of which Fujitsu owns 47.5%, already uses Fujitsu components in several of its mainframes and is reportedly looking for a processor to form the basis of its next generation of machines.

A prolonged dispute between IBM and Fujitsu over Fujitsu mainframe hardware, however, could have jeopardized those plans.

Sources close to the talks say IBM's complaint against Fujitsu centers on Fujitsu's alleged copying of portions of IBM's MVS operating system for use in its IBM-compatible MSP OSIV/F4 operating system. In March, Siemens stopped selling its version of MSP OSIV/F4, saying Fujitsu's dispute with IBM raised questions about the operating system's viability.

While not stipulating which Fujitsu programs are involved in the dispute, IBM spokesman J. Lyle McGuire said there is "no hardware, just software" involved in IBM's complaint.

McGuire added that IBM expects progress to come out of the next several months of talks.

A Fujitsu spokesman in Tokyo denied that his firm had engaged in any wrongdoing.

INDUSTRY INSIGHT
Bob Djurdjevic

IBM hopes to cut DEC gains

In an effort to halt Digital Equipment Corp.'s market share gains at its expense, IBM unleashed a flurry of low-priced products last month. The IBM announcements carried two central themes: connectivity (among the various IBM architectures) and affinity (between the System/36, 38 and the 370 architectures).

Often criticized for its disparate product lines, IBM obviously intended to address this major weakness in the company's intermediate systems strategy. That is where several incompatible product lines have made IBM vulnerable to competitors like DEC, which offers growth within a single architecture. In fact, Annex Research's latest analysis of the U.S. installed base shows that IBM had lost about 3% market share in 1985 — about the amount of DEC's market share gains during the same period.

What does IBM's connectivity theme really mean? It means that IBM will try to link the architecturally disparate product lines by using layers of new communications hardware and software products. This should make them transparent to the end user.

And what about the second theme — the affinity? Is IBM trying to tell us that a romance among its heretofore distant computers is in the offing?

Stephen Schwartz, president of

See IBM page 83

Djurdjevic is a computer industry analyst and president of Annex Research, a Phoenix-based computer research and consulting firm.

Microsoft, other software vendors up in hardware industry downturn

By Clinton Wilder

Continuing to buck the trend of the sluggish computer hardware industry, Microsoft Corp. and several leading mainframe software vendors reported strong growth in second-quarter financial reports announced last week.

While Microsoft ended the fiscal year at nearly $200 million in revenue, Computer Associates International, Inc., Software AG Systems, Inc. and VM Software, Inc. all reported solid year-to-year gains in profits and sales during the quarter.

Microsoft rode unexpected growth in overseas business to a 105% earnings gain in its fourth quarter ended June 30. The Redmond, Wash., developer of MS-DOS earned $11.5 million, or 42 cents per share, on revenue that grew 67% to $62 million.

For the year, revenue advanced 41% to $197.5 million, and profits grew 62% to $39.2 million, or $1.56 per share.

"They have not disappointed in any quarter yet since going public," said Ruthann Quindlen, an analyst with Alex Brown & Sons. "It is significant that 40% of their revenue for the year was international sales. They were there early with local language products, and they have a stronger foothold in applications overseas than in the U.S."

Computer Associates reported an 82% increase in net income for the quarter, while VM Software's profit grew 64%. "Systems utilities clearly have been the preferable part of the packaged software business during the downturn," said Charles Taylor

See SOFTWARE page 108

Mainframe, minis continue second-quarter slide

But Cray, Microsoft, Stratus and Tandem profits soar

Company	Net Income April-June, 1986 (thousands of dollars)	Percent Change From 1985	Revenue April-June, 1986 (thousands of dollars)	Percent Change From 1985
Comdisco	19,763	+10	224,471	+50
Control Data[3]	(20,300)		828,500	-9
Data General[3]	(2,000)		325,300	+14
Prime	11,422	-13	210,547	+12
Stratus	3,276	+74	30,157	+63
Wang[4]	800		716,800	+13

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U.S. and Japan settle chip trade dispute. **Page 99.**

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DEC 1986 earnings come in 38% higher than last year's. **Page 102.**

■

Compaq Computer is now favored to win the pole position in the 386 microprocessor sweepstakes, with a reported Sept. 9 introduction of a 32-bit system based on Intel's 80386 chip. Compaq is one of more than three dozen vendors currently jockeying to get off the mark with a 386 machine in 1986.

■

In another key 386 development, several expert system software vendors have disclosed plans to port their LISP and Prolog versions to the 80386 microprocessor. Intel is hoping the announcements will boost implementation of its touted chip by bringing high-speed artificial intelligence processing capabilities to

See **NEWS** page 7

Users slow to adopt Disoss

Ease-of-use features, peer communications lacking

By Elisabeth Horwitt

Most recent releases of Distributed Office Support System connectivity products from IBM and minicomputer vendors are still faulted by users for lacking critical peer-to-peer communications and ease-of-use features. These shortcomings have made users wary of adopting the document distribution software as the common communications system in multivendor environments.

The following items provide evidence of this development:

• Of 70 Fortune 1,000 companies recently surveyed by computer management consulting firm Forrester Research, Inc. in Cambridge, Mass., only 21.7% have already installed Disoss. Another 7.2% said they will install Disoss within the next six months, while 4.3% said they had already tried Disoss and thrown it out.

• IBM has withdrawn active support for 8100 and 5520 departmental processors, the systems Disoss was originally designed to connect, in an apparent effort to have users move instead to System/36 installations.

• Wang Laboratories, Inc. reports that there are currently fewer than two dozen production-environment implementations of its Disoss product.

"Disoss is really only viable over the long term as a common denominator to make Digital Equipment Corp., Data General Corp., Wang and IBM systems talk," says Jean Hazelwood, senior product manager for IBM Integration Products at Lowell, Mass.-based Wang. "Right now, Disoss is difficult to install, its performance is not great and implementation usually requires a system upgrade. IBM is only gradually filling these holes."

See **USERS** page 6

DG boosts low-end line, price of CEO

By James Connolly

WESTBORO, Mass. — Employing the proprietary microprocessor nicknamed Micro-Eagle for the first time, Data General Corp. last week announced a low-end minicomputer that it will pit against the IBM System/36 and the Digital Equipment Corp. VAX 8200.

But while boosting the performance figures for the low end of its product line with the MV/7800, DG also announced price hikes for almost half of its product line. The increases averaged 10% for software such as DG's Comprehensive Electronic Office and 6% for hardware.

The newest DG hardware products, such as the MV/20000 superminicomputer

See **DG** page 4

Tandy clones target big firms

By Alan Alper

NEW YORK — Retail giant Tandy Corp. last week took the latest step in its multipronged strategy to broaden its corporate customer base, introducing three aggressively priced IBM Personal Computer-compatible systems. Tandy also recently expanded its corporate sales force by 40% and began offering volume discounts that, at the low end, exceed those of IBM.

MIS departments at large corporations are seeking products with more functionality at costs lower than IBM's, Tandy Chairman John Roach said at a press conference last week. "Companies with

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CW SPECIAL REPORT

Centrex deals: Users find PBX threats, pressure produce bargains

By Elisabeth Horwitt and Stanley Gibson

Large corporate communications users are discovering that the time is riper than ever for wringing major cost-saving concessions from local telephone companies. By threatening to switch to private branch exchange systems, these users are resorting to something very like blackmail in order to force the divested local Bell operating companies to offer them attractive special Centrex deals.

The local carriers, rather than risk losing university and business customers with installed bases of 10,000 or more telephone lines, have demonstrated their willingness to absorb access charges, hold off on rate hikes and even install digital switches to order.

Industry experts caution MIS and telecommunications managers not to delay too long before nailing down favorable terms with their carriers — preferably for deals lasting for an extended period such as the next five years. Today's good deals on Centrex rates and access charges may soon fall victim to regulatory pressure from the North American Telecommunications Association, a customer premise equipment vendor organization.



Blackwell

There are technical as well as financial reasons for MIS putting the squeeze on local telephone companies. Sometimes threats are the only means by which customers can obtain the local telecommunications services they need, since switch technology and service options vary greatly from one central office to another, notes John Powers, vice-president of strategic services at Dedham, Mass., consulting company Telecommunications Management Corp. "There are a lot of analog Centrexes still out there, and they just can't provide the same level of goodies available on a digital switch," Powers says. He predicts by 1995, approximately

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NEWSPAPER

Lotus upgrade's compatibility lessens users' Release 2 anger

Release 2.01 of 1-2-3 targets 'critical issues'

By Douglas Barney

CAMBRIDGE, Mass. — User reaction to Release 2.01 of Lotus Development Corp.'s 1-2-3 has been generally positive, according to an informal survey by *Computerworld* last week.

The new release was designed to cool user anger aroused a year ago, when Lotus's Release 2 of 1-2-3 was found to be incompatible with the original version in some areas.

Despite Release 2's enhanced macro capabilities and its capacity to build larger spreadsheets, the compatibility problems prompted many users to hold back on upgrading. "Our response was not to upgrade wholeheartedly. Our tax department, however, had a number of very big spreadsheets, and we needed the extra memory management," said Greg Allman, a senior consultant for Deloitte Haskins & Sells, a New York-based accounting firm.

Lotus does not now guarantee total compatibility between Release 2.01 and the original release, but a company spokesman said the newer release was a major improvement. "There is no claim here that what we have achieved is 100% compatibility," said Janet Logan, a Lotus spokeswoman. "We did extensive research on Release 2 and evaluated all of the feedback, and we think that 2.01 reflects the most important and the most critical issues."

Resentment lingers

Although users praised Lotus's efforts to correct the incompatibilities, many still resent the problems they faced in upgrading. "Under Lotus's 1-2-3 Release 2, there is additional information stored with the data in a work sheet file. When you run Release 2, it can read a file created under Release 1A into memory, but when you go to save the file, a message goes up on the screen saying, 'You are about to save this file as a WK1 file, rather than as a WKS file,' " said Michael Selva, PC Coordinator for Spaulding Hospital in Boston. "I just wish they had kept the same file structure."

The key to the greater compatibility of Lotus's "maintenance release," which costs users $15, is having labels in work sheets equal zero when used in a mixed formula reference. "That is mainly an issue when people are using Lotus as a data base, where you need to do a day-to-day count or an average of some objects that are in a column or a row. If those objects are character strings, then you are going to run into problems," Selva said. "If people had developed very elaborate macros using the old Lotus, some of those macros would crash."

Program's speed

Another problem with Release 2 was the program's speed. "Large spreadsheets take longer to retrieve in Lotus Release 2 than they did in 1A, which made no sense. A spreadsheet that would take five minutes to load from 1A would now take from 15 to 20 minutes in Release 2. That was our major problem," said Bill Caulfield, information center analyst with Eaton Corp. Lotus claims to have addressed that problem with the newest release.

Another problem was created because Release 2 needs an extra 84K bytes of random-access memory (RAM) compared with Release 1A. Applications written for 1-2-3 that require nearly 640K bytes of RAM now need an expanded memory device that allows users to access more than 640K bytes, said Van Barletta, manager of tax computer services for Arthur Andersen & Co. in New York.

For some, this is not a major problem. "I've been steering people away from doing huge, huge applications in Lotus," Selva said.

Nor is it a major problem for Arthur Andersen, which had held back on upgrading to Release 2 because of its compatibility problems and will now upgrade to Release 2.01, according to Barletta. Arthur Andersen was one of the most vocal critics of Release 2. More than 1,000 packages will now be upgraded.

"I think we are well pleased with what it fixes," said Danielle Barr, vice-president of corporate systems for the Bank of New England Corp. in Boston. Release 2.01 loads faster, installs more easily and no longer requires a key disk, according to Bill Jennings, office systems analyst, who is evaluating the product for the Bank of New England. "This release contains some smaller improvements that I am sure were to fix some errors in the huge change from Release 1A to Release 2," Eaton's Caulfield said.

Although Lotus is charging $15 for the release, large-volume buyers may receive the product free. "We would probably have to distribute them here, but they would supply them to us for free. That is my best guess," Deloitte's Allman said.

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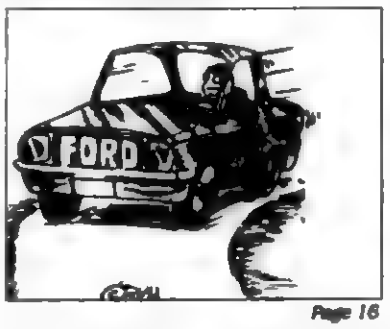
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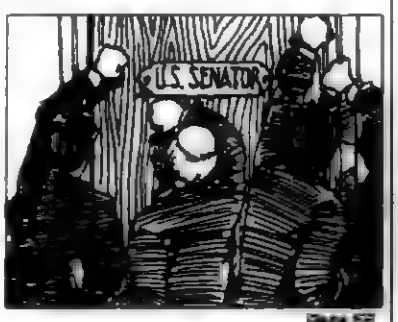
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Tandem broadens low end with two EXTs

Machines offer more power, expandability

By Jeffry Beeler

CUPERTINO, Calif. — Tandem Computers, Inc. last week prematurely retired its Nonstop EXT on-line transaction processing system less than 18 months after its introduction. Tandem replaced the EXT with two upgrades, the EXT10 and EXT25, that address the original system's growth and performance shortcomings and broaden the low end of Tandem's product line.

The new systems, targeted at companies seeking to decentralize on-line transaction processing activities, reportedly offer customers price and performance improvements. Both new systems are reputed to run the same operating system and applications as the EXT, but they differ sharply from their predecessor in price and raw computing power.

The EXT10 and EXT25 form the centerpiece of a product announcement that also includes the following two elements:

- The Model 6150 communications controller, which on one board integrates three kinds of device support that with the original EXT required three boards.
- The Model 6526 terminal, which costs roughly 50% less than Tandem's existing Model 6530 display unit and offers basically the same functions.

Although the EXT10 and EXT25 are reputed to run exactly the same operating system and applications as the processor they supplant, the two machines differ sharply from their predecessor in price and raw computing power. Capable of executing 4.3 transactions per second, a basic EXT10 provides roughly the same computing power as a comparable EXT but costs about 30% less, according to Terry Retford, Tandem's manager of processor and memory products.

Out-performs EXT

With its 11 transaction/sec. throughput rating, by contrast, an entry-level EXT25 out-performs a minimally configured EXT by a factor of 2.5 and is priced proportionally higher, Retford said.

The EXT25 owes its performance edge over the EXT10 to its superior machine cycle time and to its use of a 64K-byte cache memory, which the smaller processor lacks, he added. Compared with the EXT10, which executes a machine cycle every 100 nsec, the EXT25 is rated at 83.3 nsec.

With a footprint of 8.3 square feet, coupled with the machines' ability to operate outside a computer room, the EXT10 and EXT25 are targeted at the remote locations of large corporations, according to Retford.

Tandem's first effort to crack the distributed processing arena began in April 1985, when the company announced its original EXT. But the processor's limited expandability created more user resistance to the EXT than its manufacturer apparently expected, according to Omri Serlin, head of Mountain View, Calif.-based Itom International, Inc., which tracks the on-line transaction processor marketplace.

"For some of our clients, the concern with the existing EXT was that it was a closed-end system," said a product manager for a beta-test user that develops funds-transfer software for banks. "If our customers acquired other banks or if their volumes grew significantly, they could easily outgrow their systems."

Even the smaller EXT10 affords an upgrade path for the existing EXT. "Thus far, our EXT10 has operated even faster than we had initially expected," the source at the beta-test site said.

In addition to relieving the EXT family's horsepower restrictions, the announcement also lowers Tandem's entry-level price barrier. "With the EXT10, Tandem is trying to extend its product line so that its

See EXT page 6

DG boosts its low-end line

From page 1

and the MV/2000DC minicomputer, are unaffected by the hikes. The price of the older MV/10000 rose almost 22% to $167,100, where it stood before prices were slashed in conjunction with the MV/20000 announcement last fall.

The MV/7800 is based on the custom very large-scale integration (VLSI)-based Micro-Eagle, which was developed in DG's Sunnyvale, Calif., facilities and provides minicomputer CPU functions in a six-chip set. The MV/7800 is positioned above the MV/2000DC.

The MV/7800 supports 25% more office automation users and provides a performance increase of greater than 50% at two-thirds the price of the 2-year-old MV/4000, according to DG. The MV/4000 remains available.

DG credited the Micro-Eagle chip with the performance boosts. The system has a machine cycle time of 320 nsec, which is slower than both the MV/2000DC and the MV/4000.

However, Bill Duckett, DG manager of integrated systems, said the overall system performance is faster than that of the other machines. "When you do custom VLSI, you can do little things like putting bits of memory right on the CPU chip," Duckett said.

"Compared to systems from IBM, our MV/7800 offers 32-bit performance at the same price as the less powerful 16-bit System/36 Model 5360. Compared to systems from Digital, the MV/7800 supports more office automation users than the VAX 8200 at a lower cost of ownership," claimed Frank Pinto, director of DG's Marketing Support Division.

DG officials said the MV/7800 supports 50 users in a typical office automation environment running clerical tasks, professional support, word processing and spreadsheets. They said the system handles slightly more than one million single-precisions Whetstone instructions per second. The MV/4000 supports about 40 OA users, according to the company.

The MV/7800 is available in three configurations: a commercial version costs $27,500 with 4M bytes of memory; a rack-mount version costs $19,050; and an upgrade version costs $10,000 to $17,500, depending on the model being upgraded. Monthly maintenance for the commercial system costs $120.

The system supports up to 14M bytes of memory, 14 I/O slots, 9.4G bytes of disk storage and 128 terminals and printers.

Explaining the price increases for the MV/10000, MV/8000 II and other products, a company spokesman said these are a restoration of cuts made when DG announced the MV/20000 and wanted to maintain sales levels for the older systems.

Analyst George Colony, president of Forrester Research, Inc., said the price hikes may not hurt DG.

"They probably are doing it because DEC has been getting away with some fairly high prices. DG probably is still going to have an advantage of about 7% because it has been sticking to cut-to-the-bone prices," Colony said. He noted that price is one of DG's prime competitive weapons, and narrowing that pricing edge could drive some potential DG customers to DEC or IBM.

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Box 9171, 375 Cochituate Road,
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Users are slow to adopt Disoss

From page 1

Companies interviewed for Forrester's report gave four major reasons for not choosing to implement Disoss. One, they did not need the product. Two, they were put off by Disoss's "poor reputation." Three, they could not cost-justify implementing it. And four, they did not "believe in a mainframe-based office automation architecture" and were implementing another vendor's peer-to-peer network.

While offering Disoss connectivity has not helped minicomputer vendors broach new user installations, it has "kept them from being locked out of customer premises," according to Forrester research manager John McCarthy. "Just knowing that the Disoss link is available may prevent a company with a large IBM installation from dismissing a third-party vendor out of hand — even if it eventually decides to use the link rarely or not at all."

For example, Texaco Canada, Inc.'s Nanticoke Refinery in Ontario knew that a Disoss link was a prerequisite for its proposed implementation of Data General Corp.'s Comprehensive Electronic Office (CEO) office automation system. "We already were using Data General computers for process control, laboratory information processing and materials resource planning systems," says Tony Abraham, chief engineer of systems at the refinery. "It made sense to use CEO as a way to link refinery operations with administration and management support. We had tested CEO and thought it was a great tool for administrative and decision support, document distribution, calendaring and so on."

The refinery wanted to replace its current OA system, an IBM 8100, with a DG MV 10000. "But we still needed to communicate with 8100s throughout the rest of the company, and for that we needed Disoss, which is standard here," Abraham says. "Management wouldn't have let us get CEO otherwise."

In June 1986, Nanticoke became a test site for DG's new Disoss link, CEO Document Exchange Architecture (DXA).

Abraham says users appreciate dealing with the menu-driven CEO interface rather than with Disoss, "which is really cranky. You have to fill in a lot of blanks before you can send something." Abraham also praises CEO DXA's distributed architecture, which allows him to access documents and messages right at his workstation. "With IBM's Disoss, the secretary at the head office would send a document to my secretary's 8100, and she would have to print it out for me."

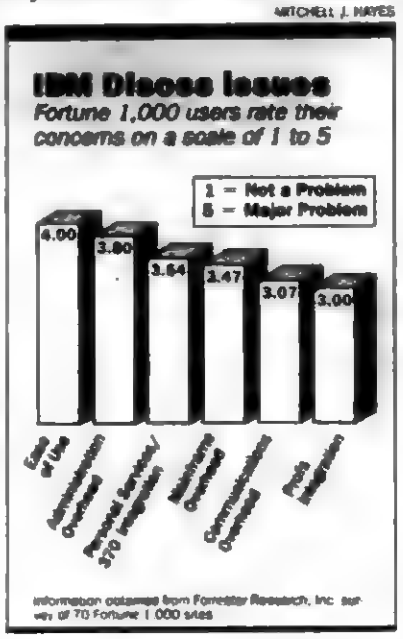
> ***Distributed networking is only one of several features that users want — and do not always get — from different vendors' Disoss products.***

Nanticoke has been testing each new version of CEO DXA as DG brings it out. DG still does not offer a Systems Network Architecture Distribution Services (SNADS)/LU6.2 implementation on Disoss that will allow peer-to-peer communications without the need to go through a Disoss host.

"That will be Version 3; we'll try it out when they release it," Abraham says. "We'll need it when we implement CEO in another Canada refinery — which should happen as soon as oil prices allow." Peer-to-peer communications is implemented through SNADS and PU2.1 running on top of Disoss.

Distributed networking is only one of several features that users want — and do not always get — from different vendors' Disoss products.

Wang's Hazelwood points out that Disoss does not offer the same level of support to all IBM systems. The 3270 Personal Computer, for instance, can only access documents in final (noneditable) form. (Disoss Version 3.3, which should be available shortly, reportedly eliminates this shortcoming.) Some IBM computers, such as Displaywriter, cannot receive transmissions directly but must periodically query a Disoss host for their incoming mail.



Third-party minicomputer vendors' Disoss implementations all suffer from one or more of the above limitations. Wang, for example, has yet to set a release date for a Disoss gateway that supports SNADS/LU2.1. And systems running its current Disoss release cannot receive mail directly but must use a mailbox on a designated Disoss host.

DEC's Disoss product, External Document Exchange, supports revisable and final-form library access but does not yet distribute mail in revisable form. A SNADS/LU6.2 implementation has been announced but not yet delivered. And Microvaxes, like IBM Displaywriters and Wang systems, cannot yet receive documents directly but must access a Disoss host system for their mail.

Chase Manhattan Corp. is currently evaluating Disoss in the role of "a transparent backbone for transmitting documents and messages" among an extensive installation of DEC, Wang and IBM equipment, says Craig Goldman, vice-president of Chase consulting and end-user support services.

"We're thinking of letting DEC users have All-In-1, Wang users Wang Office, IBM users Disoss, and all have Disoss as the common connection."

Goldman is currently mulling over Disoss presentations that were recently given at the bank by DEC, IBM and Wang. His group is using the following criteria to evaluate the different products:

- Peer-to-peer communications among all three vendors' systems.
- The capability of preserving current user interfaces on each type of system. "I don't think we can survive if we have to add the burden of special command keys," Goldman says.
- Hidden costs. "There will no doubt be software development work to achieve true transparency, as well as training costs," Goldman says.
- The level of resources needed to support the new system. For example, user processors may need to be upgraded in order to support direct mail distribution. Adding All-In-1 might require a VAX upgrade.

"We believe we'll go with all three vendors; now we're discussing communciations strategies," Goldman says. "We have decided that even if the software is not all there now, in a year, it will be sufficient to lessen our burden."

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EXTs broaden Tandem low end

From page 4

current customers can reach out further into their outlying offices," said Kimball Brown, an analyst with Dataquest, Inc., a San Jose, Calif.-based market research firm.

A basic EXT10 and EXT25 configuration consists of one system cabinet that holds two processors and up to four 128M-byte disk units. Main memory capacity ranges from 8M to 16M bytes for a two-processor EXT10 and from 16M to 32M bytes for a comparable EXT25.

To create a maximum EXT10 or EXT25 configuration, users have to add a second system enclosure. Fully expanded, the two modules reportedly execute 8.3 and 22 transactions per second, respectively.

A two-processor EXT10 and a similarly configured EXT25 cost $82,500 and $325,000, respectively. The Model 6105 communications controller costs $5,455, the Model 6526 terminal, $1,095. Shipments begin during the current quarter.

TOP OF THE NEWS

NEWS from page 1

cheaper desktop systems.

Companies joining in last week's announcement and their products are Franz, Inc., Alameda, Calif., offering fall availability of an Extended Common LISP programming environment for the Unix System V/386; Arity Corp., Concord, Mass., Prolog for the Unix System V/386, early 1987; Lucid Software Corp., Menlo Park, Calif., Common LISP on Unix System V/386, early 1987; Gold Hill Computers, Inc., Cambridge, Mass., Golden Common LISP for PC-DOS, late 1986, for Unix System V systems, early 1987.

Other companies wrapping up deals with Intel at press time were Teknowledge, Inc. and Quintis Computer Systems, Inc.

Analysts agreed the Intel announcement opens the door for low-end implementation of AI applications, but stressed that it could be years before expert systems make their way to the end user.

"Intel's pressure now is not to the end user; it's to developers," said analyst Bob Lefkowits from Infocorp.

■

National Advanced Systems reportedly will try to counter IBM's attack on the high-end scientific and engineering market this week. The Mountain View, Calif.-based manufacturer of IBM plug-compatible mainframes is expected to announce a hardware and software package for its AS/XL series of mainframes, answering IBM's addition last October of a vector processing facility to its 3090 mainframes.

■

Ashton-Tate will follow on the heels of Lotus in announcing its own site licensing program on Aug. 19, according to software industry sources. Unlike the Lotus plan, which is scheduled for an Aug. 13 unveiling, Ashton-Tate's plan will allow corporate buyers to continue negotiating volume purchase agreements with retail dealers.

Meanwhile, on Aug. 11, Ashton-Tate will team up with Apple Computer to introduce a Macintosh version of Dbase III.

■

The 32-bit workstation market will heat up with tomorrow's announcement by Sun Microsystems of the latest members of its Sun/3 line. The principal release is expected to be a color version of Sun's low-end 3/50 system, priced in the $12,000 to $13,000 range.

One analyst says the low-end color system is Sun's belated response to Apollo Computer's popular Series 3000 Color Personal Workstation, priced some $2,000 higher at $14,900. "The Series 3000 has been a major success and a real sore point for Sun," the analyst says.

There is also speculation that Sun will introduce a high-end system based on Motorola's recently announced 68020 running at 25 MHz and rated at approximately four million instructions per second.

■

Symbolics rolls out AI machines, cuts prices

By Eddy Goldberg

BOSTON — In a move to stay ahead of growing competition among symbolic processing systems vendors, market leader Symbolics, Inc. last week announced two processors, one entry level and one middle range. The systems, used in creating artificial intelligence applications, will effectively replace three-quarters of Symbolics' 3600 development family. They reportedly offer improvements in such areas as software prototyping and programmer productivity.

Symbolics also announced a systems software access control package and price discounts ranging from 24% to 31% on its 3640, 3645 and 3670 systems, which will be discontinued. The price for the top-of-the-line 3675 has been cut 8% to 9%.

Taken together, last week's announcements are expected to strengthen Symbolics' position by consolidating its product line and making the evolution from low-end to high-end systems easier and more attractive for customers, according to Harvey Newquist, editor of "AI Trends," a newsletter based in Phoenix. "It also starts bringing their costs more into line with the general trends of the industry," he added.

The announcement gives Symbolics "a strong competitive position vis-a-vis traditional hardware vendors," such as Digital Equipment Corp., IBM and Sun Microsystems, Inc., said Curt Monash, senior vice-president at Paine Webber, Inc.

Symbolics President Russell Noftsker said the systems, the 3620 and 3650, are based on proprietary gate-array CMOS technology, introduced in April [CW, April 21].

The 3620, designed for entry-level development projects, offers 20% greater processing speed, yet it is 25% the size of the 3640, which it is replacing. A minimum configuration is priced at $49,900 with a 190M-byte disk and 4M bytes of main memory. The 3650 is 40% faster than the 3670 but only half the size. It comes standard with a 368M-byte disk and costs $65,900 with 4M bytes of main memory. They are available now.

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PBX threats produce bargains

From page 1

70% of all central office switches will be digital. "In the meantime, customers have to blackmail the local telcos, saying, 'If you don't upgrade to digital, I'll go private.' "

Business MIS managers could take a lesson in Centrex wheeling and dealing from the big universities, many of which have installations of 14,000 lines or more in complexes of hundreds of buildings over thousands of acres.

The University of Missouri in Columbia, with an installed base of 12,000 lines, is a case in point. The school was a dissatisfied user of Centrex 8311 from independent telephone company GTE Co., an "outdated system which has been in use since the 1970s," according to telecommunications manager Beverly Blackwell. "It offers call transfer and direct in-dialing, but no accounting or other enhanced features."

In May 1985, the university put out a request for proposal (RFP) for a new telecommunications system. "We thought we were going to go with a PBX — that's how we designed our RFP. But we wanted to let GTE take their best shot. What they came up with was basically a Centrex proposal and yet better than any of the CPE vendors' offers," Blackwell reports.

Under the terms of the university's new contract, signed last January, GTE is installing a DMS 100 switch in its central offices specifically to serve a portion of the Columbia campus. GTE retains ownership of the DMS host and serves other customers with whatever capacity the university does not use.

"The good deal is that, even though GTE owns, manages and maintains the switch, we are essentially buying the part we use — paying for it gradually with our Centrex fees and access charges," Blackwell says. At the end of five years, the university will be "paid up," and cease paying access charges.

The rest of the campus will be served by three remote switching centers, "which we need because we are so spread out," Blackwell notes. The university owns these switches, as well as the optical-fiber and coaxial cable that connects campus buildings. "The advantage of owning the equipment is that we have control and can do our own changes," Blackwell claims. "Meanwhile, GTE is managing and maintaining the basic system."

Pleasing a favored customer

The university's RFP acted as a spur for GTE to think up ways and means to please a favored customer. "We were very optimistic about getting a good deal with them, since we are their largest customer in the nation," Blackwell says.

Now is an ideal time for other large organizations to duplicate the University of Missouri's coup, notes Richard Kuehn, president of Cleveland consulting firm RAK Associates.

"Five or six years ago, I told users, 'Centrex is a dead issue. Get out of it.' That was still in postdivestiture days when AT&T could tell the Bell operating companies, 'force up Centrex rates so that users will be forced to buy Dimension PBXs.' Divestiture enabled the former Bell companies to do their own thing, and they want to hold on to their installed Centrex base," Kuehn says.

Not all customers are finding the divested Bell operating companies to be pushovers, however. A year ago, Pacific Northwest Bell refused to renew a Centrex rate stabilization agreement with Washington Trust Bank in Spokane, Wash. As a consolation prize, the bank obtained a "Corecom" agreement under which it would pay for local access to outside lines but not for such enhanced features as call-forwarding and call pickup.

The bank opted to stay with its Centrex services, despite a consultant's assurances that a PBX system would be less expensive, notes Assistant Vice-President of Central Services Gary Miller. One major reason was that the bank was on the verge of closing and relocating several of its branch offices and concluded it would be easier to reconfigure its Centrex services than to take down and/or install new PBX systems.

Another factor that may tie a company to Centrex is the size of its user population. "For a company like us, with 4,000 lines, a PBX is not really a consideration," said Joyce Varley, lead communications analyst with Fidelity Bank in Philadelphia.

Fidelity currently uses Centrex services at six Bell of Pennsylvania central offices — one serving the bank's headquarters, the other five serving branch offices. The bank is in the third year of a five-year rate-freeze agreement with the local carrier.

But the increasing number of small companies signing up for Centrex is being more than offset by a growing number of Fortune 1,000 corporations switching to PBXs, claims Northern Business Information, Inc. telecommunications analyst William Rich.

A recent report by the New York research firm states the total Centrex installed base increased by only about 10,000 lines in 1985 and by 50,000 lines in 1986. In contrast, PBX installations increased by 2.1 million lines in 1985, and by an estimated 2.28 million in 1986.

Combatting the trend

The divested Bell operating companies are currently trying to combat this trend in two ways. One is by offering enhancements that move Centrex systems closer to PBX functionality in both voice and data communications areas.

"The ability of a central office to allow the organization to use existing wiring for data can be a major factor in the decision to stay with Centrex or change to a PBX," says University of Nebraska Director of Telecommunications Services Ruth Michalecki. "Once a company decides to go to the trouble of rewiring a group of buildings for data transmission, it often takes that extra step and installs a PBX — which also requires new wiring."

The university is currently very satisfied with a packet-switching, data-over-voice service from independent Lincoln Telephone and Telegraph Co. The service provides 9.6K bit/sec. transmission among different computers on campus on the same wiring that carries Centrex voice transmissions.

Lincoln Telephone has also indicated its willingness to add a DMS 100 digital switch to the central office serving the university. "The analog switch we have now is 10 years old, and the manufacturer no longer supports it with new software development and enhancements," Michalecki says.

The second way local telephone companies seek to hold on to Centrex customers is through rate freezes and by "eating" the expense of hooking customers up to long-distance carriers. But they — and their customers — may be denied this option, if NATA has its way. In the last year and a half, the CPE vendor organization has filed complaints with the Federal Communications Commission against divested Bell operating companies' rate-setting policies.

NATA alleges that at least 12 local carriers, by absorbing access charges and offering other rate breaks to Centrex customers, are "increasing Centrex market share through discriminatory pricing at the expense of the CPE provider," according to Robert Aldridge, attorney at NATA's general counsel, Wood, Lucksinger and Epstein. NATA contends CPE vendors are "finding it harder and harder to make a profit because they must set prices to compete against a subsidized telephone offering."

The vendor organization also claims that other local telephone customers are being forced to subsidize the Centrex service on the basis of the fact that "Centrex rates are unrealistically low," Aldridge notes.

Controversy 'looming on the horizon'

Barbara Wheeler, Centrex product manager for Bell Atlantic Corp., admits the rate-setting controversy is "looming on the horizon" and that the decisions of state Public Utility Commissions are likely to determine the future price competitiveness of different divested operating companies' Centrex offerings.

"The issue of customer access charges must be settled soon; customers with 14,000 lines can't live with the threat of having to pay $6 per station access charges — which is a typical rate," the University of Nebraska's Michalecki says. "Some Bell companies are eating that charge now for some of their customers — but no one knows how long the situation will continue. The Public Utility Commission could come along and say, 'You will charge that much money.' "

Kuehn of RAK elaborates, "A rate stabilization contract only assures the customer that the local telephone company will not initiate a rate increase. It does not stop the Public Service Commission from doing it. I think the longer the rate stabilization period, the more likely it is that at some point the Public Service Commission will say, 'We can't keep raising resident rates and leave out this business or that university.' "

As protection against this future threat, Kuehn has recommended that his clients request that their Centrex contracts include a clause that lets them cancel the service without penalty if the Public Service Commission or FCC raises rates. "Some Bell companies have agreed to do this."



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TRBA

Tandy clones target big firms

From page 1

people evaluating PCs are more concerned with value than ever. FUD — fear, uncertainty and doubt of not buying from IBM — is not as big an issue," Roach said.

Analysts generally applauded Tandy's strategy, noting that large corporations would be more inclined to buy from Tandy than from other clone makers because of the company's financial resources and nine-year track record in the PC business. In particular, the firm's creation of a dedicated sales force outside its Radio Shack Corp. outlets was lauded.

Thomas Wong, an analyst with Eberstadt Flemming & Co. in New York, said he believes Tandy has a good chance to penetrate the large corporate environment. "Corporations are looking at clones, and Tandy has the products and support to be a viable competitor," he said. "It's just a question of initial costs to staff up and how long it will take them to penetrate the market."

Business-oriented micros

The new business-oriented micros range from the Tandy 1000 SX, said to run twice as fast as the IBM PC and retailing for $1,199; the 3000 HL, an Intel Corp. 80286 machine aimed at the Personal Computer XT market and selling for $1,699 in a floppy-based version without a monitor; and the 3000 HD, a 40M-byte hard disk version of the firm's Personal Computer AT-compatible Model 3000, priced at $4,299.

At a press conference at the Waldorf Astoria, Roach stressed that Tandy's new PC-compatible computers are part of the firm's attempt to broaden its focus to include Fortune 1,000 users, a strategy that has included increasing its outside sales force by 40% during the last four months.

The thrust, he said, is to provide business users with a richer feature set at a lower cost than IBM and other clone makers. He stated that "1986 is the year PC-compatible people focus on value. Offering only PC compatibility is no longer state of the art."

> ***"Tandy's new PC-compatible computers are part of the firm's attempt to broaden its focus to include Fortune 1,000 users."***

Ron Stegall, Tandy's Business Products Division vice-president, said a number of large corporations have recently signed contracts to purchase Tandy microcomputers, although he declined to identify those companies.

He did, however, point to a recent study done by the Gartner Group, Inc. of Stamford, Conn., that ranked Tandy behind IBM as the second largest supplier of microcomputers to companies with sales of less than $500 million. Although Tandy's 22% of the market measured well below IBM's estimated 45% of the market, its new products, sold through a better trained, 1,600-member outside sales force, should help close the gap, Stegall said.

Other analysts believe Tandy, like other PC clone vendors, is caught in a bind. The firm is viewed as a lesser alternative to IBM despite offering better price/performance than Big Blue.

"MIS guys will give any excuse to buy from IBM rather than anyone else," noted Steve Bosley, an analyst with International Data Corp. (IDC) in Framingham, Mass. "I'd be real surprised if Tandy was successful selling to large corporations."

While Tandy has established a solid reputation in capturing small business accounts scattered across Middle America, Bosley contends the firm has been hard-pressed to attract corporate users. "They sold 154,000 units to business professional users last year, which represented 5.7% of the market," Bosley said. "They have a lot of people to climb to get to the top."

Tandy recently put its outside sales force on commission and began offering volume discounts that, at the low end, exceed IBM's. "We offer discounts ranging from 12% to 30%, depending on quantity," Stegall said.

"It's like the analogy: If Muhammad won't go to the mountain, then the mountain has to come to Muhammad," noted Joseph Levy, a spokesman for IDC.

Features of the Model 3000

The Model 3000 HL features an Intel Corp. 80286 microprocessor operating at 4 or 8 MHz, supporting Microsoft Corp. MS-DOS 3.2, 512K bytes of random-access memory (RAM), a 360K-byte floppy disk and seven expansion slots, four PC XT slots and three PC 16-bit slots, the firm noted. Options includes a choice of 1.2M-byte floppy and 20M- or 40M-byte hard disk drives. It, too, can attach to Vianet, Tandy's PC cluster network, Tandy said.

The 40M-byte hard disk version of the 3000 HD includes 640K bytes of RAM and supports both MS-DOS 3.2 and Microsoft's soon-to-be-released Xenix 5.0. Under Xenix, up to six users can work simultaneously on one Tandy 3000, the firm said.

The 3000 HD comes with 10M bytes of additional storage, 126K bytes of additional RAM and greater expandability than the PC AT, Tandy said. Ten expansion slots are offered, accommodating seven PC AT cards, two PC XT cards and one PC XT half-slot card.

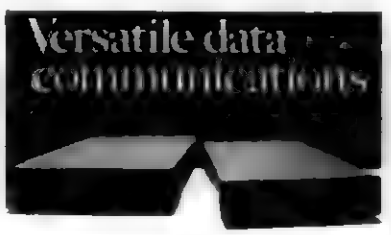
The Model 1000 SX is an Intel 8088-based machine, running most MS-DOS-compatible software at 7.16 MHz, software switchable to 4.77 MHz, Tandy said. It is offered with a new version of Personal Deskmate, an integrated program combining basic word processing, spreadsheet, electronic filing, graphics, calendar and telecommunications functions.

The 1000 SX comes with 384K bytes of RAM, expandable to 640K bytes of RAM on the motherboard; dual, double-density, double-sided 360K-byte 5¼-in. floppy disk drives; and five expansion slots, with a socket for an 8087 coprocessor. It is offered with standard connectors for a parallel printer, two joysticks, a light pen, monochrome monitor, composite video and audio and color monitor. The base price of $1,199 includes MS-DOS 3.2 and Microsoft's GW-Basic.

The micro can attach to Vianet as well as to IBM's PC Network local-area network.

Models 1000 SX and 3000 HL replace Models 1200 and 2000, respectively, which are being discontinued, Tandy said. The firm said it is already sold out of the Model 2000, although limited quantities of the Model 1200 remain.

Three new printers include a 20 char./sec. daisywheel printer, priced at $399.95; a 43 char./sec. daisywheel priced at $995; and a dot matrix printer, operating at 240 and 80 char./sec., priced at $1,295, which the company is positioning as an entry-level desktop publishing unit.



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IBM hints at price cuts, enhancements to boost 3090 sales

Big Blue says moves likely in September

By James Connolly

IBM officials have told customers to expect enhancements or price cuts next month that could boost the price/performance ratings of 3090 mainframes and drive users from the older 3080 mainframe family to the 3090 line.

According to industry observers, IBM representatives have told some customers that the company plans to effectively kill the 3080 as a market force by making the 3090 more attractive to customers who have postponed purchase decisions while watching for a clearer price/performance difference between the two product lines.

However, there is no consensus about whether price cuts or enhancements would sufficiently spur 3090 sales to boost IBM profits or about the size of any price cuts.

Analysts have complained since shortly after the first 3090 Model 200s were shipped last September that there were too few features in the 3090s to set them apart from the older 3080s, which are available primarily on the used market or as upgrades. Some of the speculation has centered on the possibility that 3090 performance will be boosted through the addition of more processors or the substitution of more powerful CPU boards.

The anticipated September price cut would be the second of the year for the 3090s. The prices for the multiple-CPU 3090 Models 200 and 400 were slashed by 10% in February.

However, one IBM executive, who asked to remain anonymous, recently hinted that because of those earlier cuts, third-quarter performance enhancements are more likely than a second round of price cuts.

One industry observer, Robert A. Bardagy, senior vice-president of marketing for Comdisco, Inc., commented, "There have been rumors for quite some time that there will be a 3090 price cut sometime between now and year's end. That would fit in with IBM's tradition of cutting prices in September. The other side of the coin is that a 5%, 10% or 12% cut is not enough to stimulate demand by itself." Comdisco leases IBM mainframes and is active in selling used 3080s in the third-party market.

'Most people are just not buying'

Analyst Francis Gens, a vice-president with International Data Corp., a Framingham, Mass.-based market research firm, reported that even if what IBM is telling its customers about a September announcement is true, the sluggishness of the 3090 market cannot be blamed on the competition from used 3080s. "Our surveys show that not that many people are going to used 3080s instead of 3090s and that the lack of differentiation isn't a big issue. Most people are just not buying."

Bardagy said 3090 enhancements make more sense than price cuts if IBM's goal is to maintain its profit margin for the mainframe. However, he questioned whether all of the potential enhancements are sufficiently developed to be announced.

Three possible enhancements, each of which would be considered major, according to Bardagy, include the following: an increase in the 3090's channel speed from 3M byte/sec. to as much as 6M byte/sec.; a new version of the MVS/XA operating system; and an improvement in cycle time from 18.5 nsec to 16 nsec.

However, Frederic G. Withington, a vice-president with Arthur D. Little, Inc., said that not only are price cuts likely to be announced as IBM answers the challenge of the 3080 and the Japanese-made mainframes, but major performance boosts for the 3090 are also probable.

"I think the Japanese are more important to IBM than the 3080 factor. They keep playing leapfrog and trying to keep the pressure on each other," Withington said.

Withington expects that rather than increasing channel speeds or replacing MVS/XA, IBM will introduce new 3090 configurations by adding two or four processors to the four-CPU Model 400. He also said IBM might introduce new emitter-coupled logic (ECL) chips to the 3090's CPU to keep pace with the ECL technology used by competitors. He said it is possible that new ECL-based technology could be offered on a field-upgrade basis, minimizing the risk of alienating users who have acquired 3090s within the past year.

Expects minor 3090 announcements

One analyst who expects only minor 3090 announcements for next month is Dale Kutnick, senior vice-president of the Gartner Group, Inc., a Stamford, Conn.-based market research firm. "I don't think you will see any price cuts at this point. If you do see any they will be minimal, maybe for something like the Model 150," Kutnick said.

Kutnick said his company "continues to be somewhat cautious," telling customers to buy 3090s only as they need them. He said the new release of MVS/XA is needed to make better use of the 3090's multiprocessing abilities and expanded storage, but that even if the channel speed is increased, users will need a new controller to support it.

Kutnick added that the enhancements, such as a new MVS/XA and more active promotion of the 3090 Model 400 (which is scheduled for October shipments), are more likely to be added after Jan. 1, when IBM hopes to get off to a strong financial start for the new year.

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Micro-mainframe links dominate info center conference

Environment tool among rollouts

By Peggy Watt

ANAHEIM, Calif. — The several hundred attendees at this year's Information Center Conference & Exposition last week saw a handful of products unveiled, including several upgrades to existing products. Microcomputer-to-mainframe communications and other connectivity issues were primary among the capabilities that were announced at the show.

Among the products unveiled were the following:

• Proteo, a software tool kit for the IBM Personal Computer and compatibles, is used to create an environment for micro to mainframe integration and is produced by a recently formed company called Proteo Software, Inc. of Markham, Ont. The company is a joint venture of Online People, Inc. of Toronto and Norenco Corp. of Minneapolis.

Proteo Software President Art Benjamin said some features were drawn from the integrated interface pioneered at Xerox Corp.'s Palo Alto Research Center. He said the simpler interface reduces training time.

Proteo is not an operating environment itself but provides the tools to create that environment and customize it for the individual user. It shields the user from operating system commands with natural language commands, uses icons where appropriate and enables the user to access data without worrying about whether it is stored locally, on a network or on a mainframe, Benjamin said.

It also features "software robots," user-definable macro commands for backup procedures, filing and sending of electronic mail, all of which can be conducted when the user is not at the keyboard. Proteo's name stands for Professional Tools for the Electronic Office.

Data can be input by menu, mouse, joystick and other alternatives, including voice. A Watson voice digitizer board from Natural Microsystems Corp. of Natick, Mass., is included with the purchase of a single-user version, which Benjamin said is available for $695. But the company is really eyeing the corporate site license sale, allowing unlimited copying throughout a corporation for a $30,000 contract through Sept. 1 and $40,000 after that date.

> ***The user receives only the information needed for the programs in use at a single workstation.***

• The Micro Resource Manager from Atrium Information Group, Inc. of Fairfield, Iowa, offers a flexible data base system designed to help the microcomputer manager track, support and analyze the use of microcomputers within a corporation.

The package is designed for the IBM PC and compatible computers and includes standard purchasing and receiving files as well as analytical report forms for planning and budgeting, according to President Ken Ross.

Its calendar functions track user requests, management's electronic answers and progress on the requests, a function that Ross said will help document staff activity.

The system can also retain documentation files that can be printed out as a customized manual for the user, who then receives only the information needed for the programs in use at a single workstation, "rather than drown the user in unfocused information," Ross said.

"It's designed to be an efficiency tool, a time saver," he said.

The multiuser version will be available in the fall and will run on IBM Netbios-compatible PC networks as well as under Unix and Microsoft Corp.'s Xenix systems, Ross said. The Micro Resource Manager system sells for $4,995 for an unlimited number of workstations. A start-up version is available for $1,495 and supports as many as 250 PCs.

• Concurrent Micro-Mainframe System from Vasco of Lombard, Ill., an authoring system for mainframe computer-based training, allows transactions to take place on a microcomputer workstation on-line with a mainframe or minicomputer.

Training takes place on the actual application via a window training shell. The pop-up instructions or Help files are similar to the reference guides already marketed by Vasco.

As a training corporation, Vasco will enter contracts to customize particular applications for computer-based instruction under Concurrent Micro-Mainframe System or license it for the user to customize.

Fees are $20,000 per mainframe system plus an annual maintenance fee of $4,000. Annual rental is $10,000, including maintenance.

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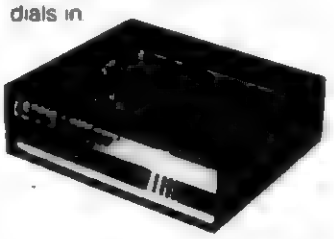
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World Digest

Auto maker supports MAP

By Takehisa Kondoh

NAGOYA, Japan — One of Japan's leading vendors of automobile electronics gear, Nippondenso Co., said this week it will use General Motors Corp.'s Manufacturing Automation Protocol (MAP) as the basis for a factorywide local-area network (LAN). The move makes Nippondenso the first Japanese auto industry player to support MAP.

MAP is an implementation of the International Standards Organization's Open Systems Interconnect protocol, which allows computers from different vendors to communicate over a broadband LAN.

The Nippondenso LAN, to be installed at a Nippondenso factory still under construction, will be connected to the equipment that will produce fuel-injection devices and semiconductor chips.

Construction of the $636.9 million factory began in May and will not end until 1995.

Nippondenso hopes to use the LAN to establish an automation system that covers every aspect of manufacturing from order taking to delivery. "We are tilting toward MAP as a factory automation protocol that may become the international standard," a Nippondenso spokesman said.

Nippondenso, a Toyota Motor Corp. affiliate with 1985 revenue of $5.8 billion, is prepared to develop, by itself, the MAP-compatible computers, communications equipment, robots and machine tool controllers needed for the new factory.

Some of that new equipment will be supplied by AB Denso Corp., a joint venture the firm established in 1984 with Allen-Bradley Co., a U.S. factory control system maker.

Nippondenso's move is expected to push other Japanese industrial manufacturers closer to MAP support.

Several Japanese manufacturers — including Fanuc Ltd., a robotics maker, and OMRON Tateisi Electronics Co., a factory automation vendor — have already announced plans to test MAP for use in their networking products.

Other manufacturers, however, are reportedly hesitant to support MAP because they are concerned that optical-fiber networks will prove superior to MAP's coaxial cables for data transmission.

Japan breaks chip record

TOKYO — Japanese semiconductor production in June hit a record monthly high of 985 million units, up 11.2% from the same month a year ago.

According to Japan's Ministry of International Trade and Industry, the previous monthly production record had been 934 million chips, set in November 1984. The dollar value of June's production was not disclosed but is said to have decreased some 10% from the same period a year ago.

Europe wary of price war

PARIS — The current semiconductor trade battle between the U.S. and Japan has created new opportunities and perils for European semiconductor vendors.

That battle may have ended last week as the U.S. and Japan concluded their semiconductor trade talks and set about implementing corrective action that could make Europe the next semiconductor battleground.

Like U.S. companies, European chip vendors have felt the pinch of aggressive Japanese pricing. But while European semiconductor vendors applaud the U.S. effort to fight back, they are uneasy about U.S. and Japanese efforts to set the rules for a game in which they all are playing. European vendors are particularly concerned that semiconductor price protection in the U.S. will make Europe the site of the next chip price war.

W. Germans end monopoly

BRUSSELS — The West German government agreed last week to end the monopoly that the national post and telecommunications authority, the Bundespost, holds on the supply of modems.

The action comes in response to a ruling by the Brussels-based Commission of the European Community that the monopoly is illegal.

The ruling, announced recently by the European Community, means that private vendors will be able to supply internal and external modems directly to customers.

Lab to make chips in space

TOKYO — Three Japanese government agencies, including the Ministry of International Trade and Industry, agreed recently to begin a $193.5 million, six-year effort to develop and build an unmanned space laboratory. The lab, to be launced in 1992, will produce semiconductors and new materials that can only be made in a zero-gravity environment.

The lab, called the *Free Flyer*, will be retrieved by the U.S. space shuttle after orbiting the earth for six months.

Bull to offer cabling system

PARIS — Groupe Bull, France's leading computer manufacturer, is expected to introduce its first cabling system at the Sicob office automation trade show that will take place in September.

The Bull Cabling System reportedly sets the specifications for wiring a new building or rewiring an existing site.

The system will be based on twisted-pair wiring and a star-shaped architecture similar to AT&T's Starlan system, sources said. Bull has already chosen Ethernet 802.3 standard as the basis of a 10M bit/sec. network to link hosts within a building.

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Ashton-Tate, Comshare join on micro-to-mainframe link

Target corporations with proliferating PCs

By Peggy Watt

TORRANCE, Calif. — Ashton-Tate took another step in its efforts to provide customers with third-party micro-to-mainframe options, announcing a link with Comshare, Inc. Under the agreement, users of Ashton-Tate products will be able to engage in a two-way direct micro-to-mainframe data exchange with Comshare's System W decision support software.

A new release of Comshare's W/Information Gateway accommodates Ashton-Tate's Dbase II, Dbase III Plus and Framework II, allowing users to collect and edit data and upload it to a mainframe data base for storage and reports. Those reports can then be shared through Comshare's Commander EIS for sending charts and reports from the mainframe to the workstation.

"Micros are part of the picture now, and managers are looking for ways to move that data," said Keith Kremer, Comshare marketing director.

Kremer said Comshare and Ashton-Tate share many of the same kinds of customers, particularly large corporate users with large data bases and proliferating numbers of personal computer workstations. Financial analysis and business strategy planning are two of the biggest uses of Comshare wares, he claimed.

"We hear it again and again from customers, 'How do we tie all these things together?' " said Ron Arons, marketing programs manager for office automation at Ashton-Tate. "We're not about to sell mainframe software, but we would like to go in with someone who already knows that market," he noted.

The W/Information Gateway release costs $450 per user. It runs on an IBM Personal Computer or compatible system and a 3270 Personal Computer with 512K bytes of random-access memory. The release supports coaxial communications using a variety of communications boards or asynchronous communications through a Hayes Microcomputer Products, Inc.-compatible modem.

The updated Comshare product is available immediately through Comshare's direct sales force, but it will also be jointly marketed by the two companies.

The companies will share marketing and promotions and train each other's sales staff to promote the new capabilities.

Comshare products can already exchange data with products from Lotus Development Corp., which has also recently pursued the micro-to-mainframe link.

This is the latest in a string of cooperative micro-to-mainframe third-party products offered by Ashton-Tate.

The company has similar agreements with nine other developers of mainframe software, including Applied Data Research, Inc. of Princeton, N.J.; Cincom Systems, Inc. of Cincinnati; Computer Corporation of America in Cambridge, Mass.; Cullinet Software, Inc. of Westwood, Mass.; Informatics General Corp. of Canoga Park, Calif.; Management Science America, Inc. in Atlanta; Micro Tempus, Inc. of Montreal; Software AG of Reston, Va.; and TSI International in Wilton, Conn.

Automation at PTO criticized

By Mitch Betts

WASHINGTON, D.C. — A Texas congressman recently charged that the massive automation project currently under way at the U.S. Patent and Trademark Office (PTO) has been mismanaged and called for the project to be reassessed.

Oscar Mastin, a spokesman for the PTO, said last week that the office has no response or comment concerning the allegations of mismanagement made by U.S. Rep. Jack Brooks (D-Texas).

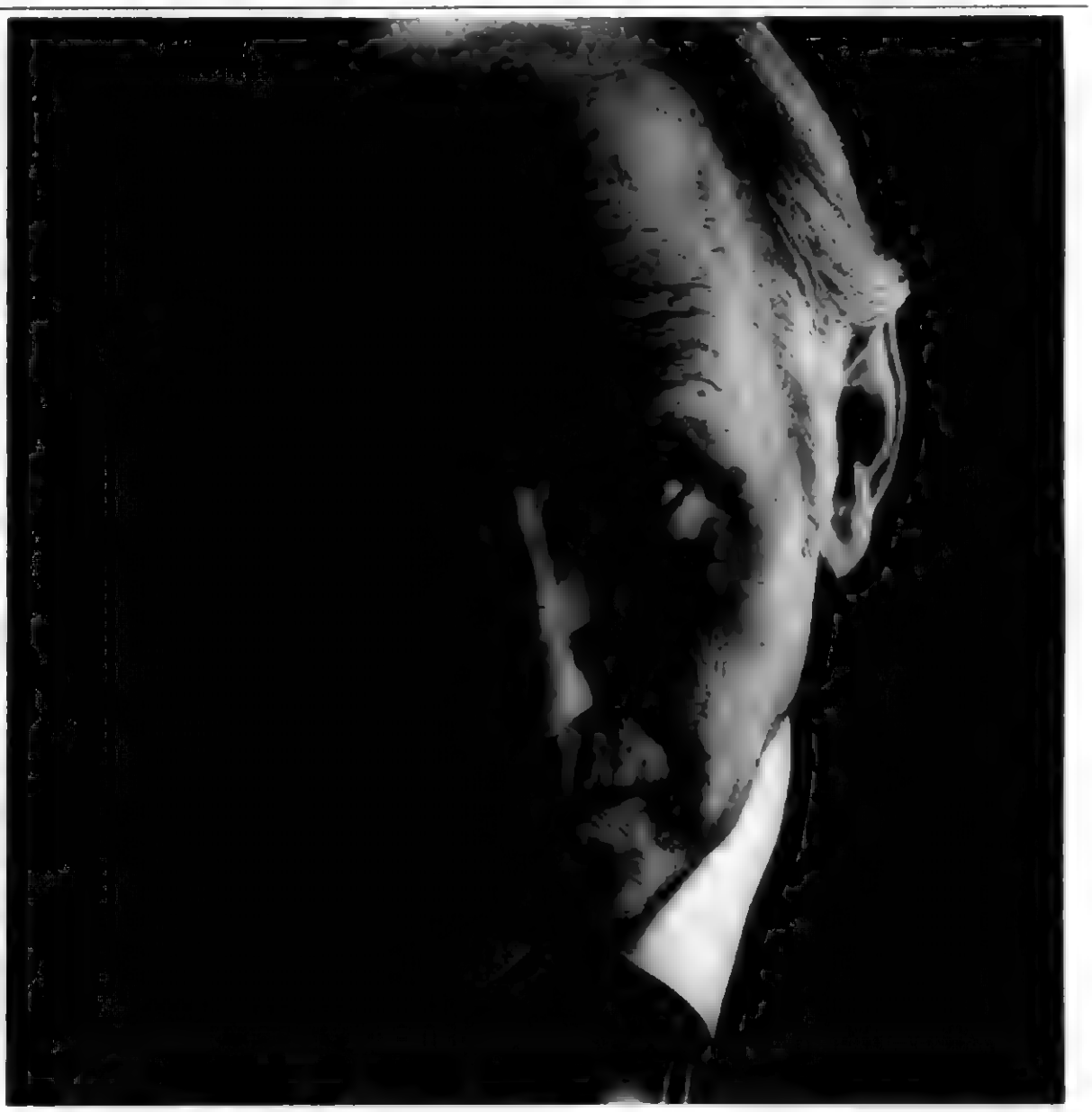
The $808 million automation project is intended to put 27 million documents on optical disks linked to custom workstations to improve the patent search capabilities [CW, Dec. 3, 1984].

A report written by the U.S. Congress' General Accounting Office (GAO) and released by Brooks concluded that planning of the patent automation program have been inadequate, that certain federal contracting rules were ignored and that the program is a year behind schedule and more costly than expected.

The estimated cost of the 18-year prime contract with Planning Research Corp., a systems integrator based in McLean, Va., has increased by 56% to $448 million, the GAO said.

According to the GAO audit, the PTO pursued automation with little regard to costs, used an inaccurate cost-benefits analysis and did not consider alternatives to automation.

The GAO report said the the Department of Commerce should stop funding the program until its direction and scope are reassessed.



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VIEWPOINT

EDITORIAL

Seizing power

If "power to the users" means millions of instructions per second and other performance benchmarks to you, then you may be more an "appliance operator" than a true citizen of the information age. So says author Jay Bloombecker in this week's In Depth article on the growing legislative influence of computer users groups.

The moniker is purposely pejorative. Bloombecker wants to anger computer professionals into raising their voices on legislation that directly affects the workaday world of MIS: software licenses, software warranties, operation of bulletin boards, taxation of software and regulation of VDT use.

When corporate or individual users have banded together, most often in users groups, they have met with remarkable success in confronting the well-financed, well-organized vendors that attempt to lobby laws into existence for their own benefit.

Witness the efforts of Technical Evaluation through Strategic Cooperation, a group of 31 Fortune 100 managers who pushed ADAPSO into creating first a microsoftware customer and vendor advisory board, then guidelines on microcomputer software warranties. The battle to guarantee that software performs as promised is not yet over, but TESC won a significant victory for corporate users who refused to accept as adequate vendor-initiated warranties.

In another series of victories, computer users in several states including Arizona, California, Illinois and Hawaii beat back vendor attempts to pass legislation that was billed as protection against software piracy but in reality was an attempt to limit software manufacturers' responsibility for product performance.

Similar successes have been won in the standards arena, despite the fact that standards-setting bodies are traditionally dominated by vendors that most benefit from spending money and time in world capitals hashing out protocols.

As reported in these pages last week, vendors are finally attending to a growing number of users who want the networking functions promised by long-awaited, long-delayed Open Systems Interconnect protocols from the International Standards Organization. These users are turning to the Transmission Control Protocol/Interconnect Protocol originally developed for the military, and vendors are tagging along behind, grudgingly providing the needed support.

On a grander scale, General Motors Corp. bestowed Manufacturing Automation Protocol on the computing world. Vendors that worked for years on Ethernet, let us say, might question the audacity of a user determining a standard. But the point is that GM recognized the importance of standards and so took control of its own fate.

Of course, MAP is technically an OSI protocol. But at least GM got a chance to determine that part of OSI that most impacts its own needs and those of other manufacturers.

In short, there is power for the taking, particularly when users band together. Wise MIS managers will use the tools of their trade — computers, networks, bulletin boards and technical and professional groups — to help shape the agendas of vendors and legislators alike.



News Item: IBM seeks to reverse revenue drop, outbids DEC and Wang for $300-400 million Ford OA contract.

LETTERS TO THE EDITOR

Automation can't turn GIGO to PIPO

The In Depth feature, "Paper chase: Keeping up with office productivity" [CW, July 21], by Edward Yourdon, has inspired me to write. The headline and teaser of this article both attracted my attention, since I am an office worker and want to be properly equipped so my company can compete successfully.

When I came to the fourth paragraph, my enthusiasm waned. I read the rest of the page with increasing astonishment. I had believed the author wanted to promote the concept of office automation to staff and managers. What the author accomplished was to insult the entire secretarial profession and then go on to trash the postal service.

"Many organizations are also finding it increasingly difficult to hire competent clerical and administrative people, thus making it necessary for the few competent administrators to be more productive and for managers to do more and more activities for themselves," Yourdon writes. I agree. Competent people are rare in any field but especially those in which salaries and career paths are out of tune with the degree of responsibility and detail work required. Aside from here, where is it written that it is the manager's responsibility to compensate for lack of skills or motivation in all employees? There are assumptions operating here unlikely to be shared by most clerks, administrators or managers.

As Yourdon proceeded with this profession assassination, the insight I obtained was that he missed the point. Scarcity of high-quality personnel is a problem that will not be solved by office automation.

On the contrary, new technology and procedures call for increasing levels of skill and awareness to maximize their effective use. While the modern executive can keyboard correspondence, run it through a spelling checker, dictionary and thesaurus and have it print out automatically formatted in the proper company style, an office professional with good administrative and interpersonal skills will remain a necessary member of any management team.

I enjoy the new age of office automation when I no longer need to go through my executives' texts with a fine-tooth comb for spelling and spacing errors, never have to keyboard an address twice, keep the same pencil for a year, post bulletins with the sweep of an Enter key and maintain my Rolodex on file. However, I suspect it will be a while yet before the personal computer will tell the vice-president that the marketing director already sent a memo addressing that issue or that there are three more people who should have copies of a proposal.

It takes judgment and skill to assure PIPO (perfect in/perfect out) rather than GIGO (garbage in/garbage out).

My suggestion to Yourdon is that if he hired educated, intelligent secretaries at professional wages with continuing education benefits and opportunities for career growth, he would never have met the young lady who disillusioned him so. If he wants to encourage the advancement of office automation, he should consider the possibility of taking a more than superficial look at the field of information processing and the ways in which its growth is being influenced by professional secretaries, information specialists, word-processing operators, the institutions that train them and their associations.

Sheila M. Oranch
Administrative Secretary
Natick, Mass.

Missed deadlines cause late delivery

The column, "Technical edit cause of delay" [CW July 14], stated that the technical review process can cause a delay in the implementation of the project.

This is very true. However, I would like to extend this to include all review processes: the functional requirements, design documents, program specs and especially the resolution of outstanding issues.

The implementation date seems so distant during the design phase that the analysts and clients think they can delay meetings and miss deadlines for approving published documents without affecting the implementation date. Then when testing is not going well and the date may be missed, everyone blames the programmers for not putting in enough overtime.

If the analysts and clients would work some overtime at the beginning of a project, more implementation dates would be met and programmers would not have to work around the clock in order to meet those dates.

Marsha J. Rogers
Programmer/Analyst
Indianapolis, Ind.

VIEWPOINT

In praise of a corporatewide information strategy

Dexter owns a business. It is big, for a business run almost single-handedly by its founder, and it is growing nicely. It has departments that offer different aspects of the firm's service to different types of customers. Two of these departments can justify their own multiuser computing capability.

Dexter is not a computer type. He knows that the manager of each department can make intelligent decisions. So he let each one decide what computer to get. They are not computer types either, so they got consultants.

The consultants were competent. But each consultant was hired by the manager of one department to look at the needs of that department. The consultants did their assigned jobs well. One department got a Hewlett-Packard Co. HP 3000. The other got a network of IBM Personal Computer XTs and ATs.

By itself, each decision was reasonable. The department with the HP 3000 uses a common data base. The other department consists of independent workers who need computation capabilities and graphics. PC ATs give them enough power, and the network gives them sufficient information exchange capabilities.

Unfortunately for Dexter, the world is not static. Sooner or later somebody will realize that his two customer groups come from the same corporation. That somebody will realize that coordinating both sides of Dexter's firm could be a handy marketing and decision-making tool. Somebody will also realize that the computers already have the necessary data. So the poor soul will try to combine both halves.

That is when the bubble will burst. The two departments' information strategies are being developed with no thought of eventual cooperation. Each is proceeding happily down the path of local optimization.



By EFREM MALLACH

The transaction processing programs on the HP 3000 will take advantage of every little quirk of that machine. The packages bought for the PCs will be selected for functionality, support and the like — but not for file structures that facilitate data interchange.

In return for a few percent more efficiency today, Dexter is buying a lot of future headaches.

Importance of information strategy

It is easy to look at the situation from the outside, when the long-term issue has been pointed out, and to see what went wrong. Dexter should have thought about his corporate information strategy before spending several hundred thousand dollars. Had the decision been made to standardize on the HP 3000, the PC users would have found that it can do computation and graphics.

Had Dexter opted for more PCs, there are file servers available to construct a shared data base. Neither of these approaches is optimal for the other purpose. Both would require some extra work. The specific choice is not the point. The point is that any choice should be made with a view to where Dexter wants to be in five years. Any other approach, any short-term view of the issues, will turn Dexter into a wholesale Excedrin user by 1990.

We cannot expect Dexter to worry about this. As the saying goes, "When you're up to your ears in alligators, it's tough to remember that your mission was to drain the swamp." Dexter is up to his ears in alligators. The last thing he wants to worry about is an information systems strategy. If he is trying to grow his business, that is also the last thing he should have to worry about.

One solution is to have a chief information officer. This concept, analogous to that of a chief financial officer, was first proposed by William Synnott and William Gruber in their book *Information Resource Management: Opportunities and Strategies for the 1980s* (Wiley, 1981).

The chief information officer integrates information technology with business needs and makes sure the whole organization pulls in the same direction. The information officer must have both technical competence and a corporate strategic perspective. The strategy must address both present needs and future goals.

All is not lost

Suppose Dexter does not want (or really need) a chief information officer. All is not lost. First, he must recognize that information is a critical business resource in the 1980s, a fourth element of the traditional management-labor-capital base on which businesses are built.

Therefore, any departmental information systems proposals must be reviewed at the top for their corporate implications, just as capital budgets are routinely reviewed today.

Second, the consultants should be told to address the implications of their proposals for the other parts of the business. Just as Dexter's managers would not accept business proposals that ignore what another department is trying to do, they should not accept information systems proposals that do not address what is being done elsewhere.

Dexter does not have to do it himself. He does not even have to hire somebody full time to do it. But, as chief executive, he is responsible for seeing that it gets done. If he does not do it now, he will suffer later.

Mallach is associate professor of computer science at the Boston College School of Management and a consultant to top managers of vendor and user organizations.

Work value analysis as yardstick for end-user productivity

READER'S PLATFORM

By A. PERRY SCHWARTZ

Although most information systems specialists are believers in the productivity gains brought about through end-user computing, some executives are beginning to question its value . . . especially where they have seen personal computers gathering dust or heard of machines being turned into paperweights.

Now that the novelty has worn off, management is apt to weigh the benefits of this gear against many other useful expenditures. In this context, how do office automation, PCs, local-area networks and departmental computers stack up? Lately, not all that well.

A major problem has been that it is often impossible to determine the benefits of end-user computing, not because these benefits do not exist, but because business analyses have been squishy concoctions of wishful thinking and naive economics.

Objective cost-justification

If end-user computing is to resume its growth, information system specialists must finally be prepared to provide sound and objective cost-justification.

In cases where white-collar effort, enhanced by end-user computing, can be traced directly to the bottom line, the analysis can be very straightforward. The problem is to develop a model of the cash flow. Unfortunately, these cases are in the distinct minority.

In the vast majority of cases where white-collar work enhanced by end-user computing yields indirect benefits, we have come to favor what we call work value analysis as a means of determining productivity increases.

Work value analysis, which has been developed in joint studies with EDS Corp., is based on the fact that white-collar workers must divide their time among a variety of activities. Some are higher value activities: for example, an engineer designing an antilock braking system for a new car or a financial analyst deciding how to invest the funds of a thousand customers.

Lower value and lost-time activities

On the other hand, proofreading a report for spelling errors or locating reference materials must be looked upon as lower value activities. And time spent waiting, traveling or looking for a missing file may be regarded as lost-time activities.

Viewed in this context, the objective of introducing end-user computing is twofold: one, efficiency — to allow the white-collar worker to accomplish activities in a shorter period of time; and two, effectiveness — to shift time from lost-time and lower value activities to higher value activities.

Work value analysis empirically determines the value of each work activity, based on salary and other factors and objective measurement of how professionals are spending their day. This method has worked very well to account for gains in efficiency and effectiveness and to document the projected benefits of end-user computing, in dollars and cents, for hundreds of employees in major companies. By comparing before and after measurements, these benefits can be objectively verified.

One criticism, which surfaced most recently in "Cost justifying investments in office systems" [*Computerworld Focus*, May 14], that has been leveled at work value analysis and other activity-based measures of white-collar productivity is that these methods fail to take into account the fact that white-collar work is neither discrete, standardized nor repetitive.

Although this criticism seems reasonable on the surface, evidence reported by a number of management experts refutes it.

One such expert is Henry Mintzberg. After a careful study of managerial jobs, he labeled as a myth the notion that managers and professionals perform mostly nonrepetitive and unstructured duties. According to Mintzberg's findings, reported by him in *The Nature of Managerial Work* (Harper and Row, 1973) and in a *Harvard Business Review* article, "The manager's job: Folklore and fact" (July-August, 1975), the work of professionals actually follows a highly regular pattern.

Work follows a predictable pattern

Another noted management specialist, Harvey Poppel, the architect of Booz, Allen & Hamilton, Inc.'s study of the office of the future, also found that white-collar workers devote their time to activities in a very predictable manner.

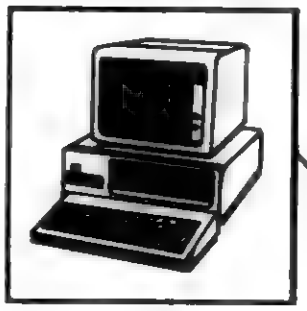
This study, covering more than 300 workers in 15 organizations and more than 90,000 time samples, was reported in "Who needs the office of the future?" (*Harvard Business Review*, November-December, 1982).

Thus, contrary to popular folklore, white-collar work does follow a repetitive, structured and predictable pattern. Consequently, the benefits of end-user computing can be objectively measured.

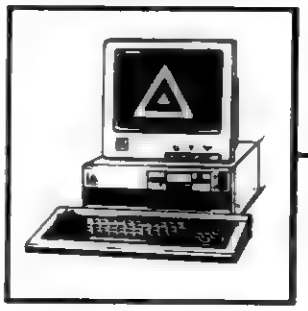
Schwartz is president of Computer Research Associates, Inc., a research and consulting firm in Atlanta.

Make the Connection

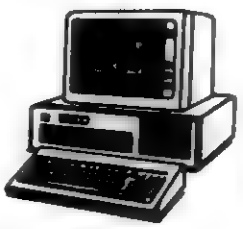
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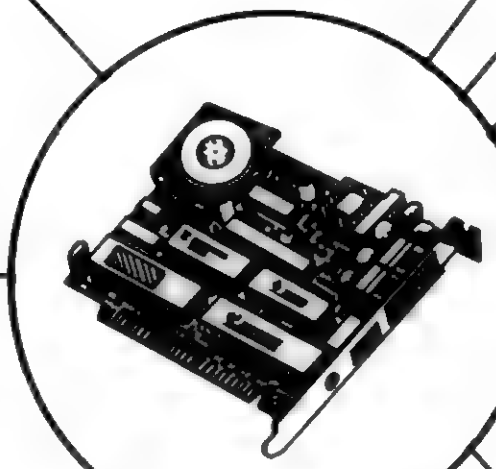


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COMMUNICATIONS

Charity gets Token-Ring

By Peggy Watt

OAKLAND, Calif. — One of the early IBM Token-Ring systems to be installed in the field, and among the very first running Novell, Inc.'s Advanced Netware operating system, has been installed at a nonprofit agency in Oakland.

United Way of the Bay Area employees can use the network to access a data base of more than 20,000 small businesses, which will reside on a Novell file server, said Associate Executive Director Jack Healy. Besides keeping lists of names and numbers, the system will help fund-raisers dial potential donors, record their responses and other general information, prepare boilerplate follow-up letters and compile lists of names and donations.

"I think we have a significant new market opportunity, and to get at this market, we need the state of the art of what technology has to offer," Healy said.

The Token-Ring was the local-area network (LAN) of choice because of its high data rate, its ability to handle multiuser data base access without slowing down and its guarantee of longevity as one of IBM's priority products, said Mark I. Freund, marketing director and a cofounder of Interconnect Network Consulting Group of Pasadena, Calif., which provided consulting services to United Way.

The 4M bit/sec. Token-Ring is faster than token bus configurations, which typically support 2.5M bit/sec. data rates, Freund said. And unlike Ethernet systems that use contention-based network access methods, the token-passing network does not suffer from response-time degradation during peak traffic periods, he added.

IBM's endorsement of the token-passing ring ensured its continued availability and development, Freund noted. Also, United Way felt that with its existing installation of a System/38 and approximately 40 stand-alone Personal Computers, it was already committed to IBM products, he added. "Picking the IBM-endorsed LAN ensured future compatibility with other IBM offerings."

The System/38, with a few remote PC connections, helps track United Way's more than 100,000 area donors, said Doug

See CHARITY page 20

AT&T to sell ISDN chip

Unite follows 2B + D, data link control protocols

By Elisabeth Horwitt

BERKELEY HEIGHTS, N.J. — AT&T Technology Systems recently announced the commercial availability of Unite, a chip that can be incorporated into communications boards that interface digital telephones, terminals and personal computers with an Integrated Services Digital Network (ISDN).

The chip implements 2B + D, the ISDN standard that specifies two 64K bit/sec. channels for digitized voice and data transmissions and a separate 16K bit/sec. channel for control signals. The chip has the built-in capability of formatting data according to High-Level Data Link Control protocols, AT&T Technology spokesman Tom Gates noted.

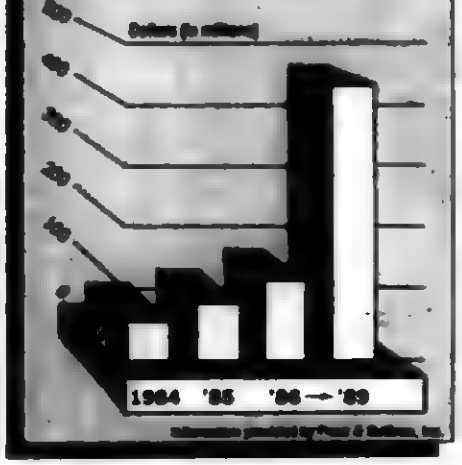
Samples of the chip are now being released to vendors of private branch exchanges, terminals and other computer equipment, Gates said. "We've been accused in the past of withholding our higher level technology. This shows that we are not jealous of our work." The chip also is being designed into AT&T products, he added. Based on the typical six- to nine-month life cycle of board-level products, ISDN interfaces based on the Unite chip should be almost a year away, according to Gates.

Workstations equipped with different vendors' ISDN boards may not be able to communicate, at least initially, Gates admitted. "Some vendors are offering 2B + D interfaces that do not entirely conform to the ISDN standard. The Consultative Committee on International Telephony and Telegraphy is trying to mesh the different versions, but that is a goal, not a fait accompli."

MITCHELL J. HAYES

Factory local-area networks

Installations expected to climb at a steady 35% per year rate through 1989.



Bridge software spans PC, TCP/IP gap over Ethernet

By Elisabeth Horwitt

MOUNTAIN VIEW, Calif. — Software recently introduced by Bridge Communications, Inc. enables IBM Personal Computer users to communicate over an Ethernet network with any other system running the Transmission Control Protocol/Internet Protocol (TCP/IP).

TCPTerm is an IBM PC implementation of TCP/IP, a set of basic networking functions that are reportedly supported by approximately 50 network and computer vendors. PCs running TCPTerm can exchange files or communicate in host-to-terminal mode with computers running TCP/IP, according to Bridge President William Carrico.

TCPTerm also provides access to Bridge network servers and gateways running TCP/IP. The product's network manage-

See SOFTWARE page 22

INSIDE

Codex introduces a low-end network management system/22

NEW THIS WEEK

- Integrated Telecomputing Systems offers the Advanced Messaging System

For more on this and other new products, see pp. 67-75.

INSTANT ANALYSIS

At Cebit, a computer industry conference held in West Germany this spring, attendees came up with a brand new interpretation of the acronym for Integrated Services Digital Network (ISDN): IBM Schafft Das Nicht, or IBM doesn't make it.

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Charity gets Token-Ring

From page 19

Rost, system manager, whose six-member staff will begin support of the new Token-Ring network as soon as the consultants move out and day-to-day operation begins.

The company has tentative plans for hooking its System/38 to the Token-Ring. Though a connection would require file conversion, Freund advised United Way that IBM will probably provide such capability.

Freund suggested that United Way use the Novell 109M-byte Novell T286B file server and Novell Netware operating system on the Token-Ring, rather than IBM's own Netbios network system and dedicated PC AT file server, which is less efficient and slower, he said. "Novell's is a more powerful file server than they need now, but when it comes time to add nodes, they should notice no degradation on the system."

United Way's decision to use Novell was reinforced by IBM's recent announcement that it would offer Netware Version 2.0 as an option bundled with its networks. Novell's updated Version 2.0A of Netware supports the Token-Ring, Freund said.

Another benefit of using Novell's file server is that it will easily evolve and expand with United Way's networking needs, Freund said. The server supports as many as four networks. Netware runs on a variety of LAN products and supports "virtually any PC software package," Freund said. "If, in the future, United Way wants a couple of PCs or a minicomputer on Ethernet or some other network to have access to the data bases available on the Novell server, their users will be able to use the same software and commands as users on the original network."

Novell also provides a remote asynchronous gateway that allows remote PCs to tap the new data base by linking into the Token-Ring LAN over phone lines, Rost said.

United Way's initial configuration consists of four 640K-byte Model 2 PC XTs with a total system cost of about $45,000.

Application software

For its application software, United Way chose an integrated package, Executive Management Information System, designed for telemarketing by Peerless Software, a division of Peerless Technology Corp. of San Antonio, Texas. Because the package was already running at both Novell and IBM Token-Ring installations, it was almost certain to run on a network combining the two, Freund said. Initial snags in installing the application on the network were attributed to minor system call changes Novell made in upgrading to the Token-Ring, he added.

All the organizers said there was no problem getting Netware and the IBM Token-Ring hardware to communicate. However, being a pioneer in the still-new IBM Token-Ring world was not without challenges. Freund said he scrounged IBM network cards from several different dealers since they were not yet widely available. He was forced to install the LAN without benefit of documentation.

The new network fits into what a United Way spokesman calls "probably the most automated United Way offices in the country." Throughout the five-county area served by United Way of the Bay Area, 100 employees currently have access to data residing on the network.

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Codex introduces low-end network management system

Monitors modems on nets of up to 248 lines

By Stanley Gibson

MANSFIELD, Mass. — Targeting the low-end network management market, Codex Corp. recently introduced the 4840 Network Management System, designed for networks of up to 248 lines. The new system, incorporating the Data General Corp. MV/2000 DC 32-bit minicomputer, is the smallest of the vendor's 4800 family of network management offerings.

The 4840 is a dedicated system that monitors and does diagnostic testing of Codex modems. A built-in alarm system notifies operators of network problems and deterioration of circuit quality according to user-defined parameters.

The system can activate analog or digital diagnostic tests for up to four remote or central sites. In conjunction with the 4840, Codex 2600 series modems can adjust their transmission rates in response to fluctuating line conditions, Codex said.

Management software

A management reporting software package called Codex Management Applications (CMA) is an optional 4840 feature. CMA provides reports that help management identify network trends, evaluate system performance and assist in future planning, according to Codex.

McCormack & Dodge Corp. became a beta-test site for the 4840 because "we were looking for a mid-price system that would offer network control," said Mike Lake, technical manager for data communications at McCormack & Dodge.

Lake said he was attracted to the larger 4800 series products, but they were too large for McCormack & Dodge's network.

The software systems firm uses the 4840 in a network that offers remote product demonstrations to nine customer education and demonstration centers around the country.

The 4840's monitoring and diagnostics help ensure that the software demonstrations do not develop problems due to network glitches, Lake said.

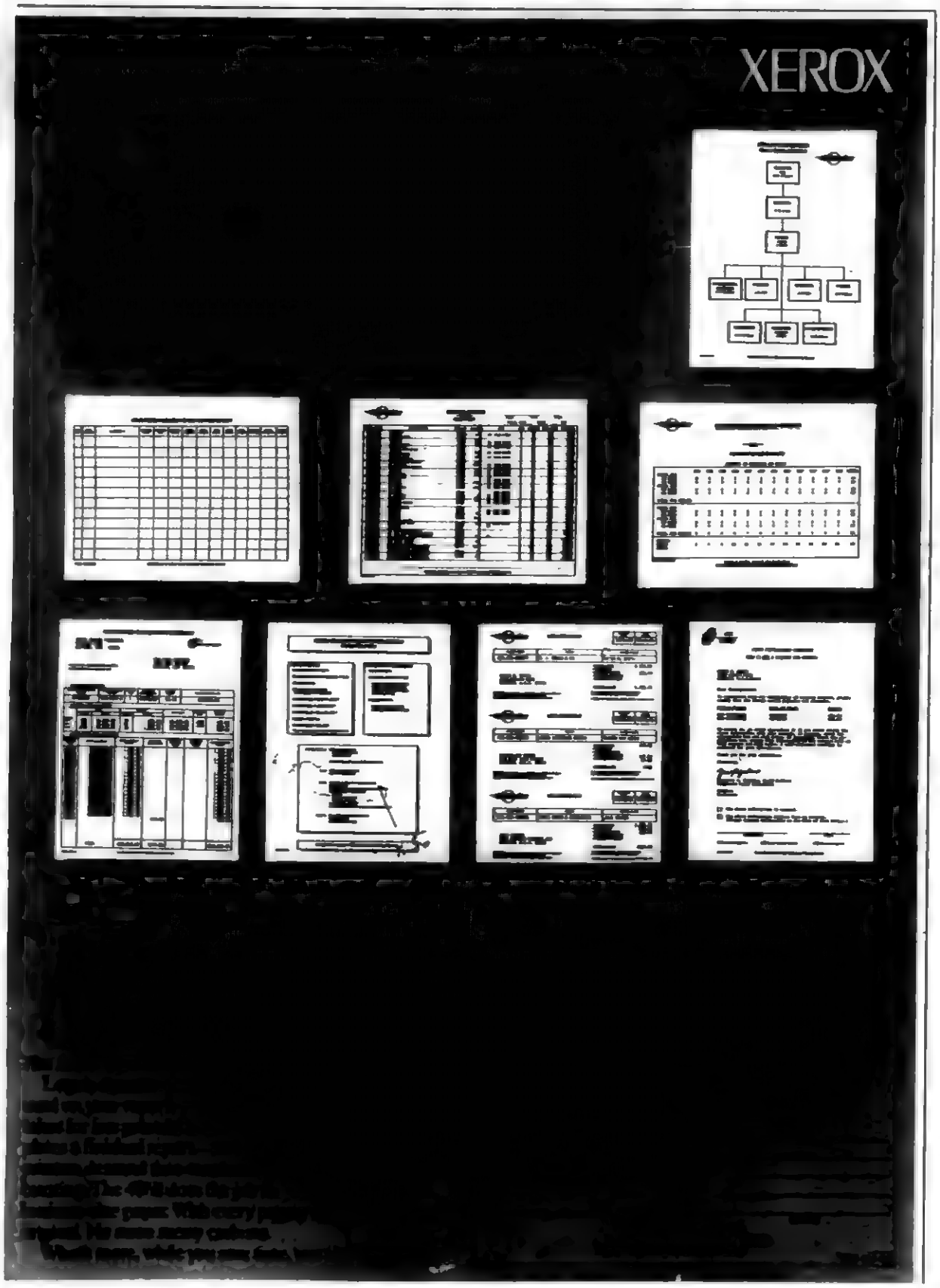
The CMA package allows network operators to identify and remedy potential trouble spots before they become serious, he added.

Menu-driven program

In addition, Lake praised the CMA package's menu-driven program, which allows employees who are not highly trained network managers to use the system. He said this feature is particularly needed in McCormack & Dodge's network, in which a computer operator, rather than a network manager, is normally in charge of the system.

The other 4800 products, the 4850 and 4860, were designed for networks of up to 496 lines and up to 744 lines, respectively. All 4800 Network Management Systems are software compatible.

The 4840 system is priced at $44,500, and the Codex Management Applications software package is priced at $2,000. Both are available within 60 days of receipt of order, according to Codex.



Software spans PC, TCP/IP gap

From page 19

ment capabilities include the generation of user audit trails for accounting and security purposes.

TCPTerm interfaces directly with IBM PC-DOS. Carrico said Bridge is currently considering a new release of TCPTerm that would link TCP/IP to Netbios, IBM's widely supported interface for network applications. A link between TCP/IP and Netbios would permit direct communication between an application on the IBM PC and an application on another networked system, he noted.

TCP/IP networking products from Bridge and several other vendors enable a wide range of user systems to run applications on Cray Research, Inc. hosts residing at Minnesota Supercomputer Center, Inc. Many of the Minneapolis time-sharing company's customers are research and academic institutions that use Arpanet, the Department of Defense network for which TCP/IP was originally designed.

"We like TCP/IP because it is an open protocol, because it is a government-supported protocol and because it is used on a wide number of systems," said Robert Williams, Minnesota Supercomputer executive vice-president.

The company currently has IBM PCs doing file transfer and terminal emulation across the TCP/IP network, but it would like the higher level communications capabilities that a Netbios-to-TCP/IP link would provide.

"The IBM PC user should be able to do his number crunching on the Cray, then use the results in a local PC program," Williams said.

Available now, TCPTerm is priced at $300 for the single-user version.

SOFTWARE & SERVICES

SOFTALK
Charles Babcock

Firm quietly making move

Martin Marietta Data Systems, Inc. in Princeton, N.J., is an outfit that few people in DP have had much cause to consider.

We know Martin Marietta Corp. as a builder of missiles, defense-oriented electronic systems and the external fuel tank on the space shuttle. But what does the company have to do with mainstream DP?

As you may recall, the parent company has acquired two noted software companies: Mathematica Products Group, Inc., the originator of the Ramis II information center management system, in 1983, and Oxford Software Corp., producer of the UFO application development system, in 1985. Since then, Martin Marietta Data Systems has been attempting to fold these two firms and their products into its product line.

Being acquired by a $4.4 billion corporation is no guarantee of success for a small software company's product line. On the contrary, software development is such an individual thing that the imposition of a strong corporate environment may have a detrimental effect. So where is Martin Marietta going with these two acquisitions?

In mid-May, Martin Marietta released an update of Ramis II that offered multiple users the ability to simultaneously read and update files and data bases. The difference between this concurrency and the one-user-at-a-time product was great enough that "every line of code in Ramis has been replaced," except for the basic infrastruc-

See FIRM page 27

Babcock is Computerworld's senior editor, software & services.

Software consultant finds development tools lacking

By Charles Babcock

John B. Landry III, a man regarded as a leading practitioner of software development, says the software industry is going through a "rebirth of development technology."

The ability to embed expert systems in commercial applications opens the door to new software development possibilities, Landry says.

Landry, developer of McCormack & Dodge Corp.'s trendsetting Millennium series and now chairman of Distribution Management Systems, Inc., a Lexington, Mass., applications firm, was hired as a consultant to ADAPSO to report on directions in software development. The report is the first in a series to the 800 software and service firms in ADAPSO and is intended to help them in their own development efforts.

Landry says expert systems need to fit into the IBM mainframe environment to be adopted in commercial systems. IBM's SQL, which is emerging as a de facto standard, provides a common data manipulation command set for future applications, he adds.

While LISP and Prologue, the typical expert system languages, do not run on IBM mainframes, rules-based programming systems that do fit into commercial mainframe environments are on the horizon, he writes.

IBM announced VM/ES for developing expert systems under VM/CMS. Digital Equipment Corp. is expected to announce a shell system later this year, Landry says, and his own company will offer a shell product this fall that will allow expert systems using SQL commands to be embedded in applications.

These approaches not only result in in-

See CONSULTANT page 28

SOFTWARE NOTES

Goldman named CEO of AI firm

Robert Goldman, former president of **Cullinet Software, Inc.,** joined the **Artificial Intelligence Corp.** (AIC) of Waltham, Mass., last week as president and chief executive officer. The firm is the producer of **Intellect,** the natural language query system marketed by IBM and Cullinet, among others.

"All the work being done in expert systems is being done with LISP and Prolog. Nobody has attacked expert systems from the IBM mainframe side," Goldman maintained. Unlike many other AI firms, AIC has built interfaces to the main IBM environments, he said. Goldman resigned his position at

See NOTES page 27

Manufacturing modules debut

By Stanley Gibson

NATICK, Mass. — McCormack & Dodge Corp. released the first three in a series of eight upgraded manufacturing modules for its Production and Inventory Optimization System (PIOS).

The software was designed to run on Digital Equipment Corp. minicomputers using DEC's Application Control Management System/Terminal Data Management System (ACMS/TDMS) transaction processing system. The previous version had worked with DEC's Forms Management System (FMS).

"Most of the ACMS changes are transparent to the user," said James Koren, who is in charge of implementing the system at Infotron Systems Corp. in Cherry Hill, N.J. He said the version would allow him to cut data entry time in half.

See MANUFACTURING page 27

INSIDE

IBM announces a System/36 manufacturing application with host support/**26**

NEW THIS WEEK

- Sun Microsystems offers Autocad on Sun 3 workstations
- Venturcom's Prelude information management system now supports Unix

For more on these and other new products, see pp. 67-75.

INSTANT ANALYSIS

"This period in DP history will be remembered as the rebirth of software development technology. The last major renewal occurred with the acceptance of online transaction processing and nonrelational DBMS systems."

— John Landry in the ADAPSO report, "Software Development Technology"

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☐ REASON #2: ARRAY PROCESSING OPTIMIZES ACCESS TO LARGE SETS OF DATA.
Relational DBMSs have always dealt with logical sets of data. But they manipulated only one physical record at a time. V5 eliminates overhead by physically delivering arrays of hundreds, even thousands, of records at a time.

☐ REASON #3: PARALLEL-PROCESSING OPTIMIZES COMPUTER RESOURCE USAGE.
V5 is 100% re-entrant shared code, and ORACLE's parallel-processing architecture fully exploits modern dyadic and quadratic processors from IBM, and other multi-processing computers such as those from DEC and Stratus. So ORACLE uses all the MIPS in parallel-processor configurations.

☐ REASON #4: MULTI-TABLE CLUSTERING OPTIMIZES JOINS.
ORACLE stores data from different tables on the same physical disk page. This technique—called *multi-table clustering*—permits you to access data from multiple tables in one disk read operation. Clustering improves ORACLE performance on all multi-table operations, such as join queries, update transactions, etc.

☐ REASON #5: HIGH-SPEED RELATIONAL SORT FACILITY OPTIMIZES DATA AGGREGATION.
Ad hoc relational queries frequently request that data be grouped, ordered or otherwise sorted. V5's internal sort facility performs aggregation and elimination early, faster than previously thought possible.

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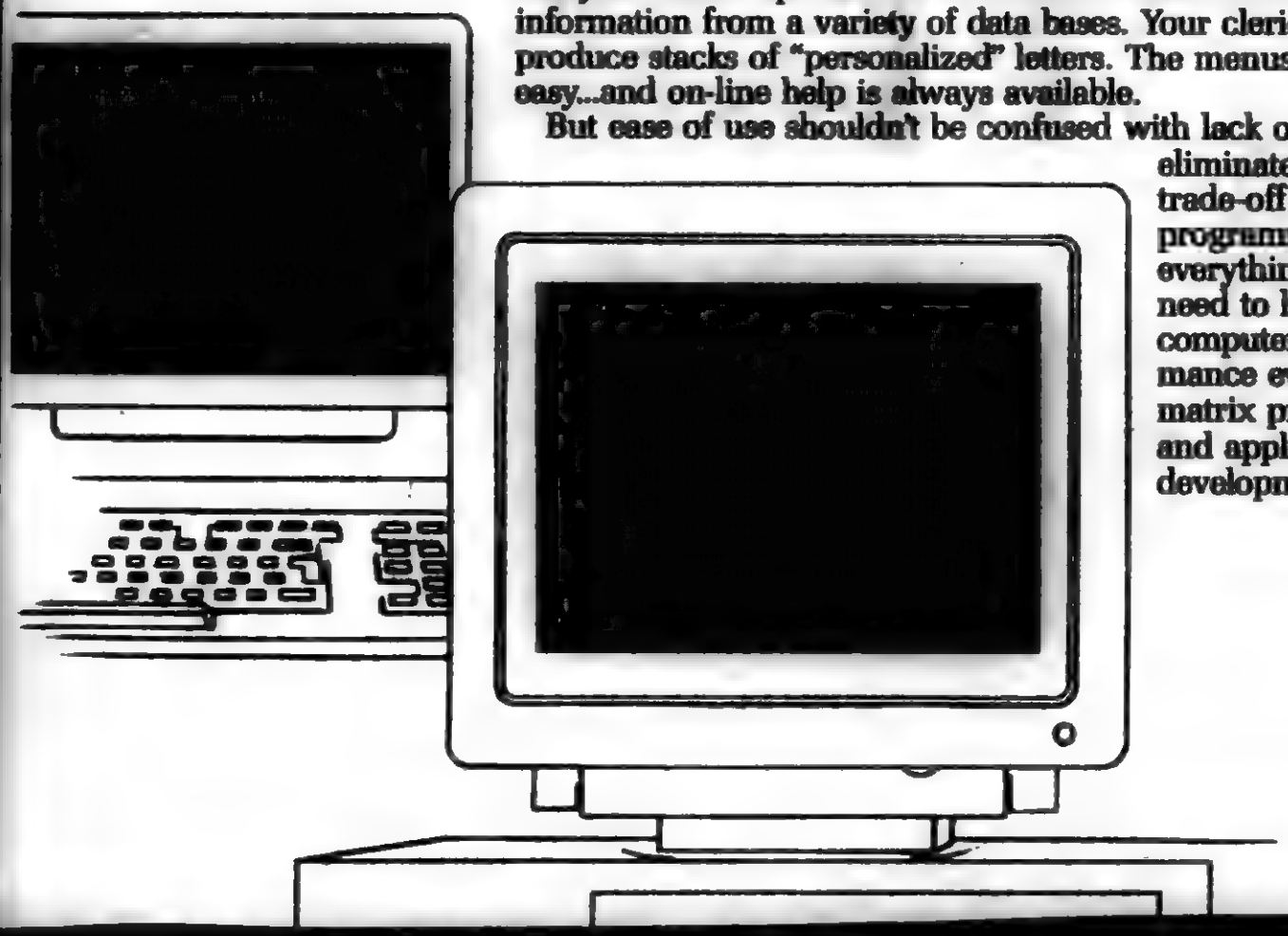
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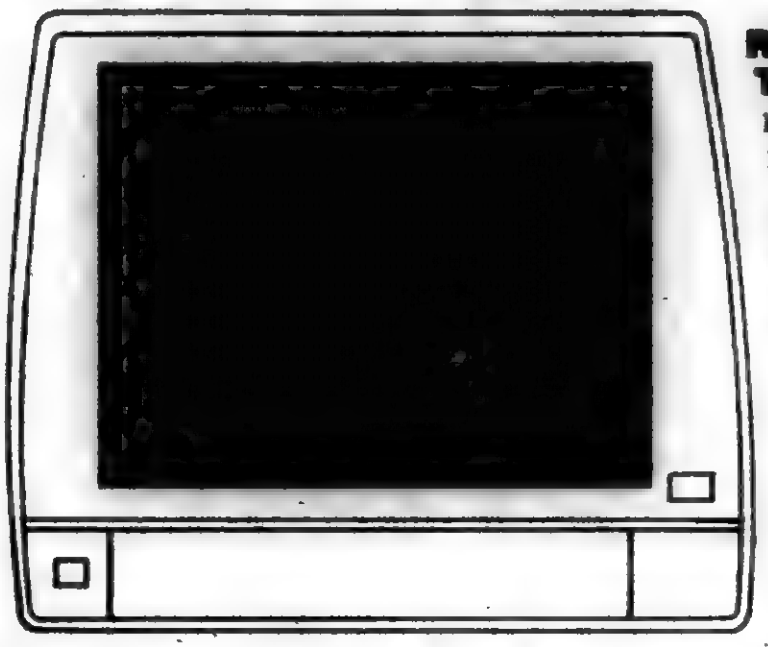


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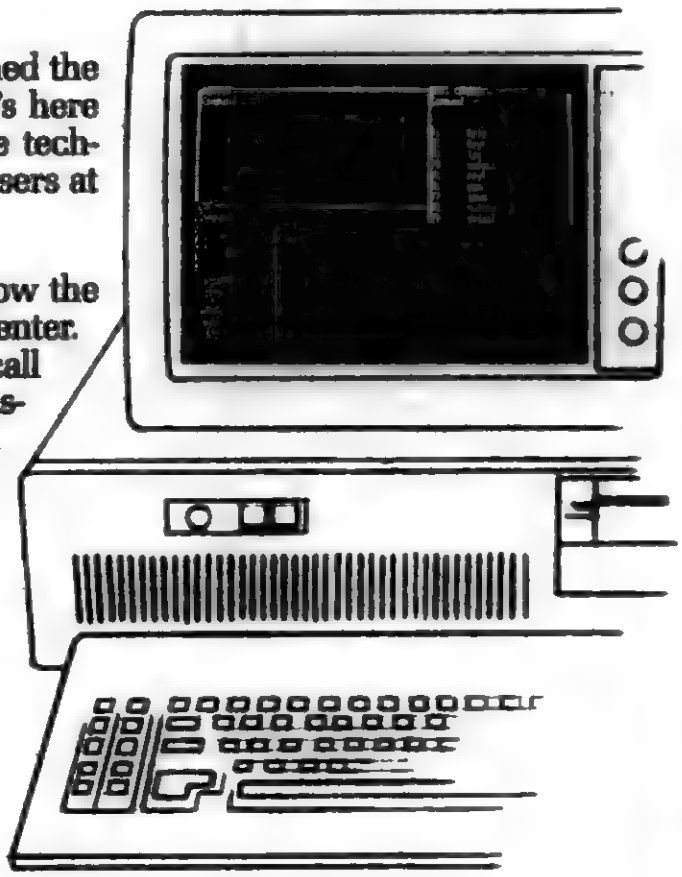


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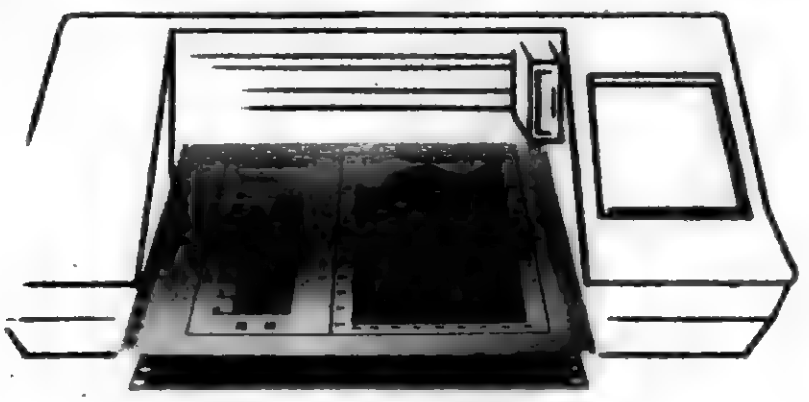
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System/36 shop floor aid out

Tracks manufacturing employee, job status

WHITE PLAINS, N.Y. — IBM announced a System/36 manufacturing application, Production Monitoring and Control program (PM&C), for tracking employee status and the status of jobs on the shop floor.

Using data collection terminals on the shop floor, employees clock on and off jobs, move materials and report activity to PM&C.

The system then analyses the status of jobs, work centers and employees for up-to-date reports, according to IBM.

"The shop floor can be more easily controlled, since problems can be identified and resolved as they occur," IBM spokesmen said.

Written in RPG-II

Written in the System/36 programming language, RPG-II, it is available immediately for $3,600.

IBM also announced host support for the exchange of information between PM&C and as many as five MAPICS II applications.

MAPICS, for Manufacturing, Accounting and Production Information and Control System, is IBM's manufacturing system. Host support is available immediately for $360, IBM said.

Consultant finds tools lacking

From page 23

telligent, workhorse applications but also combat a number of traditional development problems.

The typical development process, he charges, has too many people, too many different modes of expression — from English specifications to flow charts to program code — and too little user feedback.

With four people working on a project, there are 12 communication paths and that many potential avenues of misunderstanding. With 32 people, there are 992 communication paths and that much greater potential for error.

To combat these deficiencies, he recommends automating the system building process as much as possible, shortening communication paths, improving communication vehicles and integrating the development tools into a common system. In addition, software developers should seek a development environment that leads to applications that are both portable and efficient.

Working with advances in third-generation languages, such as structured Cobol or reusable code, does little to solve the communications problems in the system analysis and design stages, he notes.

Fourth-generation technology includes fourth-generation languages, applications development systems and application generators. Each offers advantages over third-generation languages, but none meets all six goals named above.

IBM's fourth-generation language, Cross System Product, provides a tool kit to develop applications across the major IBM operating systems, thereby offering portability. It also has a component that will automatically optimize system performance after the application is created.

Also available are such development systems as Millennium SDT, UFO from Oxford Software Corp. (now part of Martin Marietta Corp.) and Gener/ol from Pansophic Systems, Inc.

Millennium SDT is the set of tools Landry used to develop the Millennium series. Management Science America, Inc. and Software International Corp. have brought out similar tool sets for their integrated, application series.

IBM's Cross System Product and other tool sets still leave the design phase underautomated, he notes, but they allow developers to quickly build prototypes that can be fleshed out into applications. The design becomes the application, "reducing communication paths and providing consistent tools for representation," he said.

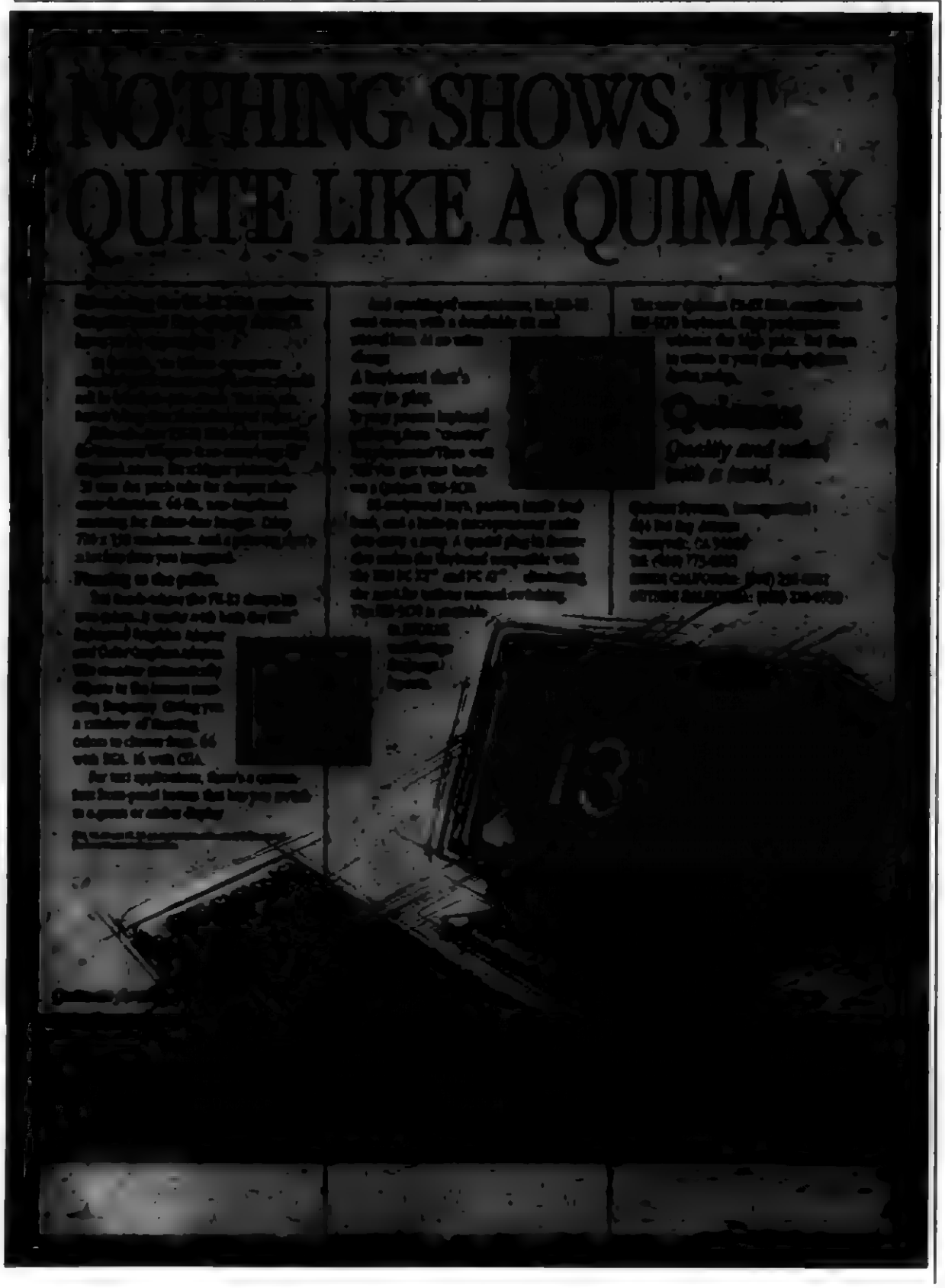
Application generators

Another fourth-generation technology, applications generators, are expensive — $100,000 to $200,000 — but can convert design specifications into prototypes and generate the production application. (This week's Product Spotlight focuses on applications generators, beginning on page 39.) Examples include Pansophic's Telon, Sage Systems, Inc.'s APS, CGI Systems Co.'s Pacbase, Higher Order Software, Inc.'s Use-It and Tarkenton Software's Gamma.

These systems automate the design and coding process, Landry writes, but the ability to develop prototypes "is constrained by the amount of detail required in the design specification."

In the hands of skilled developers, fourth-generation languages combined with data base management systems allow applications to be created more quickly, often through prototyping that allows prompt user feedback. Furthermore, the prototype can be fleshed out to become the system, "reducing communication paths and providing consistent tools for representation."

But experienced users of fourth-generation languages are rare. In the hands of a poor developer, they create "a lousy system but much more quickly," he writes.



Firm quietly making move

From page 23

ture, says Donald R. Shaw, vice-president and general manager of Data Systems.

Over the last few years, Ramis II has been dropping back in second place to its primary competitor, Information Builders, Inc.'s Focus. Obviously, Martin Marietta was not satisfied with that position.

The rewrite process opened up the opportunity to coordinate the operation of Ramis with other parts of Data Systems' product line. Its manufacturing applications, Modular Application Series (MAS), have been revamped, and their files are now accessible to a Ramis II user. In a similar vein, Data Systems' accounting applications, which sell mainly to large manufacturing installations, are integrated with MAS in their current, controlled release.

One can sense a powerful realignment taking place here. Manufacturing software is one of the growth areas of the industry; manufacturers, such as the auto makers in Detroit, have been automating with a vengeance since the back-to-back recessions of 1980 and 1982, and their appetite for software has only been whetted by their early success.

So what happened to Oxford Software's UFO? It has been folded into a new Data Systems product, Consensus, that packages a version of Cobol, a nonprocedural fourth-generation language, and UFO together into a shared application development environment. The Cobol language offered is the one familiar to standard Cobol programmers, but its use of interactive screen painting facilities enables a Cobol programmer to develop CICS applications without further training.

There isn't space to discuss the initiatives Data Systems is launching in microcomputer software as well. Suffice it to say it has some of the same underlying goals: "We are trying to find a scheme that enables us to capitalize on the recognition of old products and at the same time create a new family structure," Shaw says.

The revamped manufacturing applications are sitting atop a unifying architecture, "a kind of meta operating system," that not only ties together applications but also provides interfaces to different forms of hardware. Other companies are moving in the same direction, but Martin Marietta at least has the advantage of having arrived late and chosen this direction early.

Manufacturing modules debut

From page 23

Koren also said he anticipates benefits from the ACMS/TDMS version's ability to support a large number of concurrent users. With the FMS system, 40 users can log on to PIOS from any of the 650 terminals attached to Infotron's cluster of seven DEC VAXs. The ACMS/TDMS version will allow several hundred users to log on to PIOS simultaneously.

The software was developed in accordance with McCormack & Dodge's agreement with DEC to stay in step with DEC's own software improvements, according to Jack Knapp, McCormack & Dodge marketing manager. Knapp said the ACMS/TDMS version is also 35% to 40% faster than FMS and contains improved security features, among other enhancements. The 11 current users of the FMS version of PIOS are upgrading to the new ACMS system, he said.

The three PIOS/ACMS modules available immediately include bill of materials, material requirements planning and inventory control. Two more modules will be available in the next month or so, and the remaining five reportedly will be available before the end of the year. Each PIOS module is priced at $25,000; existing customers may trade in FMS modules for ACMS/TDMS versions.

PIOS was developed by Rath & Strong Systems Products, Inc. of Dallas, which was acquired by McCormack & Dodge in 1985.

Notes: AMS buys Anacomp line

From page 23

Cullinet March 12 upon the appointment of David Chapman as Cullinet's new vice-chairman and CEO.

■

American Management Systems, Inc. (AMS) has acquired the **Bankserv** product line of **Anacomp, Inc.** of Indianapolis. The line includes six credit management systems for banks, including the Installment Loan System, one of the most widely used loan packages.

■

Information Builders, Inc. is offering an $8,500 interface from **Focus** to **Datacom/DB**, the relational data base management system from **Applied Data Research, Inc.** It will permit a Focus user running under MVS/TSO to use Focus reporting and data analysis functions against data in Datacom/DB, Information Builders officials said.

■

Burroughs Corp.'s Linc, also known as the **Logic and Information Network Compiler**, now runs on its **XE 550** Unix-based superminicomputer. The system is able to generate applications that run on Burroughs' B1000 through B7000 series, V and A series and the supermini, Burroughs said.



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MICROCOMPUTERS



MICROBITS
David Ahl

One size never fits everybody

Some people paint pictures. Others jog to work. I build shelves.

On cleanup days, most of my neighbors put out tons of trash. I throw away maybe one bag.

All of which is to say that I am an accumulator, a saver, a collector.

I don't know when it started. Probably when I was born. Maybe before. And as the years passed, this passion for collecting grew — to stamps, first-day covers, coins, comics, magazines, records (I have the first RCA 33-rpm long-play record ever made), neckerchief slides, puppets, robots and finally to computers.

Recently, a friend of mine mentioned that he had upgraded to an IBM Personal Computer and was selling his Tandy Corp. TRS-80 Model III — actually, two of them — and was I interested? Since I still use a Model III for word processing, I was sorely tempted. I already had three Model IIIs (one I use, one my kids use and the other is a spare), but he knew that I had long ago concluded that you can't have too many computers, just as you can't have too many screwdrivers or too many RCA-to-RCA phono cables.

This time I resisted — at least temporarily. My house and U-Lok storage locker are already overflowing, and I felt I had to put an end to this mindless accumulation.

I recently filled out a questionnaire from a computer magazine asking what computers I owned. They allowed space for only four computers, not nearly enough for my 22 machines. Do I use them all? Well, not really. (In fact, since many of these companies no longer produce PCs, I didn't bother to decipher the alphabet soup that makes up their

See ONE page 33

Ahl founded Creative Computing Magazine *and is the author of more than 20 books on recreational, educational and professional computer applications.*

Microsoft, Intel offer users Xenix 286-Unix migration

By Eddy Goldberg

Intel Corp. and Microsoft Corp. recently announced an agreement that will ensure that users of Microsoft's Xenix 286 will have a place in the growing environment of multiuser, multitasking systems based on the Intel 80386 chip and AT&T's Unix System V.3.

Under terms of the agreement, Intel will include in its System V/386 Unix V.3 derivative the capabilities and features needed to run programs written for Microsoft's Xenix 286.

This will provide users of Xenix 286-based applications with a migration path that will allow the Xenix 286 software base to be merged into the Unix market, according to Leslie Vadasz, senior vice-president and general manager of Intel's Systems Group in Hillsboro, Ore.

The agreement specifically provides for Xenix binary compatibility under Unix V.3-based Intel board and system products. Intel's 80286 and 80386 are the principal processor families affected, and products will include Intel's Opennet local-area network family, its Host Communication Products, Apex multiple processor systems and applications software running on Intel boards and systems.

The System V/386 products are scheduled for availability in mid-1987, according to an Intel spokesman. System V/386 features currently include support for the 32-bit programming model of the 386 chip and demand-paged virtual memory as well as support for the Virtual 86 mode of the processor. This allows Microsoft MS-DOS software running on Intel 8086- and 8088-based systems to run on 386-based products using System/V 386.

Another Unix-DOS development

In another Unix-DOS development, Linkdata, Inc. of Union, N.J., introduced a Unix System V Release 2 version of its MPC/68 coprocessor board that allows IBM Personal Computer ATs and compatibles to support up to 17 users in a multiuser, multitasking system.

The company also expanded the MPC/68 from 512K bytes to 1M-byte, 2M-byte and 4M-byte memory options. The MPC/68's speed has also been boosted from 8 MHz to 10- or 12.5-MHz options.

The memory expansion allows the company's enhanced Motorola, Inc. 68000 coprocessors to support Unix V.2 concurrently with MS-DOS operations. Users can switch between the two environments with a single keystroke, allowing MS-DOS

See XENIX page 34

TI develops expert package for PC

System developer aimed at entry-level market

By James Connolly

AUSTIN, Texas — Aiming its expert systems development program at a lower entry-level point, Texas Instruments, Inc. last week introduced a development system designed for use on IBM Personal Computer-class systems.

In addition to announcing the Personal Consultant Easy expert system shell, TI released Version 2.0 of its Personal Consultant Plus, which is the company's year-old system for IBM Personal Computer AT-class machines.

Personal Consultant Easy includes the basic functions of Personal Consultant Plus 2.0 and allows the novice user to develop small to medium-size expert systems, according to Mark Linesch, TI's product marketing manager for the Personal Consultant series. "Personal Consultant Easy allows quick prototyping for the newcomer and power for the experienced user," Linesch said.

Linesch emphasized that systems developed with Personal Consultant Easy are compatible with Personal Consultant Plus 2.0 and TI's high-end Explorer Lisp-based symbolic processing system. Personal Consultant Easy supports knowledge bases of up to 640K bytes of random-access memory (RAM), rule-based applications and graphics using TI's version of the IBM Enhanced Graphics Adapter (EGA). It includes data import facilities for Microsoft Corp. MS-DOS files and Ashton-Tate DBase II, III and III-Plus inquiries.

Personal Consultant Plus 2.0 supports up to 2M bytes of RAM and features new development capabilities like frame description, which allows the user to break

See TI page 34

INSIDE

Mouse Systems Corp. is set to announce a PC Mouse version that provides a dedicated mouse port/**34**

NEW THIS WEEK

- Tandy offers the 102 portable computer
- Comark Corp. announces the Expert-AT workstation

■ For more on these and other new products, see pp. 67-75.

INSTANT ANALYSIS

"By and large, IBM would not want to come out with a 386 machine until probably 1988, because it tends to milk product life cycles."

— Jan Lewis, president of the Palo Alto Research Group, on IBM's plans for a more powerful personal computer

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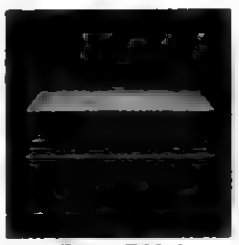
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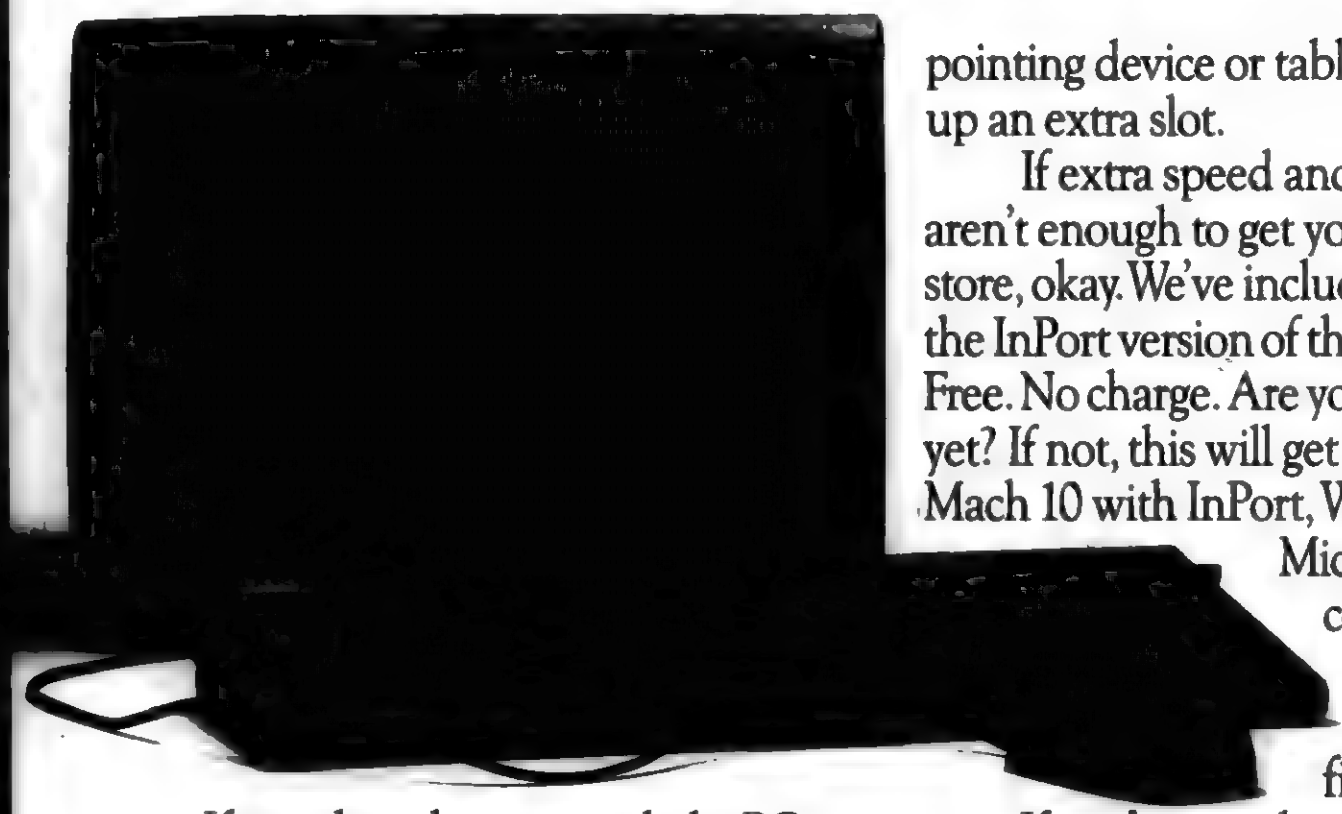
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One size never fits everybody

From page 29

names.) I'm keeping my original S-100 bus Altair, IMSAI, SOL, CSS, and Sorcerer for historical and sentimental reasons. Likewise for my first PET and Texas Instruments 99/4 (with the Chiclet keyboards) and CC40, Sinclair ZX81, and Spectravideo 318.

It was only a short while ago that I retired my 1978 Apple Computer, Inc. Apple II in favor of an Apple IIe. My Atari Corp. 800 is still a terrific game machine; there are some marvelous music programs for the Commodore 64; and the Mac has no equal for page layout.

> ***Several computers are more effective than one general-purpose machine. Sure, I could do all of my personal computing tasks on one computer, but it would be an ineffective compromise.***

Which brings me to the point of all this: Several computers are more effective than one general-purpose machine. Sure, I could do all of my personal computing tasks on one computer, say an IBM PC XT or clone. But it would be an ineffective compromise.

For spreadsheet and data base applications, it would be fine. But for word processing, it would be less effective, for I would not have access to hundreds of old disks containing previous articles, memos and notes.

For telecommunications, I sometimes want to use the same computer I use for word processing, but other times, when I am on the road, I want to use a portable like a NEC 8201 or a Tandy Model 200.

For desktop publishing, many packages have been released for the IBM PC, but the Apple Macintosh is still the leader. The page layout packages for it are unequaled, as are the libraries of "clip art."

And since children are among the users of my personal computers, I felt it would be a mistake to not have an Apple II; there are more educational packages for it than for everything else combined.

My computers also serves as a diversion from work, so the scores of entertainment, music and graphics and drawing packages available for the Commodore 64 and Atari 8-bit computers made it essential to have at least one of each machine. Within six months, that will be true of the Atari ST and Commodore Amiga as well.

So the next time your boss says, "You want to buy another *what*?," just wave this column and say, "Well, if *Abi* has 22 computers, why can't I have just one more?"



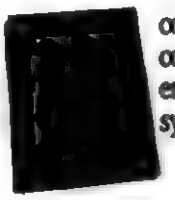
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PC Mouse version alleviates need for multifunction card

Provides dedicated port for peripherals

SANTA CLARA, Calif. — Mouse Systems Corp. is scheduled to introduce today a version of its optical PC Mouse that also provides a dedicated mouse port.

With the $199 PC Mouse Bus Plus, users can connect a PC Mouse and peripheral devices to a microcomputer without having to purchase a multifunction card, the firm said. The product also eliminates the need for an external power supply.

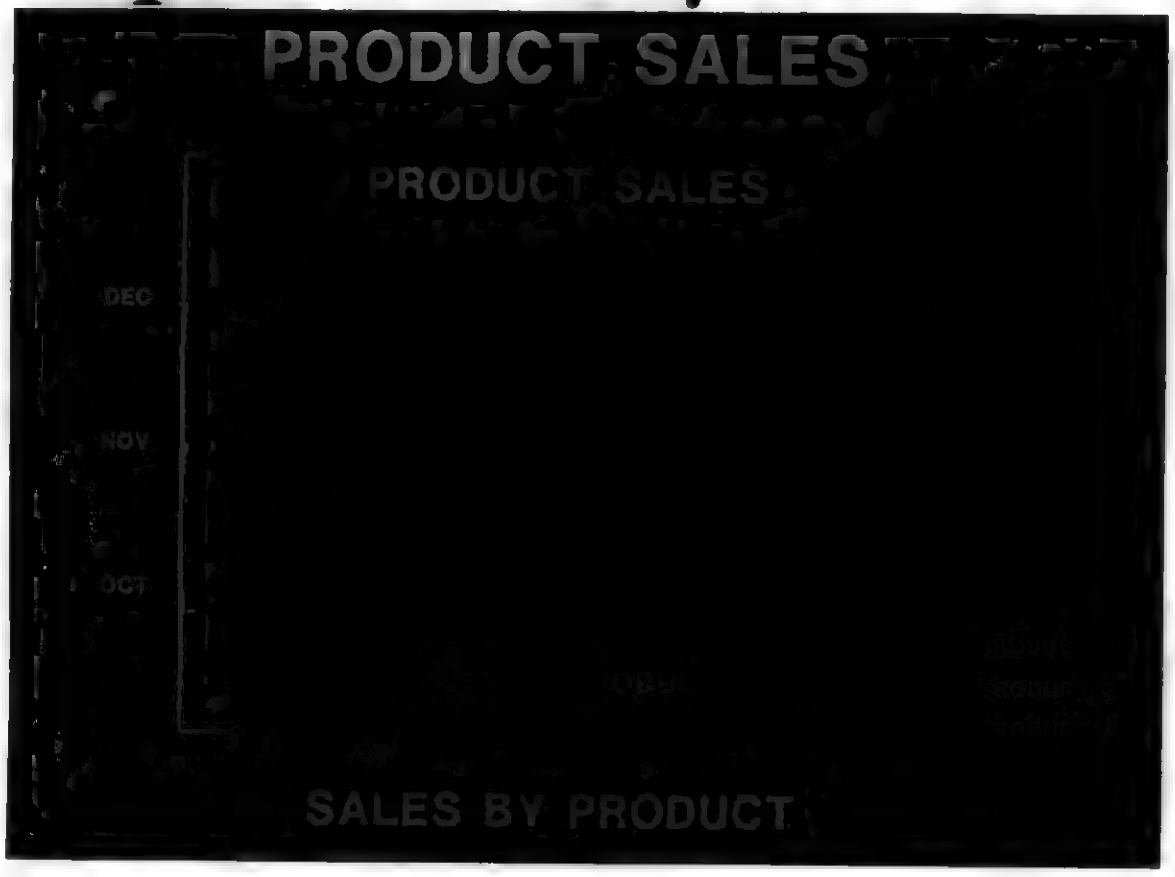
Guaranteed for life, PC Mouse Bus Plus includes a PC Mouse and the Bus Plus card. Mouse System's PC Paint Plus business graphics package and Designer Pop-Up Menu software.

With the menu software, the mouse can immediately be used with 13 major application packages, including Lotus Development Corp.'s 1-2-3 and Symphony, Micropro International Corp.'s Wordstar and Ashton-Tate's Dbase III and Framework. The device is said to be fully compatible with all software packages designed for a mouse, including Microsoft Corp.'s Windows and Microsoft Word and Digital Research, Inc.'s Graphics Environment Manager environment, the firm said.

The PC Mouse Bus Plus incorporates a new device driver that the company said gives more flexibility in adding peripheral devices to an IBM Personal Computer. According to the company, the driver frees the standard COM1 and COM2 port addresses, permitting two serial ports and the Bus Plus's dedicated mouse port to function simultaneously.

PC Mouse Bus Plus is currently available.

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EXECUCOM

Xenix-Unix migration

From page 29

to run local software while Unix executes applications in the background.

Linkdata is also offering a new front-end processor to provide faster I/O for the Unix systems. An eight-port front-end processor with a 68000 chip is priced at $1,895 and a 16-port version at $3,495.

Under Unix System V, the MPC/68 can run applications written in Digital Equipment Corp.'s VAX Dibol, Digital Information Systems Corp.'s DBL, Ryan-McFarland Corp.'s RM Cobol and the C programming language.

Prices for a 1M-byte, 10-MHz MPC/68 board including a Unix System V license for eight users is $4,495 and is currently available. An upgrade to 2M bytes at 10 MHz costs $2,695 and is available in beta-site quantities.

TI develops expert tool

From page 29

up a problem into smaller and related problems, and meta rules, which tell the user how to best use a piece of information in conjunction with other knowledge.

A runtime option is available for both products.

The products will be available in September. Personal Consultant Easy costs $495. Personal Consultant Plus 2.0 costs $2,950. Runtime diskettes cost $95 or $995 for 20 copies.

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SYSTEMS & PERIPHERALS

HARD TALK
James Connolly

IBM 4300s next in line

Now, eyes can shift to the 4300s. IBM has made its pitch for the new System/36s and 38s and has tried to clarify its strategy for users of those segments of the mid-range lineup. But what becomes of the company's 4361s and 4381s? The answers apparently will be coming within six months, with some signs due as early as September.

The latest reports indicate IBM will introduce its Micro370 microprocessor-based, mainframe architecture small-scale system as soon as next month. That machine is likely to extend downward from the 4361 product line and effectively replace the 4361 as the entry point to IBM's mainframe world.

In addition, the long-rumored CMOS-based replacement for the four 6-month-old models of the 4381 family is drawing closer. Experienced IBM watchers have been predicting that the 4381 replacements will be introduced in February, just one year after the four newest models were announced as mid-life kickers — or late-in-life kickers — this year.

One challenge IBM must address, however, as it turns its attention toward the 4300s and the Micro370, is that it cannot afford to bring back the confusion that has surrounded its mid-range line and left customers wondering if the individual systems to which they had committed themselves fit into

See IBM page 38

Connolly is Computerworld's senior editor, systems & peripherals.

DEC cuts IBM CPU share

Study of medium-scale mart also shows supermini growth

By James Connolly

FRAMINGHAM, Mass. — Digital Equipment Corp. continues to make inroads in its fight with IBM for the medium-scale processor market, although IBM's emphasis on selling mainframe-type systems in that market gives it an edge in value of shipments.

That was one conclusion of a recent study of the medium-scale industry by the Framingham-based market research firm International Data Corp. (IDC). The report also predicted that the market for the high-end minicomputer and low-end mainframe systems will grow for the rest of the 1980s, although at a slower annual pace of 9% than the 15% that it grew during the years 1980 to 1985.

In addition, users surveyed by IDC reported that they expect continued growth in their need for superminicomputer processor capacity. In separate surveys, with more than 700 IBM customers responding to one survey and 470 non-IBM users answering another questionnaire, IDC found that most users plan steady growth in CPU demand for the years 1986 to 1988.

For example, only 16% of the non-IBM users and 18% of the IBM customers reported no planned growth in CPU requirements, whereas more than 33% of each group said they expect annual growth in excess of 25%. More than 30% of each group also reported higher than 25% annual growth rates for disk capacity and personal computers.

IDC analyst Richard Mikita said one other key finding of the survey was that the majority of the users said the major bottleneck in a superminicomputer system is disk-access speed rather than CPU speed.

"It is clear that in this medium-scale range, it is the overall system capability,

See DEC page 36

Lynk intelligent workstations bow

By Eddy Goldberg

KING OF PRUSSIA, Pa. — The Lynk Corp. recently announced a number of intelligent workstations and printers for the IBM System/36 and System/38 departmental computers, as well as enhancements and price cuts for its IBM 5291-compatible workstations.

Lynk spokesmen described the Computinglynk/I and II as the first intelligent workstations offered for the IBM System/36 and 38. The products are built around Lynk's first product, the IBM 3180-2-compatible Lynkstation/802, which began shipping last December. The 15-in. Computinglynk workstations are designed to combine IBM Personal Computer functionality with a workstation, allowing users to run 3180 programs and use stand-alone personal computing software such as word processing and spreadsheet programs, said Jacob R. Powell, marketing vice-president.

The Computinglynk/I is a "diskless PC" supporting IBM's virtual diskette. It will include Microsoft Corp.'s MS-DOS 3.2 and be available in September for $2,195. A $395 optional 3½-in. disk drive will be available in October.

The Computinglynk/II, in addition to containing the features of the Computinglynk/I, will allow users to add one or two 5¼-in. disk drives and up to four IBM PC-compatible expansion cards. The price for a single-drive model, available in September, is $2,890. Field upgrade kits for existing Lynk workstations also will be available in September.

Lynk also announced that the price for its Lynkstation/912, a 15-in. workstation for the IBM System/36 and 38, has been lowered from $1,525 to $1,395.

See LYNK page 38

INSIDE

NCR introduces an enhanced tape cartridge controller/36

NCR offers two sets of integrated circuit design tools for Mentor Graphics workstations/38

NEW THIS WEEK

- Lattice Logic offers Application Specific Engine Workstation
- Gould, Inc. introduces IP9000 series image processor
- For more on these and other new products, see pp. 67-75.

INSTANT ANALYSIS

"When we have the tax bill behind us, maybe then people will start buying computers."

— William Easterbrook, analyst, Kidder Peabody & Co.

Apollo unveils TOS package

Office system includes publishing software

By Rosemary Hamilton

CHELMSFORD, Mass. — In keeping with its plans to market a series of prepackaged systems, Apollo Computer, Inc. recently introduced a package designed for technical office applications that will include WPS.C, electronic publishing software from Interleaf, Inc.

The Technical Office Support (TOS) system will be offered in a similar fashion to the computer-aided-software engineering package introduced in early July. The two TOS configurations are based on the vendor's low-end workstation — the Series 3000 — and come with Apollo's Domain/IX operating system and DPSS/Mail.

While Interleaf's WPS.C will be a standard part of the package, customers are also provided with discounts ranging from 30% to 40% on four third-party application packages. Additionally, Imagen Corp. will offer its 8 page/min laser printer, Imagestation, at a 20% discount.

The TOS-3000 Starter 5 Pack, which sells for $78,800, includes five Series 3000s, each with 4M bytes of main memory, three 72M-byte disks, a 60M-byte cartridge tape and two floppy drives. The package also has five node licenses for Apollo's DPSS/Mail and Interleaf's WPS.C software.

The TOS-3000 5 Server Pack, which sells for $106,400 and is also based on five Series 3000s with 4M bytes of main memory each, has less disk and tape storage than the Starter Pack but includes a Domain File Server with 442M-byte disk capacity. It has two 72M-byte disks, one 60M-byte cartridge tape and one floppy drive.

Compugraphic CG6000 merges text, graphics via pasteup enhancement

By Eddy Goldberg

WILMINGTON, Mass. — Compugraphic Corp. recently added electronic pasteup capabilities to its Modular Composition System (MCS) product line with the CG 6000, an electronic publishing workstation based on hardware from Sun Microsystems, Inc.

The CG 6000 allows users to merge and manipulate text and graphics to produce fully made-up pages with text, line art and halftones in position.

Up to four Compugraphic MCS or Powerview text input systems can be hooked to the CG 6000 workstation. The text is then merged with digitized graphics from a Compugraphic Scanner 2000, according to the vendor.

Output is on either the Compugraphic 8600 Imagesetter phototypesetter or the Compugraphic 9600 laser output device.

Built on MC68020-based workstations

The CG 6000, built on the Sun-3 Motorola, Inc. MC68020-based workstation, features 1,024- by 1,024-pixel screen resolution, pull-down menus, message prompts and a Help function.

Delivery of the Compugraphic CG 6000 is scheduled for first-quarter 1987.

The price for the CG 6000, Compugraphic Scanner 2000, software, 120M-byte hard disk drive and 45M-byte tape drive for archiving and backing up both text and graphics is $70,000.

According to the vendor, two optional 120M-byte hard disks can be added for a maximum storage capability of 360M bytes.

NCR offers tape cartridge controller for backup

Features 64K-byte buffer, bus sharing

By Stanley Gibson

WICHITA, Kan. — NCR Corp. recently announced a ¼-in. tape cartridge controller for backup and restoration of data from disk to tape. The one-board ADP-55 small computer systems interface (SCSI) to QIC-36 Tape Controller replaces NCR's two-board ADP-54 model.

"We did a redesign on it and, using very large-scale integration technology, got it down to one board," said John Ast, OEM products marketing manager for NCR.

Like the ADP-54, the ADP-55 connects to a 45M-byte or 60M-byte cartridge tape drive using the QIC-36 interface and features a 64K-byte buffer with parity.

The ADP-55 supports bus arbitration or disconnect-reconnect, which allows other peripherals, according to priority, to use the SCSI bus to which the tape controller is connected. Ast noted that the ADP-55 can also do off-line copies and send data to a disk as well as retrieve data.

The new model, available in October, comes in a single-ended version, used with minicomputers and microcomputers, and a differential version, used with mainframes. NCR's suggested retail price is $395 for the single-ended board and $445 for the differential board.

DEC cuts into IBM share

From page 35

not just CPU speed but a really balanced system, that is important," Mikita said, noting that major vendors appear to be addressing the disk-access problem and improving I/O bandwidths through a variety of means while worrying less about hot-box vendors who boast of high CPU speeds.

Mikita said DEC is a threat to IBM and that DEC's single-product-line strategy has brought it up to second place in the medium-scale market in five years. "One of the interesting things is the perception of DEC right now. The perception of many people is that DEC is on a roll, but the underlying thought is that it is a temporary thing and that IBM will regain its dominance," Mikita said.

IDC found that DEC holds a lead in terms of unit shipments and largest installed base but trails IBM in shipment revenue, largely because so many of IBM's shipments involve expensive high-end systems such as the 4381.

"Since the average system price for IBM's medium-scale offerings is substantially higher than that of its main rivals, Big Blue can make the most money without shipping the most computers," the report said.

Expanding on that report, Mikita said, "For IBM, the medium scale is right at the border in terms of success. It is in the small-scale market where IBM's market really falls apart."

Mikita noted that IBM's introduction of four new models of the 4381, including a low-end Model 11 aimed at the superminicomputer market, helped IBM's price/performance figures but not enough to have a major impact on the medium-scale market. He said that one of IBM's next steps, the introduction of a microprocessor-based 370 architecture machine, could have a greater impact by driving the entry point for that mainframe architecture still lower.

However, Mikita added, there is no consensus on whether a mainframe architecture is suitable for the lower end of that market.



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New Dimensions in Software Productivity.

Software brings CAD to workstation level

By David Bright

DAYTON, Ohio — NCR Corp.'s Microelectronics Division has introduced two sets of software tools said to allow complete integrated circuit design at the workstation level. Called Vigen and Vilay, the products are additions to NCR's VLSI Design System that runs on Mentor Graphics Corp. workstations.

According to NCR Microelectronics officials, the new products cost-effectively bring mainframe computer-aided design power down to the workstation level.

Vigen is a cell generator and compiler; Vilay is a design and layout tool with over-the-cell routing for high-density designs.

Developed jointly by NCR Microelectronics, Mentor Graphics and Silicon Design Labs, Vigen reportedly helps designers incorporate more functions on a chip than previously possible for workstations, decrease design times and increase chip performance.

When creating an application-specific integrated circuit design with Vigen, the system designer can customize a cell by specifying the desired parameters.

The designer can also specify and generate a desired logic block "on the fly" while still in a schematic capture system. The generated cells can then be used with traditional fixed standard cells in schematic capture and logic simulation. In addition to the automatic place-and-route software and layout editor software, Vilay includes interconnect and timing analysis postlayout verification tools and various utilities such as I/O preplacement.

Vilay was jointly developed by NCR Microelectronics and Mentor Graphics.

With Vilay, "the designer can make important choices and refine his design at any point in the project," said Gene Patterson, NCR Semicustom director.

Both tool sets should be available in the fourth quarter. Vigen is expected to be priced at approximately $15,000 per system, Vilay at $16,500.

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IBM 4300s next in line

From page 35

IBM's long-term plans.

If IBM bills the Micro370 as a replacement for the 4361, it will present a clear message for 4361 owners — they are doomed. But there could be other messages in a Micro370 announcement. One such problem could be an alignment of the Micro370 against the System/36.

One analyst who says that such an alignment is unlikely to happen immediately is Francis Gens of International Data Corp. "The key for the Micro370 will be how soon they can get the software for it so they can make it a turnkey system and eliminate the need for a system operator. That means that it might be a while before it is a real office machine," Gens says. So the Micro370 will probably be promoted in the 4361's market, supporting engineering, scientific and limited commercial applications.

There remain at least two more interesting developments that IBM may bring to the public within the next month or two. The first is a renewed effort to drive 4300 customers from DOS/VSE to MVS. IBM has been trying to do so for several years with limited success and is expected to use financial incentives to push harder. But, as Gens noted during a recent interview, the challenge for the IBM sales rep and the low-end systems user is justifying the cost and overhead connected with MVS.

The second development is an expected statement of direction relating to a long-term effort to implement a cross-system software consistency. IBM reportedly has formed a special team of software engineers to develop common interfaces and tools that can be used with all of its mainframe and minicomputer systems. The problem with this effort — expected to involve piece-by-piece developments over the course of years — is that it sounds so much like what IBM has tried in the past. IBM has tried to make its systems communicate in the past, and, despite all of the company's power and resources, links between the diverse product lines are far from wrinkle-free, to say the least.

Lynk intelligent systems bow

From page 35

Lynk also unveiled two printers for the System/36 and 38. The Lynkwriter/224 is a 400 char./sec., 132-column dot matrix printer that emulates the IBM 4214, but operates at twice the speed, according to Powell. The Lynkwriter/224 provides near-letter-quality printing at 100 char./sec. and text-quality printing at 200 char./sec. It will be available in September for $4,495.

The Lynkwriter/214 LC is a 250 char./sec., 132-column, high-resolution impact dot matrix printer that connects directly to System/36 and 38 channels and emulates all the functions and features of the IBM 5219 printer for $3,250.

Product Spotlight

Edited by Barbara Wierzbicki



ILLUSTRATION BY BRUCE GILFOY

INSIDE

Application generators and DBMS: ***A dynamic duo****/42*

Chart of selected application generators*/49-50*

Application generators

Tools can give MIS a needed productivity boost

By GLOVER T. FERGUSON and PER O. FLAATTEN

Toward the end of 1983, the information systems department of Du Pont Co., based in Wilmington, Del., found itself faced with a massive application backlog. To position itself for the development effort that would be required, the department undertook a project to create an integrated environment to boost the entire systems life cycle productivity. A project team of five people was assembled for this purpose. At the time, there was a well-established systems life cycle and an associated methodology, but both the development and the maintenance areas suffered from a proliferation of technologies, with each project manager tending to use the technologies — productivity tools, data base management systems (DBMS), teleprocessing monitors and so on — that he knew best.

Du Pont's approach to the problem was to start by analyzing the application backlog in order to classify the types of systems that were likely to be developed over the following five years or so. Then, a technology plan was developed. This plan identified, for the various types of systems, the technical architectures that would best address the backlog.

A set of technical guidelines was prepared to support the project teams, and a compatible set of tools was acquired for each target environment. When satisfactory tools were not available on the market, they were developed from scratch. These tools were then integrated under a common interactive programming environment, combining functions ranging from source program editing to code management, and they were interfaced with an analysis/design tool and a central data dictionary.

Now, 2½ years later, the project is in its final stage of rollout. An informal study shows that productivity has increased by at least 20%. More important, Du Pont says it believes that high-quality systems are being developed.

All MIS departments are under fire to produce.

Continued on page 42

Selecting and installing an application generator requires MIS to analyze requirements, design, code, test and train. In short, you must perform the work of a systems integrator.

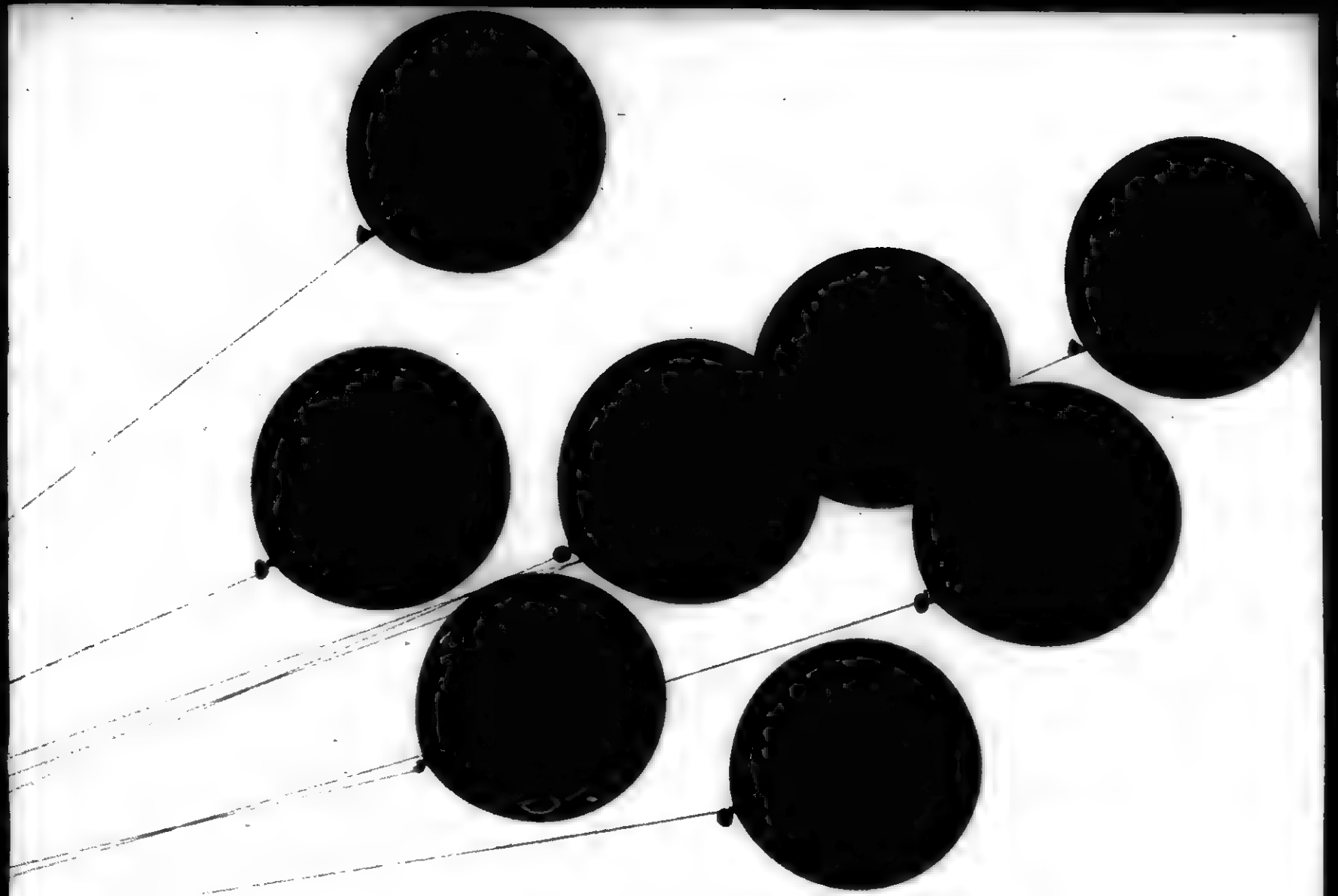
Ferguson is a partner in the Technical Services Organization of Arthur Andersen & Co., based in Chicago. He is in charge of designing and supporting systems development tools worldwide for the use of Arthur Andersen consultants on client engagements. Flaatten is Arthur Andersen's manager of information technology research, specializing in the systems development tools market.

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NETWORKING

Tools give productivity boost MIS needs

Continued from page 39

To respond to the pressure from the executive suite and to step up production of new applications, MIS is looking to an increased use of tools — report writers, application generators, fourth-generation languages — in order to boost productivity levels.

The Du Pont figure of 20% quoted earlier is less impressive than the five-, ten- or twenty-fold increases in productivity that some vendors claim. Such increases may be possible but only under different assumptions or different circumstances. For instance, if the starting point is low enough, it is easy to produce dramatic increases in productivity. However, this happens mostly as a result of a combination of factors, such as increased motivation, better training, new hiring and better system development standards.

These factors tend to occur whenever a new tool is implemented, regardless of the merits of the tool as such. There is a theory that any change, however minor, produces an increase in productivity simply by getting people to focus on what they do.

Another explanation for inflated figures is the tendency to measure productivity only on that part of the life cycle that the tool addresses. For instance, a report writer user quoted productivity gains five to 10 times that achieved with Cobol. However, since report writing constituted less than 10% of the entire development activity, the total impact was considerably less.

The last explanation is the vendors' natural tendency to report the most extreme success stories — the cases in which the application developed, the organization and the technical environment all were a perfect fit for the tool. This is too much to be hoped for in every case.

Nonetheless, a 20% or 25% increase in productivity is a substantial improvement. For a typical MIS department of 25 project managers, analysts and programmers, where maintenance is occupying two-thirds of the department, the payback period for a representative application generator would range from one to four years — or a savings of, say, two developers. This is not to say that you can expect to decrease your head count by two, but you can avoid hiring two new people. In other words, you get two more developers for free.

More to the point, it may enable you to implement a critical application in six months instead of nine — or it may allow you to enhance that critical application so that your organization can keep ahead in the competitive race.

Another hidden productivity improvement occurs when richer functionality can be delivered for the same effort. In all these cases, the payoff can be considerably higher than the direct payroll savings.

When such tools are purchased without having planning and organizational measures securely in place, however, the results can be disappointing. Buying tools without investing in requirements analysis, selection, preparation, training, implementation and support has been tried: It does not work. The lessons to be drawn from Du Pont's success are twofold. First, it takes planning, time and effort to undertake such a project. Second, it cannot be done without dedication and commitment from the organization.

Before addressing application generators specifically, we must first hit upon a working definition of the product. To that end, this article includes those products that mechanize some or all of the activities usually associated with the detailed design and programming of custom applications.

To qualify as an application generator — as

Continued on page 45

Expert's Opinion

Integrating tools speeds and simplifies application building process

By SHAKU ATRE

In the computer industry, when users embrace a concept, that same concept — under a plethora of different names — is introduced by a number of vendors. Such is the case with application generation. These tools come under various names, including development workbenches, fourth-generation languages, program generators and programmer productivity tools. Some 300 vendors offer such tools for mainframes and another 150 do for micro-based systems.

As if the sheer number of available products was not enough, these tools also employ different approaches to the tasks of simplification of development, modification and ongoing support.

One such tact is to make an application generator an integral part of a data base management system. When these two components work in tandem, programmers can generate software that allows application programs to be written faster and better.

What features then should be provided by a DBMS with application generation facilities?

Procedural features.

Interface to high-level procedural languages, for example, Cobol, PL/I, Fortran and APL.

Interface to low-level procedural language such as assembler.

Full set of structured constructs.

Performance monitoring, tuning and enhancement features.

Third-generation language programmer usability feature.

Nonprocedural features.

Query language.

Report generator.

Graphics generator.

Relational front-end feature.

Two-dimensional menu interface feature.

Easy-to-use editors.

Support of sequential files such as VSAM.

Integrated and active data dictionary/directory.

Data base design techniques.

Data definition, data manipulation, data control features.

Decision support system features.

Financial modeling language.

Statistical analysis.

Interface to standard statistical packages such as SAS Institute, Inc.'s SAS.

Support of electronic spreadsheets.

Mainframe-microcomputer connection feature.

Programming languages on mainframe and equivalent counterpart on microcomputer.

Separate version of tool that runs stand-alone on both microcomputer and mainframe.

Mainframe-to-microcomputer transmission feature.

Mainframe-to-microcomputer communication link.

Extraction capability on mainframe for downloading.

Multiuser environment support feature.

Support of standard teleprocessing monitors such as IBM's CICS, TSO and CMS.

IBM 3270 emulation feature.

With all these features, how effective will the programmers and the programs be, and how effectively will these programs run? Effectiveness is doing the right thing; efficiency is doing the thing right. Application generators in tandem with DBMS should provide us with programmer effectiveness but what about efficiency? We have to achieve the right balance between the use of application programmer resources and the use of the computer resources. Deriving the most benefit from available resources may be one of the biggest managerial challenges to application generation implementation.

The chief advantage of using an application generator integrated with a DBMS is that these tools speed the application-building process. Equally important, applications are easily and quickly modified, thus minimizing debugging problems and thereby reducing maintenance costs.



> ***"Deriving the most benefit from available resources may be one of the biggest managerial challenges to any tool implementation."***
>
> — Shaku Atre

As is the case with most products, however, there are trade-offs.

Computer resource usage with these tools is high, a significant drawback. An application generator uses up to 50% more computer resources than does a third-generation language performing an equivalent function. This is because application generators make the computer do most of the drudge work that third-generation languages make people do.

The difference comes primarily in the usage of I/O operations, rather than CPU processing. Poor data base design could balloon this figure much higher. Further, since most of today's application generators are targeted to IBM 370-compatible machines, program transportability is poor.

Moreover, these tools do not handle computation-intensive work well. The application generators target the same computer spectrum as does Cobol — I/O-intensive character- or byte-crunching operations rather than CPU-intensive number-crunching operations.

For this reason, a scientific third-generation language such as Fortran should still be used for computational work. If an application requires both character crunching and number crunching, I suggest writing the program with an application generator but calling the third-generation language routines for computational work.

The point is that applications must be selected carefully. A banking deposit and withdrawal system with high-speed real-time requirements would be a poor choice for an environment in which to use an application generator.

Materials requirements planning, however, with its integration of inventory, purchasing, bill of materials, engineering planning and accounting data bases, would be ideal for application generator implementation. ■

Atre is president of Atre International Consultants, Inc. of Rye, N.Y., which specializes in information center implementation and data base/data communications consulting and training.

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A CHECKLIST FOR EVALUATING APPLICATION GENERATORS

Power of the language.

Control flow: High-level branching among applications. Screen selection by function key.

Implicit data movement between fields that have similar names. Can these movements be overridden?

Validation and editing capabilities.

Error handling.

Context data handling in conversations consisting of multiple exchanges.

High-level constructs.

Basic syntax.

Subset suitable for end-user computing (query/reporting).

Technical environment.

Product compatibility with such prerequisite software as operating system, teleprocessing monitor and data base management system.

Hardware compatibility regarding color, graphics, personal computers.

Security.

Third-generation language interfaces (Cobol, PL/I): Can subprograms be called? Can source statements be intermingled? Can generated modules be called from Cobol or PL/I programs?

Data dictionary support.

Support for data element — or field — description. If this does not exist, the data description facility cannot be qualified as a true dictionary.

Support for relationships between records, files, programs, jobs and so on; user extensibility.

Version control, for example, test vs. production.

Bridge to other dictionaries and/or batch data entry in addition to the normal on-line data entry.

Cross-reference reports and usefulness for maintenance analysis and planning. Can the user create his own cross-reference reports?

Vendor support.

Vendor stability.

Frequency of product releases and future plans.

Existence of a users group.

Data structures.

Repeating groups on screens, reports and files.

Multiple record types on the same file.

Record/field redefinition.

Variable types such as binary, packed decimal and floating point.

Array handling; number of dimensions; availability of operators handling entire arrays as opposed to programming a loop and using subscripts.

Relational operators — SELECT, JOIN, INTERSECTION; "set-at-a-time" processing, for example, FOR EACH record WHERE . . .

Default options provided for simple queries and reports.

Extraction of multiple reports on a single pass of the data base or master file.

Ease of use.

Ease of learning.

Ease of use. (This is not synonymous with ease of learning. Many easy-to-learn products are easy to learn, because they can only do simple things. They are therefore not easy to use on medium to complex problems.)

On-line Help and documentation.

Interactive/interpretive vs. source generation-oriented.

Symbolic debugging.

Support for test-production version control.

Support for on-line testing ("scripting" or terminal simulation).

Support for regression testing.

Coexistence with present shop standards such as menu structures, function key usage and languages.

Enterprise/application requirements.

Compatible with the present systems development life cycle.

Generates the type of application required, for example, transaction processing, management information and control, professional support.

Supports concurrent data update and automatic recovery restart within application performance constraints.

Special staffing requirements.

Non-English language support where required.

Information provided by Arthur Andersen & Co.



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Continued from page 42

opposed to a screen or report generator, a Cobol precompiler or a data dictionary — the product should address all four areas of application coding:

- Screen design.
- Report writing.
- Data base description and manipulation.
- Procedural code.

The hallmark of commercial data processing requires that all these areas be addressed. This explains the success of application generators in this part of the DP community and its absence from other areas such as systems programming, embedded systems, mathematical/scientific applications and so on.

This definition covers several types of application generators:

Transaction processing generators, first and foremost, are well adapted to the on-line environment. Many of these products also generate batch programs, although this is not their primary strength. The environment in which they operate is usually the target machine vendor's DBMS and teleprocessing monitor — in the IBM world, it is CICS-DL/1 and, more recently, IMS-DB/DC as well, but not yet DB2. Therefore, they are very well suited to generating production-quality applications, with concurrent data base updates and extensive recovery/restart. This type of product has been popular for about 10 years.

Fourth-generation languages may well represent the most popular type of application generator to date. Historically oriented toward report writing, these products usually add their own file structure and are also capable of generating on-line transactions to update these files. Thus, they can support the development of all aspects of an application — provided the requirements are simple enough.

The current weaknesses of fourth-generation languages lie in the areas of concurrent update and restart/recovery, which are either inadequate or costly to implement. However, several manufacturers have begun enhancing their offerings in the past year or so to include more and more production-like facilities.

These products, like the transaction processing generators, have been available for 10 years or more. Moreover, fourth-generation language popularity has been boosted by the advent of information centers and end-user computing.

Comprehensive information management systems, products that hit their stride in the early 1980s, may be found at the data base end of the spectrum. Here, the central facility is the DBMS, to which is added a high-level language and tools such as screen painters and query and report languages. Production-quality applications are the result, since it is possible to take full advantage of the underlying DBMS.

However, the implications of selecting a tool from this category are deeper than buying a transaction generator or a fourth-generation language, since the choice is primarily that of a third-party DBMS and sometimes a third-party teleprocessing monitor as well. Note that IBM has not been and is not currently a market leader in this area: None of IBM's offerings is as well integrated or as complete as the products of the four or five leading vendors.

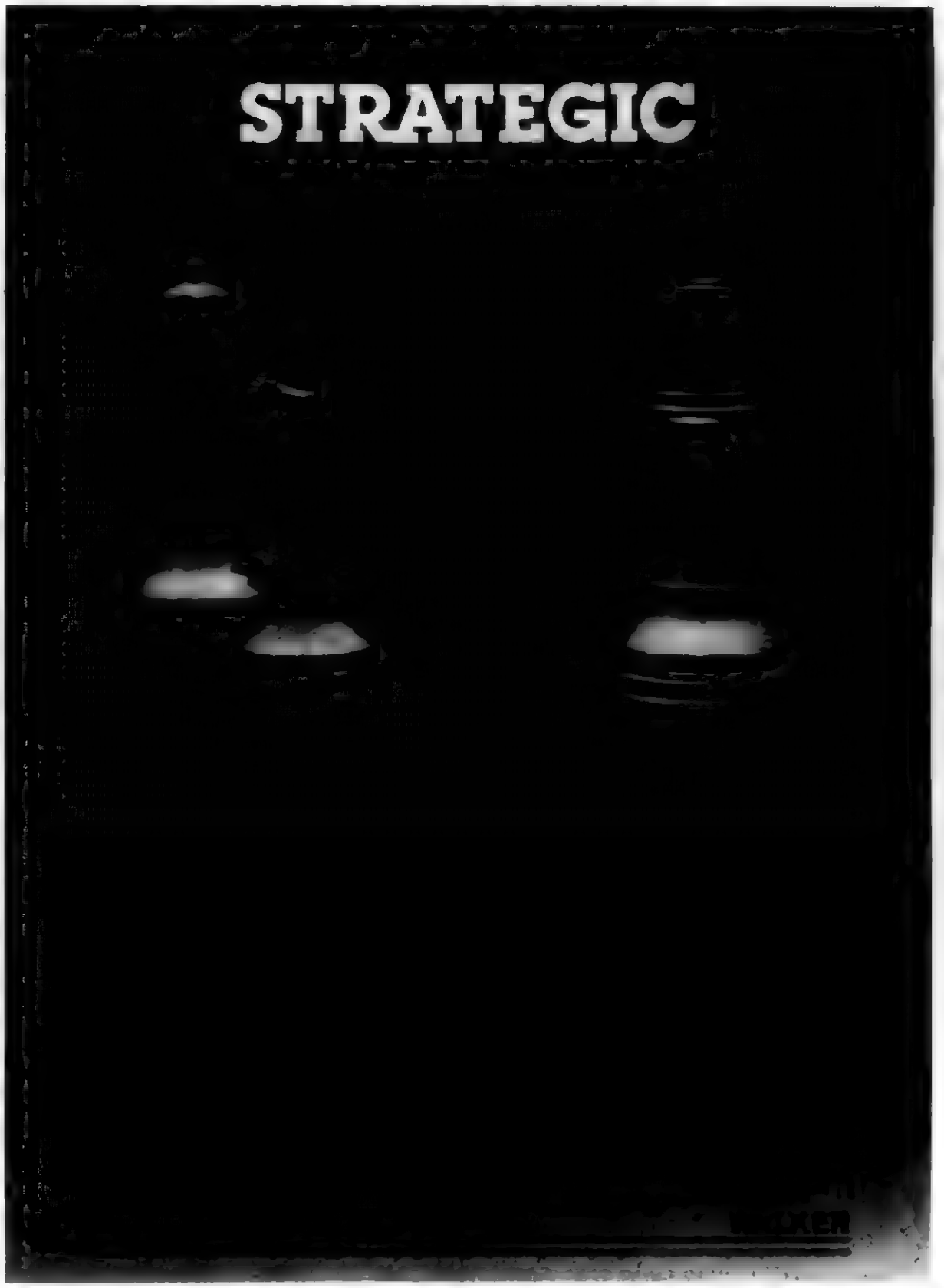
> ***Selecting an application today requires that you hedge some of your bets. But if you get the right fit and if you safeguard the investment in the new tool with parallel investments in planning and organizational change, the payback period should be short enough to justify the acquisition.***

Source program generators work somewhat like the transaction processors but with a few important differences. Transaction processing generators very often produce tables or intermediate code invoked by a runtime facility akin to an interpreter. Source program generators, on the other hand, produce source code in a third-generation language such as Cobol or PL/I, which is then compiled and linked into an executable batch program or on-line module.

The advantages over the "interpreted" approach are added portability and better coexistence with existing applications. The main drawback is that there is a potentially time-consuming compilation and link-edit process between coding and testing. With the interpreted approach, you can make a change and test it almost in the same breath. A perceived advantage of the source code generators is that there is an apparent safeguard against performance problems or bugs in the generator. Users feel that they can always, as a last resort, fix the generated Cobol or PL/I code. Such products have existed for a long time, but their increased popularity is a recent trend prompted by the ever-decreasing cost of compilation.

Each of these categories tackles primarily one of the four facets of an application — screens, reports, data

Continued on next page



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bases and code — and adds facilities for the other three. These tools vary in style and features, but their functional capabilities are basically the same — with perhaps the exception of the fourth-generation language. As previously stated, the strength of fourth-generation languages lies in report writing, but their weakness is that they do not provide the necessary foundation for on-line transaction processing — concurrent update and automatic recovery/restart. Offsetting this is that a fourth-generation language is the only kind of tool that allows end users to develop their own applications.

There are other tools that are often forgotten when discussing application generators. Since they do offer most of the functions of application generators, it is pertinent to include them here.

First, there is the category of application generators initially provided by software vendors as a tool for customizing the application package, but which are evolving into full-fledged application generators. Millenium:SDT from McCormack & Dodge Corp. is just such a product. Second, there is a category that we may call the workbench approach, which consists of tools that make it easier for the programmer to reuse code and which may also provide hardware resources, such as an intelligent workstation. Maestro, from Four Phase Systems, a subsidiary of Motorola, Inc., for example, provides a programming environment for reusable code.

Honorable mentions also include partial application generating tools such as screen generators, query programs and report writers, data dictionaries and macro or shorthand preprocessors. There are also a number of tools that automate the first part — analysis, specification and design — of the systems development cycle.

Last, halfway between application generators and application software (perhaps closer to the latter) are facilities such as decision support systems, spreadsheets and personal computer-based tools.

This completes the characterization of today's productivity tool offerings. The market figures for the product categories outlined above totaled $500 million worldwide in 1984 and that figure is projected to grow 25% a year to reach $2 billion in 1990, according to International Data Corp., a Framingham, Mass.-based market research firm.

This expanding market offers a plethora of fast-changing products. Those that are more end-user oriented are gaining production-like facilities, while those aimed at information systems professionals are getting friendlier interfaces. The data base-oriented products are becoming relational, and there is experimentation with artificial intelligence techniques such as rule-based systems and natural languages. Intelligent workstations — PCs tied to the mainframe — are revolutionizing both the application development process and the structure of the applications themselves. The field is in a state of flux.

Despite all this activity, however, it appears that there is not much more productivity to be gained from today's technology. Arthur Andersen says that there are three reasons for this. The first limitation is that only a small part of the development life cycle is mechanized. We need to integrate requirements analysis, specification, design, coding and testing in a single tool that will also permit project management, change control, easier maintenance and performance tuning. This type of product will evolve over the next few years.

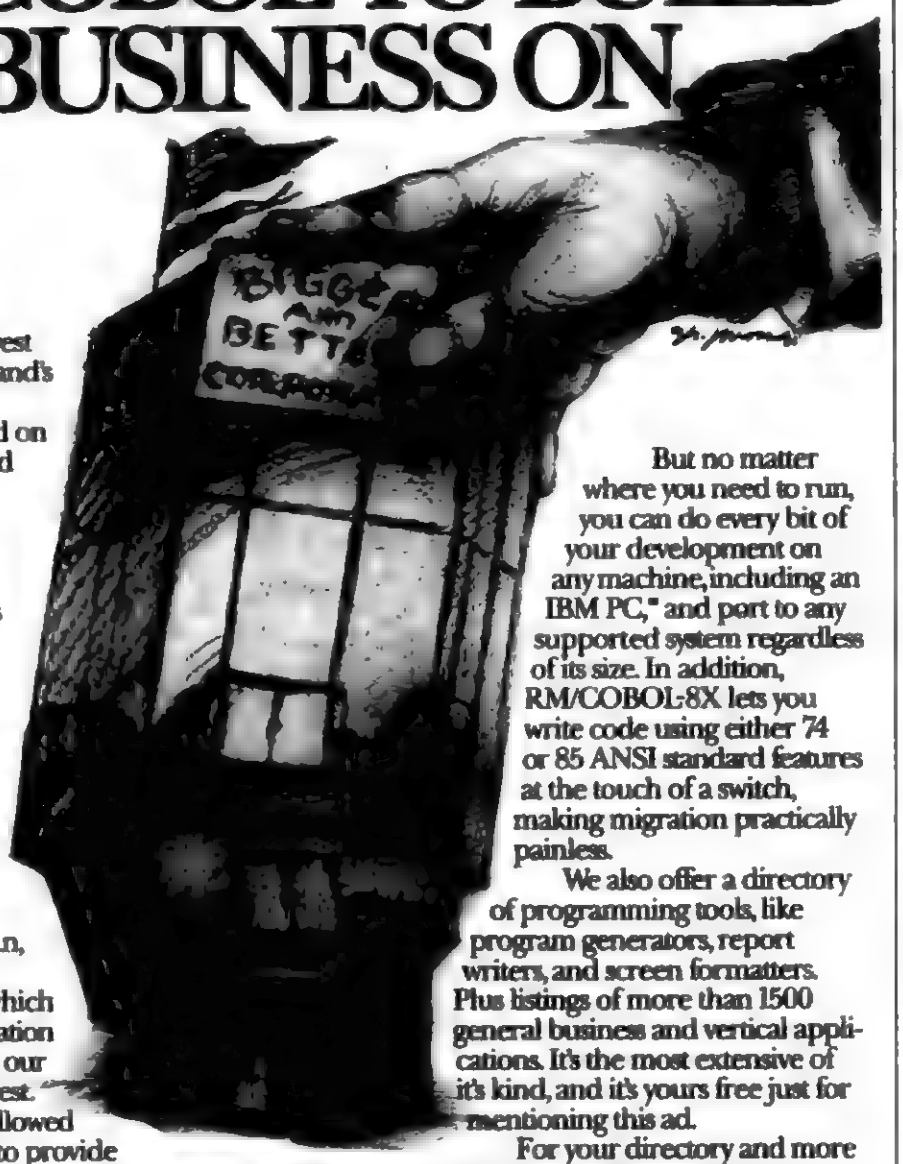
The second limiting factor is that productivity increases must be based on the reuse of standard functions. So far, only technical functions are reusable: screen painting, conversation structure, batch architecture, simple validation rules and reporting functions such as running totals and control breaks. To increase productivity greatly beyond what today's tools can accomplish in the design and coding areas, we must move on to a higher level of abstraction and reuse business functions (those expressed by the user) rather than just the technical ones. Object-oriented programming shows some promise in this area, but it must be transformed and adapted to the world of commercial data processing.

The third technological restriction is the new style of application that is emerging, based on the replacement of dumb CRT terminals by personal computers. This style, often called cooperative processing, is based on dividing the application functions between the mainframe and the workstation, so that most of the user interface is executed locally. This approach has the potential to create much friendlier systems and increase the user's productivity dramatically. But the rules of this game are not yet set, and the concept will have to mature considerably before we can hope to see the tools to generate these applications mature correspondingly. The situation is analogous for departmental computing and other forms of distributed processing.

This tumultuous state of affairs poses a dilemma to the vice-president of MIS who wishes to acquire an application generator: Will the tool that suits him best today also be best tomorrow? This quandry only gets worse when you consider that we may be on the eve of a breakthrough in new technology for the automation of systems development.

It is easy to predict that things

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will change; it is not so easy to predict how. To select an application generator today will require you to hedge some of your bets. But if you get the right fit and if you safeguard the investment in the new tool with parallel investments in planning and organizational change, the payback period should be short enough to make the acquisition economically justified.

The single most important criterion for choosing an application generator is whether or not it will generate the type of application that you require. There are three basic types of commercial data processing applications: transaction processing — simple on-line data entry and data base update with some reporting and very high performance, reliability and availability requirements; management and control — primarily accounting and accounting-related applications; and professional or executive support — also called strategic applications.

The second criterion is: Will the generated application run in my technical environment? On my mainframe? On my terminals or PCs? Under the requisite operating system? Will I have to change my choice of DBMS? My teleprocessing monitor? Many of these questions are only relevant if you have IBM or IBM-compatible equipment.

In most other cases, there is only one environmental solution and thus only one or two appropriate generators. Then the question becomes, Can I use the available tools at all? Since most shops already have some tools, or at least shop standards and a shop culture, the generator must be able to adapt to the existing environment.

A related concern is that of the coexistence of the applications generated with the programs that are already running. This is usually most critical for transaction processing. The issues to be resolved involve such matters as the conversational structure under CICS: Can I mix and match old and new transactions within a conversation? Within a partition or region? If the application must reside in another region, what operational difficulties does this cause for the operator of the system in the user department? Can I interface to existing routines — or indeed augment the generator — written in a standard programming language such as Cobol or PL/I?

The last tier of this selection criteria is how much of the life cycle is covered by the application generator and other tools that can be integrated with it. This is not an easy question to answer, since practically all products today are designed to cover a relatively small part of the systems life cycle. For example, there is a huge gap in the area of testing support, requiring you to purchase several products from different sources. It is difficult to predict whether different tools will behave with synergism — or whether they will coexist at all.

There are a number of functions and features that are emphasized by vendors of application generators. Only you can decide whether they are important to you. Pick a small number of criteria that your choice must meet, and then, if more than one candidate should remain, use a list of secondary criteria. This will avoid the situation that is frequently seen, where the product is picked on the basis of "gut feel" and justified by a creative checklist that stresses the preselected product's areas of strength and glosses over its weaknesses.

> ***Pick a small number of criteria that your choice must meet. This will avoid the situation where the product is picked on the basis of 'gut feel' and justified by a creative checklist that stresses the preselected product's areas of strength and glosses over its weaknesses.***

The secondary characteristics that you select will obviously depend on your own situation. If productivity improvement is your main criterion for picking an application generator, the following factors are the most important:

- Data dictionary support.
- Power of the language.
- Development environment.
- Maintainability.

Weighed against the productivity benefits are the visible and hidden costs. The purchase or lease price of the software is the main visible cost. To this you must add the cost of vendor support, upgrading to future releases, training and implementation, personnel requirements and the hardware environment. In particular, if you have a hardware-constrained situation, you should evaluate the resource utilization of the generator, both when generating and — probably more importantly — when running the generated application in production.

The real performance pitfall comes when the application generator makes assumptions about the

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application logic and/or the data base structure that do not hold true. For instance, an application generator might generate a data base description for an inverted-list type of DBMS with an index for every field in the data base — just in case — most likely causing very high response times for update transactions. The balanced view on performance is that since hardware resources are becoming more and more affordable, the overhead of an application generator is less and less important — but there are always applications that are so demanding that they need to be coded with special care.

An application generator may not be a suitable solution for those applications at a given time. If you are in doubt whether an application generator will handle your performance requirements, the best approach is to try to find, with the vendor's help, a similar application with higher volumes successfully operating on the same hardware that you have.

Another user realized that he could save substantial resources by creating a data base extract program to create a report file, against which he ran his report writer to produce the daily reports. Had he not realized that the report writer he was using required a sequential pass of the entire data base for each report to be printed, he would have been using much more resource than necessary.

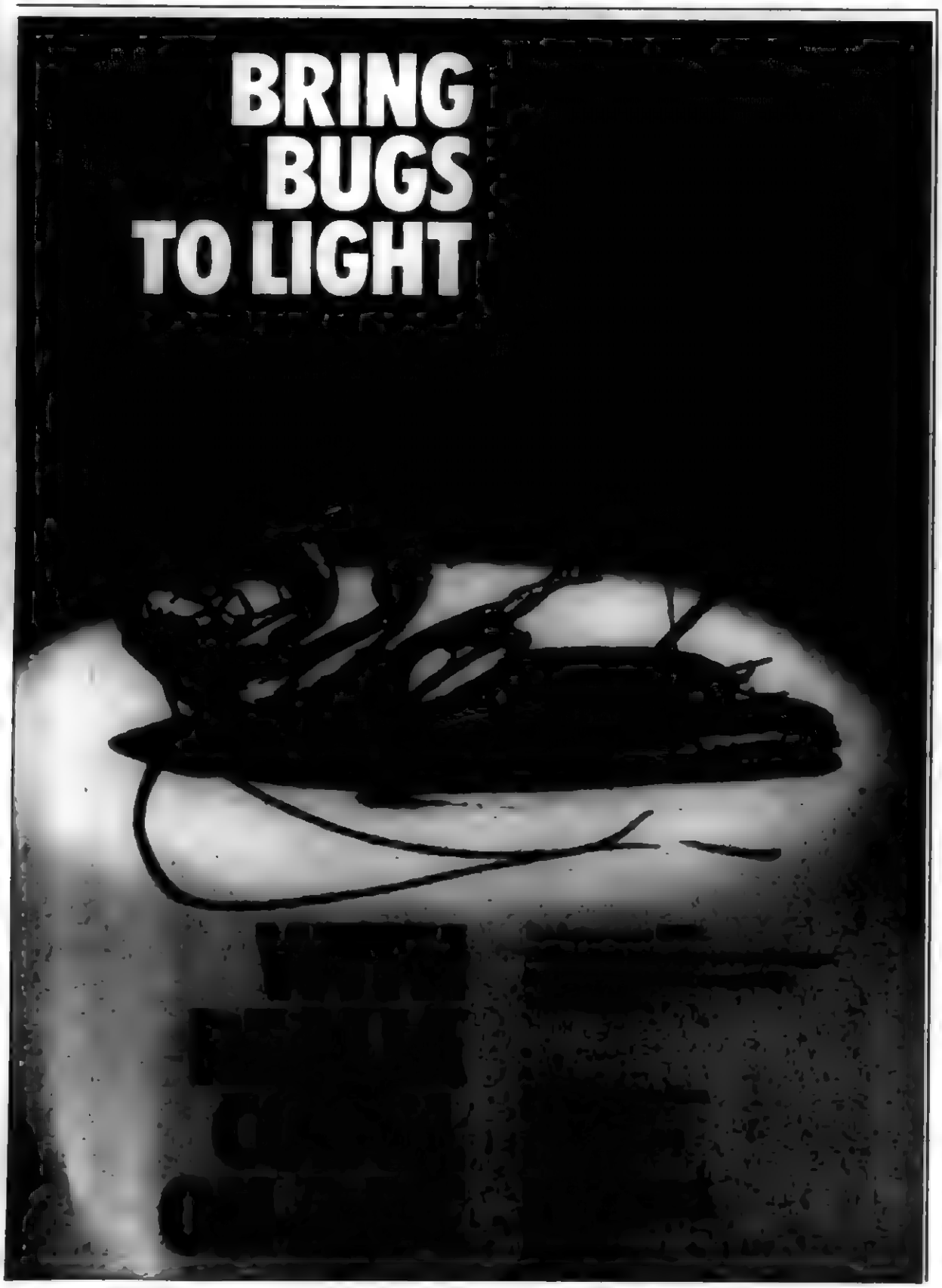
It is important to analyze the technical architecture of the generated code before finalizing the design of your system. In fact, this should be done before you even decide which parts of your system will be written using the generator. This is especially dangerous when using the generator for problems that it was not intended to solve. In particular, we cannot overstress the danger of using an end-user-oriented product for high-volume transaction processing.

Yet another pitfall lies in not recognizing the problems of maintenance. In fact, since you can now produce applications faster than before, there will be more code to maintain. One generator vendor quotes an example of a customer on the West Coast that has literally tens of thousands of progams written in a fourth-generation language. It would not be surprising to find that this may negate some of the initial development benefits. An immediate consequence of such proliferation is that reuse and/or modification of a given program is endangered when you cannot locate it.

The most serious dangers come from inadequate management attention. There are two diametrically opposed dangers — raising expectations too high and therefore becoming disillusioned with the product before it can prove itself and insufficient prior and continued commitment. The latter problem appears to be much more frequent when installing a source code generator than when picking a DBMS with its associated generators.

As one DP development manager confided: "We gravely underestimated the impact that a Cobol generator would have on our shop. Maybe it's because, after all, it was only there to produce Cobol, which we were already doing by hand. Had we chosen to install a comprehensive information management system, such as those from Cullinet Software, Inc., Applied Data Research, Inc. or Software AG of North America, Inc., we would probably have prepared ourselves much better. As it is, it was a miracle that we were given time to correct our mistakes and that the product we chose got off the ground."

Another frequent problem happens when the rollout process is not adequately planned and supported. We have seen many shops where only the team that picked the tool and the one that used it initially, perhaps on a pilot project, reap the benefits. The tool may be unused by the rest of the teams, or it may be used halfheartedly.



In fact, if there is one lesson to be learned from the successes and failures we have seen, it is that the process of selecting and installing an application generator and associated tools deserves to be treated as any other development project. It has all the same characteristics. It is nothing more than the automation of certain repetitive tasks normally performed by analysts and programmers.

To automate successfully, you must understand all the functions performed in your department as well as their interactions. The same life cycle applies as in any other project. You must analyze requirements, design, code, test and train; you must procure and install hardware resources. In a word, you must perform the work of a systems integrator.

What this means is that the acquisition of a tool should be preceded by planning, planning and planning. This is what happened in the information systems department of Du Pont. They put together the best project team they could muster — not the best project team they thought they could spare. They planned and conducted the project as though they were doing it for their most important user. On the whole, they managed to give the project team the support it required to choose and implement the best solution.

Finally, note that Du Pont was working from a solid foundation of methodology, standards and well-trained people. Remember that if you try to mechanize chaos, all you are going to achieve is the ability to produce more chaos faster. ■

SELECTED PRODUCTIVITY TOOLS

APPLICATION GENERATORS FOR TRANSACTION PROCESSING

Cortex Corp.
128 Roberts Road
Waltham, Mass. 02154
Cortex Application Factory
Number installed ..... Not available
Target environment ..... DEC VAX
Price ..... $4,200-$100,000
Cortex Application Factory is a complete, integrated application development system that automates development and maintenance of medium-size to large production business applications directly from specifications entered on-line.

Cincom Systems, Inc.
2300 Montana Ave.
Cincinnati, Ohio 45211
Mantis
Number installed 2,000
Target environment ..... IBM MVS and VM CMS, VAX VMS, Wang VS, Honeywell USAS
Price ..... $30,000-$80,000
Mantis is a fourth-generation development system that addresses the life cycle of an application from prototyping through production. It is a fully interpretive procedural language that allows applications to be developed, tested and debugged on-line.

IBM
Contact local marketing representative
Cross System Product (CSP)
Number installed ..... Not available
Target environment ..... IBM CICS/OS/VS, CICS/DOS/VS, IBM SSX/VSE, VM/SP CMS
Price ..... $10,970 plus monthly license charge of $550
CSP is an application development and execution system that integrates the following functions into one set of tools: structured program design, program editing, definition librarian, screen definition, high-level language processing, prototyping, on-line testing and debugging, query and report generation for files and cross-system program portability.

IMSADF II
Number installed ..... Not available
Target environment ..... IMS
Price ..... $64,680 plus a monthly license charge of $2,500
IMSADF II is a general-purpose programming system for generating and executing IBM DB/DC applications. It provides facilities for developing, maintaining and extending IBM on-line or batch data base/data communications applications.

Martin Marietta Data Systems
P.O. Box 2392
Princeton, N.J. 08540
UFO
Number installed 1,500
Target environment ..... CICS, OS, DOS, VS, CICS/VS, CMS, VM
Price ..... $40,000-$80,000
UFO is part of Consensus, an integrated on-line application development system. Users develop on-line applications or access data by using any combination of Consensus's three interrelated on-line components: UFO, OPL4 and Cobol XE. UFO is a nonprocedural approach to on-line program development.

Pansophic Systems, Inc.
709 Enterprise Drive
Oak Brook, Ill. 60521
Ganar/ol
Number installed 800
Target environment ..... MVS, VSE, CICS, DOS
Price ..... $35,000-$40,000
Ganar/ol is an interactive applications development system for CICS. Company support interfaces for major data base vendors is provided. Ganar/ol also features a command builder that allows you to write your own interfaces and languages not usually supported, such as Fortran.

Sperry Corp.
Information Systems Group
P.O. Box 500, Mail Station B-200
Blue Bell, Pa. 19424
Mapper
Number installed 2,000
Target environment ..... Sperry 1100
Price ..... $62,100-$80,310
The Mapper system is a fourth-generation language productivity environment that provides end users with programmerless facilities. It also offers the DP department computer-aided application development tools that cover the entire life cycle from business analysis to ongoing maintenance.

Sterling Software
Answer Systems Division
21060 Vanowen St.
Canoga Park, Calif. 91304
Mark V
Number installed 180
Target environment ..... MVS (MS DB/DC, CICS); VSE (CICS)
Price ..... Available upon request
Mark V is an application development system for the design, prototyping, implementation and maintenance of complete on-line systems with performance-critical requirements. Mark V provides application portability by generating applications for IMS or CICS and is upwardly compatible with the new IBM releases.

DBMS WITH APPLICATION GENERATION FACILITIES

Applied Data Research, Inc.
Suite CN-8, Rt. 206 and Orchard Road
Princeton, N.J. 08540
Datacom/DB with Ideal
Number installed ..... 12,000 DB, 750 Ideal
Target environment ..... MVS, VSE
Price ..... Datacom/DB — $65,000-$116,000, ADR/Ideal — $64,900-$97,900
ADR/Ideal is a fourth-generation application development system. It is a fully relational DBMS containing an integrated data dictionary. ADR/Ideal is used primarily by data processing professionals to build medium- to large-scale data processing applications.

Computer Associates International, Inc.
711 Stewart Ave.
Garden City, N.Y. 11530
CA-Universe
Number installed 175
Target environment ..... MVS, VSE, VM
Price ..... $140,000-$170,000
CA-Universe is a fully relational DBMS with an on-line, active data dictionary. Development facilities include screen painting, auto screen generation and screen chaining. CA-Universe also includes a procedural development language called ADL and provides a host language interface facility.

Computer Corporation of America
4 Cambridge Center
Cambridge, Mass. 02142
Accolade
Number installed 75
Target environment ..... MVS, VSE, DOS, PC/DOS
Price ..... $40,000-$180,000
Accolade is CCA's tool for life cycle development of on-line Cobol applications. The newest release of Accolade is a fully functioned personal computer version.

Cullinet Software, Inc.
400 Blue Hill Drive
Westwood, Mass. 02090
IDMS with ADS/O
Number installed 1,043
Target environment ..... MVS, VSE, all IBM mainframes
Price $40,000
ADS/O allows programmers to build applications with IDMS/R and native VSAM applications. System increases programmer productivity of development by automating many of the repetitive data description and housekeeping tasks required of third-generation languages.

Oracle Corp.
20 Davis Drive
Belmont, Calif. 94002
*SQL*Forms*
Number installed 30,000
Target environment ..... DEC Ultrix, CMS, IBM Personal Computer XT, Personal Computer AT, MVS, VSE, VAX, Unix
Price ..... $180-$18,000
SQL*Forms is a high-level fourth-generation language application generator completely integrated with the Oracle relational DBMS. Key areas of use include on-line transactions, applications processing, ad hoc query and update.

Relational Technology, Inc.
1080 Marina Village Pkwy.
Alameda, Calif. 94501
Ingres
Number installed 4,000
Target environment ..... VAX/VMS, Unix, IBM VM/CMS, MVS
Price ..... $780-$35,000
Ingres is a distributed SQL-based relational data base system that is portable across systems ranging from mainframes to microcomputers. Product features include a full distributed data base and networking support. Integrated tools include a fourth-generation application development environment and end-user decision support tools.

Software AG of North America, Inc.
11800 Sunrise Valley Drive
Reston, Va. 22091
Adabas with Natural
Number installed 2,100
Target environment ..... MVS, VSE, VAX, VM/CMS, DOS
Price ..... $40,000-$80,000
Software AG's Natural includes full facilities for support of the entire applications life cycle, including prototypes, coding, testing and execution of a fourth-generation language application. Components include programming, coding, screen development and query management. Natural includes full security and is fully integrated to the company's Predict data dictionary.

COBOL PROGRAM GENERATORS

Burroughs Corp.
Burroughs Place
Detroit, Mich. 48232
Linc II
Number installed 1,400
Target environment ..... Burroughs A series, V series
Price ..... $30,000-$185,000
Linc II is an advanced fourth-generation information system generator. Using Linc II, analysts can define an organization in business-oriented terms by viewing its functions and operations from three basic perspectives: the fundamental components of the organization, the daily business events that occur and the different ways in which these are viewed by management in user departments. From input specifications entered through an interactive development system, complete information systems are generated including the data base, transaction management, network management and application programs.

CGI Systems, Inc.
P.O. Box 1645, One Blue Hill Plaza
Pearl River, N.Y. 10965
Packase
Number installed 400
Target environment ..... MVS, VS1, DOS/VSE, IBM DOS
Price ..... $140,000-$280,000
Packase is a full-application life cycle system that integrates and automates all phases of the application development and maintenance processes. It automatically creates Cobol programs, screen maps, data base descriptions, error messages, on-line application Help, user and technical documentation and management reports, all from the specifications entered in its data dictionary.

Products included in this chart are a representative sampling of the types of application generators available on the market. The companies listed responded to a recent telephone survey conducted by Computerworld. Vendor list supplied by Arthur Andersen & Co.
Chart compiled by Catherine Schlosser and Christie Sears.

Why does the Bank of Tokyo, Ltd. have a yen for Zeke:



Zeke automated scheduling is worth a fortune to The Bank of Tokyo, Ltd. "We've found that Zeke eliminates the possibility of out-of-order submissions and other errors," says VP/Electronic Data Processing Systems Department Manager Kazuahiro Kobayashi. "It takes the burden of individual submission off our operators.

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(817) 640-6911 (answered 24 hours a day) 1-800-227-7774 (outside Texas)

Product Spotlight Application Generators

[redacted]
Number installed 100
Target environment..... CICS, IMS/DC, batch
Price ..... $130,000-$265,000
Telon is an application generation system with full prototyping capabilities. Product features include edits with error messages and integrated test facilities, allowing access to design and review applications — together with end users — without requiring compilation. Applications can be generated in Cobol or PL/I.

[redacted]
2200 Mowry St.
Fremont, Calif. 94538
Application Productivity Systems (APS)
Number installed 70
Target environment..... MVS, MVS/XA, VM/CMS running IMS, SQL/DS or CICS, PC-DOS
Price ..... Available upon request
APS is a family of integrated ISPF-based productivity products for the IBM development center. Product is used for prototyping and development of on-line and batch DB2, CICS and IMS applications. Layered language structure provides user interfaces for multiple skills. Open architecture and rule-based systems support development environment extensibility and control.

[redacted]
Suite 444, 3340 Peachtree Road, N.E.
Atlanta, Ga. 30326
Gamma
Number installed 80
Target environment..... MVS, VSE
Price ..... $130,000-$200,000
Gamma is an application generator that automates the physical design, documentation and programming phases of system development. Features include interactive design and specification facilities with screen and report painting capability. Its open architecture application data base design makes customized output possible.

[redacted]
3502 E. Via de Ventura
Scottsdale, Ariz. 85258
Transform
Number installed 60
Target environment.. MVS, IMS, CICS, batch
Price ..... $100,000-$300,000
Transform produces installable applications from design specification input. Transform Logic products automate the application development process, including program design and testing. Applications maintenance is achieved through a nonprocedural input of user specifications. Transform performs data management, automates reusability of data elements and manages data for multiple system users.

FOURTH-GENERATION LANGUAGES

[redacted]
187 Danbury Road
Wilton, Conn. 06897
Nomad 2
Number installed 400
Target environment..... VM/CMS, MVS/TSO, IBM PC (fourth quarter)
Price $130,000
Nomad 2, a fourth-generation language/DBMS incorporating procedural and nonprocedural languages, features more than 140 functions for data manipulation and integrated decision support. Product includes a range of tools for designing customized, screen-driven systems and maintenance routines. Newly announced is the Nomad Assistant report writing facility. In addition to IMS and IDMS interfaces, Nomad 2 provides read/write interfaces to SQL/DS, DB2 and the Teradata DBC/1012 data base machine.

[redacted]
100 6th Ave.
Waltham, Mass. 02154
Info
Number installed 3,800
Target environment..... Data General AOS/VS, VAX/VMS, Prime Primos, Non-stop II DPS 6, GCOS
Price ..... $8,000-$40,000
Info is a relational data management system and fourth-generation language designed for use on minicomputers. It provides easy access to information as well as programming capabilities to both end users and professional data processing personnel.

[redacted]
Contact local marketing representative
Application System
Number installed ..... Not available
Target environment..... IBM mainframes
Price ..... Available upon request
Application system integrates the following into one product: data management, information retrieval, report writing, graphics, statistics, project management, business modeling and application creation. It also can be used by DP professionals to develop applications quickly to meet the specialized needs of individuals and departments.

Information Center/1
Number installed ..... Not available
Target environment..... IBM CICS/VM, VS APL or APL2 required; MVS or VM optional
Price ..... $22,000 plus a monthly license charge of $1,380
Information Center/1 is a set of decision support tools and aids that encourages professionals to select and organize data into a tailored, useful form. Designed for nontechnical users, it provides simple and logical menus and prompts. The major components of the Info Center/1 are data entry and validation, query, retrieval and analysis, reporting, planning and graphics.

[redacted]
1350 Broadway
New York, N.Y. 10001
Focus
Number installed ..... Not available
Target environment..... MVS, VM, VSE, Microsoft MS-DOS, VAX, CMS, Unix, VS
Price ..... $1,295-$100,000
Focus is a DBMS with an integrated fourth-generation language. Key areas of use include tracking systems and financial and management applications. Functionally equivalent versions are available with data and application portability between IBM mainframes, VAX-, VS- and Unix- and MS-DOS-based systems.

[redacted]
P.O. Box 2282
Princeton, N.J. 08540
Ramis II
Number installed 1,700
Target environment..... DOS VSE, OS/VS1, VS MVS, VM/CMS, AT&T Unix System V, PC-DOS, VM PC
Price ..... $30,000-$80,000
Ramis II is a fourth-generation language DBMS. It is a modular information processing system designed to meet business needs using ad hoc queries, decision support and application development. It features a natural language and an intelligent menu-based architecture designed for both the novice and the expert. It has data access to all major data bases. Ramis II exports relational combinations of data from multiple files.

[redacted]
Box 8000, SAS Circle
Cary, N.C. 27511
SAS System
Number installed ..... Not available
Target environment..... DOS/VSE, SEX, DG Eclipse MV series, MVS, VM, VAX, various mids, IBM PC, PC-DOS, competitive
Price ..... $1,500-$12,000
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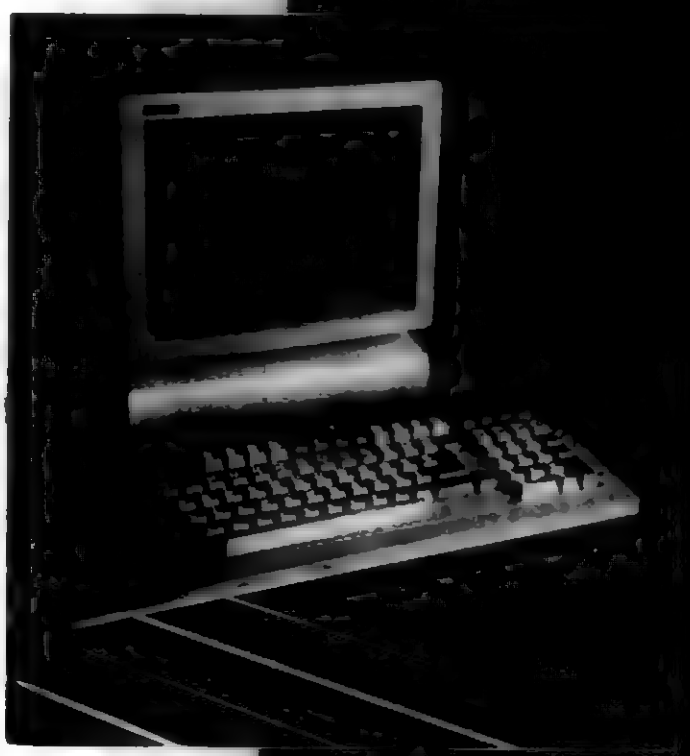
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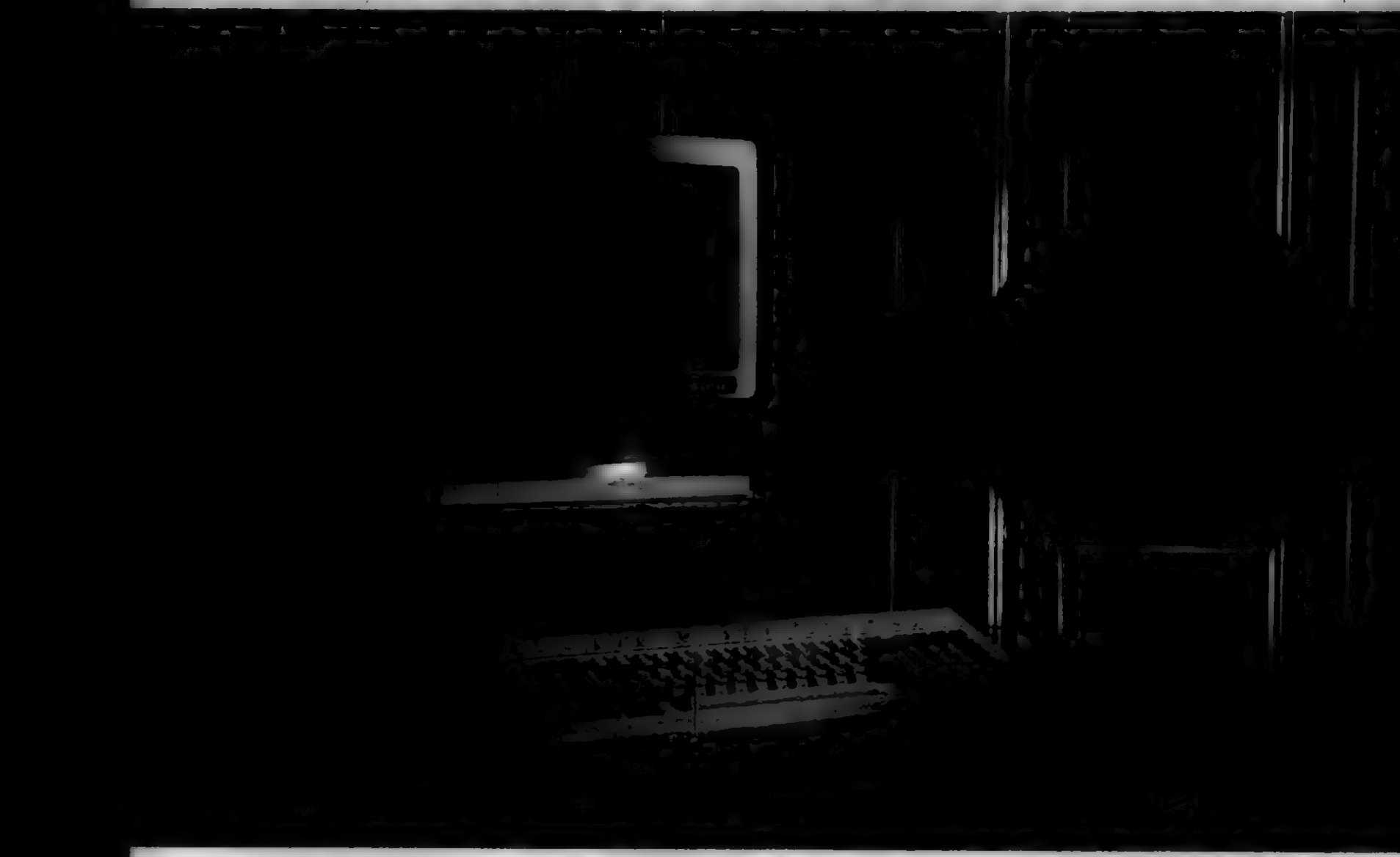
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In Depth

Lobbying for protection

Corporate users can defend their own rights

Precious little is done to protect the rights of computer users. • A few individuals used their PCs to lobby against one-sided "privacy" laws — and won. • Just think how effective corporate users groups might be.

By JAY BLOOMBECKER

Warning: This is an article about how democracy is coming to computing. It is a challenge to those who would like to see it spread. I make no pretense of objectivity or dispassion — only accuracy. I want to make your blood boil and your face flush, impelling you out of lassitude into revolutionary commitment. I want to turn the "appliance operators" into "cybernetworkers" — citizens of the information age.



ILLUSTRATION BY JON MENSCHIK

It is invigorating, in this age of anomie, yuppies and nuclear despair, to learn that there are people who not only care about computing but who also have been able to turn their concerns into effective action.

In the last year, four individuals — consultant Grey Staples, lawyers L. J. Kutten and Barry Bayer and myself — have mobilized the computer community in three different states (see story page 58). Small-time operators using our own petty cash for expenses, we went up against a $50,000 corporate lobbying effort and won every time.

What began as an individual effort has expanded. Corporate users are raising their voices — and they are being heard. In a fascinating dialectic, the introduction of developer-sponsored software license legislation has been followed by the introduction of consumer-oriented software warranty legislation. For the present at least, both types of legislation have been put on hold in favor of nonlegislative and economic solutions attempting to address the expressed needs of both the developers of software and its individual and business consumers. The future belongs to those who join together to have their voices heard.

Act I: Thesis

It all started with the Software License Enforcement Act. Touted as an antipiracy bill, the act was passed in Louisiana in September 1984 with great fanfare. W. Krag Brotby, president of Vault Corp., a company that specializes in copy-protection software, predicted that the law would provide a model for the other 49 states.

Vault had invested $50,000, by Brotby's estimate, in an effort to push the bill through. Alan Grogan, a respected computer lawyer whose firm represents Vault, had drafted the bill. Donald Radoff, a publicist, had set up a clearinghouse for information about software protection legislation, particularly the bill that Vault was pushing.

Press releases and interviews originating with Vault led the media to report that the bill had been introduced in California, Georgia, Texas, Maryland, Hawaii and Arizona. Actually, in three of these states the bill was never introduced. In the other three, it has gone down to defeat, at least for the moment.

Before declaring this result as a victory for consumer protection, a bit of background is necessary.

Making invalid contracts valid

In its simplest terms, the Software License Enforcement Act attempts to validate "shrink-wrap contracts." A look at the law and the equities of these so-called contracts demonstrates why this unusual effort to create new contract law is seen as necessary by the backers of the bill and why those consumers of computer goods and services who have looked at the bill have been almost unanimous in their opposition.

Virtually all software sold for personal computers at the retail level is accompanied by these shrink-wrap licenses. Usually a document beneath the shrink wrap on the software package warns the buyer that opening the package or using the software is deemed consent to the terms of a "software license." These terms are a set of provisions written by a lawyer for the manufacturer.

One thing that the Software License Enforcement Act attempts to do is ensure that these documents are seen by state contract law as valid contracts. Often contract law requires an active meeting of the minds. In other words, unless you and I agree to the terms of an agreement, there is no agreement. I cannot, for instance, put a label on a book and say that opening the book is deemed agreement to a license that

About the author

BloomBecker is an attorney and the director of the National Center for Computer Crime Data in Los Angeles.

prohibits you from reselling the book or from giving it away.

Yet that is the sort of agreement that the so-called software licenses seek to enforce. Whether the software licenses themselves are binding is an open question, since none has been the subject of any judicial interpretation.

The purpose of the Software License Enforcement Act is to get state legislatures to make the shrink-wrap licenses binding. It wants to change the states' laws to declare that these licenses are valid agreements and that buying or using software to which these licenses are attached does constitute adequate meeting of the minds for the buyer to be held responsible for the terms that they contain.

It is my legal opinion that contracts require — and should require — more knowing assent to their terms than just using a product that has a bunch of one-sided legalese on a document attached to it. These one-sided licenses almost invariably take as much as possible for the manufacturer and give as little as possible to the buyer. Most significantly, many of the contracts limit the warranty that accompanies the software.

> ***Limiting the warranty is a way for the manufacturer to avoid the responsibility of standing behind its product. It is a way of saying that if the software does not do what you reasonably expect it to do, that is too bad — buy another product, but leave the manufacturer alone.***

Generally, the law implies that a product will work for the tasks for which it is intended to be used. A word processing program is expected to do word processing; a spreadsheet program is expected to do spreadsheets. The effect of warranty law is to say that the consumer is protected if the product purchased does not work.

Limiting the warranty is a way for the manufacturer to avoid the responsibility of standing behind its product. It is a way of saying that if the software does not do what you reasonably expect it to do, that is too bad — buy another product, but leave the manufacturer alone.

The point I am making is that reasonable folks have found this bill to be "appalling," as Ron Beach of the North Orange County Computer Club (NOCC) put it, or that it "tramples on the rights of consumers," as computer lawyer Kutten notes.

Under these circumstances, it seems fair to assume that at the very least, users group members who buy software would be interested in knowing the provisions of the legislation and having the opportunity to present their opinions to those considering the bill.

Piracy and contract law

It is truly astonishing to see the intimidating effect of words in our supposedly sophisticated society. Call a bill a piece of antipiracy legislation, and normally sane people will choose not to challenge it lest they appear soft on what has now clearly been communicated as wrong.

Some people seem to think that to be soft on piracy is tantamount to loosing all credibility in computing circles. In many critics' eyes, users groups have been for piracy what brothels have been for prostitution.

Piracy is wrong, if by piracy you mean violations of the copyright law. How wrong it is, the most effective way to combat it, how to protect the correlative rights of the software consumers and hosts of other equally vexing and complex questions remain open and widely discussed.

Despite misleading lobbying to the contrary, the Software License Enforcement Act is not primarily a piece of antipiracy legislation. It is special-interest legislation designed to improve the economic position of software manufacturers without doing anything of substance to challenge software piracy.

In Hawaii, the state's acting director of consumer protection dispatched the connection between piracy and the software license enforcement act pending in his state neatly. "The bill appears to be an antipiracy measure intended to protect the proprietary interests of software manufacturers," Mark Nomura of Hawaii's Office of Consumer Protection testified to the state's Senate Committee on Consumer Protection and Commerce in 1985. "The bill does not appear to further deter piracy or address the primary problem — detecting the violator."

Act II: Antithesis

As the dust cleared over the shrink-wrap license battle (see story page 58), California Assemblywoman Gloria Molina was addressing the consumers' interest in microcomputer software that worked. Molina, herself the unhappy buyer of a piece of software, introduced a bill into the California legislature that would require hardware manufacturers and software developers to guarantee product performance and reliability for six months following a sale.

Although they were able to lobby successfully against the Molina bill, some vendors and ADAPSO are concerned about the possibility of widespread adoption of state legislation on warranties. David Sturtevant,

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ADAPSO's vice-president of public communications, explains that his association found the prospect of warranty laws most disagreeable.

"We favor industrywide competition in the area of warranties rather than requiring that developers all meet stringent requirements of a bill like Assemblywoman Molina's," he says. Sturtevant adds that uniformity of legislation is important to the software developer. "The cost of entry rises," he notes, "if a developer has to meet different requirements in each of 50 states."

Act II: Synthesis

The group Technical Evaluation through Strategic Cooperation (TESC) has been a prime mover in getting ADAPSO to attempt to deal with the warranty problem in a nonlegislative way, according to TESC President Robert Corr. TESC, made up of 31 primarily Fortune 100-level companies, meets from time to time with vendors from the microcomputer community to discuss issues of [illegible].

Joe Cane of General Dynamics Corp., a TESC member, explains, "We thought that warranties contained in the shrink-wrap licenses were not necessarily adequate for the corporate user. We tried to approach the vendors through TESC, but that didn't have enough punch, so we went to ADAPSO."

ADAPSO's Sturtevant explains that in addition to the Molina bill and industry requests for action, tension was growing between the distribution channel, the user community and the development community. "We've gotten a lot of letters saying, 'Software vendors can't have it both ways,' " he says. "The vendors can't say, 'Don't pirate software,' and at the same time tell the consumer, 'All we guarantee you is that there's a diskette in the box.' "

The union of the two groups resulted in the formation of the ADAPSO Microsoftware Customer/Vendor Advisory Board. The board was made up of more than 30

Continued on page 60

Software laws: A brief history

Louisiana. Louisiana was the first — and only — state to embrace the Software License Enforcement Act. The bill was announced in New Orleans at a Comdex/Spring '84 press conference featuring Vault Corp. President W. Krag Brotby and Louisiana Assistant Secretary of State J. Robert Wooley. Wooley left little doubt as to his motivation, declaring his intention to make Louisiana "Silicon Bayou."

Seven months later, the bill passed. Brotby noted that it did not meet with any serious objections, concluding, "I think that indicates it is a good, flexible law."

His words should be a warning to all those readers who think that a legislature can be adequately informed without their input. In fact, the only thing that the absence of objections to the Louisiana bill shows is the fact that little exists in the way of consumer protection for computer users in that state. Anyone doubting that conclusion should try to find a functioning users group there.

Arizona. Consultant Grey Staples of Scottsdale, Ariz., did not find the Software License Enforcement Act introduced in Arizona a good, flexible law. He learned about the bill after reading a notice about it on a users group bulletin board and immediately took steps to defeat it. He obtained a copy of the bill and published its text on 30 bulletin boards in the Phoenix area.

He encouraged all computer users to download the bill, read it and communicate with their legislators if the bill was not to their liking. Several other interested parties in Arizona testified before the legislature or wrote in opposition to the bill. Despite the appearance of Brotby and Vault attorney Alan Grogan, the bill was tabled until the 1986 legislative session.

Hawaii. In the course of researching an article on the Software License Enforcement Act, I learned that Hawaii's House of Representatives passed a version of the software enforcement bill in 1985. It was to be heard about two weeks later by the Hawaii Senate Committee on Consumer Protection and Commerce.

I called Mark Nomura of the state's Office of Consumer Protection and asked him to consider testifying against the bill. He invited me to send him a memorandum expressing my position. I sent copies of the memorandum to him as well as to the committee itself. Nomura was one of the few people to testify. He opposed the bill and contributed significantly to its defeat.

> *"I don't believe a small cadre of hired guns should be able to ride roughshod over people's rights."*
> — L. J. Kutten, computer lawyer

Simultaneously, computer lawyer L. J. Kutten was engaged in a much more ambitious lobbying effort. Taking advantage of the communications capabilities of Readers Digest Association, Inc.'s The Source, Kutten sent Sourcemail letters to all Source subscribers in Hawaii, urging them to communicate with their legislators and oppose the software licensing act. He also offered the subscribers two memoranda he had written outlining the problems with the act.

Kutten's actions apparently were very effective. Hawaii Sen. Steven Cobb, chairman of the committee considering the legislation, called Kutten and told him that the bill was dead.

Illinois. Kutten was joined by computer lawyer Barry Bayer in a similar effort to defeat the Illinois version of the Software License Enforcement Act. The bill was supposed to be a "know-nothing bill," one Kutten said would pass easily. Instead, Kutten notes, "Pure hell broke out in Illinois" after he sent fourteen sourcemail letters like those he sent in Hawaii to Source users in Illinois. He also sent letters to computer users groups in Illinois.

Kutten, an outspoken writer on consumer protection, explains his motivation succinctly. "I believe in morals and ethics," he says. "And I don't believe a small cadre of hired guns should be able to ride roughshod over the rights of the people." He calls the Software License Enforcement Act "The Consumer Rip-Off Act of 1985."

Meanwhile, Bayer was learning about computer politics for the first time. A member of a Chicago Bar Association committee on computers and law, he was aware of the software legislation from the committee's work on it. Convinced that the bill was a poor one, he went to Springfield, the Illinois state capital, to testify against it. His presence and behind-the-scenes contacts with legislators, users groups and the media kept the bill from being put on the legislature's consent calendar, which allows approval without serious discussion.

In the next week, Bayer got calls from legislators asking him if he would agree to language designed to make the bill agreeable and get it through the legislature. What he finally agreed to — and what eventually passed — was a bill "more symbolic than substantive." It provided for consumer protection and affirmed that nothing in the act should change the rights conferred on software users by the federal copyright act.

Perhaps in an attempt to divert attention or legislative energy, Bayer was instrumental in getting a bill introduced in 1986 that would have further weakened the 1985 Illinois shrink-wrap legislation. However, corporate users and developers who had been silent in the 1985 deliberations turned up to offer their help with this amendment, and the bill did not leave committee.

California. Attorneys played a major role in defeating the Software License Enforcement Act in California. Before the bill was introduced in the state, members of the Orange County Bar Association Patent Section and the State Bar Copyright and Intellectual Property Committee wrote letters to California Assemblyman Gray Davis, the bill's sponsor. Their strong opposition, raising many of the points previously addressed here, led Mercedes Arze, Davis' senior aide, to predict that the bill would never pass unless it became agreeable to the consumer. The bill was postponed until the 1986 legislative session, during which it was not reintroduced.

— [illegible]

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Continued from page 58

representatives of personal computer, corporate and university users groups as well as software vendors, computer retailers and a representative from Molina's office.

After several meetings, the advisory board assembled a brief document titled "ADAPSO Guidelines on Packaged Microcomputer Software Warranties in the Absence of Negotiated Agreements." While far less demanding than the requirements of Molina's original proposal, the provisions of the board's document convinced her to defer action on a second version of the legislation.

Jane Winden of Molina's office says, "Within the next three months, we will find out which members of ADAPSO have made changes consistent with the ADAPSO guidelines, and we will examine the warranties they are now using." Molina is quoted as saying she prefers to see the software industry police itself.

> ***"The Software License Enforcement Act is not primarily a piece of antipiracy legislation. It is special interest legislation designed to improve the economic position of software manufacturers without doing anything of substance to challenge software piracy."***

Users groups and legislation

Given the consistent success of individuals attempting to represent the interests of computer users, the natural question is, What success could groups of those users achieve?

In theory, users groups support educational activity, consumer protection and lobbying. Jon Seidell, head of the Independent Computer Consultants Association's Committee for Social Responsibility, explains the basic rationale for such activity: "Providers of computer goods and services are organized. Information users are not."

"We're philosophically behind the idea of involvement," says Jonathan Rotenberg, president of the Boston Computer Society. "We are committed to building an expanded program of outreach and public service."

"We should form lobbying groups to keep us aware of what is going on in the legislature," says Ned Ashby, president of the NOCC.

As for institutional users groups, the activities of ADAPSO and TESC indicate that corporate and other institutional users have begun to see the relevance of involvement in the legislative process. Increasingly, those in users groups can be expected to affect legislation if their groups choose to exercise the power available to them. Sturtevant makes no secret that he chose the members of the ADAPSO advisory board with a view to representing as many different groups as possible.

"It is not an accident that the group represents a geographic dispersion," he notes. "We tried to find all the constituencies we could and still be able to have manageable meetings."

ADAPSO's efforts are not unique. The Data Processing Management Association (DPMA) reportedly has established a committee to look into the issue of shrink-wrap licenses, says Joseph Collins, DPMA governmental affairs manager. "We've scheduled an article in the *Data Manager* [DPMA's membership magazine] to acquaint our members with the dimensions of the problems. Later we will be polling members to get a sense of their reactions to the issue."

Still, relatively few users groups, either on the individual or corporate level, are involved in attempts to influence computer policy issues. The theory of political involvement seems quite removed from the practice. Precious little seems to be happening to protect the rights of computer users. A number of reasons, listed below, may explain this difference between theory and practice.

Legal fears and apathy

Though favoring action, NOCC's Ashby notes that the nonprofit status of his and most other users groups made lobbying appear dangerous from the perspective of tax liability. Harris Luscomb, general counsel for the Boston Computer Society, explains that the Internal Revenue Code allows a nonprofit corporation spending $500,000 or less per year on exempt purposes to spend up to one-fifth of its expenditures on attempts to influence legislation. There is no limit on amounts spent simply acquiring information about legislation and disseminating it to the organization's membership.

Far more significant than legal fears seems to be the relative parochialism of most users group members' interests. NOCC's Beach waxes nostalgic thinking of the old days when hackers were the mainstay of computer users groups. "If something didn't work — and it often didn't — six of us would get together and work at it till we got it going," he notes. "Now we have 'appliance operators' who couldn't care less about how a product got to them or how it works."

The black box mentality of today's computer users seems to spill over into their attitudes toward politics, Beach says. "The appliance operators get a piece of software they

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In Depth/Lobbying for Protection

don't understand from a vendor they don't trust. If it doesn't work, they just say, 'They [the vendors] did it to me again.' "

Since lack of interest may be a function of lack of information, efforts such as those of DPMA in alerting its members to the issues involved in shrink-wrap licensing laws are likely to be most useful.

Lack of issues

Several users group executives point to the lack of consumer protection laws affecting users as the reason that no action has been taken. Software licenses and warranties are not the only issues that affect the interests of individual and institutional computer users.

As computer crime concerns grow, more sophisticated bills dealing with the operation of bulletin boards — such as the Texas computer crime law and the pending New York and federal laws — address issues of significance to a large portion of the user community. MIS managers, given the task of making sure that all computers under their control carry explicit warnings that entry into the system is unauthorized except under certain circumstances (as the proposed New York law may require), will certainly find that legislation of great relevance.

Analogously, bills concerning taxation of software and conditions under which VDTs may or may not be used are likely to affect many computer users in dramatic, if not undesirable, ways.

Perhaps one of the reasons that more issues are not coming to the attention of users is that users have no one looking through the bills that are introduced to see if, indeed, any of these do affect them.

Lack of leadership

From Boston to Silicon Valley, users group representatives report that the questions of lobbying and consumer protection are frequent topics of discussion at board of director meetings. Why has this conversation not filtered down to the members?

Jerry Nightingale, executive director of the Silicon Valley Computer Club in Santa Clara, Calif., urges more leadership on this issue. "Sometimes members need to be led. There's not always demand for something until you give them something and then try to take it away."

Mark Silvergeld, director of the Consumer's Union, a nonprofit consumer affairs organization, suggests that if anyone is going to tackle consumer protection groups, it is not going to be the traditional consumer protection groups. "Consumer groups are grinding out the old basics," he says. "Intellectual property issues are too abstract for most consumer groups."

Mobilizing for change

One of the saddest ironies is the fact that users groups represent the disorganization of the computer community, despite the many tools for organization provided by computers, computer networks and bulletin boards.

"Considering that we all have computers, modems and word processing systems," Bayer says, "we should be able to turn out thousands of letters on an important issue. I can guarantee that 10 letters to a legislator will get him to think seriously about a bill."

Yet computer clubs are seen by many of their members, and even many of their leaders, as little more than umbrella groups for individual hardware, software or professional users groups, the interests of which tend to be technology- or profession-specific. With literally millions of members belonging to the varied users groups, it is truly astonishing that there is no vehicle for the groups' executives to communicate with each other about issues of common concern, be they legislative, practical or technical.

There is no reason for things to stay as they are. Here are five possibilities for change:

The goose-your-group letter. It is easy to assume that your professional association has things covered. Unfortunately, this assumption is often not correct. As ADAPSO responded to letters it received, so will your professional association react to the suggestions of its members. It is often the silence of the membership that keeps the leadership from pursuing new courses of action.

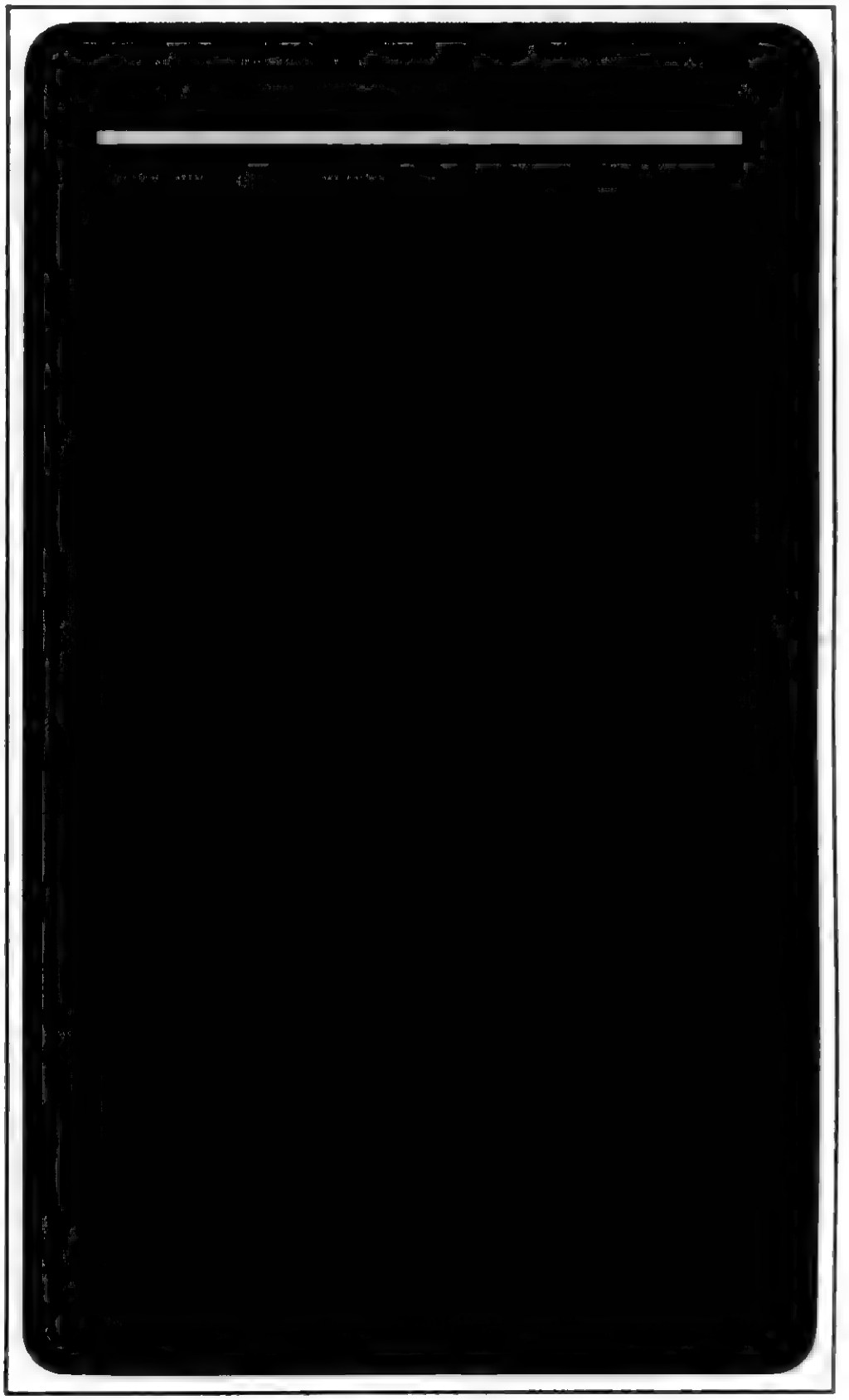
When I wrote earlier on this subject, it suddenly occurred to me that I was part of the problem I was describing. As a member of the Boston Computer Society, I had not done anything to make it responsive to the needs I thought important.

Self-enlightened — or at least guilty — I wrote a letter to Rotenberg proposing that the group study the possibility of gathering legislative information of interest to consumers and producers of computer goods and services as well as disseminating that information in a variety of ways.

Rotenberg wrote back supporting the proposal, suggesting that the society's Social Impact Group pursue it. After discussing the proposal with Anita Micossi, head of that group, we have agreed to propose that *Computer Update*, the society's magazine, retain the services of a legislative research group to provide monthly reports of new pending legislation.

In writing again on the topic, I raise the proposal once more. Clearly, legislative tracking is a function that a publication such as *Computerworld* could easily finance. All it requires is a flood of mail from readers of this article and a continuation of the publication's determination to serve its readership.

The computer users' consumer protection counsel. Why not institutionalize the good work that the people I have discussed have done? Let's



get a group of volunteers who commit themselves to watch legislation that might affect computer users and to communicate their findings to users groups. I will bet there are 20 L. J. Kuttens who would be delighted to be working for the good of the entire computer user community, if only for a limited time period.

Expanded use of policy groups. If lobbying is worth doing, it is worth doing right. TESC provides a model of consumers working together that many other non-Fortune 100 corporations could emulate. There is always the possibility of adding to a single group's impact by joining with other users groups to meet with vendors and discuss issues of concern. For example, TESC does not involve itself in lobbying, but others could use the same structure TESC uses toward that end.

> ***Legislators are more ignorant than evil. Let them know that you oppose a bill, and they will listen. One or two people's input can make the difference.***

Where the issues are not of the vendor-buyer variety but involve legislative matters, the same groups can join forces for lobbying efforts, as, for instance, the Association for Systems Management and DPMA do. Assuming that a pilot volunteer project could demonstrate the value of lobbying, a serious, permanent commitment to the idea should follow.

Based on his experience, Bayer is currently exploring the possibility of creating a lobbying group in Illinois. "If you want to lobby, you have to be there full-time," he maintains. "We were clearly outsiders looking in."

Again, it is sadly ironic that computer users have taken so little advantage of the information processing resources that make lobbying remarkably quick and relatively cost-effective. Companies like Public Affairs Information, Inc. and Legi-Tech, both in Sacramento, Calif., offer a variety of information services based on their on-line data bases of all bills and regulations in the 50 states. They will provide, on request, access to their data bases, regular reports and copies of specific bills. Charges are quite negotiable and can be tailored to the needs of the user.

These companies and lobbyists such as DeHart and Darr Associates in McLean, Va., offer representations at the state capitals. Personal representation is more expensive but still follows the laws of economy of scale.

The world computer users group. The most ambitious proposal to empower computer users I have seen comes from California State University Professor Harold Sackman, the chairman of the International Federation for Information Processing Societies' (IFIPS) Technical Committee on the Relationship between Computers and Society.

IFIPS consists of 45 national and regional organizations representing national computer activities in 57 countries. Sackman has proposed that this organization develop and launch a World Computer Users Group. This group would include "diversified educational and legal support for individual consumers of computer services," he says.

According to Sackman, the group would be "aimed at cooperative and shared social development of mass computer services with computer industry regulatory bodies, information service vendors, local government, national government and international organizations."

There is every reason for corporate and other institutional users to band together with individual computer users on matters of mutual concern. As computing is democratized, the computer professional is already becoming a personal computer consumer anyway. There may be situations in which loyalties are divided between the role of consumer and that of corporate user, but certainly in many other situations the interests served will be the same.

Commitment to the process

As a participant in the legislative process, I can personally attest to the thrill of having the wind in your face that comes from doing good and getting results. In addition, my political involvement — and that of the others I have discussed — gives me a sense of security as a citizen in the computer age.

Legislators are more ignorant than evil. Let them know that you oppose a bill, and they will listen: As several of us have seen, just one or two people's input can make the difference.

If we are to take seriously the challenge of the computer age, we must expect that laws and regulations increasingly will focus on computers, communications, their uses and their users. The legislatures of our country can become the forum in which all those affected by these issues gather together to work out intelligent compromises.

But it will never happen without your commitment and that of other users. If users groups can channel the energy of their members, a level of democracy in computing never before dreamed of can be achieved. ■



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CORRECTION

The year of publication given for Edward Yourdon's *Nations at Risk*, excerpted in the July 21 In Depth, was incorrect. The correct year of publication is 1986.

MANAGEMENT

TAKING CHARGE
Charles A. Khuen

Using systems to step up sales

In the business-to-business world of heated global competition, intense price wars and rapid product obsolescence, the need for increased sales and marketing productivity has become critical.

More and more large U.S. companies are staking their futures on market knowledge, taking their strategic cues from customers rather than relying solely on input from research and development, engineering, manufacturing or finance.

A recent joint study on the marketing shape of U.S. corporations by Coopers & Lybrand and Yankelovich, Skelley and White, Inc. shows that as chief executive officers shift their focus outward rather than inward, they are beginning to tackle the complex challenge of launching sales and marketing into the information age.

The CEOs' new recognition of the importance of information-based sales and marketing presents MIS with a challenge and an opportunity. The challenge is both organizational and technical; those MIS executives willing to meet it have an unprecedented opportunity to make their services a strategic weapon for their corporation in the marketplace.

From the corporate standpoint, what is needed is a system that enhances the productivity of each individual sales representative and selling channel. This system must also leverage the pro-

See USING page 66

Khuen is president of Adelie Corp., which provides corporations with service, systems and support for sales and marketing productivity.

DP solves merger puzzles

Bank exec notes benefits in the economies of scale

By Stanley Gibson

BOSTON — Bank mergers do not happen when two data processing managers meet, find they have a lot in common and inform their respective presidents that it would be great if their banks merged.


CIO L'Heureux

Instead, data processing is usually called upon to fit together the pieces after a bank merger deal is completed. True to its nature, data processing is nearly always in a supporting role.

"Operations are not a critical part of bank [merger] discussions," says Philip F. L'Heureux, chief information officer for the Bank of New England Corp.

L'Heureux has played a pivotal role since Bank of New England NA completed its merger with Connecticut Bank and Trust Co., creating the Bank of New England Corp. in June 1985. He continues to quarterback DP support as the bank, now with $18.25 billion in assets, acquires more banks throughout New England. It acquired Maine National Corp. and Old Colony Bank of Providence, R.I., in December 1985. Currently, seven more acquisitions are awaiting regulatory approval; L'Heureux has a data processing action plan for each.

Although data processing was not a motivating factor in bringing about Bank of New England's mergers, DP economies of scale have already been an important benefit of the mergers. Both banks had projected large increases in staff, but a year later the DP payroll remains unchanged as consolidation has made an increase unnecessary. For Bank of New England, it is not a case of less is more, but rather, the same is more.

L'Heureux, 44, began his career as a programmer at Connecticut Bank and Trust in 1968. Before becoming chief information officer at Bank of New England, he was head of operations at Connecticut Bank and Trust. Immediately following the merger, he was appointed to the newly created position of chief information officer. His office, situated on the 36th floor of Boston's Bank of New England building, commands a panoramic view of Beacon Hill and the Charles River.

In a sign of the stature of data process-

See DP page 65

On-line service speeds translations

By Mitch Betts

To speed business transactions with foreign clients, a variety of companies have turned to an electronic mail service that provides on-line translation of documents.

Neil Wiggin, director of exports for J. H. France Refractories Co. in Snowshoe, Pa., knew the $12 million brick maker would need a translation service to help it penetrate international markets. "The value of translation was clear to us. We knew people were most comfortable doing business in their native language," he said.

But "it's like trying to find a needle in a haystack to find people who can do this kind of translation work," Wiggin noted. Consequently, he turned to a new service called Globalink that links professional translators with businesses through various electronic mail networks.

Globalink, a 1-year-old start-up company based in Oakton, Va., receives documents through electronic mail, telex, facsimile or modem and then routes them to free-lance translators in its network. The translated document is then sent to the Globalink operations center for quality control and routed to the recipient.

See SERVICE page 64

INSIDE

Calendar: Shows, conferences, seminars/84

INSTANT ANALYSIS

"The most successful applications of advanced office technology occur when users are taught how to operate the machines and are then left essentially on their own to figure out ways in which the technology can be applied to improve the handling of their jobs."

— John J. Connell, executive director, Office Technology Research Group

MANAGEMENT MEMO

Trends: Women's pay lagging; DP turnover 'whopping'

Women who work in information centers are consistently paid less than the men there, according to the 1986 Report on Information Centers, a survey by the American Management Association and *Information Center* magazine.

Among staff members, men's salaries average $38,700 and women's $30,400, according to the survey. For managers, men get an average of $46,600 and women $39,200, according to the survey.

The study found average pay to be $40,100 a year — $35,800 for staff and $44,500 for managers — for professionals at information centers, which provide training and support services for end users.

The survey also found information centers are growing to keep up with expansion of end-user computing, with more centers being created and existing ones getting bigger. It showed a 15% increase in information center start-ups over 1985. Respondents expect an average growth of 20% in staff, bringing the number of employees to an average of eight per center by year's end.

■

Information systems departments are not leading development of artificial intelligence, according to a pair of New Haven, Conn., consultants.

About 40% of the largest 500 companies are pursuing AI, but the work is usually led by advanced technology staffs, research and development departments or end users, according to Software People Concepts and AI Services Co.

Software People President Roger Sobkowia says the trend mirrors the introduction of data base systems, office automation and personal computers. "Again, it seems MIS is missing the boat," he says.

Information systems managers, by nature cautious, feel they have their hands full and view AI as novel, complex and costly, says George Hairston, president of AI Services.

■

Data processing pay and turnover are being pushed up by competition for qualified workers, according to another recent survey. Edward Perlin Associates, Inc. of New York puts the turnover rate at a "whopping" 17%, down a notch from last year's record 18%.

Managers are trying to cope by offering raises and promotions, according to Perlin. Among the 48 large companies surveyed, the cost of pay and incentives for data processing staffs rose 10%. The average entry-level salary is up 7.7% to $25,300.

A data processing shop with 400 workers could spend as much as $2 million a year on expenses related to staff turnover, says Perlin consultant Peter Tamblyn.

CALENDAR

AUGUST 10-16

AM/FM International Ninth Annual Conference. Snowmass, Colo., Aug. 11-14 — Contact: AM/FM International, Suite 820, 8775 E. Orchard Road, Englewood, Colo. 80111.

AAAI-86 Fifth National Conference on Artificial Intelligence. Philadelphia, Aug. 11-15 — Contact: AAAI-86, The American Association for Artificial Intelligence, 445 Burgess Drive, Menlo Park, Calif. 94025.

Data Communications: Fundamentals and Beyond. Boston, Aug. 13-15 — Contact: The American Institute, Carnegie Building, 55 Main St., Madison, N.J. 07940. Also being held Aug. 20-22 in Indianapolis.

Buying and Selling Rights to Software, Hardware and Services. Atlanta, Aug. 14 — Contact: Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015. Also being held Aug. 15 in Philadelphia, Aug. 18 in Boston and Aug.19 in Chicago.

AUGUST 17-23

Thirteenth Annual Conference on Computer Graphics and Interactive Techniques. Dallas, Aug. 18-22 — Contact: SIGGRAPH '86, Conference Management, Smith, Bucklin & Associates, Inc., 111 E. Wacker Drive, Chicago, Ill. 60601.

The Institute on Artificial Intelligence and Expert Systems. Waltham, Mass., Aug. 18-22 — Contact: Joan Merrick, Seminar Coordination Office, Suite 415, 850 Boylston St., Chestnut Hill, Mass. 02167. Also being held Sept. 29-Oct. 3 in Chicago.

Advanced Communications Architectures Seminar. Washington, D.C., Aug. 19-20 — Contact: Communications Solutions, Inc., 992 S. Saratoga-Sunnyvale Road, San Jose, Calif. 95129.

DEC: The Next Five Years. New York, Aug. 19-20 — Contact: The Yankee Group, Seminar Division, 14th Floor, 89 Broad St., Boston, Mass. 02110.

Second Annual Physical and Electronic Security Symposium and Exposition. Philadelphia, Aug. 19-21 — Contact: Michael C. Otten, Booz, Allen and Hamilton, Inc., 4330 East-West Highway, Bethesda, Md. 20814.

EDI Training Session. Arlington, Va., Aug. 21-22 — Contact: TDCC, 1101 17th St. N.W., Washington, D.C. 20036. Also being held Sept. 25-26 in Arlington.

AUGUST 24-30

The Third International Congress on Advances in Non-Impact Printing Technologies. San Francisco, Aug. 24-28 — Contact: Society of Photographic Scientists and Engineers, 7003 Kilworth Lane, Springfield, Va. 22151.

Interconnect '86. San Mateo, Calif., Aug. 26-28 — Contact: Agnes M. Pavel, Program Director, U.S. Telecommunications Suppliers Association, Suite 1618, 333 N. Michigan Ave., Chicago, Ill. 60601.

Service speeds translations

From page 63

The service is available through a variety of electronic mail systems, including MCI Communications Corp.'s MCI Mail; Compuserve, Inc.'s Compuserve; Western Union Telegraph Co.'s Easylink; Readers Digest Association, Inc.'s The Source; and ITT Dialcom, Inc.'s Dialcom. A flat rate of 3 cents per character, plus $4 for handling, applies to all translations.

"We can get the information more rapidly to our customers," Wiggin said, "no matter where they may be in the world. Just yesterday I sent a letter to be translated from Spanish into English, and I had it back within an hour or so, translated and ready to go."

Typical translation services may take three days to translate a document and return it by mail or courier, but Wiggin said the on-line service achieves a turnaround time of an hour for most letters and 24 hours for lengthy, technical documents.

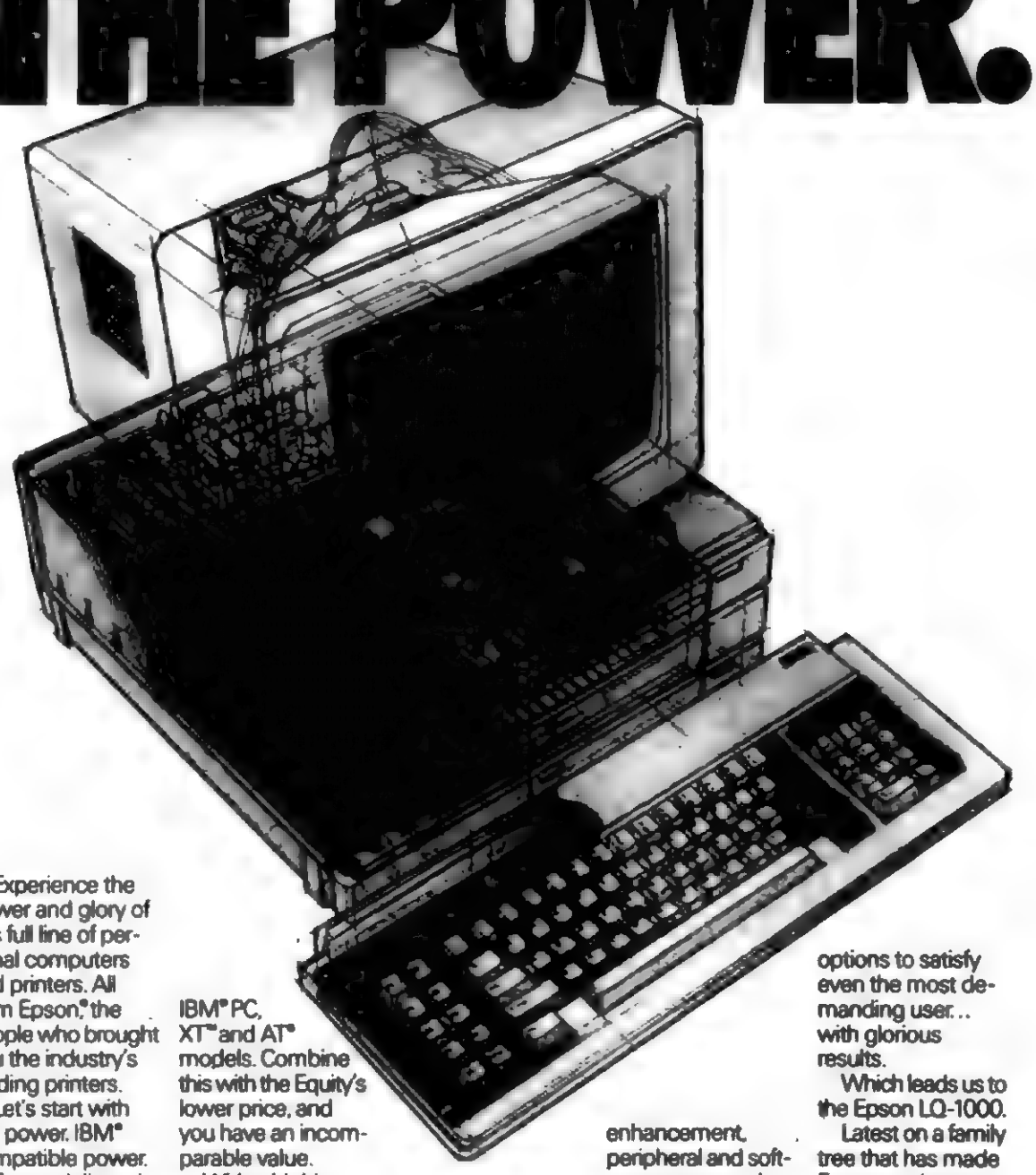
By speeding up business transactions, Wiggin said, the service gives his firm a competitive advantage over slow-moving rivals. Furthermore, using translated documents fosters clear and unambiguous business communications, he said.

"Many times there's a misunderstanding between people on contracts," he explained. "You ought to have the contract written in the language of the person who's going to be working with it. It's better to have it in their language to avoid misunderstandings," he said.

David Bremmer, an executive with the Spencer, Bennett, Nowak advertising agency in Seekonk, Mass., said he first used Globalink to handle technical ad copy. "It's important to be able to promise a client fast, accurate translations," he said. "It makes us look good."

Late last year, St. Louis-based Kangaroos, Inc., a footwear importer, recognized that its business with Italy was intensifying and required frequent translations of correspondence and legal documents, according to Richard Rosenberg, assistant director of marketing. "Through Globalink we are able to provide a special courtesy to our business with the Italians and other international contacts," he said.

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Latest on a family tree that has made Epson a printer industry leader for more than twenty years, the Epson LQ-1000 is proof that dot matrix technology can be raised to new heights of speed and resolution.

DP solves banks' merger puzzle

From page 63

ing operations in the corporate hierarchy, the 36th floor is headquarters for the Bank of New England and houses the holding company's principal officers. L'Heureux's office is adjacent to that of John Carusone, senior vice-president of corporate planning, with whom L'Heureux works closely in devising merger strategy.

"We have a close personal and professional relationship," says Carusone, who was vice-president of strategic planning at Connecticut Bank and Trust when L'Heureux was head of operations there.

At the outset of merger discussions between Connecticut Bank and Trust and Bank of New England, officials of both banks agreed that neither bank would acquire a new piece of technology or software without discussing it with the other. "We knew the issue was standardization," L'Heureux says.

To develop a complete game plan prior to the merger, consultants from Arthur D. Little, Inc. of Cambridge, Mass., interviewed officials of various departments at the banks. They wrote up 18 short-term issues and recommendations, which resulted in a formal plan that was finalized in October 1985.

"You've got to have a plan and tie it into the strategic as well as the tactical plan of the bank," says George Rockwell, head of financial consulting at Arthur D. Little.

The plan determined that both banks had certain stengths that could be built upon. For example, Connecticut Bank and Trust had a strong retail and community banking culture and consequently was selected to be the DP headquarters for that area. Old Colony Bank was strong in mortgage banking and was chosen to be the center for that function. Bank of New England had been strong in commercial banking and therefore became the corporate headquarters for that activity.

"We're not closing down operations for the sake of consolidation but are trying to maximize the assets of each location," L'Heureux says.

The bank's two major data centers, each of which contains an IBM 3090, are in Malden, Mass., and East Hartford, Conn. There are additional centers in Rhode Island, western Massachusetts and Maine, and all are tied together with T1 lines.

With the establishment of the data centers and their specialties, the centers are managed in what L'Heureux calls a centralized-decentralized approach. Although the major planning is centralized, numerous details are left to each local center. "If someone wants to hire a programmer, they know best whether they should or not," L'Heureux explains. Purchases greater than $500,000, including the amount of projected savings, must be brought before a companywide committee.

One example of how the bank has made the same number of employees go further is the payroll department. Before the mergers there were nine programmers doing payroll, three in each of three locations. However, after locating the payroll center in East Hartford, the bank moved three people to join the three already there and shifted the other three payroll programmers to work on new DP projects.

The bank was able to draw on the experience of operating a successful computerized installment loan system in Connecticut to start up a similar system in western Massachusetts without hiring additional staff.

The bank achieved a major consolidation on June 15, 1986, when all the automated teller machines (ATM) of all the merged banks were tied together so that any cardholder could use any ATM in the system. In connecting the ATMs, a multivendor solution was required because of the different makes of machines at the various banks and the impracticality of replacing them.

Another consolidation will occur when L'Heureux chooses a companywide installment loan system to replace the six systems currently in place, which will greatly reduce the total software support burden, saving time and money, he says.

L'Heureux not only has to deal with the variables of the bank's strategic planning and such nuts-and-bolts issues as connecting various computers, but he must also handle personnel at an acquired bank.

'It's important not to be too disruptive'

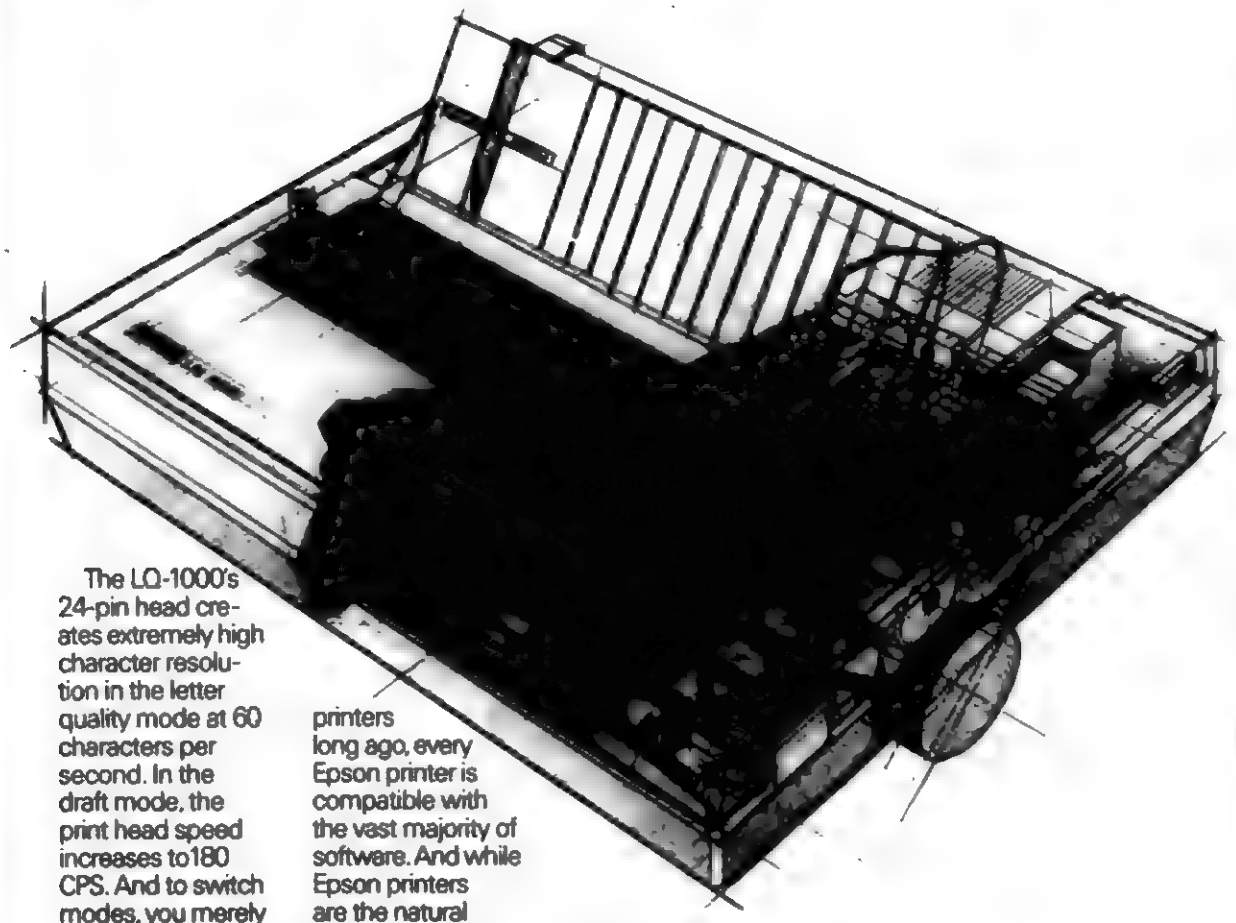
"Each bank is different. It's a very subtle thing, trying to understand the cultures. It's very important not to be too disruptive," Rockwell says.

An example of redirecting existing employees to advance corporate objectives occurred at Old Colony Bank. At the time of acquisition, the bank's old Sperry Univac mainframe was out of date and incompatible with Bank of New England's other systems. In addition, there were (and were expected to be) few Univac assembly language programmers in the Rhode Island area. The computer was sold, and mortgages are now handled by a service bureau in Dallas.

"There was apprehension at first," L'Heureux says of the employees' response to the changes in Rhode Island. However, all 12 Old Colony programmers are still employed in Rhode Island, working on projects for the Massachusetts or Connecticut data centers.

Not only does the move add to the bank's bottom line, but L'Heureux sees benefits for the programmers as well. After retraining as Cobol and CICS programmers, the switch gets them on a promising career path and out of dead-end positions programming the old Univac.

THE GLORY.



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EPSON
COMPUTERS
PRINTERS

Using systems to step up sales

From page 63

ductivity of all groups under the sales and marketing umbrella so that total corporate sales and marketing productivity can be optimized.

To achieve this goal, each group within the total sales and marketing operation — field sales, marketing communications, sales promotion, direct marketing, telemarketing and sales administration — must work together efficiently. All must share the information learned through each contact with the customer and leverage their actions for success. This approach allows the corporation to maximize the return on all its customer contacts.

The issue then becomes how to set up and implement a comprehensive central data base that the disparate groups within sales and marketing would be willing to use and share and that MIS could realistically be expected to support.

In addition to the challenge these intrafunctional barriers provide, other functional areas within the corporation should ideally be linked to sales and marketing. Although order entry, customer service and billing information exist at the corporate level, attempts to use that information for active marketing and sales have usually fallen short.

An integrated system designed to leverage sales and marketing productivity should incorporate four vital elements:

• The system must accommodate both centralized control and local ownership. Central control allows data backup and recovery and encourages operational discipline and reliability. However, local ownership is essential to winning the cooperation and participation of the field sales force.

• The system must offer both structure and flexibility. Structure, of course, is essential to facilitating the transfer of information in an orderly fashion. It also ensures that reports will be consistent over time. Flexibility is essential to allowing for quick response to changes in programs, territories and promotions and to supporting the ease-of-use features users demand.

• The system must focus on supporting — not managing — each of the participating departments. Big Brother systems designed to allow management to track sales performance tend to attract questionable data.

• It must be able to go on-line without requiring that sales and marketing organizations be reorganized or change their objectives.

While these characteristics sound difficult to realize and indeed represent a technical challenge, they can be achieved by combining the best of currently accepted personal computer, mainframe and communication technologies. The nature of such a system is not hard for an MIS director to envision.

It will offer networked, remote processing structured around a central marketing data base that operates on the corporate central mainframe. At the same time, it will be supported by operation-specific application software that meets the support needs of particular groups within sales and marketing.

Integration at work

Integration and the use of a central data base sets up a synergy cycle. In company after company, the more each department uses the system, the more information goes into the central data base and the better that central data base becomes. In turn, the more comprehensive the data base becomes, the more people use it and benefit from it.

Instead of overlap, confusion, delays and conflict, integration improves communication, boosts morale and lets everyone come out ahead in productivity and profits. When advertising and promotion personnel know the exact impact of each advertisement and trade show lead, higher returns on the advertising investment become possible.

At an instrumentation company, when sales representatives were supported with timely account status reports, customized personal letters for prospects and accurate lead assignments, they reported sales increases of more than 30% each and were able to handle nearly four times the number of accounts they had previously.

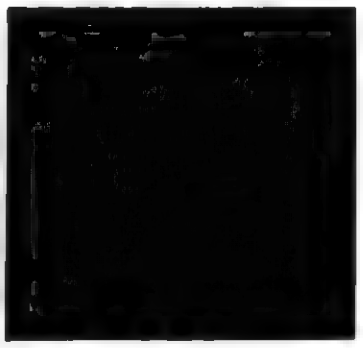
Automating sales and marketing also allows MIS to demonstrate its potential to develop a system that is in effect a corporate strategic weapon, one with an impact on both profitability and market share. Taking a leadership role in sales and marketing productivity improvement offers MIS the opportunity to implement corporate business objectives and, at the same time, gives corporate management the competitive edge needed in today's tough business environment.

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NEW PRODUCTS

Focus Vision stores, shows color pictures

Information Builders, Inc. of New York has announced Focus Vision, a personal computer data base management system said to capture virtually any image and display it as part of a PC/Focus data base record.

Focus Vision reportedly permits full-color pictures and graphics to be captured, stored and displayed along with standard text. The image can be made to be any size and can be placed anywhere on the screen. Video sources include camera, videocassette recorder, videodisk or compact disk.

According to the vendor, applications built with PC/Focus can add Focus Vision without having to be redesigned. Focus Vision also contains new Focus language commands that are said to be easily embedded in pre-existing applications.

Focus Vision is offered in two models, System 1000 and System 2000, both of which require PC/Focus Version 2.0 and an IBM Personal Computer AT or compatible computer, a 10M-byte hard disk and 640K bytes of main memory.

Focus Vision System 1000 is intended for capturing existing images produced by other software products and making them part of a PC/Focus data base. Focus Vision System 1000 software costs $750.

Focus Vision System 2000 reportedly will capture new images into the PC/Focus data base and will allow the capture, storage or display of live or prerecorded video images as well as images from other software in up to 256 colors.

System 2000 is available in two modes, capture and display and display only. The capture and display version of Focus Vision System 2000 requires the Focus Vision System 2000 software — priced at $995 — an AT&T Image Capture Master Board, a Quadram Corp. Palette Master board, two red-green-blue (RGB) analog monitors and a video camera and recorder. The display-only version of System 2000 requires Focus Vision System 2000-D software — priced at $395 — a Quadram Palette Master board and an RGB analog monitor.

PC/Focus Version 2.0 will reportedly be available at the end of the third quarter. Version 2.0 costs from $798 to $1,295, depending on quantity. Focus Vision will be available in the fourth quarter.

PBX capabilities enhanced

Messaging system cures office communication ills

Integrated Telecomputing Systems, Inc. of Sunnyvale, Calif., has introduced its Advanced Messaging System, said to provide Centrex users with private branch exchange capabilities.

The Advanced Messaging System, which also works with PBXs, consists of a full-featured telephone called Messagephone; the PC Message Attendant Station, a phone messaging system that can be linked to an IBM Personal Computer; and the Messagereader, a text-to-voice synthesizer installed in an IBM PC.

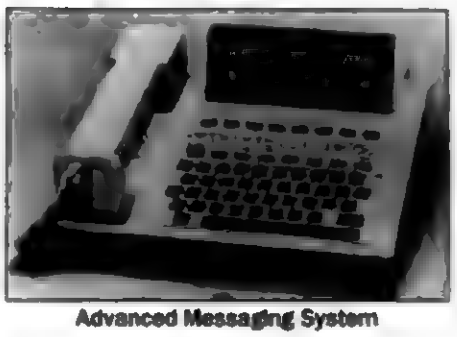
An optional interface, ITS/LAN, also is available.

The Advanced Messaging System is priced on a components basis, a company spokesman said. Messagephone costs $700 for one line with a modem and $800 for three lines with a modem. The Messagereader costs $4,000.

The Advanced Messaging System is intended to solve such office communication problems as telephone tag, misdialed numbers and unanswered calls. The system is designed to enhance the features of PBXs and Centrex services, making these features more accessible and easy to use, according to the vendor.

The Messagephone and PC Message Attendant Station are plug-compatible with most Centrex and PBX systems. Working with these systems, the Advanced Messaging System can perform advanced functions such as call transfers, conferencing, camp-on, call forwarding and call pickup.

According to the vendor, the core of the Advanced Messaging System is the Messagephone, a messaging telephone that can perform message storage and retrieval, automatic dialing of telephone numbers in messages, identification of incoming calls and automatic dialing of 200 or more preprogrammed phone numbers.



Advanced Messaging System

Messagephone also features a full keyboard with programmable keys, a three-line, easy-to-read vacuum fluorescent display and a built-in 300 bit/sec. modem. It also has 32K bytes of random-access memory, allowing storage of up to several hundred messages.

The system offers advanced messaging between Messagephones in the same office, allowing users to send memos and queries back and forth. Users also key in status messages, such as "out of office" or "back at 3 p.m.," and self-reminder notices that the system displays at preset times.

The Advanced Messaging System also offers voice mail capabilities through the Messagereader, which converts ASCII text into speech, said a spokesman from the company.

A special password keyed into the Messagereader by the user allows remote access to stored messages on a standard Touch-Tone telephone 24 hours a day.

Realfile expands PC file sharing

Realia, Inc. of Chicago has announced Realfile, an operating environment said to extend the file-sharing features of PC-DOS on the IBM PC Network and compatible networks.

Realfile supports sharing of indexed files among multiple machines. A central journal communicates task record locks, current positions and block alterations. Information in the journal allows Realfile to locally cache data from shared files.

Realfile reportedly minimizes network traffic, makes the most of local file caching and ensures the distributed caching behaves properly when multiple programs are accessing the same file, said Ken Belcher, Realia president.

The Realfile operating environment is priced at $150. A three-pack is available for $295. Future upgrades will be available for a per-copy upgrade fee. Realfile runs on the IBM Personal Computer, Personal Computer XT, AT, 3270 Personal Computer and compatible systems.

HP offers enhancements for Integral Personal Computer

Designed for EPROM placement of programs

Hewlett-Packard Co. of Palo Alto, Calif., has introduced three product enhancements for its HP Integral Personal Computer.

The enhancements feature the HP 82968A erasable programmable read-only memory/read-only memory (EPROM/ROM) board, the HP 82971A EPROM/ROM module and the HP 82970A software development tools.

The enhancements are said to allow the HP Integral PC to store C, Pascal, Fortran 77, HP technical Basic software programs or data files in EPROM, programmable read-only memory (PROM) or masked ROM.

Enhancements loaded into RAM

According to the vendor, the enhancements can also be loaded into the Integral PC's random-access memory (RAM), then executed. Turnkey secure systems can be developed for harsh environments as well as reliable software execution.

The HP 82968A EPROM/ROM board has sockets for four integrated circuits and is installed in the Integral PC's operating-system ROM module.

Holding up to 256K bytes of EPROM, the board is well suited for customers who want to place small programs, utilities, HP-UX scripts, data files or I/O drivers in EPROM, according to the vendor. The HP 82968A EPROM/ROM board is priced at $95.

With sockets for 16 customer-selected ICs, the HP 82971A EPROM/ROM module may be installed in either of the Integral PC's two I/O ports or an HP 82904A bus expander, the vendor stated.

The HP 82971A EPROM/ROM module costs $295.

The HP 82970A software development tools, priced at $195, include a software utility disk and a tutorial manual that give customers the ability to transfer programs or data files into EPROM, according to the vendor.

Software drivers are reportedly provided to communicate via the HP Integral PC HP 82919A RS-232C interface with EPROM programming devices such as a Data I/O Corp. Data I/O Model 29B.

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NEW PRODUCTS/SOFTWARE & SERVICES

SOFTWARE & SERVICES

Systems software

Venturcom, Inc. has announced that its **Prelude Information Management System** supports AT&T's Unix System V Release 3.

Prelude is said to be a comprehensive system for developing software tailored to specific, data-intensive applications. When combined with Unix System V Release 3 remote file-sharing capability, Prelude can transparently distribute programs and data files across many computers from different vendors.

The Prelude management information system costs $1,800 for a two-user configuration license.

Venturcom, 215 First St., Cambridge, Mass. 02142.

■

Datanex, Inc. has introduced the **EZCom-3770** systems network architectural (SNA) remote job entry subsystem for Digital Equipment Corp.'s VAX/VMS and Microvax/MicroVMS systems.

EZCom-3770 is said to emulate IBM 3777 Model 4 SNA/RJE workstation functions and uses DEC interfaces such as the DMF32 synchronous port for VAX systems and the DPV-11 interface for Microvax.

EZCom-3770 costs $3,500 for Microvax and $7,500 for VAX systems.

Datanex, P.O. Box 1728, Eugene, Ore. 97440.

■

CFS, Inc. has announced **Release 6.7** of its **Display Operator Console Support** (DOCS) package for IBM mainframe sites.

One of the extensions provided in DOCS 6.7 is a command that displays job accounting data accumulated for each active partition, as well as summary performance data.

The other extension is a command that displays all or selected I/O units present in the DOS/VSE system.

Fields displayed include the channel and unit address of the unit and the volume serial number of tape or disk devices. DOCS 6.7 costs $7,610.

CFS, 1600 VFW Pkwy., West Roxbury, Mass. 02132.

Applications packages

McDonnell Douglas Information Systems Group has announced **Solid Modeller** and **Architectural Site Modeller** (ASM) architectural software packages for its Graphics Decision Systems product family.

Solid Modeller reportedly creates three-dimensional designs by combining geometric shapes and sweeping, revolving and extruding two-dimensional elements. It is priced from $10,000.

Architectural Site Modeller generates 3-D models of proposed building sites. It is priced from $10,000.

McDonnell Douglas, P.O. Box 516, St. Louis, Mo. 63166.

■

Control Data Corp. has added **Ed-Layout**, a printed-circuit board layout package to its Cybernet Express electronics workstation.

The Ed-Layout software is said to provide electronics engineers with the tools for creating, editing and documenting actual drawings necessary to build a printed-circuit board. Included in Ed-Layout are a number of utilities that speed board definition, placement of board parts and pin-to-pin routing of signals.

Ed-Layout costs $4,250.

CDC, 8100 34th Ave. S., Minneapolis, Minn. 55420.

■

Sun Microsystems, Inc. has announced that **Autocad Version 2.5**, Autodesk, Inc.'s two-dimensional computer-aided engineering, design and drafting software, is available on the company's Sun 3 family of workstations.

The Autocad Version 2.5 offering increases Sun's offerings in mechanical, architectural and engineering design to more than 80 third-party software and hardware products.

The Autocad software on Sun's 32-bit workstation is priced at $2,750.

Sun Microsystems, 2550 Garcia Ave., Mountain View, Calif. 94043.

Languages

Force Computers, Inc. has introduced a **Pascal compiler** under Unix, as part of its VME-based Unix V microforce series.

Pascal under Unix, said to generate fast and compact code, is enhanced by strict compile and runtime error checking. Features of the package include a source-level interactive debugger and Pascal profiler support to identify program bottlenecks.

A single unit license for Pascal under Unix costs $600.

Force Computers, 727 University Ave., Los Gatos, Calif. 95030.

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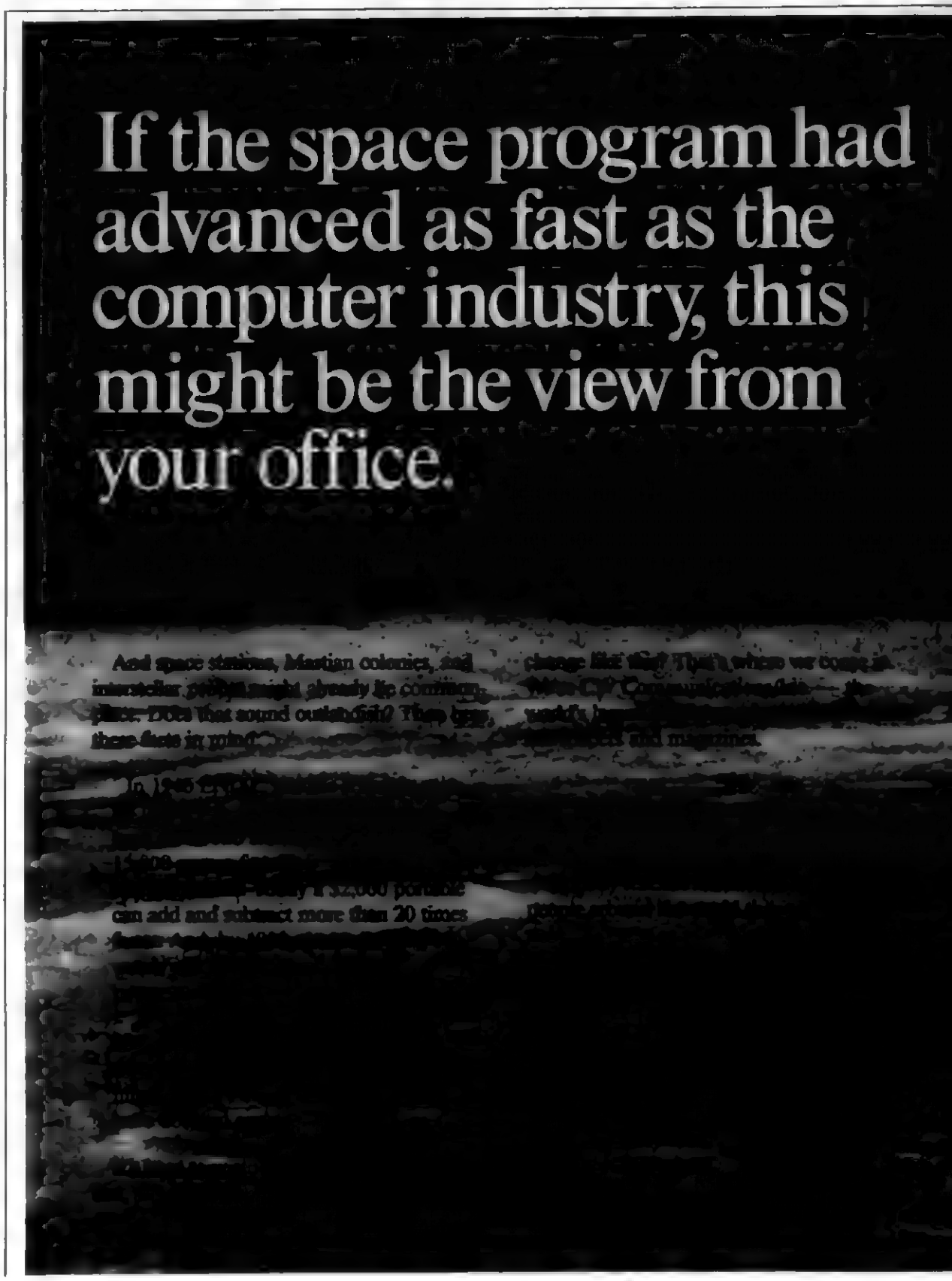
Whitesmiths, Ltd. has released **Version 3.0 RSX-11M Plus** C and Pascal compilers for the Digital Equipment Corp. PDP-11.

New ANSI features of Version 3.0 include structure assignment, structures-as-function arguments, functions-returning structures, void and volatile types and a complete ANSI C library.

Additional features include C source-level interactive debugging with breakpointing and variable display and operating system-specific library functions in source-code form.

Version 3.0 RSX-11M Plus costs $1,000 and $1,300 with Pascal.

Whitesmiths, 97 Lowell Road, Concord, Mass. 01742.



NEW PRODUCTS/SOFTWARE & SERVICES

Utilities

Plum Hall, Inc. has introduced the **Plum Hall Validation Suite**, a set of C programs for testing and evaluating C compilers and interpreters.

The Plum Hall Validation Suite for C was designed to test functioning of required features. The first subsection evaluates language features, and the second subsection tests operator precedence.

Other features of the product include a compiler capacity test, an executive interpreter that is a script language processor, expression generator and coverage.

Source license fees for up to 20 programmmers are priced at $4,500; the conformance section alone costs $2,200.

Plum Hall, 1 Spruce Ave., Cardiff, N.J. 08232.

A graphics and technical analysis system called **Teletrac** has been announced by **Telerate, Inc.**

Said to function on a specially designed microcomputer, Teletrac is a front-line trading and analytical tool for users in the foreign exchange and fixed-income money markets. Teletrac is received over high-speed satellite or leased telephone lines or can be piped into video switching systems.

Teletrac leases for $960/mo for color monitor and $795/mo for monochrome monitor.

Telerate, One World Trade Center, New York, N.Y. 10048.

■

Computertime Network Corp. has introduced **Dialogue**, a set of products said to allow access to Record Management System files on Digital Equipment Corp. VAX or Microvax computers through the use of screen forms.

With Dialogue, users can create screen forms, menus and reports. Programmers can use Dialogue's library of subroutines to facilitate I/O. Dialogue programs can be used as subroutines called from third-generation language programs or by themselves for file maintenance.

Dialogue costs $2,000 on Microvax, $10,000 on a VAX 750 or 780 and $23,500 on a VAX 880.

Computertime Network, 400 Amherst St., Nashua, N.H. 03063.

■

Versatec, Inc. has announced **Integrated Versaplot 9.2**, plotting software for outputting data from Prime Computer, Inc. computers.

Output can be to a magnetic tape or Versatec monochrome or color plotter. Integrated Versaplot 9.2 offers Prime users pen-plotter program call capability through Fortran-callable subroutines, user-adjustable clipping window and plotting viewport and support of Versatec 511A output multiplexer for use of multiple plotters.

Integrated Versaplot costs $4,000.

Versatec, 2710 Walsh Ave., Santa Clara, Calif. 95051.

Training software

Advanced Systems, Inc. has introduced **Displaywrite III, Course 6265**, a program for understanding Displaywrite III word processing.

The first of four Course 6265 video modules defines word processing and guides students through the creation of a document. The second module addresses revision functions as well as text formatting.

The final two modules teach the use of tables, math footnotes, spelling checking, repetitive documents, merge printing and special Displaywrite III features.

The program runs on IBM Personal Computers or compatibles.

The Displaywrite III course rents for $50 a month to $150 a month per module.

Advanced Systems, 155 E. Algonquin Road, Arlington Heights, Ill. 60005.

■

Martin Marietta Data Systems has announced **PC/Ramlearn Basic Reporting**, a training package for its Ramis II fourth-generation language and data base management system.

PC/Ramlearn includes courses on understanding the reporting environment, methods of data selection, displaying totals and subtotals and the basic Ramis II report request.

PC/Ramlearn runs on IBM PC-DOS or Microsoft Corp. MS-DOS Version 2.0 or higher.

It runs on IBM Personal Computers or compatibles with 192K bytes of memory with a color display and color graphics adapter.

PC/Ramlearn Basic Reporting costs $5,000 for duplication of up to 25 copies and $15,000 for up to 100 copies.

Martin Marietta, P.O. Box 2392, Princeton, N.J. 08540.

Services

The **Society of Manufacturing Engineers** and the **Industrial Technology Institute** have announced the publication of a **directory** of vendor products said to conform to Manufacturing Automation Protocol (MAP) and Technical and Office Protocol (TOP) specifications.

Products listed in the directory are categorized by end systems, intermediate systems, original equipment manufacturer producta, gateways, network products and network services.

Each listing includes such information as a vendor contact, the protocols implemented and the intended operating environment.

Subscriptions cost $135.

An on-line data base is also available.

Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

MICROS

Systems

Tandy Corp. has added the **Tandy 102** portable computer to its line of personal computers.

The Tandy 102 features a full-size 56-key typewriter-style keyboard with eight programmable function keys, four command keys and four cursor control keys.

Other features include a 40-char. by 8-line LCD display, 24K bytes of random-access memory and internal 300 bit/sec. direct-connect autodial modem.

The 102 includes five built-in read-only memory software programs for text editing, address and telephone filing, appointment record keeping, telecommunications and Basic language programming.

The Tandy 102 is priced at $499.

Tandy, 1800 One Tandy Center, Fort Worth, Texas 76102.

■

Comark Corp. has introduced the **Expert-AT workstation**, an IBM Personal Computer- and Personal Computer AT-compatible computer system.

Expert-AT has eight expansion slots, 640K bytes of random-access memory, 200W power supply and passive heat exchanger, the vendor said.

The workstation features a 19-in. red-green-blue monitor with 16 colors, 640- by 350-pixel medium-resolution display and full travel membrane keyboard with 10 function keys, according to the vendor.

The unit also provides tilt and swivel control.

The Expert-AT workstation is priced at $6,495.

Comark, P.O. Box 474, 93 West St., Medfield, Mass. 02052.

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Arbiter interfaces directly with VTAM and executes in its own address space, where it presents none of the performance or integrity exposure problems associated with CICS- or TSO-based link products.

Because Arbiter is a VTAM application, there are fewer layers of software between the PC user and the information, saving processor overhead. Arbiter's advanced data compression scheme also saves valuable network resources.

As a subsystem, Arbiter fully supports RACF and other popular security packages. It also feeds data into IBM's SMF—data you can use to tune Arbiter. Or use for network capacity planning, usage accounting and auditing.

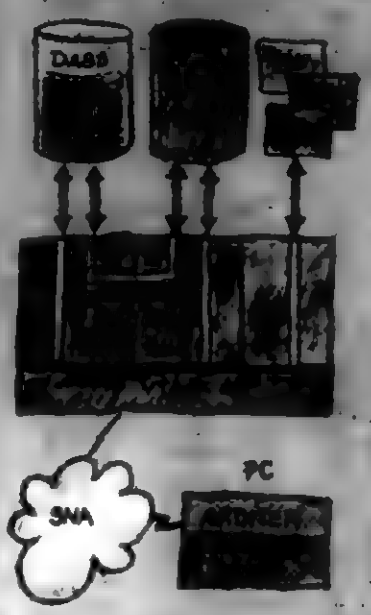
Instead of time-consuming file transfers and data reformatting, Arbiter allows the PC user to access corporate data via remote disks—already formatted for Lotus 1-2-3,® dBASE II® or III,® or other popular software formats like WKS, DIF® or CSV. Remote disks are accessed exactly like the disks attached to the PC.

Arbiter enables your information center to extract data from any host-formatted file structure (e.g., IMS, DB2 or VSAM) using its existing tools, whether they're COBOL, Pascal, PL/I, SAS® or FOCUS.®

Arbiter is licensed for a fixed fee based on the mainframe processor. PC licenses entail no additional charge and there is no limit to the number of PCs that can be attached to the licensed mainframe.

Introductory pricing is currently in effect for a limited time period.

Now's the time to give peace a chance in your data center by calling Tangram today at (919) 481-4444. You can declare an immediate truce by trying Arbiter yourself at your installation, with no obligation.



Arbiter has three components: The Remote Disk Environment (RDE) provides a seamless interface to remote disks on the host, which may be accessed by PC users or host application programs. The External File Interface (EFI) transfers data to and from files on the host and the remote disks. The Interactive Session Relay (ISR) allows "power users" to connect a PC to another mainframe subsystem—for example, TSO or CICS—without disconnecting from Arbiter.

TANGRAM SYSTEMS CORPORATION

Tangram Systems Corporation
115 MacKenan Drive, Suite 100
P.O. Box 5069
Cary, NC 27511-1999
(919) 481-4444

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Software applications packages

Computer Technology Associates, Inc. has released **Performance Analysis Tool Box**, a personal computer-based performance modeling tool.

Users direct Performance Analysis Tool Box to describe the hardware, software, communications and work load characteristics of the system to be modeled. Performance Analysis Tool Box uses analytical queueing network algorithms and approximation techniques to solve the system model. Reports including work load throughput and response time may be obtained through the Performance Analysis Tool Box.

Performance Analysis Tool Box costs $10,000.

Computer Technology Associates, Suite 600 W., 7927 Jones Branch Drive, McLean, Va. 22102.

■

Diagonal Data Corp. has introduced **Maintlog**, a software module that interfaces the vendor's Micro Maint plant maintenance software package with Centec Corp.'s personal computer-based, computer-aided manufacturing management (CAMM).

The Maintlog interface is said to allow Micro Maint to process CAMM-developed equipment log files to determine the need for specific maintenance to be performed on the equipment being logged. When a condition requiring maintenance is detected by the CAMM system, Micro Maint then generates an appropriate work order.

The Maintlog interface module costs $550.

Diagonal Data, 2000 E. Edgewood Drive, Lakeland, Fla. 33803.

Software utilities

Popular Programs, Inc. has released **Pop-Up PC-12C Calculator**, a random-access memory-resident calculator.

Pop-Up PC-12C Calculator is said to emulate Hewlett-Packard Co.'s 12C calculator. The calculator is a desk tool program for IBM Personal Computers and compatibles.

The Pop-Up PC-12C calculator is priced at $69.95.

Popular Programs, Suite 180, 135 Lake St., Kirkland, Wash. 98033.

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(312) 790-8040

NEW PRODUCTS/MICROCOMPUTERS

Software enhancements

Bay Computer Corp. has announced its **PC/Audit Version 3.5** card for password protection and automatic logoff of IBM Personal Computers tied to a mainframe or network.

According to the vendor, if the PC/Audit senses no activity on the keyboard of a PC after a certain period of time, the card will automatically break the link with the mainframe. Additionally, the PC/Audit will provide the system manager with a detailed audit of all computer usage, including files accessed.

The PC/Audit card costs $239.

Bay Computer, York & Haverhill Sts., Andover, Mass. 01810.

■

Microhelp, Inc. has announced **Peeks 'n Pokes Version 3.1** and the **Inside Track Version 3.1** software programs for IBM Personal Computers and compatibles.

Peeks 'n Pokes Version 3.1 includes such functions as reading and changing the system configuration, determining the total space and unused space on a disk and accessing the printer status.

Inside Track Version 3.1 includes such functions as how to display data faster, how to control the keyboard and how to copy memory from one location to another.

Peeks 'n Pokes Version 3.1 costs $45, and the Inside Track Version 3.1 costs $65.

Microhelp, 2220 Carlyle Drive, Marietta, Ga. 30062.

Communications

Emulex Corp., has announced **DCP/MUX**, a communications coprocessor board that expands the multiuser capability of IBM Personal Computer ATs, RT Personal Computers and compatibles.

The DCP/MUX works by incorporating an on-board Intel Corp. 80286 microprocessor that allows the board to off-load processor-demanding terminal communications.

Features of the DCP/MUX include an on-board interval timer that supports three 16-bit counters and a configurable 16- to 64K-byte shared memory window.

The four-line 128K-byte DCP/MUX costs $1,250; the eight-line 128K-byte DCP/MUX costs $1,495, the vendor said.

Emulex, P.O. Box 6725, 3545 Harbor Blvd., Costa Mesa, Calif. 92626.

■

Lattice, Inc. has announced **Sidetalk**, a package of telecommunications programs plus a communications programming language.

Sidetalk includes telecommunications programs to retrieve electronic mail, schedule automatic data transfers and set up a bulletin board system. A multitasking operation allows users' telecommunications to to be managed while the computer performs other tasks.

The Sidetalk Communications Language, similar to Basic, can be used to modify or create customized communications processes.

Sidetalk requires Microsoft Corp. MS-DOS or IBM PC-DOS 2.0 or higher and one serial port. It costs $119.95.

Lattice, P.O. Box 3072, Glen Ellyn, Ill. 60138.

Data storage

Torus Systems, Inc. has announced its **Cacher** disk-caching program.

According to the vendor, Cacher monitors all hard-disk activity and automatically caches all data transferred to or from the disk in up to 8M bytes of cache memory.

The program is compatible with the IBM Personal Computer XT and AT.

Cacher costs $99.

Torus Systems, Suite 105, 495 Seaport Court, Redwood, Calif. 94063.

■

J & M Systems, Ltd. has announced its **10M-byte hard drive kit** for the Tandy Corp. 1000 system.

The user-installable kit consists of a 10M-byte Winchester drive, controller, cables, mounting hardware and installation manual. All components are mounted internally, with the drive being mounted in the second floppy drive position.

The system requires IBM PC-DOS 2.1 or higher.

The hard drive kit for the Tandy 1000 costs $495.

J & M Systems, 15100-A Central S.E., Albuquerque, N.M. 87123.

Printers/Plotters/Peripherals

Summagraphics Corp. has introduced the **Professional series**, a graphics tablet featuring a full 18-in. by 12-in. active area.

The Professional series offers 1,000 line/in. resolution and features an interface cable, power supply and documentation. It utilizes the capabilities of graphic software packages such as Autodesk, Inc.'s Autocad and Versacad.

The Professional series tablet can be used with the IBM Personal Computer and compatibles and Apple Computer, Inc. Macintosh computers.

Professional series packages cost $995.

Summagraphics, 777 State St. Extension, Fairfield, Conn. 06430.

COMMUNICATIONS

Controllers

Renex Corp. has announced its **RTD** unit asynchronous communications controller, said to support dual hosts.

RTD permits communication be-

Continued on page 72

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NEW PRODUCTS/COMMUNICATIONS

Continued from page 71

tween large and small IBM systems and between IBM and other manufacturers.

Features include the ability to support seven colors, auto bit/sec. rate detection and up to five sessions per port. The basic unit supports terminal emulation of IBM 3270 terminals.

RTD is offered in eight- or 16-asynchronous port models.

The RTD unit ranges in price from $4,800 to $6,400.

Renex, 1513 Davis Ford Road, Woodbridge, Va. 22192.

Software

Tektronix, Inc.'s Software Development Products division has announced **ICom40/Apollo** for Apollo Computer, Inc. workstations.

ICom40/Apollo is said to allow communication between the Apollo Version 9 and the Tektronix 8540 and 8540A integration units, permitting a user to enter 8540 commands into and receive 8540 output from the Apollo workstation.

With ICom40/Apollo and Apollo-hosted compilers and assemblers, a user can perform high-level and low-level debugging from his workstation using the features provided by the host operating system.

The ICom40/Apollo package costs $2,000.

Tektronix, P.O. Box 14752, Portland, Ore. 97214.

Multiplexers/Modems

Algo, Inc. has announced its **Algo MC610** statistical multiplexer.

Algo MC610 is said to be a statistical multiplexer, a resource sharing switch and a data concentrator capable of supporting up to 500 local or remote asynchronous user stations.

The MC610's switching features make it possible for any RS-232 device to dynamically connect to any other local or remote RS-232 device. The MC610 with six ports in single quantity costs $1,495.

Algo, 9198C Red Branch Road, Columbia, Md. 21045.

■

Lantel Corp. has introduced its **Series 900 modems** including the **192CRU, 900A, 900S, 900T** and **900DC** broadband products for networks using 192.25 MHz as a translation frequency.

The 192CRU central retransmission unit is a single-channel frequency translator available for five video channels from 83.75 MHz to 113.75 MHz. It costs $1,490. The 900T and 900DC analog voice modems can interface two single-line telephones or connect a single-line phone to a private branch exchange. Each costs $880.

The 900A data modem offers asynchronous communications at 9.6K bit/sec. The 900S can operate either as an asynchronous or synchronous unit and offers operation from zero to 19.2K bit/sec. The 900A costs $780, and the 900S costs $980.

Lantel, 3100 Northwoods Place, Norcross, Ga. 30071.

■

Hewlett-Packard Co. has announced its **Digital Multiplexed Interface** (DMI) link product.

The HP DMI allows the HP 3000 to connect 23 RS-232C ports, at rates up to 19.2K bit/sec., to the private branch exchange network via a single T1 interface running on small-diameter telephone cable.

According to the vendor, the HP DMI eliminates the need for individual RS-232C connections by using data modules between the HP 3000 and the PBX.

The product costs $9,300.

HP, Inquiries Manager, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

Network services

Western Union Corp. has added the **TRW Business Credit on-line data base** to its Infomaster service.

The TRW Business credit addition is said to provide access to credit information and key business information on eight million business locations, allowing them to check payment history, per-



To make the right protocol connections, don't get a board.

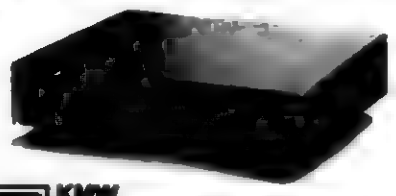
Each time you connect a PC or peripheral to your IBM System 34, 36 or 38, you face a dilemma. If you buy a board level protocol converter, you have to install it yourself — and use up a slot doing it. If you buy a multiport converter, you might be paying for ports you don't need.

That's why we're pleased to announce our one-port, portable Series III TWINAX protocol converter. Compact and affordable, it's perfect for communications applications that require a single local port.

Best of all, the Series III converter doesn't require technical expertise. Simply plug it in and it's ready to go. And it can be moved easily from device to device as your needs dictate.

The Series III TWINAX converter provides IBM System 3X connections for most devices, including printers, CRT's and microcomputers (such as IBM, Wang and Macintosh). It can be used with a low cost modem to give a remote device access to the 3X as well. And like our Series II multiport TWINAX converter, it incorporates three levels of internal diagnostics, menu-driven programmability, printer passthrough, file transfer and 25th status line capabilities.

So now, you can take care of virtually all your single port protocol connections without getting a board. Call us today at 1-800/531-5167 (in Texas, 512/836-8080) or write KMW Systems Corporation, 8307 Highway 71 West, Austin, Texas 78735.



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formance and stability of current and potential customers or suppliers. The TRW Business Profile reports are continually updated.

Each TRW Business Profile is available for $33, including a $25 surcharge and the standard $8 Infomaster service search fee.

Western Union, One Lake St., Upper Saddle River, N.J. 07458.

■

Network Technologies International, Inc. has released **National Health Forum**, a collection of information systems and services for the health care industry.

National Health Forum provides nationwide computerized information on hospital cost, quality of care, financial performance, population demographics and health services utilization.

The National Health Forum system incorporates an electronic conferencing utility that allows scattered participants to share and evaluate critical organizational analyses.

The National Health Forum system costs $12,000 plus remote computer service charges.

Network Technologies International, Suite 280, 315 W. Huron St., Ann Arbor, Mich. 48103.

Test equipment

Tekelec has announced the **Quasi Random Signal Source** (QRSS) option for its TE820A T1/DS1 test system.

The QRSS option is a plug-in card said to enable testing of data and voice equipment to ensure the integrity of the TE820A test system.

The QRSS option transmits known patterns through the DS1 equipment and compares the received pattern to the original. If errors have been introduced into the original pattern, the TE820A will supply a bit-error count that can be displayed as either error rate, individual errors or errored seconds.

The QRSS option costs $1,500.

Tekelec, 26540 Agoura Road, Calabasas, Calif. 91302.

■

Phonetics, Inc. has introduced the **Sensaphone Computer Monitoring System.**

The Sensaphone Computer Monitoring system sounds an alert if there is any threat of damage to an unguarded system and automatically calls up to four phone numbers to report the alert condition in English.

The Sensaphone system also responds with a status report on the six conditions it has been programmed to monitor, such as temperature, power supply, air conditioning, water under the floor or intrusion.

Sensaphone Computer Monitoring system ranges in price from $250 to $500.

Phonetics, 101 State Road, Media, Pa. 19063.

Auxiliary equipment

Electro Standards Laboratory, Inc. has introduced its **Model 8874-D IEEE 488 ABCD Switch** for switching devices having IEEE 488 interface.

The Model 8874-D is said to allow the user to switch a device having an IEEE 488 interface to any one of four IEEE 488 ports or switch any one of four devices into one port. All 24 leads of the interface are transferred simultaneously by operating the front panel selector switch. All cable connections are made at the rear panel.

The Model 8874-D costs $220.

Electro Standards Laboratory, P.O. Box 9144, Providence, R.I. 02940.

■

Dynapac has introduced the **Multi-Log X.25** monitoring device.

The Multi-Log X.25 is said to monitor packet-level data frames and produce statistics on calls made and data transferred during these calls. Output statistics such as calling address, incoming/outcoming call, reverse charges, date, time and duration are given, according to the vendor.

Multi-Log X.25 can handle a maximum of 20 calls. Multi-Log X.25 statistics are produced in one of two optional formats and are output from an RS-232 port for connection to a computer system or printer.

Multi-Log X.25 is priced at $2,995.

Dynapac, 6464 General Green Way, Alexandria, Va. 22312.

■

Electronic Specialists, Inc. has introduced the **Model PDS-11/Sup** Kleen Line modem protection.

Kleen Line security systems are said to suppress damaging telephone and power line spikes caused by lightning, spherics or phone office switch gear.

Model PDS-11/Sup has suppression on red and green phone lines with yellow and black lines brought straight through. A 6500A suppressor protects the AC power line.

Kleen Line Models are available for standard RJ-11 and RJ-45 modular connectors.

The Model PDS-11/Sup costs $109.05.

Electronic Specialists, 171 S. Main St., Natick, Mass. 01760.

■

Mod-Tap System has introduced its **Modular IBM Adapters**.

The Modular IBM Adapters are said to allow the user to convert the IBM Cabling System to standard twisted-pair wiring through modular connectors. The Modular Adapters are available with either a modular jack or a modular plug.

Continued on page 74



Design refinements cut size, cost and power consumption for 4800bps modems

Additional LSI microminiaturization in UDS 208A/B modems has produced significant performance improvements, along with dramatic reductions in size and power consumption. The 208A/B can be strapped as either full-duplex, four-wire (half-duplex, two-wire) over dedicated lines or half-duplex on the dial-up telephone network. It is now available in the "minibox" package. The result: a 54% reduction in volume. The 208A/B is also available in space-saving OEM card configurations.

DC power consumption has been reduced to approximately 2W. Other performance improvements include:

- Compatibility with all currently available 208s.
- Full loopback capability – local and remote; analog and digital.
- Suitability for multi-drop applications.
- Improvement in signal-to-noise performance, thanks to advanced equalizer design.

If it's time to bring your datacomm system up to 4800bps, then it's time to ask for technical details on UDS 208s. Universal Data Systems, 5000 Bradford Drive, Huntsville, AL 35805. Telephone 205/721-8000; Telex 752802 UDS HTV.

Universal Data Systems

MOTOROLA INC. Information Systems Group

UDS modems are offered nationally by leading distributors. Call the nearest UDS office for distributor listings in your area.

DISTRICT OFFICES: Apple Valley, MN, 612/432-8344 • Atlanta, GA, 404/998-3716 • Aurora, CO, 303/366-6000 • Blue Bell, PA, 215/643-2339 • Boston, MA, 617/875-8855 • Columbus, OH, 614/888-3885 • East Brunswick, NJ, 201/238-1616 • Glendora, IL, 312/858-6160 • Houston, TX, 713/988-8888 • Huntsville, AL, 205/721-8000 • Issaquah, WA, 206/392-6800 • Lincoln, NE, 402/420-0780 • Mesa, AZ, 602/830-8811 • Milwaukee, WI, 414/273-8743 • Mission Viejo, CA, 714/770-4555 • Mountain View, CA, 415/969-3323 • Richardson, TX, 214/680-0302 • St. Louis, MO, 314/434-4919 • Silver Spring, MD, 301/942-8888 • Tampa, FL, 813/884-8719 • Vestal, NY, 607/797-3800 • Van Nuys, CA, 818/909-2882 • Willowdale, Ont, Can, 416/495-0888

Created by Diamond Mail, Inc., Winter Park, Florida

Continued from page 73

The adapters can be ordered in 4-, 6-, 8- and 8-wire keyed polarization. The adapters can be used in IBM Token-Ring applications with the IBM 8228 Multistation Access Units, according to the vendor.

The Modular IBM Adapters cost $28.28.

Mod-Tap System, P.O. Box 706, Ayer Road, Harvard, Mass. 01451.

SYSTEMS & PERIPHERALS

Turnkey systems

Lattice Logic U.S.A. has announced its **Application Specific Engine** workstation.

The Application Specific Engine consists of a 32-bit computer that runs the vendor's Chipsmith silicon compiler software; a large 1,280- by 800-pixel monochrome monitor that displays design data through the Digital Research, Inc. Graphics Environment Management windowing system; 3M bytes of real memory; 16M bytes of virtual memory; and an 80M-byte hard disk.

The Application Specific Engine workstation is priced from $15,995 for an entry-level workstation. A complete system costs $24,995.

Lattice Logic U.S.A., Suite 199, 3333 Bowers Ave., Santa Clara, Calif. 95054.

CAD/CAM/CAE

Daisy Systems Corp. has enhanced its **Physical Modeling Extension** (PMX) with **PMX Fastboard**.

The PMX system is said to allow designers to simulate systems that use advanced components, such as Intel Corp.'s 80386 32-bit microprocessor, at speeds of up to 25 MHz.

The PMX Fastboard allows users to incorporate the actual microprocessors and other very large-scale integrated components when simulating board- and system-level designs, according to the vendor.

The Fastboard is said to support variable vector playback rates from 200 KHz up to 25 MHz in increments of 20 nsec.

It features a 64K-byte vector depth for each of 94 logic signal channels.

PMX Fastboard costs $15,000.

Daisy Systems, 700 Middlefield Road, Mountain View, Calif. 94039.

Data storage

Ciprico, Inc. has introduced the **Rimfire 2000** enhanced storage module drive disk and small computer systems interface controller and the **Tapemaster 2000** ½-in. tape controller for Multibus II systems.

The Rimfire 2000 features a 128K-byte and 512K-byte on-board sector cache, a defect management system that includes track and sector mapping and compatibility with 24-MHz disk drives and a 48-bit error correction code.

The Tapemaster 2000 reportedly features a dual-ranked first-in, first-out in the data path, allowing data transfer rates of up to 1.5M bit/sec., scatter read and gather write commands.

Rimfire 2000 costs $3,495, and Tapemaster 2000 costs $2,795, according to the vendor.

Ciprico, 2955 Xenium Lane, Plymouth, Minn. 55441.

Zetaco, Inc. has announced **Model ARZ-1**, a disk controller said to emulate Data General Corp.'s Argus/6236, and **Model LRS-10**, a DG-compatible optical disk subsystem.

Model ARZ-1 supports data transfer rates of up to 3M bit/sec. It includes a 1G-byte optical disk drive, a 100M-byte magnetic disk drive, an Argus-emulating peripheral controller and controller-to-drive cabling.

Model ARZ-1 is priced at $4,995. Model LRS-10 costs from $20,000 to $30,000.

Zetaco, 6850 Shady Oak Road, Eden Prairie, Minn. 55344.

■

Bering Industries, Inc. has announced its **Model 5840-RM Twinpac** dual Bernoulli disk drive subsystem for the Hewlett-Packard Co. CS/80 and SS/80 computers.

The Model 5840-RM Twinpac features two 8-in., 20M-byte removable Bernoulli cartridges and can be used as primary storage and as a backup system. According to the vendor, the average read/write transfer rate of the drive is 655/364K bit/sec., and the average seek time is 40 msec.

The Model 5840-RM Twinpac costs $5,890 and the Model 5820-RM Unipac costs $4,890.

Bering Industries, 1400 Fulton Place, Fremont, Calif. 94539.

Terminals

Gould, Inc. has introduced the **IP9000 Series Image Processor**.

The IP9000 series is said to process 2,048- by 2,048-pixel by 32-bit true color images with a 1,280- by 1,024-pixel, 60Hz flicker-free image display. The IP9000 arbitrated bus structure permits multiple functions to run concurrently, allowing a user to perform a Fast Fourier Transform while simultaneously acquiring, processing and displaying an image.

The IP9000 series is available in Model 9516, a one-user system, and Model 9527, a two-user system.

The IP9516 costs $74,000, and the IP9527 costs $120,000.

Gould, 46360 Fremont Blvd., Fremont, Calif. 94538.

Printers/Plotters

Western Graphtec, Inc. has introduced the **GP 9011** E-size pinch roller plotter.

The GP 9011 is a four-pen pinch roller plotter capable of handling sizes from 8½- by 11-in. to architectural engineering sizes. The unit fea-

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tures an axis-compensating function that automatically lines up the X and Y axes with the paper. A 20-char. by 2-line LCD display enables program debugging and simple interactive operation of various manual functions. The GP 9011 costs $8,950.

Western Graphtec, 12 Chrysler St., Irvine, Calif. 92718.

■

Western Graphtec, Inc. has introduced its **MP2300** eight-pen flatbed plotter.

The MP2300 has a plotting speed of 10 in./sec. in the drawing mode and 16 in./sec. when the pen is raised. Other features of the MP2300 include an automatic pen capping system, automatic pen selection, a dual-voltage switch and an electrostatic paper-hold-down system.

The MP2300 is priced at $1,250.

Western Graphtec, 12 Chrysler St., Irvine, Calif. 92718.

■

Printronix, Inc. has introduced its **L300 bar code printer**.

The L300 is said to be capable of producing all major bar codes. According to the vendor, a variety of forms may be used, including card stock, adhesive-back forms for labels and six-part forms for reports, invoices and sales orders. Features include a dark plot mode for increased ribbon life and a quick-access cover option that enables users to remove labels without opening the cover.

The L300 is priced at $5,400.

Printronix, P.O. Box 19559, 17500 Cartwright Road, Irvine, Calif. 92713.

Auxiliary equipment

Digital Controls Corp. has announced its **Model 9000** small computer system interface (SCSI) switch.

According to the vendor, Model 9000 allows reconfiguration of peripheral controllers between multiple processor systems that use the SCSI host adapter interface. It allows switching and reconfiguration for backup or job-related changes, according to the vendor.

Model 9000 is priced at $1,350.

Digital Controls, 3495 Newmark Drive, Miamisburg, Ohio 45342.

■

Perfectdata Corp. has announced **Perfect-Vu**, a line of screen filters for video display units.

The filter line features an acrylic polymethyl methacrylate said to offer light-absorbing and light-diffusing characteristics. The screens reduce glare by 96% and enhance contrast between the data displayed and the background.

Perfect-Vu is available in eight sizes. Pricing is $34.95 each.

Perfectdata, 9174 Deering Ave., Chatsworth, Calif. 91311.

■

Decitek Test Systems, Inc. has introduced the **CT-300** portable interactive tester.

The CT-300 is said to provide diagnostic capability to test and exercise most terminals and printer devices. CT-300 was designed for applications such as incoming inspection, quality assurance, field service, manufacturing final test, marketing demonstrations and in-house maintenance.

The CT-300 incorporates two serial ports, one parallel port and a data line monitor. The front panel load port accepts both erasable, programmable, read-only memory-based cartridges and battery-backed random-access memory cartridges.

The CT-300 is priced at $1,995.

Decitek Test Systems, 25 South St., Hopkinton, Mass. 01748.

PRICE REDUCTIONS

Dayna Communications has announced price reductions for its **MacCharlie and MacCharlie Plus.**

MacCharlie and MacCharlie Plus both provide a fast interface between IBM Personal Computers and Apple Computer, Inc.'s Macintosh programs and files.

Both programs include 256K bytes of random-access memory and one disk drive, according to the vendor.

Both MacCharlie and MacCharlie Plus now cost $795.

Dayna Communications, Suite 530, 50 S. Main St., Salt Lake City, Utah 84144.

■

Bering Industries, Inc. has announced price reductions on its **Series 8000-EP** enhanced performance drives for Hewlett-Packard Co.'s CS/80 and SS/80 computers.

The EP line features faster transfer rates and seek times than those of Bering's standard Series 8000 line as well as a faster disk controller.

The 8065-EP 65M-byte hard disk now costs $4,650, the 8095-EP 95M-byte disk now costs $5,450, the 80135-EP 135M-byte hard disk now costs $8,150 and the 80190-EP 190M-byte hard disk has been reduced to $9,150.

Bering Industries, 1400 Fulton Place, Fremont, Calif. 94539.

■

Hewlett-Packard Co. has reduced the price of its **Enhanced Portable Plus** portable computer and the **extended memory drawer** and **memory card**.

The Enhanced Portable Plus computer with 512K bytes of random-access memory, featuring a high-contrast LCD display, has been reduced from $3,395 to $2,995.

The extended memory drawer has been reduced from $495 to $395. The memory card, previously priced at $350, has been reduced to $250.

HP, Inquiries Manager, 1000 N.E. Circle Blvd., Corvallis, Ore. 97330.

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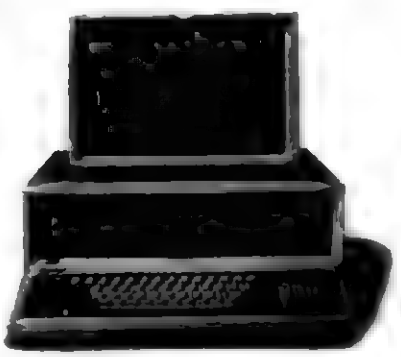


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COMPUTER INDUSTRY

Section begins on page 102

Teknowledge retools expert systems for business market

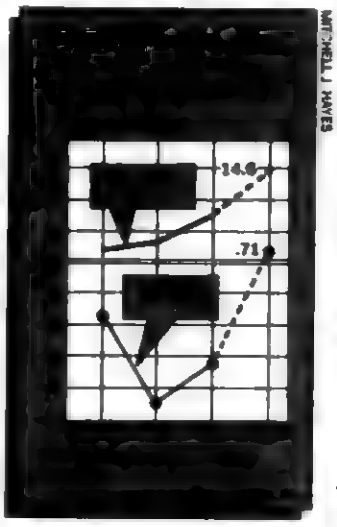
Despite profits, analysts doubt MIS acceptance

By Maura McEnaney

PALO ALTO, Calif. — By the time Teknowledge, Inc. had launched its initial public offering last March, the company had earned its stripes in the artificial intelligence software and services market.

After five years in business, the developer of expert system shells could boast an impressive client list. Heavies like General Motors Corp., Procter & Gamble Co. and FMC Corp. not only had large service contracts with Teknowledge, but each owned a 10% interest in the company.

In addition to its noteworthy client list, Teknowledge in 1984 was one of the first AI-related firms to bring a product to the market.



MATTHEW J. HAYES

Despite Teknowledge's early achievements, however, analysts say the company could be in for a rude awakening as it attempts to bring its products and services out of the technical sphere and into mainstream business applications.

Although sales of its M.1 and S.1 expert system tool kits account for less than 25% of the company's revenue today, Teknowledge further distinguishes itself as being one of the few profitable AI-related firms. For the year ended June 30, Teknowledge expects to turn a small but nonetheless significant profit of $710,000, or 13 cents a share, compared with fiscal 1985 losses of $1.16 per share.

According to Dataquest, Inc. analyst Roseann Stach, who is also a former employee of Teknowledge, the biggest issue for Teknowledge and other AI firms is timing.

"The market that is evolving is not the end-user market," Stach says. "MIS managers today are getting bombarded with all types of technology and are not easily convinced of the benefit of expert systems. It would be much easier to sell them software that cleans Cobol code." Expert systems may not make it into MIS shops for another three to seven years, she adds.

Founded in 1981 by a group of 20 scientists, including current Vice-President Frederick Hayes-Roth, Teknowledge was launched as a training and services organization for companies interested in developing in-house expert systems. In 1984, Teknowledge introduced its S.1 tool kit for LISP workstations and the M.1 tool kit, written in Prolog for developing smaller knowledge-based systems on micros.

Because of the limited installations of LISP-based machines, Teknowledge late last year announced plans to rewrite its software in the C language to allow the product to run on Unix-based systems and Digital Equipment Corp.'s VAX machines running VMS.

Teknowledge Chairman, President and Chief Executive Officer Lee Hecht says that under the C language, the M.1 and S.1 packages can be used to solve more general business problems, an area the company is anxious to enter and one that offers the most revenue potential.

Advertising, marketing and field services expenses associated with that strategy change contributed to an anticipated $270,000 fourth-quarter loss, the company said last week. Teknowledge also cited a delay in some expected orders for the shortfall but expects its revenue to show 48% growth to $4.3 million in the quarter.

Although Hecht says Teknowledge's shift into the mainstream computer market and its continued emphasis on its high-margin services is necessary, others say the company is confused.

See TEKNOWLEDGE page 78

AT A GLANCE

TEKNOWLEDGE

Founded: 1981
Headquarters: Palo Alto, Calif.
Chairman and CEO: Lee Hecht
Primary products: Expert system shells
Estimated 1986 revenue: $14.6 million (fiscal year ended June 30)
Estimated 1986 profits: $710,000
Initial public offering: March 1986
Employees: 180

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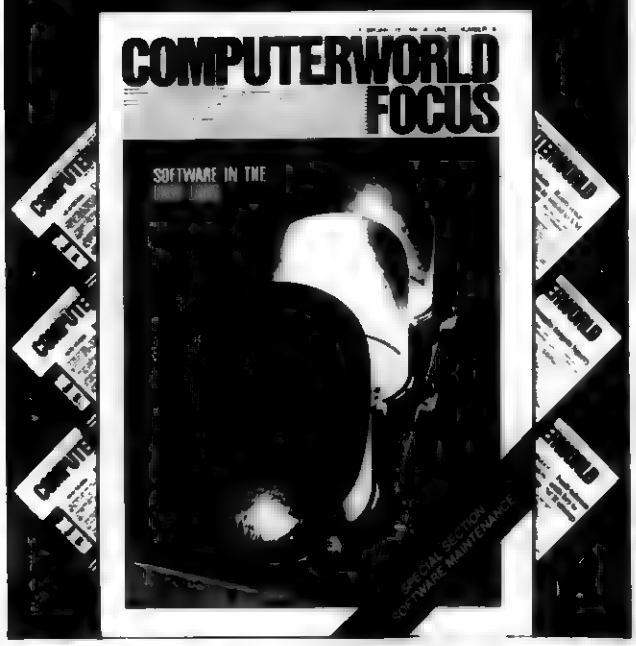
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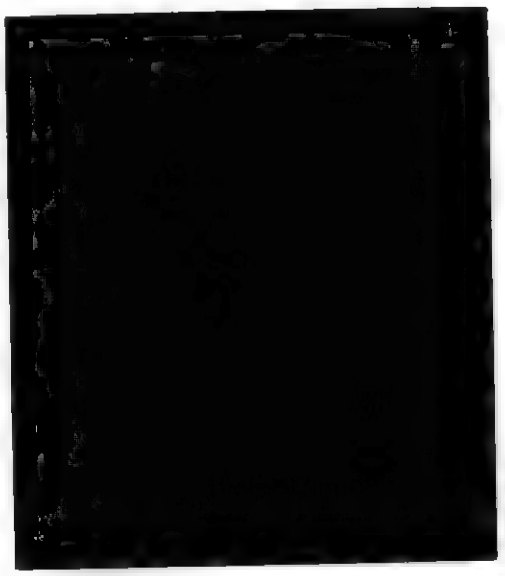
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A PUBLICATION OF CW COMMUNICATIONS

Teknowledge retools systems

From page 76

"They change their product strategy every quarter," says Harvey Newquist, analyst with DM Data, Inc. in Scottsdale, Ariz. "They started out as an education and contract company, then with S.1 shifted to become a mid-level tool company and later with M.1 tried to get into the low end," Newquist says.

Porting the products over to the C language allows Teknowledge to address a part of the market the company was losing, but it is also a portion of the market that has not yet grasped the benefits of expert systems. Teknowledge is also lagging behind AI competitors like Inference Corp. and Intellicorp, both of which have succeeded with niche products for factory automation and government applications, Newquist says.

AI companies that will survive must have products consistent with today's operating environments, provide a lot of support and have strong management and execution, according to Dataquest's Stach. She says Teknowledge has a chance, provided those problems are not overlooked.

"The thing to watch is how well the management controls their products," Stach says. "Teknowledge has to decide what business it is in — service or software. It needs to figure out which is the cart and which is the horse."

5¢ NICKELS AND DIMES

Ungermann-Bass, Inc. reported revenue for the quarter ended June 30 of $22.7 million, compared with $18.7 million in the comparable period one year ago. The company reported a net loss for the quarter of $3.9 million, or 23 cents per share, compared with a net income of $1.3 million, or 8 cents per share, in the same quarter last year.

■

Mohawk Data Sciences Corp. reported net income for the fourth quarter of $1.5 million, or 10 cents per share, on revenue of $48.9 million. This compares with a net loss of $120 million, or $8.20 per share, on revenue of $78.7 million reported in the like quarter a year ago.

■

Wyse Technology, Inc. reported revenue for the first quarter ended June 30 of $52.6 million, an increase of 43% over the $36.9 million reported in the like quarter of the previous year. Profits were $4 million, or 34 cents per share, compared with $2.2 million, or 24 cents per share, a year ago.

■

Paradyne Corp. announced revenue for the second quarter ended June 30 of $67.1 million, compared with $66 million one year ago. Net income was $495,000, or 2 cents per share, compared with a net loss of $9.2 million, or 41 cents per share, in the like quarter a year ago.

■

Fortune Systems Corp. announced net income of $263,000, or 1 cent per share, on revenue of $9.7 million for the second quarter ended June 30. This compares with net income of $222,000, or 1 cent per share, on revenue of $14.6 million in the comparable period last year.

■

Quantum Corp. reported revenue for the first quarter ended June 29 of $25.3 million, compared with $34 million in the previous year. Profits were $2.5 million, or 25 cents per share, compared with $5.7 million, or 60 cents per share, in the like quarter a year ago.

■

Britton Lee, Inc. announced revenue for the second quarter ended June 30 of $7.4 million, compared with $8.1 million in the previous year. Net loss for the second quarter was $262,000, or 3 cents per share, compared with net income of $1.1 million, or 14 cents per share, reported in the second quarter in the prior year.

■

Integrated Software Systems Corp. reported net income of $166,000, or 3 cents per share, on revenue of $7.6 million for the second quarter ended June 30. This compares with net income of $613,000, or 11 cents per share, on revenue of $8.7 million reported for the second quarter of fiscal 1985.

■

Duquesne Systems, Inc. announced revenue for the third quarter ended June 30 of $7.4 million, a 157% increase over $2.9 million in the like period a year ago. Profits were $1.5 million, or 30 cents per share, compared with $564,000, or 13 cents per share, a 159% increase over net income reported in the comparable period a year ago.

■

Northern Telecom, Inc. reported net income of $58 million, or 50 cents per share, on revenue of $1.1 billion for the second quarter ended June 30. This compares with net income of $76.4 million, or 66 cents per share, on revenue of $1.1 billion in the previous year.

■

Compugraphic Corp. announced revenue for the second quarter ended June 30 of $83 million, compared with $105.1 million in the like period a year ago. The company reported a net loss of $1.8 million, or 22 cents per share, compared with a net profit of $8.4 million, or $1.01 per share, in the comparable period one year ago.

■

Xerox Corp. announced income from continuing operations for the second quarter ended June 30 of $135 million, or $1.27 per share, compared with $120 million, or $1.12 per share, in the comparable period last year.

Net income in the second quarter, including a discontinued operations charge of $12 million, was $122 million, or $1.13 per share, compared with $220 million, or $2.17 per share (including a $95 million gain from discontinued operations), a year ago.

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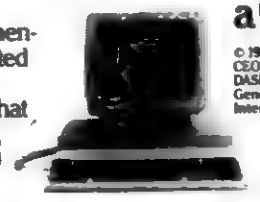
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TI upswing continues in second quarter

Sales, income increase; continued growth seen

By James A. Martin

DALLAS — Texas Instruments, Inc. last week reported its third consecutive quarter of improvement in operating performance.

The company's second-quarter net income was $12.3 million, or 35 cents per share, compared with a loss of $3.9 million, or 16 cents per share, in the same quarter of 1985.

Net sales billed for the three months ended June 30 were $1.24 billion, up slightly from $1.23 billion in the previous year.

Although no specific figures were given, the company said its data systems division was profitable in both the second quarter and the first six months of the year, compared with year-earlier losses.

The semiconductor division's performance improved for the quarter, operating slightly below break-even. For the six months, however, the division sustained operating losses due to weak capital spending and a decrease in computer shipments.

Continued semiconductor losses

Although TI should experience overall sales and income growth for the remainder of the year, semiconductor losses should continue in the third quarter with some improvement in the fourth quarter, according to James L. Barlage, managing director of Smith Barney, Harris Upham & Co.

Sales in the data systems division should remain static, unless there is some improvement in the economy. "Their costs are now under control, but I don't see much happening in revenue there," Barlage said.

Data systems has been lagging behind competitors in sales of its micro and minicomputers, but its efforts to establish a foothold in the emerging artifical intelligence technology mart could provide some much-needed income growth by next year, he added.

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Panoptic wanted to tell MIS/DP directors and managers from large and small companies about GENER/OL, its interactive application development system for CICS. So the company ran a testimonial ad in Computerworld and offered a free *Your System Isn't Ready Because...* tee shirt to respondents with the title of MIS/DP director or manager.

The tee shirts were used as entries to first calls, hand delivered by Panoptic salespeople. And a great number of shirts were delivered. "*We got responses from the high-level people that we weren't able to reach before, and these people were interested in more than just tee shirts,*" recalls Jack Lusbeck, Director of Marketing for Panoptic. "*They were also interested in learning how GENER/OL can save them money, so the tee shirt requests yielded many viable sales leads. And those leads are already turning into sales.*" Jack reports.

And responses are still coming in. "*Responses have come from companies of every size. In fact, just name a company, and we probably heard from them.*" says Jack.

"*We're now running only in Computerworld and we're expanding our program.*" Jack explains. Prior to this campaign, when Jack would call his sales people for prospective publications in which to advertise, three or four publications were generally listed.

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All don't walk to IBM's beat

From page 102

All of those companies recently reported second-quarter earnings gains ranging from solid to spectacular. These are hardly niche companies but broad-based, established firms that are selling plenty of computer hardware and software. Not to mention the computer services market, which appears as strong as ever.

Is this really an industry slump?

Granted, the high-end, general-purpose mainframe systems business is down. Companies with most of their eggs in that basket — like Amdahl Corp. — exemplify this downward trend, while vendors diversifying away from that market — like NCR — are seeing rewards.

Slower U.S. capital spending is a reality, and no computer industry segment feels that pinch more than large systems that require a multimillion dollar investment decision.

But what of all the spending for DEC minis, MSA applications, Compaq clones and Tandem transaction processors? Although information systems spending will fall below earlier projections for the year, there are clearly plenty of MIS dollars out there for vendors with the right products and the right approach.

One year ago, the slump was an across-the-board reality. Now, many vendors have recovered not by waiting for the economy to improve but by making the right technological and business decisions. For others, the industry slump is an excuse on which to blame a host of product and/or marketing disappointments.

Stuck in the mud

While IBM's woes in some cases typify the difficulties of certain industry segments, it does not make sense to simply look at IBM's falling profits and conclude that the entire industry is still stuck in the mud. Due partially to its mind-boggling size, IBM has many unique problems — such as the mid-range confusion born of IBM's different architectures for different markets.

While Wall Street might still believe the maxim that when IBM sneezes (actually, wheezes may be more accurate), the industry catches a cold, a clearer look at the industry halfway through 1986 proves otherwise. IBM and many other vendors are ailing, but plenty more are healthy, and some even look ready to run a triathlon. Armonk is not the only place to read an industry weathervane.

■

It's not nice to fool Wall Street. Daisy Systems Corp. learned this earlier in the year when it admitted that its predicted rosy scenario would not materialize. The latest victim of such an "oops" was Floating Point Systems, Inc.

Floating Point recently announced that revenue for the quarter ended July 31 will fall below year-earlier levels, while profits will reach 50% of last year's, at best. The firm's stock promptly lost almost half its value in a New York Stock Exchange sell-off, and last week, two separate class-action lawsuits on behalf of shareholders were filed against the company.

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Action lifts CDC division

From page 102

ing a commodities market, he says. Competition from Japanese and U.S. West Coast vendors intensified dramatically, saturating the market with peripherals, which led to large price reductions.

But external reasons cannot explain the magnitude of CDC's problems. The peripherals division was in the classic market leadership position, primarily built on its dominant position in the removable drive portion of the industry, Perlman says.

As that technology shifted quickly to fixed drives, the division could not move quickly enough to catch up.

"There is more than enough guilt to go around," Perlman admits.

The firm banked on thin-film head technology to become prominent, but instead, orders declined. Its volume production facilities were designed for ferrite or composite heads, causing too much inventory and capacity.

The return to profitability resulted from Perlman's decision to concentrate on the high-performance, high-capacity drive OEM market, which he says was the firm's biggest strength.

He slashed the work force from approximately 19,000 to 10,000 people. He eliminated eight of 15 products. The factories reorganized into just-in-time manufacturing lines, adopted statistical methods of control and increased automation.

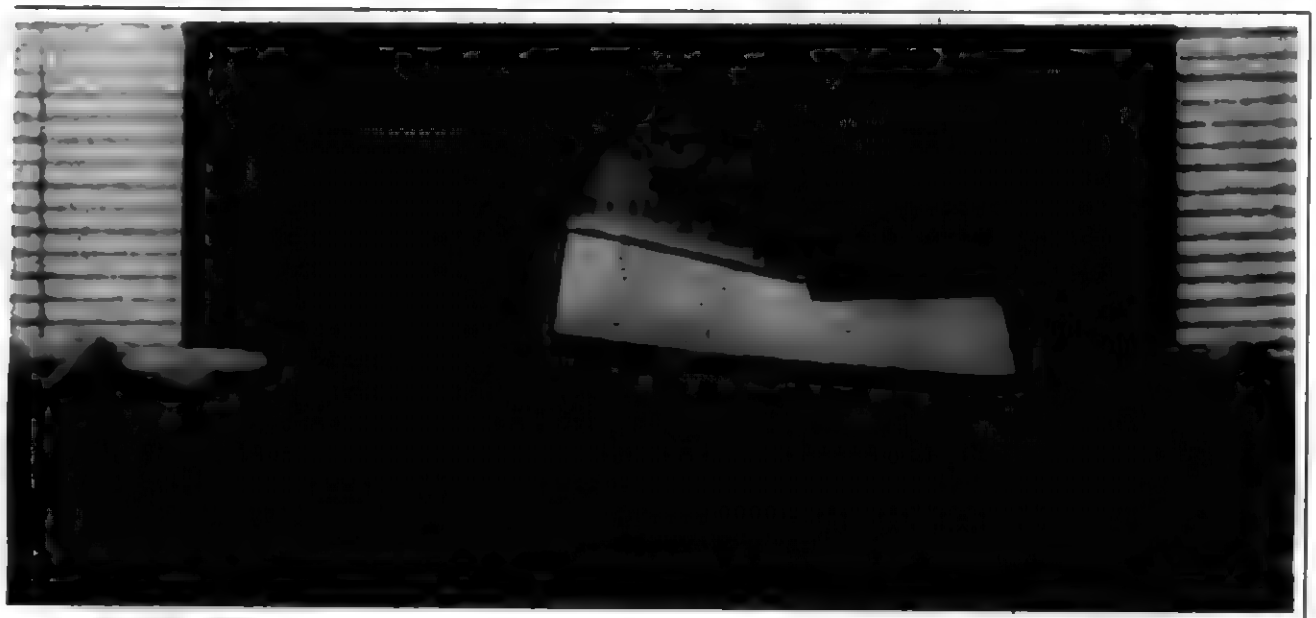
CDC also sold off a number of the group's businesses, such as its magnetic media unit to Xidex Corp. and its IBM plug-compatible Series/1 minicomputer peripherals business to Cambex Corp.

The Data Storage Products Group was decentralized in June to include four autonomous units — components, large-disk, small-disk and optical/tape. The optical storage business is a joint venture with N. V. Philips.

"I don't want to tell you that morale was wonderful through all this," Perlman says. "But I think people now feel that they have been a part of the turnaround, and for people that have been through that, it's pretty heady stuff."

"You have to give Perlman much of the credit for the turnaround," Blauer says. "He is what that business needed — a strong, action-oriented guy who gets things fixed."

Perlman is clear about his plans for the group's future. "We have to continue the improvement in gross margins," he says. "I believe that we have to take from 20% to 25% out of our product cost each year for the next two years to remain competitive."



Lawmaker delays effort

From page 102

need for the legislation because the industry was able to self-regulate," ADAPSO attorney Joe Ruble said.

In April, ADAPSO produced a set of warranty guidelines that the group hopes its members will adopt. Among the firms to adopt the guidelines is Lotus Development Corp.

Industry representatives say they understand the campaign for stronger warranties has not ended with this legislative session.

"Assemblywoman Molina voluntarily withdrew the bill from consideration, but she remains the judge and jury," ADAPSO's Ruble said. "The warranty issue is a continuing campaign on our part."

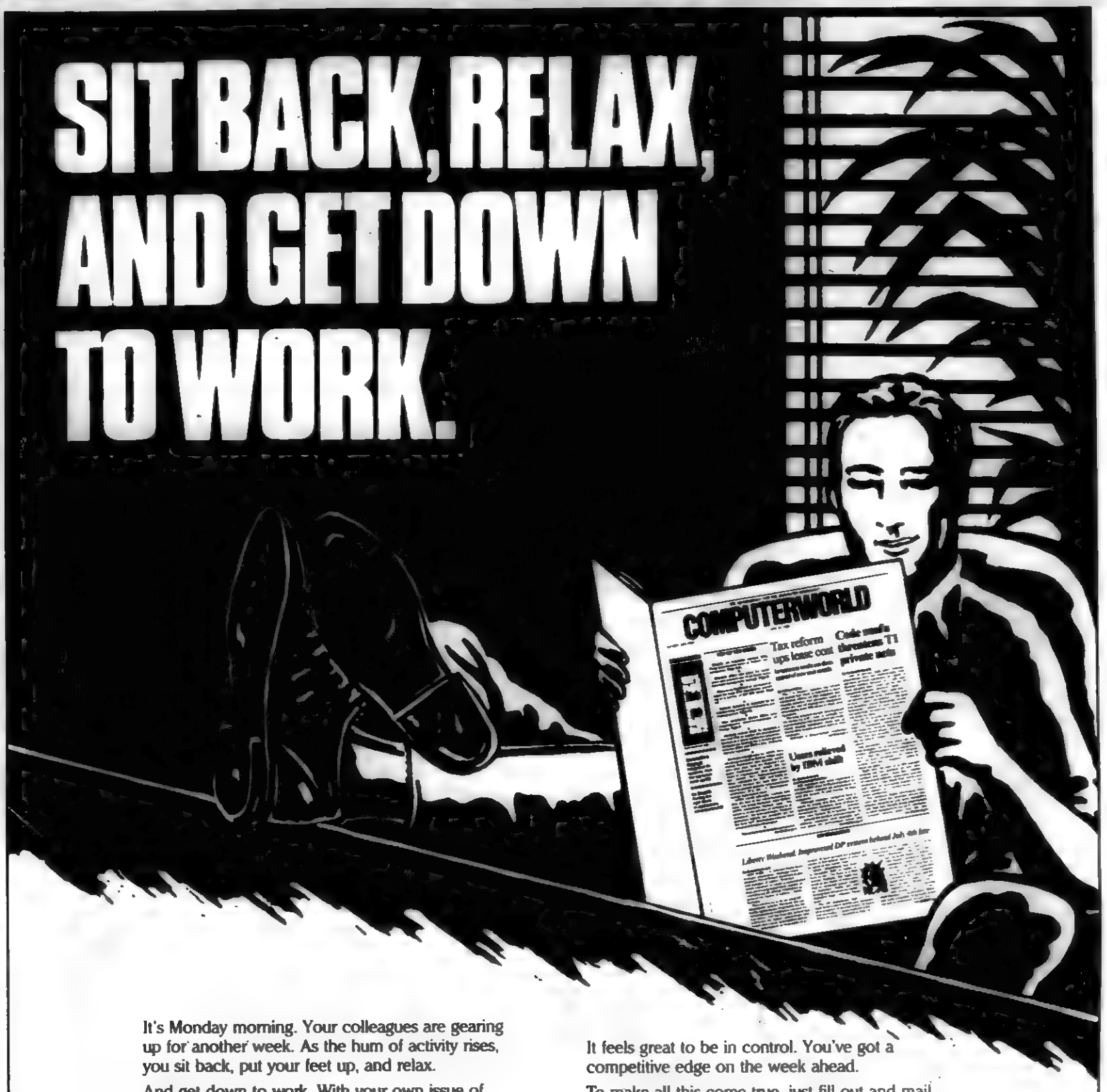
Others in the industry say they prefer legislative action on warranties because software is not classified in the Uniform Commercial Code covering warranties.

"I believe legislative clarification of our situation might be constructive," noted Marty Rinehart, chairman of the Software Publisher Association's warranty commission.

According to Rinehart, chairman of Wallsoft Systems, a software company in New York City, Molina's bill was faulty in that it did not take different kinds of software into account. For example, companies producing game software have a completely different set of responsibilities than data base software firms, he said.

Legislation similar to the Molina bill was also drafted but never filed in New York state this year.

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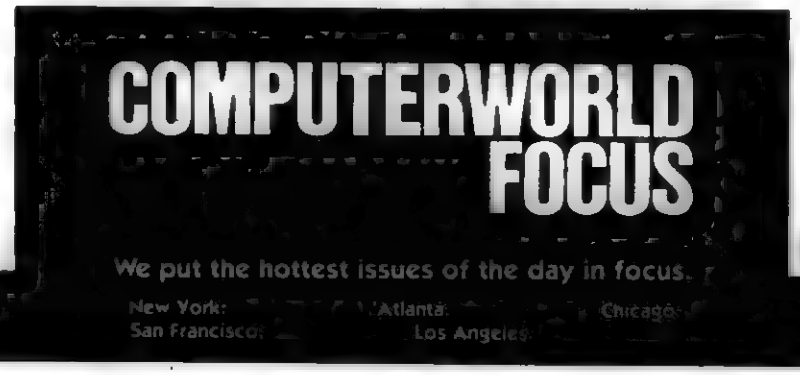
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Seeking individual with 3-5 yrs data processing experience in the insurance industry. Must be a skilled COBOL programmer and have 1+ yrs CICS or IMS. To $38,000

Marjie Peterson
ROBERT HALF
of Washington Plaza
800 University St. #2316
Seattle, WA 98101
(206) 624-6000

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State-of-the-art software development leader seeks analyst to perform custom programming and design. Must have Wang 2200 with Basic-2. $40,000

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1901 Northwest Expressway
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Want to be sure your IMS skills continue to grow? Key skills sought incl IMS DB/DC, Data Modeling, Data Dict, DB2/SQL. First rate training & many new positions available. Salary to $45,000

SYSTEM PROGRAMMERS

Several CT clients seek person to play key role in genning, supporting & modifying MVS opn systems. Excellent suburban loc's, growth situations, CICS/IDMS exp helpful. Salaries to $42,000

SYSTEMS MANAGERS

Manage the DES/DEV of on-line, interactive, data base systems in growing fin'l svc co. We have exclusive oppty's for talented, results oriented mgr's w/exp in portfolio mgmt, check processing, funds XFER & DDA appls. IBM bkgrd req'd. Excellent benefits, full reloc. Salary to $55,000+

PROG/ANALYST SYSTEM/ANALYST

HARTFORD area oppty's for P/A's & S/A's w/CICS & IMS or IDMS exp. 2+ yrs exp req'd for an oppty to work in state-of-the-art IBM environ & implement data base sys. Our client will provide data base training for qualified candidates w/ min 2 yrs COBOL. Excellent oppty for indiv's seeking growth & advancement. Paid reloc. Salary to $37,000

IDMS DBA

HARTFORD area suburban client seeks IDMS exp'd tech oriented indiv to join growing data base area. Lead the design of IDMS/ADSO based sys for this Fortune 100 co. 2+ yrs IDMS exp + desire for tech career req'd. Salary to $38,000

SOFTWARE SPECIALISTS (5)

Major IBM software vendor seeks top tech indiv's w/perf analysis, IMS/LOG, tech training, networking, opn sys, CICS or BEST/1 bkgrd. Multi oppty's. Full reloc, temp living, bonuses, etc. Salaries to $52,000

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of Hartford
111 Pearl Street
Hartford, CT 06103
(203) 278-7170

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If you've managed s/w pros in CAD/CAM related efforts, this oppty is for you! Exciting devel firm seeks seasoned mgr for mechanical design efforts. Previous superminis, UNIX OS, + IBM mainframe prefer. Salary to $55,000

WANG VS P/A

Prestigious mortgage/RE investment co seeks take charge P/A for MIS expansion. COBOL/BASIC w/ pkg modification/install exp + any OA or PC/VS bkgrd a plus. Network of VS300 & 100's w/supportive mgmt. Low $30's

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of Austin
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Suite 334
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Mfg organization seeks boardroom image mgr with 5-7 yrs DP exp. DOS/VSE CICS environ. Reports to VP Mfg. 4-yr deg req. Hi $40's

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of Minnesota
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(612) 338-6001

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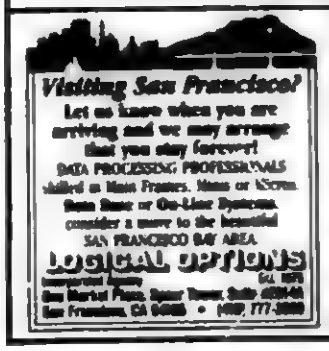
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Cedars-Sinai Medical Center is a world class health care enterprise with a solid commitment to sensible use of effective technology. The compensation structure for this position is highly competitive with an attractive complement of benefits including 4 weeks vacation Medical/Dental tax deferred savings and continuing education opportunities.

Please forward your resume with a salary history to

Mr. John Gilbert
CEDARS-SINAI MEDICAL CENTER
EMPLOYMENT DEPARTMENT
8700 Beverly Blvd.
Los Angeles, CA 90048

CIS

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Senior Technical Analyst
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Our Information Systems Division provides support to almost 80 hospitals throughout the United States. We are currently running IBM 3083E MVS/XA environment operating in conjunction with our new WANG remote processing systems, continuously implementing new technologies and techniques. You will be involved in critical package evaluation and structuring in-house systems to meet new and expanding applications needs in areas of patient accounting and patient care.

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Qualifications include:
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SENIOR TECHNICAL ANALYST

Qualifications include:
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- Experience in distributed IBM MVS/Wang VS environment desirable.
- Familiarity with Wang WP a plus.

Charter Medical is located in Macon, Georgia, a beautiful and progressive city one hour south of Atlanta.

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Data Processing

Geisinger

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As the management support unit to a 566-bed tertiary care medical center and other health care affiliates, GEISINGER System Services provides data processing professionals state-of-the-art challenges and advancement in a Central DP System for multi-entity users. The present environment is an on-line environment utilizing an IBM 3083 with MVS, CICS, TSO/ISPF, VTAM and FOCUS and multiple VAX with VMS ethernet, and MUMPS. Due to growth within the department we have career opportunities for:

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Three to four years technical support and/or system software experience required. Two years as a CICS systems programmer required. This experience includes the installation and maintenance of IBM (MVS/XA, VM, CICS, TSO, VTAM via SMP) as well as other software, maintenance of a complex data communications environment with access to multiple CPUs. BS in Computer Science required.

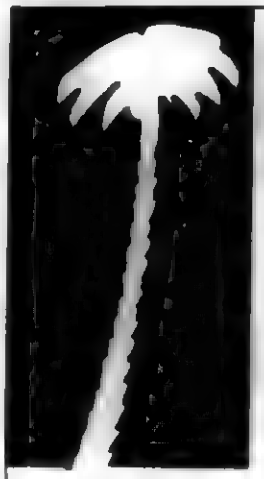
Analyst / Programmer

Three years of programming/analysis experience with CICS-Command Level, COBOL, MVS, and VTAM required. Health care experience preferred. BS in Computer Science required. The individual we seek must be user oriented.

All applicants must demonstrate the ability to work independently and have excellent communication skills. MIS is seeking experienced, aggressive individuals.

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Mr. Cy Dougherty, Personnel Director, Software Services of Florida, Inc.
PARAGON CROSSING, SUITE 104, 11300 4TH ST. N., ST. PETERSBURG, FL 33702

TECHNICAL ASSISTANT

The Department of Aeronautics and Astronautics at MIT seeks a part-time Technical Assistant to assist the Systems Manager in the general operations of a multi-vendor computer environment. Will act as the Assistant Systems Manager for Operations assisting in the direction of student employees, identifying and assisting in the solution of systems problems, handling back-ups and systems upgrades, and dealing with vendors in hardware and software purchase and maintenance. Requires a degree in Computer Science or a technical field involving some computer subjects (or the equivalent combination of education and hands-on experience with computers). Some general programming experience required. Opportunity exists for work in graphics and networking. Excellent verbal, written and interpersonal skills essential.

Send 2 copies of resume to the MIT Personnel Office, 77 Massachusetts Avenue, E19-239, Cambridge, MA 02139. Refer to position #5868-047.

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MIT

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LSTC, a dynamic Cleveland based company, wholly-owned by a Fortune "50" Retailer, is the developer of the "5th GENERATION" mainframe Applications Generator, THE INTELLIGENT ASSISTANT.

Immediate positions are available to professionals having at least SIX (6) YEARS OF EXPERIENCE in mainframe programming and application systems design, CICS or IMS/DC or ADR DATACOM, COBOL; and some knowledge of databases, e.g. IMS, ADABAS, IDMS, ADR'S DB, etc.

If you are ready to discuss a career opportunity and join the LEADER in the mainframe software industry, call or write MR. ED LIGHTCAP.

All inquiries will be handled in the strictest of confidence.

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Large east coast consulting firm seeks a Training Consultant with strong ADABAS/NATURAL background and ability to field questions. Generous benefits; travel necessary, international opportunities. Send resume in confidence to:

CW-84813
Computerworld
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COMPUTER PROGRAMMER

The Pacific Stars and Stripes, a U.S. Forces newspaper headquartered in Tokyo, Japan, seeks a Computer Programmer, preferably with Wang VS systems experience. Position will involve modification and implementation of business application packages. Experience with Program Generators, COBOL, BASIC, micro-computers, and telecommunications in a distributed processing environment is desired. Experience with AP, AR, FA, FL, IC, OE and POS applications in a wholesale/retail publishing and distribution business will be considered a plus. Basic pay $21,804 a year, plus a housing allowance or free bachelor's quarters, commissary and BX privileges, group insurance and retirement, furlough after 3 years and every two years thereafter, as well as other benefits.

Send resume to reach Assistant Director for Civilian Personnel, (CPOH), OPA, 9th ABG (PROV) (USAGH), ATTENTION: NAF, APO San Francisco 96343-0082, no later than 25 August 1988.

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Associate Director, Computing and MIS Center. Immediate opening for individual qualified to assume responsibility for all systems design and programming and to assist in the selection and implementation of an on-line integrated MIS, and in the selection of hardware and software to meet future needs. Major computing hardware includes a SPERRY 1100/72 and a VAX 8200. Bachelors' degree or higher in Business Administration, Computer Science or related field required with a working knowledge of COBOL plus a minimum of three years' experience in supervising systems and programming in a higher education setting. Preference will be given to candidates who have good managerial skills, an advanced degree and/or extensive relevant supervisory experience, and who have working knowledge of on-line systems design, data base management technology, and fourth generation languages. Salary commensurate with qualifications. Excellent fringe benefits. Letter of interest and resume should be forwarded by August 18 to Duquesne University, Office of Human Resource Management, 600 Forbes Avenue, Pittsburgh, PA 15282. An Equal Opportunity Employer.

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Hechinger, a Washington based, rapidly growing and highly successful home center retailer NOW has a challenging career opportunity for a qualified professional to join us as we move ahead in our MVS conversion. The successful candidate will need previous managerial experience in an MVS environment, and a proven track record in the training and motivation of his/her staff. The current configuration is dual IBM 4300 processors with plans to upgrade to an IBM 3090X processor this year. CICS and IMS experience is a plus. Position offers excellent salary and benefits package. If you want to be part of a winning team, this is it! Send resume to:

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Human Resources Dept., Section DCM
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EOE

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Join the management team of professionals directing the computer information center for Marion County/City of Salem. Current Environment: IBM 4381, DOS/VSE, VM, CICS, VTAM and SQL Data Base. Supporting 150 terminals and microcomputer networks. Center operates 24 hours a day, 7 days a week to support Police, Fire and Ambulance dispatch.

Qualifications: BA or BS Degree. Five years' current operations management experience with large IBM equipment, using DOS/VSE operating system. Must have excellent communication skills.

This challenging position requires a team manager who can work effectively with staff and user community in a progressive growth organization in the beautiful Pacific Northwest. Excellent fringe benefits. Salary range $2,899 to $3,566/month. Closing date 8/22/88.

Resume and salary history to George Smith, Director, Marion/Salem Computer Facility, 555 Ferry Street S.E., Salem, OR 97301, (503) 588-5001.

PROGRAMMER

Corvallis the Northwest. A Portland-based corporation requires a person with knowledge of DIBOL and 3-4 years programming experience. Business application experience, familiarity with DEC equipment and VAX/VMS system is desirable. DIBOL is a must.

This Company is a distributor of petroleum and chemical products, with operating locations throughout the West. This position is in the Portland Corporate Office.

Interested individuals should send a resume, salary history and salary requirements in confidence to:

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Portland, OR 97205

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SPSS inc.

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- Strong experience leading software development projects, including at least 2 years managing a complex development project.
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- Experience in developing products for microcomputers and familiarity with PC products used in business or education.
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Multiple large scale projects to challenge your management ability and test your technical skills.

Multiple large scale projects are in planning. State-of-the-art technologies are being utilized in new business systems development efforts. DP and user professionals are working as a creative team. All in support of corporate-wide business systems development for one of the nation's largest brewing companies. Reporting to the Manager of Business Systems Development, you will put the full range of your managerial expertise to work with this sophisticated combination of: projects...technologies...and people.

Your technical experience must include the development of large IS projects, utilizing a systems development methodology in an IBM environment with COBOL, CICS and database management. This must include 5 or more years at the project management level. Degree or equivalent required; advanced degree preferred.

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Advanced Systems Division

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Develop wide range of challenging aerospace software applications for design and production environments. CAD/CAM along with knowledge of IBM FORTRAN or Cray FORTRAN and some PL/1 or Pascal; Structural Design and Database concepts. Must have 3-6 years experience.

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Analyze and develop automated system design solution in support of engineering, logistics and life cycle cost areas on IBM hardware. IMS DB/DC, COBOL and related software experience. AFR 66-1 maintenance data, AFR 65-110 operation data, and AFM 66-267 maintenance data or 3M collection systems. Must have 3-5 years experience.

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Experience in data modeling analysis, logical and physical database design, database maintenance activities including backup, recovery and reorganization which require a working knowledge of IMS utilities. Experience in database performance monitoring and performance tuning. Fourth Generation languages, and IDMS applications. 5 years experience as an IMS DBA.

PROGRAMMERS/ANALYSTS

Analyze and develop systems design solutions to Manufacturing and Engineering business application problems. Interact with users, implement systems with an integrated database architecture. IMS DB/DC, COBOL and related software experience required. DYL 280, MARK V and Fourth Generation language. Requires 3-5 years experience.

PROGRAMMER ANALYSTS

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Develop software tools for RADAR analyses, electromagnetics, and/or Weapon Systems. Requires ability to develop project from engineering requirements to documented package. Background in mathematics, physics, or engineering plus experience in TSO, FORTRAN (as used on IBM or Cray) and VAX desired.

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Review systems development phases, write technical standards and reports, resolve EDP quality issues and participate in vendor software evaluations. Background in software, Q/A, EDP audit, programming, vendor software selection, and technical writing. Requires BS degree and 10 years experience. in software Q/A.

Northrop provides our employees a competitive, comprehensive benefits package. Please send your resume to: **Bill Hargen, Northrop Advanced Systems Division, Employment Office, Dept. CW2504, P.O. Box 1138, Pico Rivera, CA 90660-8977.**

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Advanced Systems Division

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ISC Defense Systems, a leading nationwide field service contractor is looking for several experienced ADP Maintenance Engineers in several CONUS locations. Candidates must possess at least 5 years experience in performing preventative and remedial maintenance for a variety of IBM or DEC mainframe and peripheral equipment.

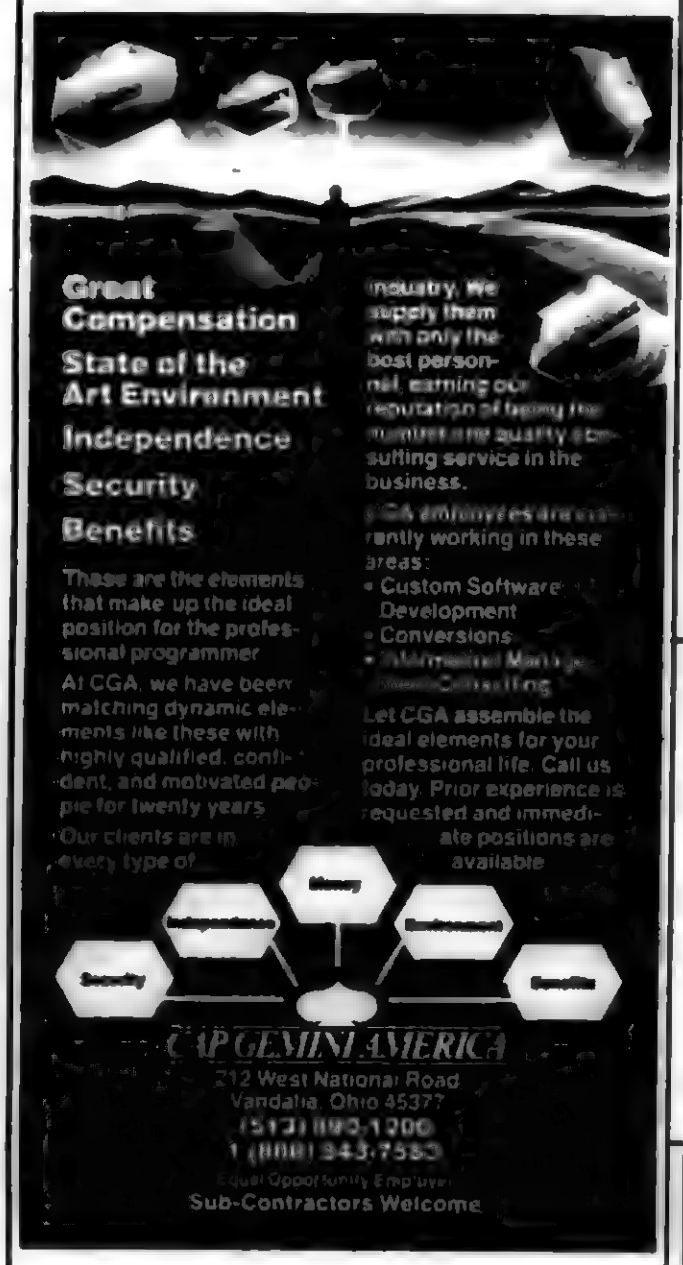
In addition to highly competitive salaries, ISC offers tuition assistance, a 401(k) plan, fully paid insurance, vacations and holidays. U.S. citizenship is required for these positions.

For immediate consideration, please send resume and salary history in confidence to: ISC Defense Systems, Inc., Engineering Services Division, P.O. Box 3025, Lancaster, PA 17604-3025.

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POSITION ANNOUNCEMENTS



Information Systems Consultant

Clarkson University is seeking an Information Systems Consultant to help plan the use of computing in administrative departments, develop specific computer applications, provide maintenance for existing systems, and resolve problems for administrative staff using computer systems in their work.

The requirements for this position are: two years experience as a Programmer/Analyst, experience developing and maintaining online systems, ability to work effectively with administrative and computer services staff, effective oral and written communications skills.

A working knowledge of any of the following will be helpful: VM/CMS, COBOL, SAS, NOMAD.

The administrative computing group consists of six professionals providing services to the administrative departments of the university. We offer an excellent benefit package, salary commensurate with experience. Send resume, salary requirement, and three references, in confidence to

Dale W. Lauderback, Manager, Computing Services, Clarkson University, Potsdam, New York 13676.

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(207) 773-4749

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Use maintenance experience to head expansion effort of multi-location Midwest-based company. Strong background in branch maintenance management essential. Technical knowledge of mini-computers, data communications, CDC disk drives, data products printers and Ampscript tape drives desirable. Will be responsible over all hardware operations to include training field engineers for new sites, overseeing inventory functions, shipping/receiving operations and supervising refurbishment of equipment. Tremendous opportunity for take-charge person to develop own methods. Full benefits package and incentives. Send resume and salary history to CW-8/4/86, Computerworld, Box 9171, Framingham, MA 01701-9171

PROGRAMMER/ANALYST

State Center Community College District seeks a Programmer/Analyst to design, develop, and implement student and administrative application software.

Requirements: 3 years of progressively responsible programming and analyst experience and BS in Computer Science or equivalent combination of education and experience; familiarity with system design procedures, nonprocedural language and relational data-base concepts.

Please forward request for application materials to: Personnel Commission, Attn: Robyn Ferrel, 1525 E. Weldon Ave., Fresno, CA 93704. Phone: (209) 226-0720. Application materials must be received in our office no later than August 21, 1986.

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System Programmer V

WVNET is a field and consortium of seventeen colleges and universities of West Virginia. The host site is comprised of:

1 IBM 3081/GX32 MVS SP 2.1.2, DFP/XA, SES2 SMU3279, Omegamon/MVS, CICS 1.6.1, Omegamon/CICS, DISOSS, DISOSS 3.3, Personal Services/370, Adstar, RMF, CJBM, OBS/Writer, ACF/VTAM, ACF/NCP, X.25

1 IBM 3081/D16 - VM/SP 4, Spires, RSCS/E, Smart, Dirmaint, SMU3278, Waterloo/Script, ISPF, ACF/VTAM, X.25

1 UNIVAC 1100/80

4 DEC VAX 11/780's in a VAXCLUSTER

1 DEC PDP 11/44

WVNET is seeking an IBM MVS System Programmer V to support CICS, DISOSS, and Personal Services/370. This position requires a Bachelors Degree or an equivalent combination of education and experience. A demonstrated proficiency in at least one higher level language, IBM 370 Assembler language, problem solving system analysis and the ability to perform independent work is required. Previous experience supporting CICS is preferred. Salary $28,600. Apply by August 25th, 1986 to Personnel Manager, WVNET, 837 Chestnut Ridge Road, Morgantown, West Virginia 26505. Phone (304) 293-5192. *AN EQUAL OPPORTUNITY EMPLOYER.*

Systems Engineer - Analyze data processing requirements to determine electronic data processing system capabilities required for project or work loads; plan layout of new system installation or existing systems modification. Confer with Project Manager regarding capability of system, requirements and projected work load. Determine design configuration. Set up, maintain and support operating systems. Modify existing systems to improve capability and work load. MS in Computer Science required. Masters program must include at least one course each in PL-1 and Assembler languages, and operating systems. Must have one year experience using SAS in IBM OS/MVS environment. 40 hour week, 8:30 AM to 5:00 PM. $29,000 per year. Send resumes to 7310 Woodward Avenue, Room 415, Detroit, Michigan 48202. Reference # 13086. Employer paid ad.

Mathematical Systems Analyst wanted to design, develop and implement computer software for real time automotive applications using Computer Aided Design and Computer Aided Manufacturing (CAD/CAM), Finite Element Techniques, C, Assembly language and FORTRAN computer languages and advanced trigonometry, mathematic transforms and geometry on a VAX 8600 mainframe and PROPRIETY microprocessors; Requires M.S. in Mathematics and Master's degree level courses in Computer Network, Computer Aided Design/Finite Element Analysis, Mathematical Models and Numerical Analysis; $26,776.70 per year; 40 hours per week. Send resumes to 7310 Woodward Ave., Room 415, Detroit, Michigan 48202. Ref. #13086 "Employer Paid Ad".

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EOE/MF

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Candidates: Please send your resume directly to LPI. No agency responses will be accepted. No telephone calls please.

LPI

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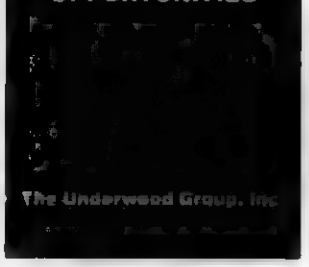
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Foreign Editorial/ Sales Offices

Argentina: Ruben Argento, Computerworld Argentina, Av. Belgrano 406-Piso 9, CP 1092 Buenos Aires. Phone: 34-5583/5584. Telex: 22644.

Asia: Euan Barty, Asia Computerworld Communications Ltd., 701-4 Kam Chung Bldg., 54 Jaffe Road, Wanchai, Hong Kong. Phone: (05) 8L63238. Telex: 72827 (COMWR HX)

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Hungary: Dezso Futasz, SZT Computerworld, P.O. Box 386, Budapest, 1536, Hungary.

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U.S., Japan resolve year-long semiconductor trade dispute

Japan agrees to promote sales of U.S.-made chips

By Edward Warner
Computerworld International News Service

WASHINGTON, D.C. — The U.S. and Japanese governments last week announced the settlement of their year-long semiconductor trade dispute. The settlement requires the Japanese government to monitor the costs and prices of Japanese-made semiconductors and take several steps toward promoting the sale of U.S.-made semiconductors in Japan.

The settlement suspends the U.S. government's plan to impose punitive import duties in two cases of alleged Japanese chip-dumping. Although one case involved 64K-byte erasable programmable read-only memory chips and the other arose over 256K-byte dynamic random-access memory chips, both named most of the same Japanese vendors, including Fujitsu Ltd., Toshiba Ltd. and NEC Corp.

The settlement stopped short of guaranteeing U.S. semiconductor vendors a specific share of the Japanese market, but the U.S. chip industry's trade group said it will reactivate its unfair trade charges unless significant market share gains are made in the next five years.

> ***The SIA said it will reactivate its unfair trade charges unless significant market share gains occur in the next five years.***

Alan Wolff, an attorney representing the Semiconductor Industry Association (SIA), said the U.S. industry expects to capture slightly more than 20% of the Japanese market by 1991, or it will renew its trade complaints at the International Trade Commission. He said this should result in about $6 billion in increased U.S. sales in Japan, where U.S. vendors' current market share is slightly more than 8%.

The SIA nonetheless praised the agreement as the first step toward a new era of cooperation in U.S.-Japan trade relations. "It must be considered a point of departure rather than a destination, but it places us on the right path to achieve a fair, balanced and truly competitive trading environment," said George Scalise, senior vice-president of Advanced Micro Devices, Inc. and public policy chairman of the SIA.

Scalise acknowledged that the agreement will raise chip prices for U.S. consumers in the short term, but he said the current prices are unrealistic, predatory and weaken the industry to the long-term detriment of consumers. He said the U.S. semiconductor industry has a history of reducing prices by about 30% per year.

U.S. Trade Representative Clayton Yeutter called the pact "one of the most significant agreements that has ever been negotiated by the United States of America." He said the pact was reached "at the 11th hour and 59th minute."

In return for suspension of the chip-dumping cases, U.S. negotiators won the Japanese government's agreement to monitor the costs and prices of Japanese semiconductors exported to the U.S. The monitoring will be done by Japan's Ministry of International Trade and Industry (MITI), which will require Japanese chip vendors to submit cost and export price data to the agency.

Should the monitoring program uncover a Japanese vendor engaged in chip dumping, the Japanese government promised to take legal action against the offender.

The two nations plan to draw up a list of chips to be monitored that will include standard Japanese chips that pose a threat of being sold at less than fair market value in the U.S. or are destined for "third countries," according to a U.S. Department of Commerce statement. The statement did not define "third countries," but sources say those nations include most of Western Europe. If the Commerce Department comes to believe that any monitored chip is being dumped in the U.S., it can demand the data the alleged offender supplied to MITI under the program.

To increase U.S. vendors' access to the Japanese chip market, the settlement also calls on the Japanese government to encourage Japanese semiconductor customers to buy non-Japanese chips. It also urges promoting long-term relationships and joint product development between U.S. chip vendors and Japanese customers, providing U.S. vendors with equal access to Japanese patents resulting from government-sponsored research.

The agreement also calls upon the Japanese government to establish an organization to encourage Japanese chip customers to buy from non-Japanese vendors. The organization will, at the request of potential customers, assess the quality of non-Japanese semiconductors.

CW Correspondent Mitch Betts contributed to this story.

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Marc Blessing
Director
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A division of Management Recruiters International with 172 offices in the U.S., CompuSearch markets itself as the nation's largest recruitment agency devoted exclusively to MIS/DP placement. But it was not always that way, according to Marc Blessing, Director of CompuSearch.

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An International Data Group Publication

DEC finishes record year

From page 102

pany's performance resulted from a revamped VAX line with dozens of new offerings, compatible computer architectures, lowered manufacturing costs and an aggressive effort to crack traditional IBM mainframe installations in markets such as banking and insurance.

"Their products are in place for the commercial market, and it's just a matter of spending time with those accounts, which they are doing now," said Jay Stevens, an analyst with Dean Witter Reynolds, Inc.

DEC has hired some 6,000 sales and service employees in the past year, while overall employment increased by about 5,000 to 94,700 worldwide, according to DEC spokesman Mark Steinkrauss. The differential was due to attrition in manufacturing and administrative jobs.

Steinkrauss said the Microvax II has been a key product in DEC's strategy in the commercial market. "When the customer understands how effective that is in departmental computing, it's a real door-opener for us," he said.

Tomorrow, DEC is expected to announce products to fill in its high end and to continue to target the commercial and financial marketplace.

"All of our surveys indicate that they are improving their position in the banking market," said Rich Mikita of market research firm International Data Corp.

"The new machines will help that by filling in the gap between the VAX 8600 and 8800. And their research efforts to improve the transaction processing capabilities of the VAX and Vaxcluster will be of particular interest in banking," Mikita said.

Salomon Brothers analyst Marc Schulman noted that of all DEC CPUs, the VAX 8600 and 8650 furthest exceeded their sales expectations during the year. "Those are the systems most targeted at the large commercial accounts," he said.

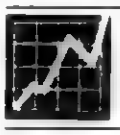
Many of DEC's sales have come at the expense of minicomputer rivals IBM, Hewlett-Packard Co. and DG. "HP is in a major transition, IBM is trying to rationalize its mid-range and DG is still trying to get into the commercial arena," Dean Witter's Stevens said. "DEC's three leading competitors are in transition, and that might not occur again in this century."

DEC increased its fourth-quarter net profit margin to 11% from 5.4% one year earlier. Steinkrauss attributed the margin to increased manufacturing efficiency, inventories that are $800 million lower than year-ago levels, a greater percentage of higher margin new products in DEC's product mix and consolidation of facilities.

DEC's gross margin of 47.1% during the quarter was at its highest level in at least 13 years, Schulman said.

In addition to the financial services industry, Steinkrauss said DEC made strong gains during the year selling to the Bell operating companies and to customers using the VAX 8800 for simulation and modeling in fields such as aerospace.

Caution is the watchword for semiconductor investments



ACTIVE ISSUES
Kathy Porteus

Amid the wreckage of semiconductor stocks, some of which recently fell to three-year lows, there are few salvageable investment ideas. Some analysts suggest avoiding the entire group, whereas others recommend major companies like Intel Corp. (INTC — 19), Motorola, Inc. (MOT — 35¾) and Texas Instruments, Inc. (TXN — 109¾) for long-term investments. But what about the smaller specialty semiconductor companies?

Both large and small capitalization semiconductor companies have been hurt by overall industry trends, including a declining book-to-bill ratio, computer industry doldrums and flat or declining order rates. But "because smaller niche or specialty companies depend largely on one product or one market segment," says John Geraghty, vice-president with First Boston Corp., their business may swing more positively or negatively than the overall industry trend.

As an example, Geraghty cites Monolithic Memories, Inc. (MMIC — 12½), a maker of bipolar large-scale integrated semiconductor memory and logic circuits. Geraghty, who recommends purchase of Monolithic, says the company's programmable array logic circuits are selling well. Owing to licensees, the company is also less exposed to foreign competition, Geraghty says.

Throughout this prolonged recession, Monolithic has shown weakness but has not reported a loss. Geraghty estimates Monolithic will earn 50 cents per share in fiscal 1986, ending Sept. 30, and 95 cents in fiscal 1987.

"The leverage of these smaller companies is so tremendous that it is difficult to forecast earnings," acknowledges Paul Johnson, analyst with L. F. Rothschild, Unterberg Towbin, who estimates Monolithic will earn $1 per share in fiscal 1987. Considering current market conditions, Monolithic has "done a great job," Johnson says.

Another smaller chip company Geraghty likes is Standard Microsystems Corp. (SMSC — 13⅛), which produces standard and custom metal oxide semiconductor integrated circuits. "The company is investing a fair amount in research and development and has good new products," Geraghty says.

Eli Sayegh, analyst with S. G. Warburg & Co., advises investors to avoid everything at this stage. Although the bulk of damage has already occurred, Sayegh says, "you're not going to see any near-term performances, so at best, you'd be sitting on dead money."

Sayegh concurs with other analysts in saying that Monolithic will continue out-performing the industry. But in addition to moving in sympathy with other semiconductor issues, its stock price has dropped, Sayegh says, because investors have begun anticipating weakness in the firm's programmable array logic business, which will cause lower earnings expectations.

Sayegh calls both Monolithic and LSI Logic Corp. (LLSI — 9⅝) examples of "profitless prosperity." According to Sayegh, LSI's sales continue to grow nicely, but margins remain under pressure and are essentially break-even.

Rothschild's Johnson remains neutral on LSI because of its limited near-term earnings visibility. However, he praises the company for its broad semicustom product portfolio, strong management team, global diversification strategy and solid cash position.

James Barlage, vice-president of Smith Barney, Harris Upham & Co., avoids second-tier semiconductor companies because the stocks are "still pretty fully priced even given the correction we've seen."

Barlage also considers the niche strategies of companies such as Integrated Device Technology (IDTI — 7¾) and VLSI Technology, Inc. (VLSI — 9 1/4) a disadvantage because "such strategies provide virtually no flexibility in the event technology changes or competition intensifies."

Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

Compaq up; AST down in micros

From page 102

do the job of sales and support on the $1,000 to $10,000 deals better than any manufacturer's sales force."

The earnings and revenue drop of Irvine, Calif.-based AST Research, which had been expected [CW, July 14], did reflect the market pressures of low-priced clones.

In a prepared statement, AST President Safi Qureshey cited "market acceptance of PCs other than IBM" and "recent functionality changes IBM has made in its PC" as reasons for the fourth-quarter decline.

The latter citation refers to recent IBM pricing changes that offer higher margins to retailers selling IBM micros fully configured by IBM, rather than enhanced with memory boards and other features from independent vendors such as AST Research.

AST earned $4.1 million, or 35 cents per share, down from $6.7 million, or 61 cents per share, a year earlier. Revenue fell 6% to $40 million. During the quarter, AST laid off 65 employees, or 7% of its work force.

For the fiscal year ended June 30, AST's profits were $27.2 million, or $2.34 per share, up 43% from 1985 levels. Revenue grew 24% to $172 million.

INDUSTRY NOTES

IBM to decentralize in Europe

IBM confirmed that it will decentralize its operations in Europe in an effort to improve telecommunications sales and increase local autonomy. IBM Europe will be divided into two groups, one including West Germany, France and Italy and the other made up of smaller markets.

■

Control Data Corp. announced it has repaid all of its short-term bank debt in the U.S., paying off the final $315 million with proceeds from the recent sale of $350 million in long-term corporate bonds. CDC's 27 creditor banks had given the company a deadline of Dec. 31, 1986, to repay the short-term debt.

■

Cullinet Software, Inc. said it may report the first losses in its history for the quarters ended July 31 and Oct. 31. Chief Executive Officer David Chapman said sales and earnings for most of fiscal 1987, ending next April 30, will be below expectations. He cited the cost of recent moves to spur sales, including a 30% increase in Cullinet's worldwide sales force and the firm's entry into the Digital Equipment Corp. VAX market.

Sun revenue rises in fourth quarter

By Rosemary Hamilton

MOUNTAIN VIEW, Calif. — While many large system vendors recently reported sluggish earnings, workstation vendor Sun Microsystems, Inc. last week reported a whopping 82% increase in revenue for its 1986 fiscal year and a 106% revenue increase for the fourth quarter ended June 30.

Sun reported year-end revenue of $210.1 million, up from $115.2 million in its 1985 fiscal year. Net income for the year was $11.9 million, or 46 cents per share, up from $8.5 million, or 36 cents per share.

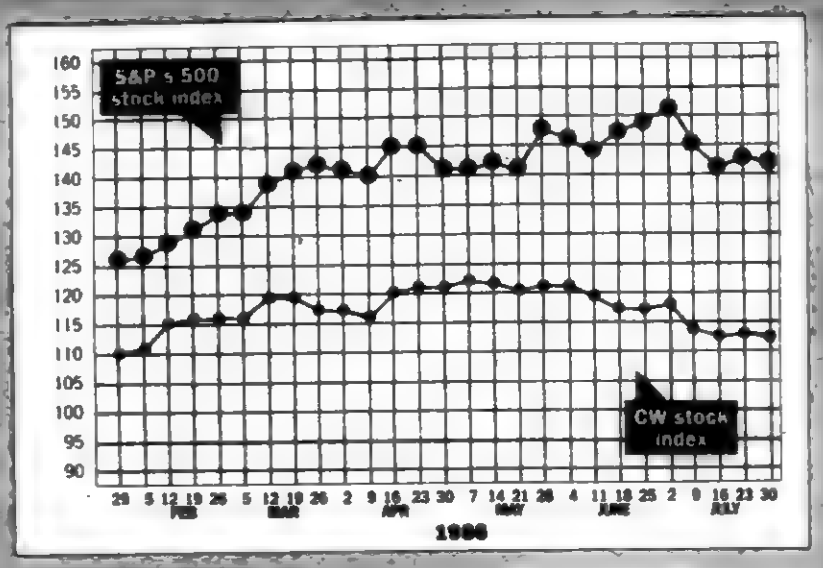
For the fourth quarter, Sun reported revenue of $76.7 million. Its quarterly net income of $5.9 million was a 181% improvement from a year ago. Per-share earnings increased to 21 cents per share, from 8 cents per share in 1985's fourth quarter.

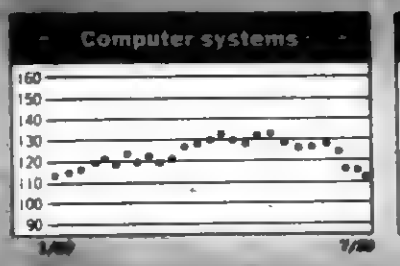
Sun last week also announced a three-year, $60 million OEM agreement with UK mainframe vendor International Computers Ltd., which will base all of its future workstation products on the Sun-3 line.

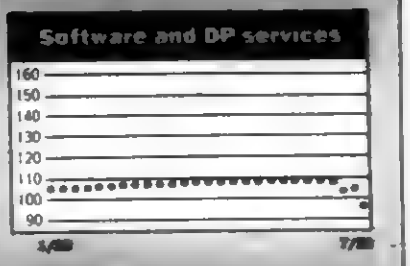
COMPUTER INDUSTRY

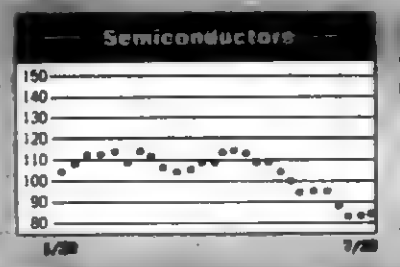
MITCHELL J. HAYES

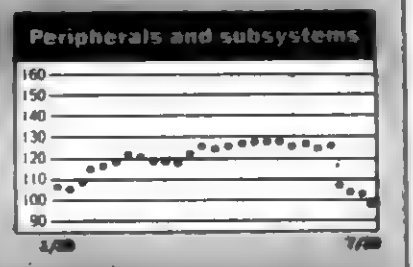
Computerworld stock trading index



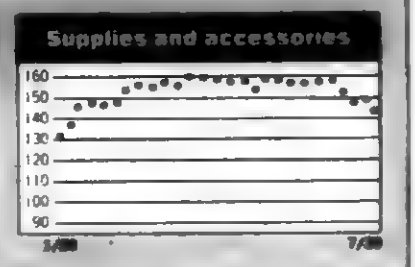












All indexes started a base-level point of 100 on Dec. 31, 1984, and track stock market performance in relation to that base. The CW stock index represents the unweighted average performance of the six computer-industry stocks.

	7/23/86	7/30/86
Computer systems	114.0	111.6
Software and DP services	101.7	97.3
Peripherals and subsystems	101.1	99.3
Supplies and accessories	147.1	143.3
Semiconductors	80.5	81.6
Leasing companies	97.7	93.0
CW stock index	112.7	112.2
Standard and Poor's 500 stock index	142.7	141.5

Computerworld stock trading summary

CLOSING PRICES WEDNESDAY, JULY 30, 1986

COMPUTER SYSTEMS

EXCH		52-WEEK RANGE (1)		PRICE CLOSE JULY 30 1986	WEEK NET CHNGE	WEEK PCT CHNGE
O	ALPHA MICROSYSTEMS	8	5	5.00	-0.5	-9.1
O	ALTOS COMPUTER SYS	19	10	12.88	-0.8	-5.5
A	AMDAHL CORP	19	10	16.63	-0.6	-3.6
O	APOLLO COMPUTER INC	21	9	10.38	-0.5	-4.6
O	APPLE COMPUTER INC	39	14	30.50	-3.6	-10.6
N	AT&T	28	20	23.88	+0.1	+0.5
N	BURROUGHS CORP	72	52	66.88	+2.1	+3.3
O	C P T CORP	7	4	4.13	-0.1	-2.9
N	COMPAQ COMPUTER CORP	18	8	13.38	+0.6	+4.9
A	COMPUTER CONSOLES INC	12	6	8.00	+0.1	+1.6
O	CONCURRENT COMP CORP	25	1	12.38	-0.9	-6.6
N	CONTROL DATA CORP DEL	28	15	20.75	-1.4	-6.2
O	CONVERGENT TECH	14	6	6.13	-0.6	-9.3
N	CRAY RESH INC	100	44	86.88	-2.8	-3.1
O	DAISY SYS CORP	32	8	9.13	+0.8	+9.0
N	DATA GEN CORP	50	31	33.13	+0.1	+0.4
N	DATAPOINT CORP	13	5	7.00	-0.4	-5.1
N	DIGITAL EQUIP CORP	94	50	92.00	+5.0	+5.7
N	ELECTRONIC ASSOC INC	7	4	3.88	-0.4	-8.8
N	FLOATING POINT SYS INC	46	16	16.63	-1.9	-10.1
N	GOULD INC	38	15	16.75	-0.1	-0.7
N	HARRIS CORP DEL	38	22	28.50	-5.0	-14.9
N	HEWLETT PACKARD CO	48	29	39.25	+0.5	+1.3
N	HONEYWELL INC	87	59	62.50	-3.4	-5.1
N	IBM	162	122	132.25	-0.9	-0.7
O	IPL SYS INC	4	1	3.00	0.0	0.0
N	ITT CORP	60	32	54.00	-0.3	-0.5
N	M A COM INC	21	13	14.75	+0.5	+3.5
N	MATSUSHITA ELEC INDL LTD	100	48	81.63	+3.0	+3.8
O	MENTOR GRAPHICS CORP	21	12	13.00	-0.5	-3.7
N	MODULAR COMPUTER SYS	9	6	8.88	0.0	0.0
N	MOHAWK DATA SCI CORP	4	1	2.25	0.0	0.0
N	NBI INC	18	9	9.75	-1.1	-10.3
N	NCR CORP	57	31	49.75	-0.5	-1.0
N	PRIME COMPUTER INC	28	15	19.38	+0.8	+4.0
N	SPERRY CORP	76	46	75.25	-0.1	-0.2
O	STRATUS COMPUTER	28	15	18.25	-1.0	-5.2
O	SYMBOLICS INC	16	7	7.50	-0.1	-1.6
O	TANDEM COMPUTERS INC	35	13	33.38	-0.4	-1.1
N	TANDY CORP	45	31	36.50	+2.0	+5.8
N	TEXAS INSTRS INC	148	86	109.00	+4.4	+4.2
A	ULTIMATE CORP	35	11	15.50	-7.0	-31.1
A	WANG LABS INC — B	23	12	14.38	+0.9	+6.5
A	WANG LABS INC — C	23	11	14.75	+1.8	+12.4
N	XEROX CORP	72	48	53.38	+0.8	+1.4

SUPPLIES & ACCESSORIES

N	AMER BUSINESS PRODS	37	26	30.75	-1.8	-5.0
N	BARRY WRIGHT CORP	28	17	18.25	-0.1	-0.7
A	DUPLEX PRODS INC	23	17	19.75	-0.5	-2.5
N	DENNIS BUSINESS FORMS INC	28	18	23.00	-0.8	-3.3
N	3M CO	118	74	111.25	+1.0	+0.8
N	MOORE LTD	28	18	25.50	+0.4	+1.5
O	STANDARD REGISTER CO	39	30	38.75	-0.5	-1.3
N	WALLACE COMPUTER SVCS	89	33	40.88	-0.1	-0.3

SOFTWARE & DP SERVICES

EXCH		52-WEEK RANGE (1)		PRICE CLOSE JULY 30 1986	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	7	3	5.25	+0.4	+7.7
N	ADVANCED SYS INC	20	11	16.13	1.3	-7.2
N	AGS COMPUTERS INC	25	14	17.50	-0.4	-2.1
O	AMERICAN MGMT SYS INC	20	7	16.75	0.10	0.0
O	AMERICAN SOFTWARE INC	15	9	11.50	-0.9	7.1
N	ANACOMP INC	7	3	5.00	-0.4	-7.0
O	ANALYSTS INTL CORP	10	5	4.75	-0.5	-9.5
O	ASHTON TATE	34	10	21.88	1.9	-7.9
O	ASK COMPUTER SYS INC	15	7	10.75	+1.1	+11.7
O	ASTRADYNE COMP IND	3	1	1.31	0.0	0.0
N	AUTOMATIC DATA PROC	39	18	31.25	2.1	-6.4
O	COMPUTER ASSOC INTL INC	25	10	22.50	+1.8	+8.4
O	COMPUTER HORIZONS CORP	15	10	10.38	-0.6	-5.7
O	COMPUTER NETWORK TECH	10	2	5.06	1.5	22.9
N	COMPUTER SCIENCES CORP	40	20	33.13	-0.9	2.6
O	COMPUTER TASK GROUP INC	19	12	12.50	-0.3	-2.0
O	COMPUTONE SYS INC	7	2	1.88	-0.8	28.6
O	COMSHARE INC	13	9	11.88	0.1	-1.0
N	CULLINET SOFTWARE INC	27	8	8.13	-2.8	25.3
O	CYCARE SYS INC	17	10	12.00	-0.1	1.0
O	DUQUESNE SYS INC	45	11	29.50	+0.5	+1.7
N	GENERAL ELEC CO	83	56	73.88	-1.1	-1.5
N	GENERAL MTRS CORP	50	33	43.38	-0.3	-0.6
N	GTE CORP	57	38	54.13	-0.9	1.6
O	HOGAN SYS INC	12	4	10.00	-0.5	-4.8
O	INFORMATION SCIENCES INC	4	1	3.00	0.0	0.0
O	INFOTRON SYS CORP	23	12	12.50	+0.5	+4.2
O	KEANE INC	18	7	7.00	-1.8	20.0
N	LOGICON INC	43	27	27.00	-0.5	-1.8
O	LOTUS DEV CORP	39	15	31.50	-1.4	-4.2
O	MANAGEMENT SCI AMER	16	8	13.38	-0.9	-6.1
O	MCI COMM CORP	13	8	9.00	-0.6	-6.5
O	MICOM SYS INC	23	11	11.00	-0.3	-2.2
O	MICRO PRO INTL CORP	4	2	2.31	-0.1	-2.6
O	MICROSOFT CORP	36	26	28.75	1.3	-4.2
O	NATIONAL DATA CORP	28	11	18.38	-0.5	-2.6
O	ON LINE SOFTWARE INT	16	6	12.00	-0.5	-4.0
O	ORACLE SYS CORP	29	16	16.00	-1.8	-9.9
N	PANSOPHIC SYS INC	36	18	26.25	-0.5	-1.9
N	PLANNING RESH CORP	24	14	18.38	-0.8	-3.9
O	POLICY MGMT SYS CORP	24	15	16.75	+0.5	+3.1
O	PROGRAMMING & SYS INC	11	5	9.13	+0.1	+1.4
O	REYNOLDS & REYNOLDS CO	35	18	32.75	+1.3	+4.0
O	SCIENTIFIC COMPUTERS INC	8	4	4.38	-0.1	-1.4
O	SEI CORP	28	19	15.75	-0.3	-1.8
O	SHARED MED SYS CORP	41	28	33.75	+1.1	+3.4
O	SOFTWARE AG SYSTEMS INC	22	13	17.25	-0.1	-0.7
O	SOFTWARE PUBG CORP	11	5	6.00	-0.5	-7.7
A	STERLING SOFTWARE INC	21	7	17.00	-0.8	-4.2
N	UCCEL CORP	23	13	19.88	-0.4	-1.9
N	URS CORP	18	10	16.13	0.0	0.0
O	VMI SOFTWARE INC	32	17	24.25	-2.8	-10.2

SEMICONDUCTORS

N	ADVANCED MICRO DEV	24	14	16.25	+1.6	+11.1
N	ANALOG DEVICES INC	28	14	17.50	+0.8	+4.5
O	ANALOGIC CORP	16	10	10.88	+0.3	+2.4
N	APPLIED MAGNETICS CORP	28	12	14.50	+0.3	+1.8
O	AMANTEK INC	24	17	18.50	-0.8	-4.3
O	HADCO CORP	7	4	4.63	+0.1	+2.8
O	INTEL CORP	32	17	18.25	+1.3	+6.9
O	MICRO MASK INC	8	3	3.75	-0.5	-11.8
N	MOTOROLA INC	60	29	37.75	+2.0	+5.6
N	NATIONAL SEMICONDUCTOR	14	9	9.63	+0.4	+4.1
N	TERADYNE INC	30	17	19.00	-0.5	2.6

PERIPHERALS & SUBSYSTEMS

EXCH		52 WEEK RANGE (1)		PRICE CLOSE JULY 30 1986	WEEK NET CHNGE	WEEK PCT CHNGE
A	AM INTL INC	9	3	6.38	-0.3	-3.8
A	ANDERSON JACOBSON INC	3	2	2.13	-0.1	-5.6
O	AST RESH INC	33	11	11.00	-0.8	-6.4
O	AUTOTROL CORP	10	6	7.25	0.0	0.0
O	AVANT GRADE COMPUTING	10	3	3.75	-0.1	-3.2
O	BANCTEC INC	13	7	7.25	1.1	13.4
N	BOLT BERANEK & NEWMAN	48	27	37.63	-1.8	-4.4
O	CAMBEX CORP	2	1	1.00	0.0	0.0
N	CENTRONICS DATA COMP	8	4	7.00	+0.3	+3.7
A	CETEC CORP	9	6	6.50	-0.4	-5.5
A	COGNITRONICS CORP	6	4	3.81	-0.1	-1.6
N	COMPUGRAPHIC CORP	29	19	19.25	+0.1	-0.7
N	COMPUTERVISION CORP	19	9	12.00	+0.5	+4.3
N	CONRAC CORP	18	11	15.00	-0.3	-1.6
A	DATAPRODUCTS CORP	18	11	13.63	-0.4	-2.7
A	DATARAM CORP	18	5	8.00	+0.3	+3.2
O	DATA SWITCH CORP	9	4	5.63	-0.8	-11.8
O	DATUM INC	7	5	5.75	0.0	0.0
N	DECISION INDS CORP	15	9	9.00	-0.5	-5.3
O	ENDATA INC	8	3	5.63	+0.3	+4.7
O	EVANS & SUTHERLAND	27	15	22.13	+2.0	+9.9
N	FLOATING POINT SYS INC	46	16	16.63	1.9	-10.1
O	GANDALF TECHNOLOGIES	8	5	6.25	0.0	0.0
N	GENERAL DATACOMM IND	15	8	10.25	-0.3	-2.4
N	HAZELTINE CORP	30	16	17.63	+0.1	+0.7
O	ICOT CORP	13	6	9.75	+0.1	+1.3
O	INFORMATION INTL INC	18	10	15.75	-0.5	-3.1
O	INTECOM INC	7	3	5.00	+0.3	+6.7
O	INTERLEAF INC	15	8	8.63	-1.4	-13.8
O	MEGADATA CORP	5	3	3.38	-0.1	-1.8
A	MSI DATA CORP	14	8	11.00	-0.4	-3.3
N	NASHUA CORP	28	12	26.75	+2.5	+10.3
O	NETWORK SYS CORP	27	10	12.00	+0.1	-1.1
N	NORTH AMERN PHILIPS CORP	48	32	37.00	-2.5	-6.3
N	NORTHERN TELECOM LTD	39	25	28.25	+0.5	+1.8
O	NOVELL INC	21	10	17.75	0.3	1.4
O	OMEX	1	0	0.38	-0.3	-40.0
N	PARADYNE CORP	13	6	6.75	-0.4	-5.3
A	PENRIL CORP	10	5	5.50	0.0	0.0
N	PLESSEY PLC	38	19	29.63	2.4	7.4
O	PRINTRONIX INC	15	10	12.88	+1.0	+8.4
O	QMS INC	18	6	13.00	-0.8	-5.9
O	RAMTEK CORP	7	2	5.25	+0.1	+2.4
N	RECOGNITION EQUIP INC	17	9	10.50	1.5	12.5
N	SANDERS ASSOC INC	63	29	59.75	0.0	0.0
O	SCAN TRON CORP	24	12	16.50	1.3	7.0
N	SCIENTIFIC ATLANTA INC	15	9	9.13	+0.1	+1.4
O	SEAGATE TECHNOLOGY	14	5	11.25	-0.5	-4.3
N	STORAGE TECHNOLOGY	7	1	2.75	-0.3	-8.3
O	SUN MICROSYSTEM INC	20	12	15.25	0.0	0.0
A	T-BAR INC	7	5	5.88	+0.1	+2.2
A	TAB PRODS CO	15	10	14.25	+0.5	+3.6
O	TANDON CORP	8	3	4.50	-0.3	-6.3
A	TEC INC	11	4	4.75	+0.3	+5.6
N	TEKTRONIX INC	65	47	56.25	+0.1	+0.2
O	TELEVIDEO SYS INC	4	2	2.88	-0.3	-8.0
N	TELEX CORP	60	40	55.38	1.1	-2.0
N	TIMEPLEX INC	24	14	15.75	+0.4	+2.4
N	TITAN CORP	12	5	8.38	+0.3	+3.1
O	VISUAL TECHNOLOGY INC	2	0	0.63	+0.1	+11.2
O	WYSE TECH	19	7	13.38	-0.6	-4.3

LEASING COMPANIES

N	COMDISCO INC	25	11	18.00	-1.3	-6.5
N	CONTINENTAL INFO SYS	12	5	10.13	+0.4	+3.8
O	FINALCO GROUP INC	6	3	3.25	0.0	0.0
O	PHOENIX AMERN INC	6	2	3.75	0.0	0.0
O	SELECTEAM INC	12	5	5.00	1.3	-20.8
N	U.S. LEASING	46	32	37.75	1.3	-3.2

EXCH: N—NEW YORK; A—AMERICAN; P—PACIFIC; B—BOSTON; L—NATIONAL; M—MIDWEST; O—OVER-THE-COUNTER; S—SPLIT

O-T-C PRICES ARE BID PRICES AS OF 3 P.M. ET LAST BID

(1) TO NEAREST DOLLAR

COMPUTER INDUSTRY

INSIDE

Teknowledge earns profits but faces skepticism in the AI mart/76

Cost cuts fuel recovery at Texas Instruments, but its computer sales remain slow/80

The U.S. and Japan announce a historic resolution of their semiconductor trade dispute/99

IBM will decentralize its European operations in an effort to spur sales/100

INSTANT ANALYSIS

"The Japanese understand now . . . that they simply can't go on exporting more than they are importing."

— U.S. Commerce Secretary Malcolm Baldrige on the U.S.-Japan semiconductor trade agreement

DEC finishes record year

Soaring profits, sales reveal commercial MIS success

By Clinton Wilder

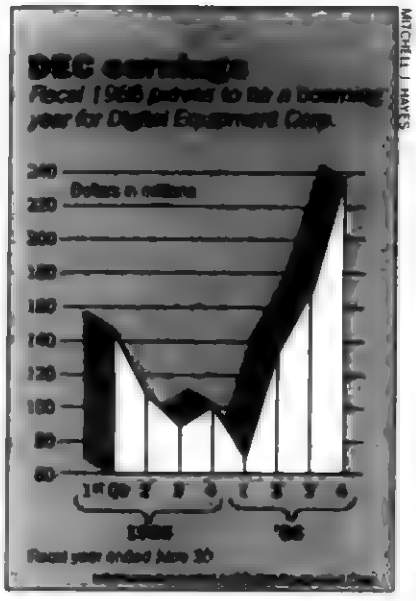
MAYNARD, Mass. — In results that reflect growing market share gains in the commercial MIS market, Digital Equipment Corp. last week reported 38% earnings growth on a 14% rise in revenue for the fiscal year ended June 28.

DEC ended its year as the industry's success story with a particularly strong fourth quarter in which profits soared by 138% to $238.6 million, or $1.81 per share. Fourth-quarter sales jumped by 17% to $2.17 billion.

Against a backdrop of disappointing results from rivals like IBM and Data General Corp., DEC posted fiscal 1986 profits of $617.4 million, or $4.81 per share, on revenue of $7.59 billion. In fiscal 1985, DEC earned $446.7 million, or $3.71 per share, on sales of $6.68 billion.

According to DEC and its observers, the com-

See DEC page 100



Swift action lifts CDC peripherals

By Donna Raimondi

MINNEAPOLIS — Lawrence Perlman faced a daunting task when he took over as president of Control Data Corp.'s Data Storage Products Group in early 1985. The peripherals division, long a corporate cash cow, had taken a sudden and dangerous nosedive and was taking all of CDC with it.

"I did not have an extended opportunity to sit back and analyze the business and then decide what to do," Perlman says. "The decisions started at 8 a.m. the first morning I took over."


CDC's Perlman

Analysts now credit Perlman's swift and drastic measures with saving what was once the most profitable part of CDC. The peripherals division recently posted a slight second-quarter profit for the first time since Perlman took over, and CDC as a whole is now expected to return to the black by the end of this year.

To accomplish the dramatic turnaround, Perlman first acknowledged that the peripherals market was softening, which was leading to order cancellations. He quickly put the brakes on runaway production of inventory that was destined to sit in warehouses.

Those actions and others that Perlman instituted helped stem the tide of the huge losses CDC experienced last year, says Gary Blauer, computer and technology analyst at Dain, Bosworth, Inc. in Minneapolis. "The slight profit this year, probably only a few million dollars, is a milestone," he says. "What remains to be seen is if the company will make continued progress."

Perlman cites a number of reasons for the slide in CDC's storage business. The low-end portions of the fixed disk and flexible disk markets were rapidly becom-

See ACTION page 82

INDUSTRY INSIGHT
Clinton Wilder

All don't walk to IBM's beat

Is IBM truly the industry's financial bellwether?

The conventional Wall Street wisdom certainly says yes, with the typical "Sell-off in technology stocks led by IBM" headlines indicating sheep-like behavior among big-block stock traders. Analysts pointed out that on IBM's black Monday three weeks ago, major selling of both Digital Equipment Corp. and NCR Corp. shares caused those stocks to drop even more, percentage-wise, than Big Blue's.

While a few jitters about DEC's stock price volatility during the current DEC boom are understandable, it seems hard to defend a 2.9% drop in NCR stock on the day it announced an 18% second-quarter earnings increase.

The computer industry bears obviously believe that IBM's current fiscal struggles are bad news for all the players in the field. Their logic is simple. Since the industry leader is in a slump, that indicates bad times for the entire industry. Conversely, if one starts from the assumption that the industry is sluggish, what better evidence is there than Big Blue's lackluster performance?

But there is indeed an answer to this rhetorical question — several answers, in fact — such as Burroughs Corp., DEC, NCR, Microsoft Corp., Computer Associates, Inc., Apple Computer, Inc., Management Science America, Inc., Tandem Computers, Inc., Stratus Computer, Inc., Compaq Computer Corp. and even Storage Technology Corp.

See ALL page 80

Wilder is Computerworld's senior editor, computer industry.

Compaq beats odds; micro downturn grips AST Research

By Clinton Wilder

Compaq Computer Corp. continued to outrun the sluggish and crowded microcomputer industry in financial results announced last week, but the slump caught up to add-on board maker AST Research, Inc., which reported a 39% earnings decline.

Houston-based Compaq, leveraging its success at the high end of the IBM Personal Computer-compatible market, said profits rose 70% from year-earlier results for the second quarter ended June 30. Compaq earned $9.6 million, or 31 cents per share, on revenue that climbed 24% to $147.1 million.

Compaq President and Chief Executive Officer Rod Canion said sales of the IBM Personal Computer AT-compatible Deskpro 286 have so far been insulated from the price pressures of Asian-made clones.

"Our latest market research showed that price is eighth on the list of factors that business users consider in purchasing that class of machine," Canion told *Computerworld*. "They're going for performance, the name of the supplier and reliability."

Canion also noted that Compaq remains committed to the dealer channel, despite the turmoil and bankruptcies in the retail microcomputer market during the past year. "The majority that have gone away were not our authorized dealers anyway," he said. "The dealer channel can still

See COMPAQ page 100

Calif. lawmaker postpones effort to legislate computer warranties

By Maura McEnaney

SACRAMENTO, Calif. — A state Assembly bill seeking explicit warranties on computer hardware and software products died in committee recently, after the bill's sponsor agreed to let vendors voluntarily adopt industry-suggested warranty guidelines.

Los Angeles Assemblywoman Gloria Molina last month did not request an Assembly vote on Assembly Bill (AB) 1507, which required computer vendors to guarantee, among other things, that products perform as advertised.

Molina's decision to let the bill die followed efforts by ADAPSO to let its members adopt self-imposed warranties that offer stronger consumer protection.

A spokeswoman in Molina's office said the assemblywoman will refile the bill next year if vendors fail to increase warranty protection. "She's going to wait and see what ADAPSO does," spokeswoman Jane Windes said.

Although software companies generally will take back and fix faulty versions of their software, many companies employ "as-is" warranties that require users to accept the product as it comes.

AB 1507 was opposed by many industry representatives who argued the bill would increase the cost of computer products and, in some cases, hinder growth of small entrepreneurial companies.

"Our position was there was no

See LEGISLATE page 82

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Information centers scramble to justify their existence/**51**

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NEWSPAPER

TOP OF THE NEWS

DEC aims at traditional IBM markets with more VAX products and a revamped marketing strategy. **Page 10.**

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A court decision against Data General to force systems vendors to unbundle software, according to legal observers. **Page 118.**

■

Top Ford information systems executive explains decision to rely on IBM in developing comprehensive office automation strategy. **Page 71.**

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Sun Microsystems' latest products herald renewed battle in engineering workstation market. **Page 4.**

■

The leading artificial intelligence conference focuses on practical applications. **Page 6.**

■

Network manager's nightmare solved with remote management package. **Page 45.**

■

The eleventh-hour cancellation of a meeting with analysts last week has triggered more speculation that all is not well at Convergent Technologies. Although Convergent President Paul Ely said the meeting was rescheduled to coincide with fall product announcements and new developments in vertical market efforts, sources continue to hint at the possibility of layoffs or wage freezes at the systems manufacturer.

■

McCormack & Dodge next week will introduce a version of its application development system, Millennium:SDT, for IBM's DB2 at its users group conference in Reno, Nev. It will also announce a version of its general-ledger application package for Cullinet's IDMS DBMS, company spokesmen said.

■

IBM last week confirmed it is "redeploying" some workers from its Rochester, Minn., plant, where the System/36 and 38 are manufactured, to its Rolm sub-

See **NEWS** page 8

Bugs plague $50M system

Fannie Mae battles delay, critics in loan conversion

By Mitch Betts

WASHINGTON, D.C. — The nation's largest supplier of home mortgage funds is about to move records on four million loans to a new $50 million computer system that skeptics say will not work and that corporate spokesmen admit is $25 million over budget and 19 months behind schedule.

The enormous cost overrun and installation delay occurred largely because the new system was riddled with some 1,000 software bugs, necessitating 13,000 tests by a staff of 60 working 12-hour shifts, including weekends and holidays.

The critical test will come Oct. 1, when the Federal National Mortgage Association, the government-chartered corporation commonly known as "Fannie Mae," shuts down its current batch processing system and turns on a new Laser Reporting system. The soon-to-be-outdated Aggregated Exception System ran on a Control Data Corp. Cyber machine, whereas Laser Reporting runs on an IBM 3084 mainframe using the MVS operating system and Cullinet Software, Inc. IDMS software.

Despite Laser Reporting's troubled three-year history, William A. Dawson, executive vice-president for technology at FNMA, expressed confidence that it will work Oct. 1, when an initial batch of two million loans are scheduled to be put into the data base management system.

In response to publicly expressed doubts that the system will run smoothly, and in light of the software problems, Dawson said his department has spent a year of testing to eliminate Cobol software bugs, including using 10% of Fannie Mae loan records. Information regarding the

See **BUGS** page 2

Mac Dbase readied, amid user doubts

By Douglas Barney

Ashton-Tate is expected today to make a belated entry into the Macintosh software market, launching a version of its Dbase III program for the Apple Computer, Inc. product.

Ashton-Tate's move has revived debate over whether a single strong software product can generate sufficient enthusiasm to make the Macintosh a sales success with business users who have been slow to endorse the non-IBM-standard computer.

Users contacted last week, including one who had standardized on the Macintosh, were skeptical of the impact that Ashton-Tate's entry would have on the Macintosh market.

"There will be virtually no impact

See **DOUBTS** page 9

Net to test OSI compatibility

By Elisabeth Horwitt

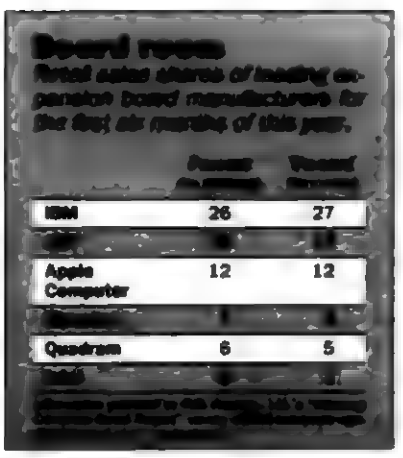
GAITHERSBURG, Md. — OSInet, a prototype network that is currently under joint development by 25 vendor and government organizations, will begin operations later this month. Ultimately, the project will guarantee business users that computer and networking products from different vendors will exchange data and documents using Open Systems Interconnect protocols.

Vendors can use OSInet to test unreleased products for conformity to the OSI communications protocols being devel-

See **NET** page 12

CW SPECIAL REPORT

Add-on boards: Solution overload causes problem for managers



By David Bright

The rapidly expanding number of personal computer add-on boards and manufacturers has provided users with a wealth of options. But microcomputer managers say that luxury has also spurred a host of problems in selecting the products best suited to meet their corporate needs.

Corporate users require a wide range of options for their various applications. Many users need extra memory for large applications or for multitasking; others require advanced graphics capabilities; and, very often, the PCs need to be hooked up to IBM mainframes, System/36s and 38s. Most of these situations require add-in boards.

In making purchase decisions, managers are faced with competing products from established companies and lesser known start-ups, and they must decide whether to buy directly from vendors or through third-party dealers and distributors. More important, some managers say, they must determine whether the options their users desire — often a series of add-on modules — are indeed compatible with existing hardware and software.

Relying on one of the dominant vendors does not guarantee good results, says Rick Strayer, who until recently was PC resource manager at H. B. Fuller Co., a large glue and solvent manufacturer in St. Paul, Minn. When Strayer looked at emulation

See **ADD-IN** page 6

Teen hacker charged with Congress, school break-ins

By Susette Burton

ROCKY RIVER, Ohio — The Rocky River police recently charged a 17-year-old with using his home computer to break into computer systems around the nation, including ones in local schools and in U.S. Congress.

Sgt. Lyle Westerfield of the Rocky River police said the juvenile was charged July 29 in the Cuyahoga County Juvenile Court with theft of services and receiving stolen property, which consisted of telephones taken from the Lakewood City School District.

Westerfield said the youth allegedly used the long-distance telephone lines of Cleveland companies to hook up with computer systems in other cities, including those of the Lakewood City School District, the Milwaukee School District, the University of Texas and Congress.

"He used his Commodore 64, a basic home computer, to post the passwords on an electronic bulletin board," Westerfield charged.

By keeping a record of all logon attempts, Lakewood City School District DP manager Don Mayle said he could tell that the youth was trying to access the Ohio Career Guidance Information System account.

Officials were not able to divulge any information about the alleged break-in to systems in Congress. Inspector Robert Howe of the U.S. Capitol Police said he could not comment on whether there is a tie-in between incidents on Capitol Hill earlier this year and the allegations reported in Rocky River.

Bugs plague $50M system

From page 1

bugs was first made public by two former project programmers who had been forced to resign after allegedly objecting to their overtime work.

Dawson, however, said that a year of rigorous testing to rid Laser Reporting of software bugs, as well as a successful pilot test, ensures that the system will work.

Even with the bugs eliminated, Dawson acknowledged that the switchover embodies risks, mainly because the old reporting system will be shut off at the same time the new one is turned on.

"We're taking every step we can to make sure it works, because this system is so different from the current system that we can't parallel it at the time of installation," Dawson said.

Cause for user concern

The software problems and lack of a backup during the initial operation period may be cause for concern among the agency's customers. "I'm not real confident it will work. A lot of things make me real apprehensive about the whole thing," commented a systems analyst at an Ohio mortgage firm, who insisted on anonymity.

The government-chartered corporation wants Laser Reporting to provide monthly updates on more than four million loans, based on monthly accounting reports filed by lenders.

The old Aggregated Exception System is batch-processed on a Control Data Corp. Cyber mainframe and contains only 20% of Fannie Mae's loan portfolio. The new Laser Reporting system is expected to replace not only this system, but also three other loan reporting systems in a phased process beginning in 1987. The four systems are incompatible but will be integrated in the Laser system.

For a variety of reasons, Fannie Mae missed its March 1985 deadline for implementing the system, so it now is committed to start up on Oct. 1. Consequently, the 60-member staff is working 12-hour shifts around the clock, including weekends and holidays, to meet the deadline, Dawson confirmed. Hal Burd, manager of the Laser project from 1983 to 1985, said the original cost estimate for Laser was roughly $20 million. Burd is now senior vice-president for operations at Horizon Financial Corp. in Gaithersburg, Md.

"We found more program bugs than I anticipated, and therefore ... our people have worked more hours and gone through a lot more than my schedule anticipated," Dawson said, adding that he is aware that some staff members are unhappy about the arduous schedule.

Two senior programmer/analysts, Frank Rega and Barry Crawford, were forced to resign after they balked at working the long hours.

"Fannie Mae made a big public commitment to go live with the system. They don't want to be embarrassed, so they're going to push this thing through ... no matter what," Rega said.

Dawson, in response, said that although some programmers have spent 24 hours on the job, on average the employees are working 9 hours a week in overtime, which he called "par for the course for our business.

"We have 1,500 customers. I can't set up a schedule and move it without inconveniencing all those customers. And so it's almost a holy date with us, and we have to make it," Dawson explained.

Crawford criticized the Cobol programs as overly complex, making them hard to debug. "They went hog-wild," he said, "writing over a thousand modules. A reporting system shouldn't be that complex no matter how big the organization."

Dawson, however, said the programs had grown complex because of numerous changes in Fannie Mae's business during the three years of development, but he added that the program bugs have been easy to fix because the system is well designed.

The system employs numerous Cobol programs written under the supervision of the Arthur Andersen & Co. consulting firm.

"We've found about 1,000 program bugs, but they've all been modest in terms of difficulty to fix. I think that says that we've applied a lot of change, but we have a very well-designed system," Dawson concluded.

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Sun broadens line, signals workstation war

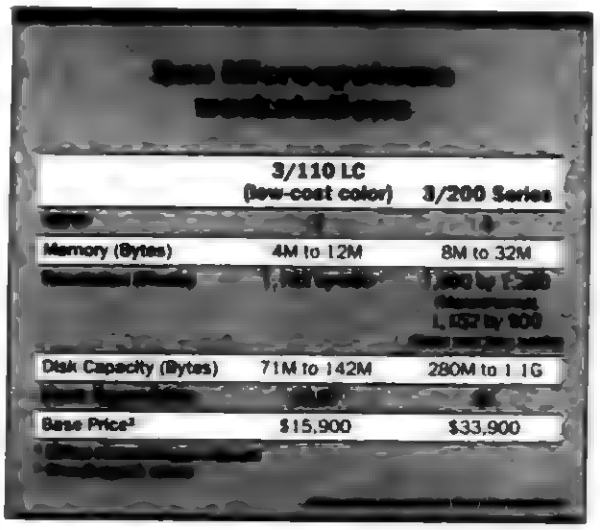
DEC, Apollo expected to answer with rollouts

By Rosemary Hamilton

Making the first move in what is expected to be another round of intense competition among the major workstation vendors, Sun Microsystems, Inc. gave its product line a major face-lift last week. The company added low- and high-end models, cut mid-range prices and introduced the first version of its operating system that combines the University of California at Berkeley 4.2 and AT&T System V versions of Unix.

"It's a major move forward, and it was typical Sun — very aggressive in price and performance," said Robert Herwick, a senior analyst at Hambrecht & Quist. "What's really positive is the broadening of its product line."

Included in Sun's announcements last week were the long-awaited low-end color workstation, the Sun-3/110*LC*, and the Sun-3/200 high-end series, which boasts a rating of 4 million instructions per second (MIPS) and is based on the new Motorola, Inc. 68020 microprocessor that has a clock speed of 25 MHz. The systems are expected to ship within 90 days of order, the vendor said.



Not alone

However, Sun will not be alone in the spotlight for long. Apollo Computer, Inc. said it will make a high-end announcement this week. Also, Digital Equipment Corp. said late last month that it would be introducing workstation-related products this month; it has also been rumored that DEC will ship a low-end workstation by year's end. Additionally, Silicon Graphics, Inc. and other vendors have scheduled a number of announcements for the Association for Computing Machinery's Siggraph computer graphics show, which will be held next week.

"Sun is ahead now, but Apollo and the others will catch up," said Vicki Brown, senior analyst at International Data Corp., a market research firm based in Framingham, Mass.

But Sun's full range of offerings is expected to strengthen its position in the workstation market, analysts said. It now has a complete line of products, from the very low end with a diskless monochrome system that costs $7,900 to a high-end system that can support up to 48 users and starts at $33,900.

Sun also cut an average of $3,000 from the price of each of its 3/75 and 3/160 series mid-range workstations. It will also offer a $19,900 CPU and memory package to upgrade the 3/160s to the 3/200 systems.

In addition to the hardware offerings, Sun introduced its new operating system, Sun OS 3.2, which is the result of a team effort between it and AT&T to merge the features of both the academically oriented Berkeley 4.2 version of Unix and the more business-oriented System V version from AT&T. The operating system will be released in two phases, the first of which is available within 90 days of order.

Phase I is based on the Berkeley 4.2 version with 4.3 enhancements and includes some of the systems calls, library routines and commands of System V. Phase II, scheduled for shipment in the second half of 1987, will reportedly provide complete System V Interface Definition compatibility, including the System V terminal driver interface.

According to Sun, Phase I has "minor differences" between 4.2 and System V. The functions that have not yet been merged are handled by providing the 4.2 capability in a default location and the System V functions as separate directories or libraries. A user can select the preferred environment and write programs for either 4.2 or System V.

Superior because of true merging

Sun claims that Sun OS 3.2 is superior to Apollo's version of System V and Berkeley 4.2 because it is a true merging of both, whereas Apollo's is two separate operating environments residing on the same system. An Apollo spokesman said he had not reviewed the new Sun operating system closely enough to comment on it.

The Sun-3/110*LC* color workstation, with a base price of $15,900, will compete directly with Apollo's Series 3000 color system, which has a starting price of $16,900, and the IBM RT Personal Computer, which starts at $16,485.

The Sun-3/200 series will compete with high-end offerings from both Apollo and DEC. Its base price of $33,900 is competitive with the pricing of both the DEC Vaxstation II/GPX series and the Apollo DN 570 and DN 580 models, but its 4-MIPS rating is more than double that of the DEC and Apollo systems.

The Sun high-end series will be offered in three desk-side versions: the 3/260HM monochrome model, the 3/260C color model and the 3/260G gray-scale model, each with a 19-in. monitor. The monochrome version has 1,600- by 1,280-pixel resolution, and the gray-scale and color models have 1,152- by 900-pixel resolution.

Each of the 3/260 models includes a 20-MHz Motorola 68881 floating-point coprocessor. An entry-level system includes 8M bytes of main memory, a 12-slot card cage, Sun OS 3.2 and associated systems software.

Main memory is expandable to 32M bytes and will be sold in 8M-byte increments at a cost of $12,000 each.

Monochrome version

The monochrome version, with a 280M-byte disk drive and 60M-byte, ¼-in. tape, costs $51,500; a similarly configured gray-scale version costs $58,500, and the color version costs $62,500. For an additional $10,000 per system, another 280M-byte disk drive can be added.

The 3/110LC is based on a 16.67-MHz Motorola 68020 chip and a 16.67-MHz 68881 coprocessor. It can display up to 256 colors simultaneously.

The 3/110LC comes with a 15-in. monitor, 4M bytes of main memory expandable to 12M bytes, an Ethernet interface, two RS-423 serial ports and a VMEbus interface. A system with a 71M-byte disk drive costs $21,900, and a system with a 142M-byte disk drive, the maximum configuration, costs an additional $4,900. The gray-scale version has the same entry-level price of $15,900, while the color version starts at $19,900.

The company will offer file servers based on the 3/200 models; pricing starts at $31,900.

Second-class postage paid at Framingham, Mass., and additional mailing offices.

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New Dimensions in Software Productivity.

AI's commercial impact is focus of science group's show

Meeting to separate science, engineering

By Eddy Goldberg

PHILADELPHIA — When the largest trade show for artificial intelligence, AAAI-86, opens today, a new goal will be added to its traditional charter. Rather than just disseminating pure AI research, organizers hope to demonstrate the evolution of research into commercial applications.

The Fifth National Conference on Artificial Intelligence will take on a more practical air, according to observers and its sponsor, the American Association for Artificial Intelligence (AAAI).

"AAAI is a scientific society that for years has been concerned with the release of theoretical findings in AI science," said Claudia Mazzetti, executive director of AAAI. However, she added, "AI is only a concept until it's applied."

"I like the fact that the technical program is restructured to include more practical applications," said Lou Giacolone, editor of "Knowledge Engineering," a New York-based newsletter.

Intel Corp. will likely make a splash at the show with its 80386 chip and products based around it, said Harvey Newquist, editor of "AI Trends," a Scottsdale, Ariz.-based newsletter.

Also, Intel Scientific Computers will demonstrate a research version of Concurrent Prolog running on its IPSC line of computers.

Gold Hill Computers, Inc. is expected to make three announcements at the conference, including an Intel 80386-based plug-in board (see story page 19).

Although large firms like Control Data Corp., Digital Equipment Corp. and IBM dominated last year's conference news [CW, Aug. 19, 1985] with major product announcements, Newquist said he thinks they will be at this year's show mainly to assure attendees of their continuing interest in the AI field.

Nevertheless, Jonathan D. Lynch, publisher of the "Applied Artificial Intelligence Reporter," a newsletter from the University of Miami, said he expects "a lot of product announcements, as the upward curve of interest continues" in the AI field.

A late withdrawal from the show is Sperry Corp., which reportedly did not have its product ready.

Texas Instruments, Inc. is expected to announce the Explorer LX system. The multiprocessor workstation will combine the Explorer LISP processor with a 16.67-MHz Motorola, Inc. 68020-based coprocessor. The Explorer LX will be available in December and will cost $73,900 in a base configuration.

Aion Corp. of Palo Alto, Calif., is set to introduce AES/MVS and AES/VM, MVS and VM versions of its Application Execution System for IBM mainframes. Also, Aion reportedly will announce ADS/VM, a version of its Application Development System for IBM VM operating systems.

Add-in boards: Solution overload

From page 1

boards to connect PCs to an IBM System/38, a board product from one of the most prominent vendors failed, he says.

To use that particular board, Strayer would have had to install extra software on the System/38. He was desperate. "The DP manager said, 'Get out of here. You're not putting all that stuff on my system,' " he recalls. In Strayer's opinion, the vendor had made the mistake of putting an unfinished product on the market. Fortunately, Strayer says, Ideassociates, Inc. was able to provide a product that did not require software installation on the minicomputer.

In choosing systems, a majority of managers stick with the more prominent, proven vendors, such as IBM, Compaq Computer Corp. and Tandy Corp., according to various spending surveys. That rule of thumb also applies to add-in board purchases, where companies like IBM, AST Research, Inc. and Hercules Computer Technology control a sizable share of the market (see chart page 1).

Expanded memory, the most typical user demand, is usually offered on boards carrying other features like extra serial ports. Depending upon configuration, a multifunction board with a corporation's desired features may retail for $800. Thus, even with a typical 25% discount, the microcomputer manager wishing to upgrade 100 PCs is faced with a $60,000 decision.

According to several estimates, about $1 billion worth of microcomputer add-in boards will be sold by vendors other than IBM this year. Fortune 1,000 corporations should account for about half of those purchases, estimates John McCarthy, research manager at Forrester Research, Inc. in Cambridge, Mass.

Because they usually purchase add-on products in large quantities, companies sometimes have the option of saving a little extra by buying directly from the vendors.

Going through dealers

But many managers, like Strayer, prefer to go through dealers. Strayer gives three reasons: The dealer gives lots of advice, the technical support from a dealer is usually better and quicker and, for accounting purposes, it is easier to track and report purchases from one company instead of many. By going through a dealer, Strayer still receives hardware discounts as high as 28%.

While some of the larger firms like Quadram Corp. have their field sales forces call on user customers, they often make joint calls or refer potential clients to dealers. This avoids alienating the dealer base, explains Cynthia Ringo, manager of Quadram's board products division.

Whether going directly to the vendor or through dealers, many micro managers and consultants shy away from IBM's products whenever possible. They say IBM charges higher prices and offers slower delivery than competing vendors.

But Ed Macke, who manages approximately 390 IBM Personal Computer XTs and ATs at Northrop Defense Systems Division in Chicago, is very pro-IBM. "If you go away from IBM, you risk being cut off at the pass at some point in the future," he says, "because you've got to be ensured of compatibility with the IBM PC standard."

If Macke does have to choose from an independent vendor, he sticks with the well-known names. The issue with non-IBM companies is "not only whether they are going to stay around, but how well will they be able to maintain compatibility. If IBM makes a change, I need a company that has money behind it that can afford to immediately try to catch up with that change. John Doe's Basement can't do that."

In Macke's experience, trying to match different vendors' products within a single system can be extremely trying. Macke has seen hard disk drives clash with emulation boards, PC network boards and color graphics adapters. "It's a real zoo," he says.

According to the president of one of the lesser known board companies, too many managers feel pressured to buy add-in boards on the basis of name recognition, rather than price and performance. "Rather than buying on price and performance, they'd rather take the path of least resistance," says Tim Farris of Boca Research, Inc. in Boca Raton, Fla.

"By getting brand-name products and paying more, they feel that they will get less flak," he adds.

Founded just more than 1½ years ago by Farris — who cofounded Quadram in 1981 — Boca Research makes memory and multifunction boards. Memek, one of its chief products, combines several functions, including expanded memory and graphics card emulation, all on one board.

"The interesting thing here is that we buy the same components as IBM, and the same factory that assembles our boards does work for IBM," Farris notes.

"It is virtually impossible to stay abreast of everything, but if something sounds interesting, we will bring it in [for evaluation] whether it's from a small company or not," says Danielle Barr, vice-president of corporate systems at the Bank of New England in Boston.

Barr often obtains boards from either dealers or vendors for 30-day evaluations. She advises other managers to document those evaluations well and make them accessible to others. "You've got to have some kind of central reference," she says.

While the smaller vendors continue to struggle for recognition, even the key companies have been experiencing hard times lately. After laying off 7% of its work force, market leader AST Research last month reported sales and earnings declines in its fourth quarter. Tecmar, Inc., which at one time offered more than 70 board-level products, is in the process of being acquired by holding company Rexon, Inc.

Intense competition

The intense competition for add-on boards was definitely a major cause of Tecmar's woes, according to Whitney Lynn, interim marketing vice-president. Tecmar's product repertoire will be "streamlined" so the company can concentrate on graphics boards and tape drives, Lynn explains.

One consultant who helps companies set up information centers maintains that in some cases, choosing products from lesser known companies can be a safe proposition. In micro-to-mainframe links, it is best to stick with tested products like Digital Communications Associates, Inc.'s Irma and boards from Pathway Design, Inc., advises Dan Ryan, a senior associate at the Boston Systems Group, Inc. in Boston.

Because expanded memory boards are so new, and because there are two competing standards, choosing no-name brands can be too risky, according to Ryan. But with conventional memory and multifunction boards, most companies' products are straightforward and reliable. "A serial port is a serial port," he says. "If you can find somebody who gives you an extra 128K and an extra serial port for the same price, then you might as well go for it."

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Five years old, modified IBM PCs still remain on the job

Options power up old technology, but market problems hit Big Blue

By Douglas Barney

Five years after the announcement of the IBM Personal Computer, a debate rages over the usefulness of the original technology.

For many, the IBM PC is obsolete, and they will settle for nothing less than an IBM Personal Computer AT or compatible with the more powerful Intel Corp. 80286 microprocessor. Others gnash their teeth in anticipation of a micro based on the powerful Intel 80386 microprocessor.

But for some, even the original PC, with a few enhancements of course, does the job. "I've got one that originally came with the 16K bytes of random-access memory and cassette port, and I use it still," says Colin Kuskley, director of training and a principal of the Center for Advanced Data Processing in New York. Kuskley has enhanced the machine with new disk drives and more memory, but he claims the machine runs all the current software and remains useful.

ANALYSIS

The introduction of hard disk drives that fit into one of the PC's expansion slots and accelerator boards that boost its speed to the rate of an IBM PC AT have also helped to keep the PC competitive with newer machines.

"The initial target for the hard disk device was the old full-height IBM PCs," says Ian Warhaftig, International Data Corp. (IDC) senior market analyst in its storage products program. IDC anticipates that 230,000 of these devices will ship this year, with many of them going into the older floppy disk-based PCs.

Many corporations still buy what amounts to the original IBM PC with a hard disk drive. "We buy more Personal Computer XTs or XT equivalents than anything else. The hard disk is more important to us now than the faster [80286] processor," says R. Bruce Johnson, manager of the personal computer resource center at Deloitte Haskins & Sells. "There are even some employee situations where they are buying just a floppy-based machine," Johnson says.

In spring of 1985, IBM announced a floppy disk-based version of the PC XT with a PC XT motherboard that allows the machine to be more easily outfitted with a hard disk drive. This machine costs little more than the PC and has effectively stopped plain vanilla PC sales dead in their tracks.

Many viewed the 1984 introduction of the IBM PC AT as the end of the road for the IBM PC. But the lack of an operating system that unleashes the full power of the AT class of machines has kept the Intel 8088-based machines in the running, a situation that many lament. "It is 5 years old, and we are reminded that we are still basically within the same boundaries," says William F. Zachmann, vice-president of research for IDC.

Sales exceed projections

IBM has clearly dominated the market for personal computers and claims to be surprised by its early success. "IBM made projections that it would sell so many [PCs] in the life of the machine, and they blew those projections out of the water in the first year," says Fred McNeese, an IBM spokesman.

But success has not always come so easily, even to IBM. When it introduced the IBM Portable Personal Computer, expectations ran high. Due to poor sales, however, the machine was withdrawn from the market to the delight of Compaq Computer Corp. fans everywhere.

The failure of the IBM PCjr to create the much heralded home market was well documented, and IBM announced it was discontinuing manufacturing in March 1985.

And even the PC line, with its open and imitable architecture, has had its share of problems lately. Low-cost clones of the IBM PC have cut into IBM sales.

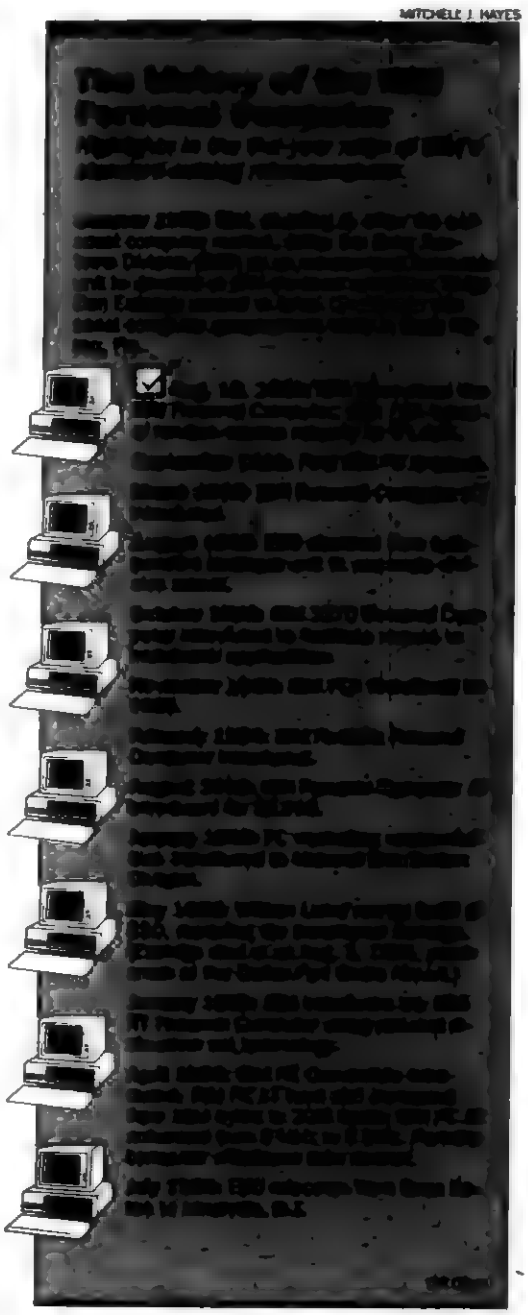
Indications show that this competition will only get worse as the low-cost leaders are supplanted by lower cost marketers. "The PC has now been turned against IBM," notes Bill Coggshall, president of Market Access International, Inc., a San Jose, Calif.-based research firm.

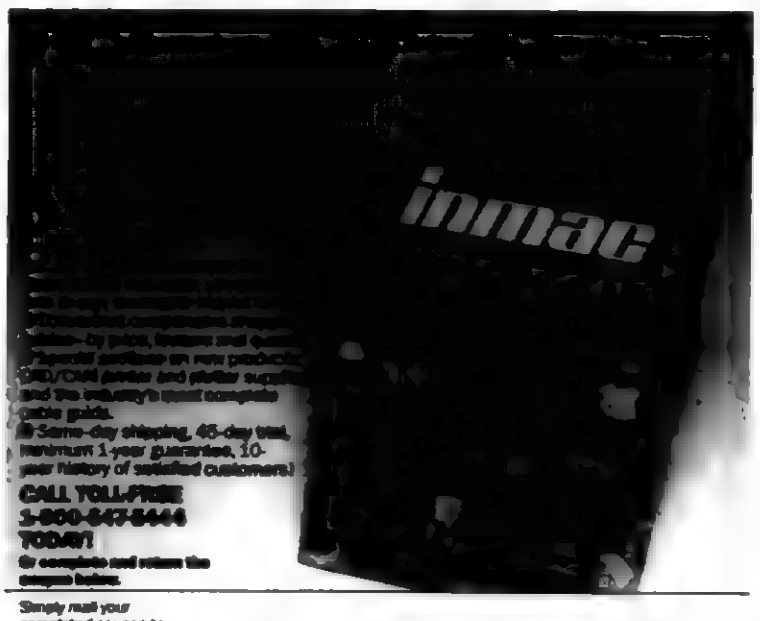
The challenge for IBM goes beyond battling the clones with a much-rumored low-cost "clone killer." The real challenge is to repeat the success of the PC with a new generation of products based upon the 80386 chip.

"A leader has to obsolete itself. IBM will have to self-obsolete before others obsolete it," Coggshall says.

With Compaq publicly committed to beating IBM to the 80386 punch, the challenge for IBM may be enormous. There is little doubt, however, that IBM's sleeves are big enough to hold a few aces.

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sidiary. A company spokesman denied reports that transfers may number up to 1,000 and may, in some cases, be involuntary. "There is some redeployment involving Rolm, but the number is significantly lower than 1,000, and it's on a voluntary basis," IBM spokesman Jim Burke said.

Mike Farrell, president of the Delaware Valley users group, an organization of System/34, 36 and 38 users, suggested that economies of scale resulting from the convergence of the System/36 and 38, as announced by IBM in June, are the probable cause of the cutbacks. But George Colony, president of Forrester Research, Inc., a Cambridge, Mass., consulting firm, asserted that System/36 sales are not meeting IBM goals.

■

Data General will announce three-dimensional, computer-aided design and manufacturing software and a processor at the Boston Computer Museum on Tuesday. Also on Tuesday, Burroughs will announce new capabilities for some of its office automation systems, including communications capabilities aimed at IBM mainframes.

■

A Federal Communications Commission mandate will cause AT&T and local phone companies to lower their rates by $1.2 billion in 1987 and 1988. The commission reduced the profitability limit it sets on what AT&T Communications and local telephone companies may earn on interstate calls in those years. As a result, AT&T said it will make price cuts averaging 2% to 3%. The FCC pointed to lower inflation as a cause of the reduction, which it will reconsider in two years.

■

On Aug. 19, Digital Communications Associates, Inc. will announce several additions to its line of Irma personal computer communications products. The announcements involve "new dimensions in token-ring workstations applications" and mainframe graphics capabilities for PC users. Observers expect the token-ring announcement to be a local-area network-to-mainframe communications product.

Doubts surround Mac Dbase plan

From page 1

upon us at this point," said Dick Webb, audit partner with Peat, Marwick, Mitchell & Co., an accounting firm in New York that has approximately 6,000 Macintosh computers and uses Microsoft Corp.'s MS File as its data base.

Last year Lotus Development Corp. announced Jazz, an integrated package heralded by some as the 1-2-3 for the Macintosh.

But sales of Jazz never took off and did not noticeably boost business sales of the Macintosh. Microsoft's Excel, an integrated product launched last year, has enjoyed more success, however.

The very nature of Dbase may make it a difficult sell on the Macintosh. A key strength of the Macintosh is its ease of use through icons, the mouse and menus. The traditional strength of Dbase, on the other hand, has been its programming language, which must be mastered in order to use the advanced capabilities of the software.

May use more icons

But some sources argue that the product will make extensive use of the Macintosh's icons and menus and will therefore be easy to use. Ashton-Tate last week declined to be interviewed concerning today's product announcement.

"I don't see that there would be anything significant about Dbase to make us change from the MS File. It would not be worthwhile to bring all our users up to speed on the full capabilities of something like Dbase," Webb said.

"It certainly makes it a more credible machine," said Rick Richardson, national director of microcomputer technology for Arthur Young, based in New York. But, he added, Ashton-Tate "will have its hands full" competing against "the very powerful" Omnis III data base package from Blyth Software, Inc.

Analysts interviewed tended to be more positive than users. According to Jeffrey Tarter, publisher of "Softletter," a Cambridge, Mass.-based newsletter, the Macintosh has come into enough corporations "through the back door," that it has become somewhat of a second standard for personal computing.

Although Tarter said he has seen the product, he declined to verify that it was Dbase or provide specific details.

"It certainly won't do any harm. There hasn't been an outstanding data base for the Mac to this point. It is probably a plus for the world of the Macintosh," said William Zachmann, vice-president of research for International Data Corp.

A member of Ashton-Tate's user advisory board discounted speculation that the group had convinced the company to move into the Macintosh market.

"Macintoshes are used in those companies in very restricted, specialised areas. I don't think the corporate advisory board has pushed them into the Macintosh market," said R. Bruce Johnson, manager of the personal computer resource center for Deloitte Haskins & Sells, a New York-based accounting firm. "I am not going to buy it, because I have an IBM standard that we have to maintain internationally."

Despite the lack of acceptance of the Macintosh at Deloitte Haskins, Johnson says he believes the Ashton-Tate product will expand the market for the Macintosh in large corporations. "One of the things that kept the Mac from acceptance in the corporate market is the lack of business applications."

The market for Macintosh data base products is heating up. Borland International, Inc. late last month acquired Singular Software, Inc. and has repriced the firm's $195 Interlace data base to $99.95.

Blythe Software this week will announce an enhanced version of Omnis III. Ashton-Tate also faces Helix, a sophisticated data base package from Odesta Corp.

MS Works to lead Macworld debuts

By Peggy Watt
and Douglas Ramey

BOSTON — Several major products for Apple Computer, Inc.'s Macintosh will debut at the Macworld Exposition this week.

Most significant among the products is the expected release of MS Works, an integrated package from Microsoft Corp. that includes financial modeling, word processing, data base and telecommunications.

General Computer Co. of Cambridge, Mass., will introduce its $1,199 Hyperdrive FX/20, an external 20M-byte hard disk drive for the Macintosh.

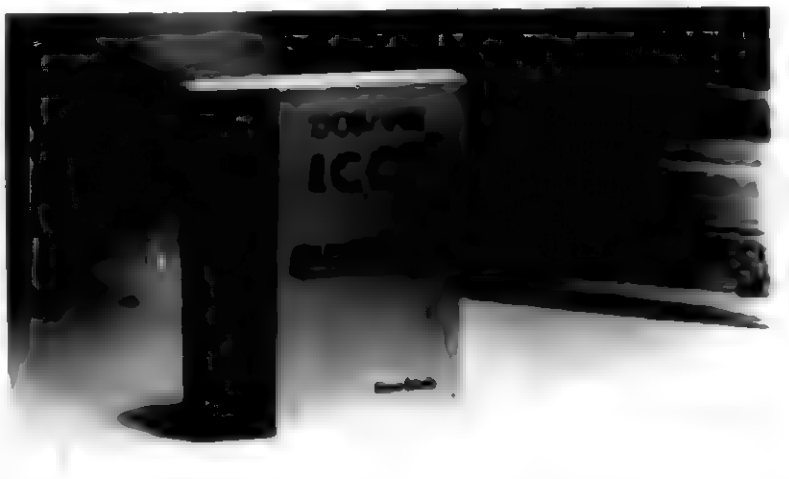
National Instruments Corp. of Austin, Texas, will introduce Macbus, a $1,495 programmable I/O processor that can connect with personal computer cards, and Labview software, an engineering workbench for developing custom instrumentation systems.

Several introductions will center around desktop publishing, and include Aldus Corp.'s Fontastic Fonts, which are two fonts for both the Apple Laserwriter and Imagewriter printers, Adobe Systems, Inc.'s 10 font packages for its Postscript printers and Ergotron, Inc.'s Mac Buffer, a server for the Laserwriter.

Other products to be announced include 20/20 Combo, a 20M-byte hard disk drive and tape backup combination from Lodown, Inc.; Filemaker Plus from Forethought, Inc.; Macback Plus and Macport Plus from Peripheral Land, Inc.; and Promodem 2400 from Prometheus Products, Inc.

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DEC launches two mid-range VAXs, direct assault on IBM

Products solidify line, open markets for firm

By Dennis Eskenazi

BOSTON — Digital Equipment Corp. last week launched its most direct attack yet on traditional IBM markets as it announced two mid-range VAX minicomputers and related products.

The products did not represent a technical departure from other VAX series computers. Their importance, DEC officials maintained, was in filling out DEC's VAX line, permitting the company to pursue customers in insurance, banking, aerospace, automotive and other markets traditionally considered IBM captives.

"This is more than a ho-hum announcement of two more VAXs," said International Data Corp. analyst Richard Mikita. "The combination of new machines, repricing and emphasis on the VAXBI interface is important for DEC's overall strategy. They more directly contrasted IBM and DEC this time," he said.

Among the introductions last week were the VAX 8550 and 8700 models, VAXBI bus-based configurations of VAX 8200 and 8300 systems, a terminal server, memory enhancements for older VAX products and a bridge to allow the 8600 and 8650 processors to access the VAXBI bus technology. Most of the enhancements and products were designed to bring various systems into line with the VAXBI bus scheme and with DEC's clustering facilities.

The VAX 8550 is a general-purpose system that could serve large departmental office systems, simulation or computer-aided design. The 8700 model — similar to the 8550 in processor performance — is closer to the VAX 8800 in size and is said to be better suited for high-speed data collection, artificial intelligence, financial modeling and very large simulation programs, DEC said.

DEC stated that its compatible VAXs, Vaxclusters and related products are ready to take over in shops that are traditionally all IBM. "Their challenge here will be an educational one, to get that message across to MIS managers," IDC's Mikita said.

Robert Hughes, DEC's vice-president of industry marketing, compared DEC's strategy of compatible systems, networking abilities and standardized software to the development of planned, standardized highways. IBM's Binary Synchronous Communications protocol is like an old two-lane road, he said. Its separate operating systems on different-size systems and its separate staffs necessary to direct operations of dissimilar architectures mean that IBM customers often have to go the long way to get where they are going.

The recently announced VAX 8550 — with almost two times the performance of its companion system, the 8500 — comes in a 27-in.-wide cabinet similar to the 8500's. DEC plans to offer an upgrade kit for an 8500-to-8550 conversion in the near future.

The 8550 offers I/O speeds of up to 16M byte/sec. Memory starts at 20M bytes and ranges to 80M bytes. A building block system costs $364,000 and includes 20M bytes of memory, the Ethernet networking capability, a four-port disk controller, one year of VMS and Decnet software licenses and a one-year, on-site hardware warranty.

Other configurations

Other configurations include a $378,000 Vaxcluster building-block system; a $398,000 VMS preconfigured system with an RA81 456M-byte disk drive, a TU81-Plus streaming tape drive and controller and a DMB32 multifunction communications controller; and a $441,000 office automation system with 48M bytes of memory, Ethernet, a KDB50 four-port disk controller and one-year licenses for VMS, Decnet and All-In-1 office automation software.

The 8700 systems start with 32M bytes of main memory and range to 128M bytes. The 8700 delivers the same I/O and memory capacity as the high-end VAX 8800 but has the same processor performance as the VAX 8550, DEC said. The 8700 comes in a large cabinet that allows connection of up to four VAXBI interface I/O channels for an aggregate bandwidth of up to 30M byte/sec. of I/O traffic. An 8700-to-8800 board addition upgrade kit will be available in the fall and has not been priced yet, DEC said.

DEC also announced native VAXBI configurations of its 8200 and 8300 systems that range in price from $79,000 to $127,000 for the 8200 and from $109,000 to $157,000 for the 8300. It released 16M-byte memory array expansion packages ($48,000) for the two new systems and 4M-byte memory arrays ($12,900) for the 8200 and 8300.

The Decserver 200 terminal server connects up to eight terminals, printers or modems to an Ethernet local-area network. The 200/MC model costs $3,450 and implements eight RS-232C asynchronous lines for terminal and printer connections, modem control and access to non-DEC systems. The 200/DL model costs $3,050 and provides eight ports for terminal and printer connections only.

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Net to test compatibility

From page 1

oped by the International Standards Organization.

The first test to be conducted on the network, scheduled for Sept. 1, will determine system interoperability using the OSI file transfer access method (FTAM).

The OSInet project is one of the first carried out in cooperation with the Corporation for Open Systems (COS), a user and vendor organization recently founded to coordinate and provide direction for OSI standards development and testing efforts.

> ***'OSInet will enable us to resolve most interoperability problems with other vendors before our products reach the user.'***
>
> — Steven Wendler
> Digital Equipment Corp.

"We fully expect that test protocols developed on OSInet will be transferred to COS," said Steven Wendler, OSI marketing manager for Digital Equipment Corp. The "National Bureau of Standards is in the business of developing test procedures, while COS's job is to run the tests. I would predict that OSInet will accelerate COS's efforts at setting up test beds," Wendler said.

"There are any number of ways to implement an OSI layer," noted John Haefner, chief of the systems and network architecture division at the National Bureau of Standards (NBS), one of the project's charter members.

"Different vendors' products may not be compatible, even though they all use the same OSI design specifications. An example of this is packet-switching networks that all use X.25, but still cannot exchange data. OSInet is designed to avoid this nonsense," Haefner said.

Vendors who are charter members of the OSInet joint development committee include DEC, AT&T, IBM, Amdahl Corp., Boeing Computer Services Co., Hewlett-Packard Co., Sperry Corp./Burroughs Corp., Wang Laboratories, Inc. Honeywell, Inc. and UK computer manufacturer ICL PLC.

"OSInet will enable us to resolve most interoperability problems with other vendors before our products reach the user," DEC's Wendler said.

"It also provides a way for us to demonstrate OSI communications for skeptical customers who have heard about the standard without seeing anything solid for too long," he said.

Among user organization charter members are the U.S. Department of the Navy, the Defense Communications Agency and the U.S. Department of Agriculture.

One of the network's first projects will be a joint development effort by the NBS and the Department of Defense (DOD) to develop and test gateways between current DOD protocols and OSI.

The Defense Communications Agency plans to use OSInet facilities to help it evaluate products that may enable the DOD communications protocols to communicate, or even merge, with OSI standards, a Defense Communications Agency spokesman said.

Boeing will be one of eight participants in the FTAM interoperability test scheduled for next month. "Boeing has been involved with OSInet since its inception," said Laurie Bride, Manufacturing Automation Protocol/Technical Office Protocol (MAP/TOP) program manager at Boeing.

The aerospace company's own OSI testing facilities are already linked to OSInet via an X.25 packet-switching connection.

"We currently have systems from more than a dozen vendors linked on a MAP/TOP network; OSInet will allow us to test interoperability with a broader set of vendors," Bride noted.

The OSInet project will be coordinated with the efforts of other standards organizations such as NBS, the MAP/TOP Users Group and COS, Haefner said.

The OSInet organization plans to "work closely with COS in order to avoid duplication of effort," he said. "Then we'll be right where we want to be, with everyone solving a piece of the puzzle." Most vendors that have joined OSInet are also members of COS.

The project has a target number of 100 organizations participating in the network by early 1987, Haefner said.

A January 1987 deadline has been set for all 25 charter members' systems to be communicating over OSInet.

The "only comparable instances of such widespread vendor cooperation were the OSI internetworking demonstrations that took place at Autofact '85 and National Computer Conference '84," Wendler said.

"But those were temporary; these facilities will be available ongoing, and represent a much bigger vendor commitment," he added.



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HP to adopt Imagen DDL for Laserjet, enhancing desktop publishing ability

By Maura McEnaney

PALO ALTO, Calif. — Hewlett-Packard Co. is scheduled this week to announce plans to incorporate Imagen Corp.'s DDL page description language as the composition language for its Laserjet line of printers.

The announcement should end speculation about HP's plans for enhancing its desktop publishing capabilities, which have been limited by its lack of a powerful page description programming language. Until now, HP has been using its own Printer Command Language (PCL), an instruction set that controls features of Laserjet.

Whereas PCL was designed to take advantage of Laserjet features and emphasize the compatibility of HP's printer line, Imagen's DDL addresses entire document layouts. It also allows pages to be created in any order and images to be easily repositioned.

"HP would like to have a stronger product for the desktop publishing market," says Cathy Dingman, an analyst at market research firm CAP International, Inc., in Marshfield, Mass. "Once they have a product with a page description language, they will have a product for desktop publishing," she says.

Under the terms of the agreement to be announced today, Santa Clara, Calif.-based Imagen will license DDL to HP. Laserjet products incorporating DDL will not be available until the fall, notes Chuck Ulfers, marketing manager for HP's Boise division in Idaho. HP will still support PCL, he says, because "we still believe the average user of a laser printer is not into desktop publishing."

There was some speculation earlier this year that HP would incorporate page description language functions into a new version of PCL; however, that is no longer necessary, Ulfers says. HP selected Imagen as the vendor of the page description language because it is highly compatible with HP's line of printers and is oriented more toward producing entire documents than market leader Adobe Systems, Inc.'s Postscript, used in Apple Computer, Inc.'s popular Laserwriter printer, he explains.

"It gives HP the wherewithal to compete with Apple without having to sell the Apple Laserwriter," says Jose Ramos, publisher of "WYSIWYG" newsletter in Redwood City, Calif.

With more than 500 independent third-party software vendors supporting PCL on its printers, HP will not have trouble attracting vendors to DDL, CAP's Dingman claims. Page composition software vendors that have committed to DDL include Aldus Corp., Lexisoft, Inc., Microsoft Corp., Software Publishing Corp. and Studio Software Corp.

Cray boosts low-end power

Cuts prices, bolsters power on older models

By Donna Raimondi

MINNEAPOLIS — Cray Research, Inc. last week announced new low-end supercomputer models as well as price reductions and a boost in CPU performance on existing models.

The Minneapolis vendor released a $12 million X-MP/44 system with four CPUs that share a four-million-word (64-bit words) emitter-coupled logic (ECL) bipolar memory arranged in 32 interleaved banks. The system is the smallest four-processor model that Cray makes, a spokeswoman said. Other X-MP/4 machines have eight- or 16-million-word memories.

The new $7 million X-MP/22 system has two CPUs sharing two million words of metal oxide semiconductor (MOS) memory arranged in 16 interleaved banks. This model is the entry-level, dual-processor model, the Cray spokeswoman said. Other models in the X-MP/2 series have four-, eight- or 16-million words.

"The demand for Cray machines is strongly in favor of dual- and quad-processor systems, so the new products and the price adjustments are just an effort to boost the low end of those lines," said supercomputer analyst Jeffrey Canin of the investment firm Hambrecht & Quist in San Francisco. In the past, Cray has paid more attention to the high end of its line, in which customer demand is strongest, he added.

Cray's low end is in need of filling out, and this announcement appears to address that need, according to Canin. The most powerful superminicomputer from the so-called Crayette companies — Cray-compatible vendors in a lower range — reaches only about one-third the power of Cray's entry-level, single-processor XM-P system. Cray has explored and rejected any systems in the superminicomputer range, so the move does not appear to be competitive with the Crayettes, Canin said.

Prices on all one- and two-processor X-MP systems have been reduced. The single-processor X-MP/1 series machines' prices were slashed $1 million, and from $500,000 to $1 million came off the dual-processor models' prices. The prices of the X-MP/4 systems that use ECL bipolar memory have not been reduced because prices of ECL memory have not fallen, the Cray spokeswoman added.

The increase in CPU performance is owing to a speedup of the X-MP clock period to 8.5 nsec from 9.5 nsec, a move Canin called a "mid-life kicker" for older systems. This was possible because of chip replacements in both the CPU and memory, the spokeswoman said. All new systems, which are compatible with the older systems, now incorporate the faster clock time.

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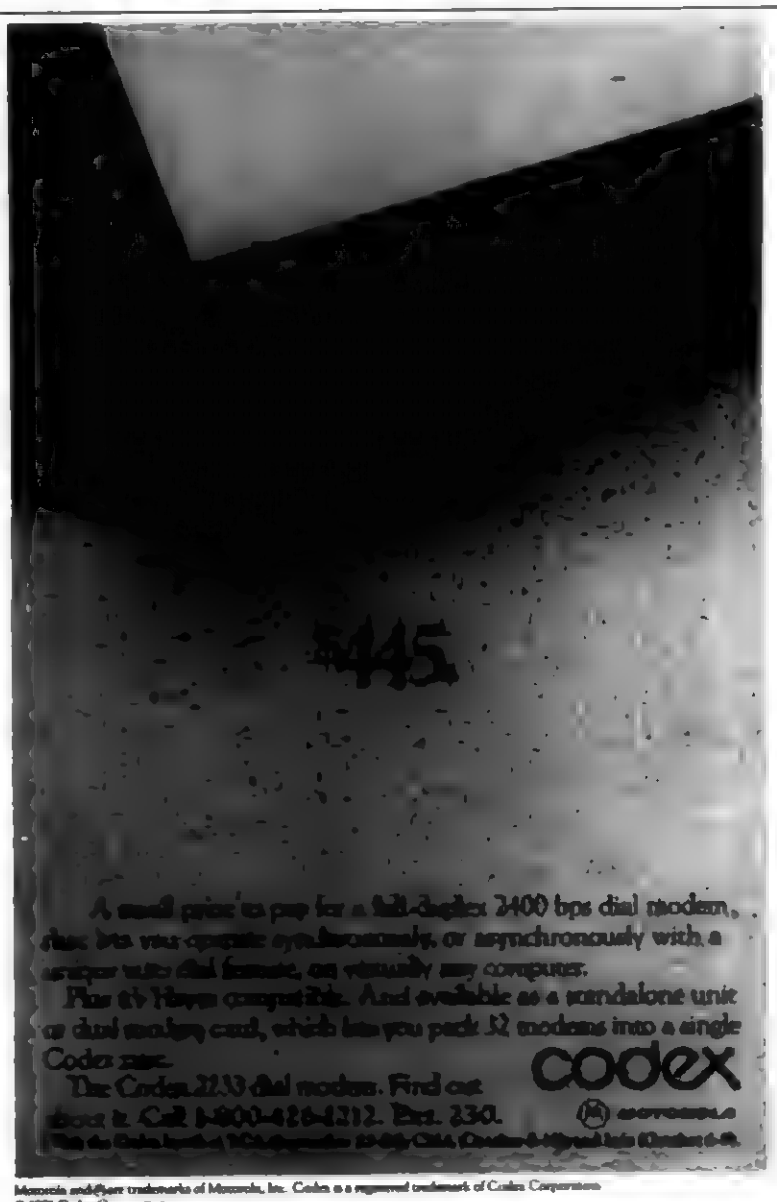
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NAS elbows into high-end vector processing competition

Enrolls AS/XL in IBM 3090 class

By Eddy Cuteberg

MOUNTAIN VIEW, Calif. — Stressing an ongoing commitment to engineering and scientific users, National Advanced Systems Corp. (NAS) last week announced the AS/XL Vector series of mainframe processors, priced in the $3.5 to $15 million range, as well as four third-party software packages.

The processors are pitted against IBM's 3090 Vector Facility and Amdahl Corp.'s 5890 mainframes.

NAS also announced the fourth-quarter 1987 release of 3090 VF Extend, a proprietary firmware feature that will give AS/XL Vector users the ability to run programs compiled for the 3090 Vector Facility.

"They've basically reannounced the AS/XL with a vector processor bundled into it," said Tom Henkel, an analyst with the Yankee Group. "IBM will probably do the same in September."

"The interesting thing about this announcement is that NAS usually competes with IBM in the mid-range. This is the first year they have started competing with Amdahl and IBM's 3090-class systems," said Jeffry Canin, supercomputer analyst at Hambrecht & Quist in San Francisco.

Henkel said IBM will ship an estimated 200 Vector Facility systems by the end of this year.

NAS said full operating system compatibility with IBM's 370 and 370 Extended Architecture will be provided in the AS/XL Vector series, which will run engineering and scientific applications in the MVS, MVS/SP, MVS/XA and VM/HPO environments. The vector systems will also provide upward compatibility for software developed on NAS AS/9100 series processors.

The uniprocessor Model V60 and dyadic Model V80 are scheduled to be available this October. A smaller uniprocessor Model V50 has a planned release date of first-quarter 1987, and the three-processor Model V90 and four-processor Model V100 are slated for third-quarter 1987 releases.

Software supported for the NAS vector systems includes: MSC/Nastran, a finite element-method software package from MacNeal-Schwendler Corp. in Los Angeles, available now; and the NAG Fortran Library from the Numerical Algorithms Group in Downers Grove, Ill., available in third-quarter 1987.

Other software includes Vector and Array Syntax Translator/Extended, a Fortran program preprocessor that converts scalar applications into vectorized code and provides portability and compatibility between 3090 Vector Facility applications and the AS/XL Vector Series, developed jointly with Pacific-Sierra Research Corp. in Los Angeles and available now; and Math Advantage, a mathematical library of core numerical algorithms from Quantitative Technology Corp. of Beaverton, Ore., also available now.

The Vector series features an internal storage hierarchy consisting of main storage, dynamic working storage and a cache buffer. Dynamic working storage, with an average access time of 12 nsec, comes in 512K-byte, 1M-byte and 2M-byte increments.

Located between the cache buffer and main storage, dynamic working storage provides additional access to faster chips for data and instruction fetches, according to Claude Steinmayer, director of worldwide scientific computing for NAS. He said access time in cache is 4.5 nsec, compared with 120 to 150 nsec in main storage.

He also noted the AS/XL Vector series is air-cooled and has a footprint one-third to one-half the size of comparable IBM 3090 vector processor configurations.

In terms of performance, Steinmayer cited an August report from the Argonne National Laboratory in Lemont, Ill., that shows Linpack, a public-domain software library consisting of software routines with a high percentage of floating-point operations, ran on the AS/XL Model 60 uniprocessor at 43 million floating-point operations per second (MFLOPS); the IBM 3090 Model 200 uniprocessor with one vector facility ran the Linpack at 15 MFLOPS, Steinmayer said.

Pricing for the AS/XL Vector Series is $3.61 million for the V50, $4.79 million for the V60, $8.01 million for the V80, $11.26 million for the V90 and $14.24 million for the V100. The 3090 VF Extend will have a one-time fee of $50,000.

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World Digest

NCR promises more

HONG KONG — NCR Corp. recently indicated to users in Hong Kong that extensions to its 9800 series of fault-tolerant, general-purpose mainframes will be released, along with a full line of banking software, toward the end of this year.

Though no specifications were revealed, a spokesman did confirm that the software will include data bases, fourth-generation tools and Cobol-based products.

An automatic teller machine, dubbed the 5841, and a banking terminal based on NCR's Tower microcomputer will also be launched in the fourth quarter. The terminal will run under Unix and/or a new transaction operating system, the spokesman said.

NCR made the unofficial announcement to users in an effort to hold its ground against IBM in the financial sector of Hong Kong. Prior to the April announcement of the 9800 series, NCR suffered a spate of user defections to Big Blue.

NCR financial services manager Mike Darch admitted that if the company had been able to launch the machine earlier, "it would have made those banks' decisions a lot harder to make."

Underscoring the point, the Belgian Bank in Hong Kong has reversed its decision to migrate from an NCR 8500-based banking system to IBM, on the strength of the recent NCR announcement. In a deal valued at $350,000, the bank has contracted to purchase a two-application processor 9822 with two data storage units.

— Francis Pearce

Plessey takeover bid barred

LONDON — A bid by General Electric Co. PLC (GEC) to reshape the UK electronics industry by taking over its rival Plessey PLC has failed. After eight months of heated debate concerning the wisdom of creating a British company with combined revenue of $11.1 billion, Paul Channon, secretary of state for trade and industry, last week came out against the move.

GEC's bid for Plessey was referred to the Monopolies and Mergers Commission in January, a body that polices corporate mergers in the UK. The commission's report, published recently, rejected GEC's overtures. Channon accepted its finding that the takeover would operate "against the public interest."

Plessey, which reportedly fought hard and sometimes acrimoniously with GEC, welcomed the outcome. However, a dispute is brewing about the future of System X, a digital public switch developed by Plessey, GEC and STC PLC, its original developer. Although the commission has rejected an overall merger, it supports the rationalization of the joint development. Both GEC and Plessey manufacture and sell the system, with Plessey taking the leading role.

"GEC has argued for many years for reorganization of the UK's activities in the public switching field," commented James Prior, GEC chairman. "Since GEC made its offer to Plessey, it has been recognized that this can only be accomplished by the combination of GEC's and Plessey's interests in public switching and associated transmission businesses."

Plessey, which replied to GEC's takeover bid in December last year with an offer to take System X off its rival's hands, declared, "We shall continue to run our profitable and successful System X business." Plessey rejected any suggestion that GEC should buy System X and said that it had been trying, unsuccessfully, to reach agreement with GEC on a joint venture for the switch since 1982.

— John Lamb

IBM PC grip slips in UK

LONDON — IBM's grip on the UK personal computer market slipped in the first six months of this year as competition from IBM-compatible suppliers intensified. According to market analyst Romtec Ltd., in the last three months of 1985, IBM accounted for 50% of business microcomputers sold through dealers. By the second quarter of this year, its share was down to 44%.

This is a slight rise on the first quarter's figures because, Romtec said, IBM came back with a new range of products.

ICL delivers for parent

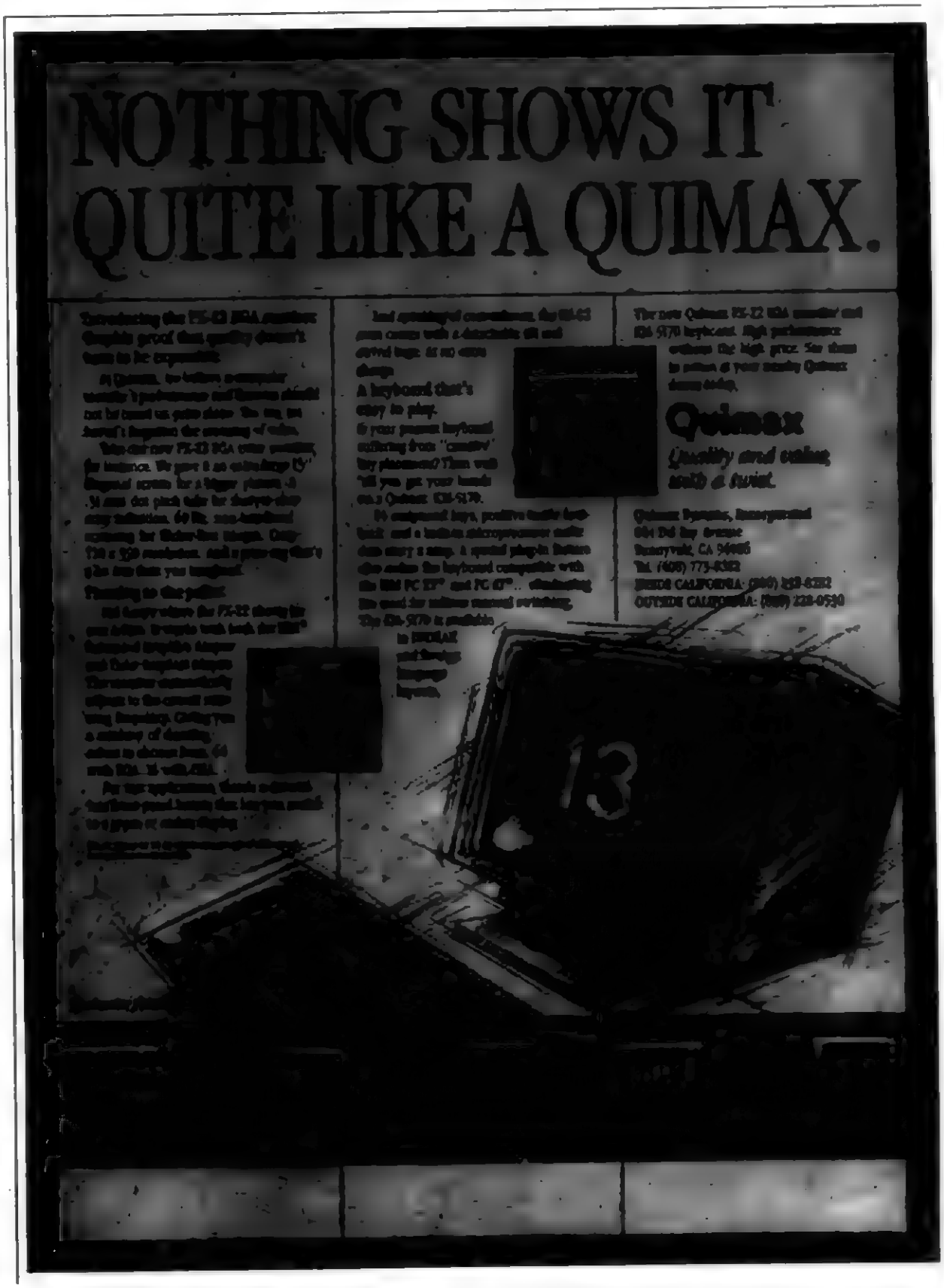
LONDON — Cost-cutting and business sell-offs at the troubled UK computers and communications group STC PLC have glossed over the firm's latest mid-year figures.

Financial results released last week show the company posted pretax profits of $73.1 million in the first six months of its fiscal year, more than twice the earnings that were announced during the same period last year.

STC's computer subsidiary, International Computers Ltd. (ICL), bought by STC in 1984, was once again the saving grace at the company. ICL posted revenue of $839 million, up 11%.

The mainframe company was the only division of STC to boost its revenue.

Compiled from the Computerworld International News Service.



VIEWPOINT

EDITORIAL

Protecting user rights

Slowly but steadily the consumer protection ethic that has sent shivers along the spines of American manufacturing has wended its way into the computer industry. A recent advance, begun last October but only recently picked up by reporters, involves a pending court case that pits a small Fort Lauderdale, Fla., construction firm, James A. Cummins, Inc., against micro software giant Lotus Development Corp.

Cummins' principal, James A. Cummins himself, alleges that he used Lotus's Symphony product to prepare a contract bid that turned out to be inaccurately computed and further alleges that a Symphony software defect caused said miscalculation. Lotus says it was Cummins who messed up.

The *Cummins* v. *Lotus* case has serious implications for users and vendors alike: A court decision in either direction could set important precedents in the matter of software vendors' liability, or lack thereof, to businesses that feel they suffered because of software inadequacies. Currently, even the most consumer-oriented software firms gainsay any such responsibility, promising only to replace individual software diskettes found to be defective.

(On another front, meanwhile, ADAPSO, the software and service industry's trade association, is urging its members to adopt stronger warranties — guaranteeing that products will perform according to specifications, for example — to stave off court decisions that could impose even *stricter* liability.)

If the courts hold microcomputer software firms responsible for losses caused by software bugs or, worse yet, by end-user misuse, we can expect a rash of lawsuits — many potentially petty — to assault the industry. (In fact, if you must know, we expect that a whole new realm of legal practice would spring up like daffodils in May.)

Smaller software companies with fewer resources would be threatened. Large software firms with large cash reserves, large quality-control staffs and large legal departments would gain an even greater competitive advantage.

It takes no wild speculative leap to see clearly that the spectre of lawsuits and the actual eventual loss of small, aggressive software firms would combine to stifle innovative research and development and ultimately do great disservice to computer users everywhere.

The software industry should be smart enough to move quickly and forcefully to fend off this vision before it becomes reality. Stronger software warranties are a must. Software buyers, like any other consumers, have a right to expect that a product will perform as promised. Steadily improving service and support is another need, since user dissatisfaction often seems greater than ever on this score.

As to *Cummins* v. *Lotus*, the issue may be one of human as opposed to software error; if so, using the case to plunge the software industry into the nightmare world of damage suits goes far beyond what is equitable or necessary to protect user rights. What is needed is wisdom, consideration and action from the software industry, not creation of another legal profession windfall by capricious courts.



LETTERS TO THE EDITOR

Mapper turns PCs to coprocessors

The Softalk column, "4GLs Drawing Bead on PCs" [CW, May 19], addressed how products such as Information Builders, Inc. Focus and others suffered from performance problems when running on personal computers.

Sperry Corp.'s Mapper software is used by more than 500,000 people around the world, making it the most widely used fourth-generation language. It is available on all sizes of computers, ranging from PCs to mainframes. To avoid a performance problem when installed on a PC, it comes with a fully sized expansion board that contains a Motorola, Inc. 68010 CPU and 512K bytes of random-access memory (RAM).

This is used, along with a proprietary operating system, to run the Mapper software while the PC's existing CPU is employed as the I/O processor. This makes the PC a coprocessor. When the PC is not running the Mapper software, the 512K of RAM is available to DOS.

It might be unfair to refer to the Mapper software as a fourth-generation language, because it is really a complete end-user computing environment, but it has features and capabilities to gladden the heart of the most sophisticated DP professional. Those who have seen it run on a PC cannot believe it, finding almost no limit in functionality when compared with the mainframe version.

Due to its mainframe heritage, Mapper software even supports two added PCs as slave terminals, running terminal emulation software that is included in the package. This ability gives us support for three concurrent users.

It changes our perspective of the system, too, so that we now think of the PC that contains the Mapper software and board as a host for the added "terminal" PCs and the one who uses the tube and keyboard of the "host" PC as just another terminal user.

We use PC Mapper (called Personal Mapper system) to develop and test applications and upload them to our mainframe Mapper system for all to share.

I understand that there is a Unix version of the Mapper system written in the C language that will be marketed soon. This would make Mapper software available on an even wider range of computers, which would address another problem mentioned in the article: portability.

Freddie G. Bielweise
President, Texas Integrated Technologies, Inc.

Bugs in models hamper reliability

Responding to my contribution to the Reader's Platform, "SDI demands trillions of instructions, 99.9999999% reliability" [CW, June 2], letters to the editor by Edward Fuchs, "AT&T reports no such error rates" [CW, July 14], and Capers Jones, "Software quality data distorted" [CW, July 28], have ignored the major point I wished to make. Both writers object to my use of data from an article, "Cost, cancellations impair software quality" [CW, Nov. 26, 1984], in which Jones is reported as saying, "In very large programs, defects in coding, documentation and incorrect bug fixes result in an average of 300 serious errors per 1,000 lines of code." My attribution of Jones' study to AT&T was incorrect as properly noted by Fuchs.

It is also true as stated in Fuchs' letter that "a software system can deliver reliable performance though it may contain some errors." And Jones writes that from "90% to 97% of the defects" are usually found before delivery of a program to users. These statements are directly related to the point of my contribution. Reliable means that the same results (from a program or experiment) can be counted on each time a process is repeated, which means we can count on the small proportion of errors Jones and Fuchs indicate are likely to remain after testing, debugging and delivery.

James Baginski, quoting General Accounting Office reports in *Aviation Week & Space Technology* [July 14, 1986], states that "only 2% of software products could be used when and as delivered." The main issue my article was addressing is not how may errors remain in a complex software program, but that the models underlying the program may have bugs that the codes (no matter how reliable) are most unlikely to be able to correct.

David Bendel Hertz
Distinguished Professor, University of Miami
Intelligent Computer Systems Research Institute

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VIEWPOINT

Beyond promises of support: Cost-effective software service

The purchase price of high-quality personal computer software is not really very high. Consider that micro packages costing a few hundred dollars do as much as the multimillion-dollar mainframe packages of years gone by.

But software vendors and customers alike are discovering the cold, hard truth on the bottom line: Support is very expensive. In fact, most vendors run their support services, such as 800-number hotlines, so as to discourage "trivial" questions. Several told us that they wanted the user to have to call two to three times before he got an answer. One major vendor said that if a package purchaser asked for help a second time, the vendor had lost money on the sale.

In reaction, many software vendors are starting to charge for help. They do not mind providing it, they say, provided they can at least break even (or perhaps make money) on the support function. Users say they would not mind paying for help if the help were worth the fee. Too often, those manning the phones are inexperienced employees, able to do little more than read the manual.

In-house support alternative

However, there are alternatives: The first is to create an in-house support program. Nearly everyone eventually does some of this, but it is really difficult to provide enough. Enough means that all questions on all the different software packages supported can be answered on a timely basis.

Let us look at the economics: A support professional (possibly an ex-end user who has decided to play computer junkie — more likely a systems analyst) would be paid about $35,000 per year. The loaded cost of such a professional in corporate America would be at least $50,000 (and more likely close to $70,000) per year. Remember, this person will need a fully configured PC plus a copy of each software package he supports.

Let us assume that he does nothing but answer micro software questions all day long, and let us also assume he actually works a normal 225 days per year (taking into account time off for weekends, vacation, sick leave and training). We would guess he might be able to handle 20 queries per day, if they are not all tough ones and if he works really hard. That is 4,500 questions per year, for a per-question cost of $11.11 to $15.15.

Assume that each user uses three different software packages and asks one question about each package per month (a very conservative model). That is 36 questions per year, or $400 to $560 per user per year. And it means you would need a support person for every 125 users, just to provide software support. You would still need other support people for training, bringing up whole new applications, writing custom software, ordering hardware and software, installing, troubleshooting and so on.



By AMY D. WOHL

Wohl is president of Wohl Associates in Bala-Cynwyd, Pa., and editor of "The Wohl Report on End-User Computing" newsletter.

Buying software support

An alternative to in-house support has recently become available: You could buy software support. So far, two possibilities are active.

Some vendors are offering separate, for fee, software support. This is different than the 800-number and the by-the-hour, what-is-your-Visa-card-number support that has been offered so far. Generally, it is a contract by user or by organization, geared at offering a specific amount of total time or a specific number of phone conversations. Access to senior support staff is often offered, and the vendor generally promises a "no-busy-signal" level of service.

Since such support should be profitable to the vendor and, at the same time, helpful to the customer, expect announcements of such programs to be a common occurrence in future months. Some very large software firms are moving to this type of service, and their policies tend to set the standards others follow. Since this is a relatively new idea, fee schedules are not yet well understood, but software vendors seem to plan to charge more than the next alternative but less than the cost of in-house support.

Also, a new kind of software service organization is starting. Personified by Debby Fain's Micro Support Resource Corp. (MSR) of Atlanta, such firms provide a contractual service to end-user organizations, offering a fixed number of calls for a set fee. Fees are quoted per software package, but MSR will offer to support multiple packages at a discount.

And look at the economics: MSR contracts to service 20 calls on a particular package for $100. That is $5 per call, for a hefty savings over in-house costs. Also, MSR maintains an on-line data base of troubleshooting information by customer and by package, making some questions much quicker and easier. A known bug, for instance, could be quickly diagnosed and a fix identified.

Also, third-party service providers can have special relationships with software firms, with better access to technical information than all but the largest end-user organizations.

Further, organizations like MSR are likely to be the technical backup for smaller firms, unable to provide staff for in-depth support, providing service to end users through fees paid by both the software vendor and, in some cases, the customer.

Good news for customers

All this is good news for software buyers, who badly need a way of providing their users with good support without drowning in the costs. Also, the better leveraging of a service-only organization, with its ability to provide cross-user information and its access to special vendor support, may, in fact, be a better mousetrap.

In any case, none of the above will change the basic, underlying needs: better software that is more intuitive and easier to use for all classes of users and the careful choice of software packages that each organization will support.

No one, including the new third-party providers, is offering to provide cost-effective support to users who insist on no restrictions to the selection process at all. Selecting small numbers of carefully chosen, broadly attractive packages will continue to offer disciplined organizations the best chance to leverage their PC investments and provide users the best available support.

Only a changing Cobol can answer the challenge of the future

READER'S PLATFORM

By JEROME GARFUNKEL

For many, the Cobol language is falling behind other application generators, in the measure of productivity. People should not and do not use Cobol for sentimental reasons. Those who use Cobol do so because it is a viable and safe application generator. We must, however, take note of all the fourth-generation languages and other high-level tools that abound today and not dismiss them as a passing fad of our industry. They were created and succeed in the marketplace because there is a demand in our DP industry for high-productivity application generators. Cobol is our most important application generator.

While many applauded the long-awaited update to the Cobol language, Cobol 85, there were others more vocal and more organized who could not justify any changes in Cobol. More important, they could not manage those changes, regardless of how beneficial they may prove to be.

The National Bureau of Standards published a 75-page cost/benefit study of Cobol 85 that concluded that the benefits to cost ratio is 5 to 1. Some, including myself, believe that this will prove to be a conservative estimate over the next 10 years. In spite of this study, it was the argument over potential incompatibilities that captured the public's attention and caused a four-year delay in the introduction of Cobol 85.

To accommodate both sides of the debate, the addenda process of enhancing Cobol was proposed and adopted as a means of keeping Cobol up to date while introducing minimum incompatibilities. Every two or three years, some new compatible features would be added to the official Cobol language, leaving manufacturers free to include or exclude these new features in their Cobol 85 compilers.

It is expected that normal market forces will cause these advanced features to be included in many compilers. Then in 10 to 15 years, the Cobol 95 language would be fully revised, with syntax and semantic corrections and perhaps some new features. At that time, the optional addenda that had been developed during the interim period can be considered for permanence in the new Cobol standard.

The net effect will be to introduce new features to the Cobol community years sooner than they otherwise would have occurred. For many who have not given up on Cobol as their main application generator, this is essential.

Some of those who argue that the addendum process for updating Cobol is too confusing and complex are the very ones who have contributed to making it confusing and complex.

Others who argue for an early full revision of Cobol are naive to think that the recent uproar over potential incompatibilities in Cobol 85 would not be repeated if the language were to be revised in the five-year cycle as previously called for.

There are some who are opposed to updating Cobol at all. They believe Cobol is good enough as it is and does not need to be kept up to date with current programming methodologies. Perhaps their real fear is being overwhelmed by the task of managing the changes — lacking either the expertise or the budget. To this group I offer some recent advice from Grace Hopper:

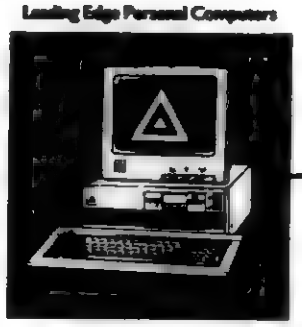
"Continually look ahead to absorb the new concepts and implement the new things. Don't ever say, 'Well, we have always done it that way.' That is the deadly thing that kills systems and managers. Just as in the automobile industry or aircraft industry, it's a changing industry. You can't sit back. Imagine what happened to the people when the Model T Ford came out — some people said, 'Get a horse.'... There were always people who wouldn't change their minds and move forward with the new things."

Garfunkel is a Cobol 85 consultant who, as a member of the ANSI X3J4 Cobol committee, was a central figure in the birth of the language.

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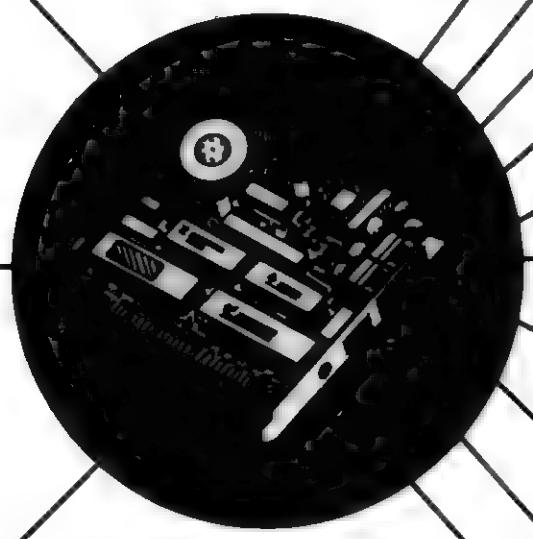
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MICROCOMPUTERS



MICRO BITS
William Zachmann

Practicality key to integration

If you believe the pompous pronouncements of the more ponderous industry pundits, the integration of office systems is something like the quest for the Holy Grail — an infinitely desirable goal nearly impossible to attain. Yet an astonishingly large number of consultants, seminar givers and article writers have made a business out of encouraging users to seek panaceas that promise office integration.

"You can't," as the Rolling Stones' Mick Jagger puts it, "always get what you want,/But if you try sometimes, you just might find,/You get what you need." It is hard to find a better way to characterize the state of office systems integration.

While the "everything solution" remains nowhere in sight, some practical solutions to specific integration problems are available. Though these products do not provide an elegant, simple and total solution, they offer more than enough to make the practical integration of office systems readily available to those users who really want it.

An excellent example of this is the Keyword 7000 Document Translation System from Keyword Office Technologies, Inc. of Calgary, Alberta.

Including both hardware and software, the Keyword 7000 could be described as a specialized expansion chassis for the IBM Personal Computer, Personal Computer XT, AT and compatibles with supporting software that makes it very easy to translate

See PRACTICALITY page 23

Zachmann is vice-president of research at International Data Corp.

Datablocks builds process control one piece at a time

By Douglas Barney

ALAMO, Ga. — A new concept in microcomputer-based process control was recently announced by Datablocks, Inc. Dr. Ed Roberts, creator of the Altair 8800A (introduced in 1975 and considered one of the first personal computers), developed the product and formed the firm last year to get it to market.

Dubbed Datablocks A-II, the system allows users to build process control systems by adding only the modules needed. More than 30 different stackable hardware building blocks are available including the central processor and memory unit, a random-access memory (RAM) disk, floppy disk and hard disk controllers and drive, power supply, programmable read-only memory (PROM) disk and PROM programmer and voice recognition and synthesis.

The product also includes its operating system, Artdos, specifically designed by Datablocks for process control.

Datablocks A-II handles a wide variety of process control applications, ranging from controlling robots, turning furnaces on and off, making sure tropical fish do not get too hot or cold and maintaining solutions in film processing, explained Jim Bybee, executive vice-president of engineering for Datablocks.

Other applications might include the control of security systems, production line automation, remote data entry stations and data logging systems.

The implementation of process control devices is simple in concept, according to Bybee. "You hook up a processor to monitor different sensors and then take appropriate action based on what is read in those sensors."

The problem, however, is that current products have been difficult to program and have not been flexible. "There is very little available that allows users to put together a development system using the tools that you will be using for doing the actual control," Bybee said.

"Normally," he added, "with your sin-

See DATABLOCKS page 20

Gold Hill to broaden LISP line

By David Bright and Eddy Goldberg

CAMBRIDGE, Mass. — At the American Association for Artificial Intellegence Conference this week in Philadelphia, Gold Hill Computers, Inc. is expected to broaden its LISP-related offerings by announcing an Intel Corp. 80386-based add-on development system for the IBM Personal Computer XT and AT, an expert system building environment for the PC AT and a Transmission Control Protocol/Internet Protocol (TCP/IP) network linking LISP machines to engineering workstations, minicomputers and mainframes.

Gold Hill will announce Acorn, a three-tiered software tool for building expert systems on PC ATs and compatibles. Acorn, based on Gold Hill's Golden Common LISP 286 Developer, is intended to allow novices, developers and high-level AI programmers to develop and deliver expert systems on conventional processors. Applications using up to 15M bytes of memory can be built with Acorn, which the vendor claims is the largest expert system building tool available for personal computers.

The top layer is an expert system shell that provides a user interface for easily describing objects and expressing rules and relationships.

The middle level is a tool kit, in which the knowledge representation language is available to the developer. This level requires more programming ability but allows more flexibility.

The lower level is Common LISP and is intended for AI programmers able to use the full power and flexibility of the language.

See GOLD page 22

INSIDE

Leading Edge Hardware Products adds memory to its Model D Personal Computer/20

Crosspoint Systems product line allows PCs to share peripherals/20

NEW THIS WEEK

- AST Research offers Turbolaser printer for PCs
- For more on this and other new products, see pp. 77-90.

INSTANT ANALYSIS

"By year end, Ashton-Tate will have lost 30% to 50% of its development market to compilers like Nantucket's Clipper. They are protecting their revenue base by losing their customer base."

— Marty Rinehart, chairman, Wallsoft Systems, Inc., referring to Ashton-Tate's lack of a Dbase compiler

Oracle's SQL★Calc makes a relational DBMS as easy as 1-2-3.

Oracle Corporation has developed a Lotus 1-2-3 compatible spreadsheet and integrated it with its ORACLE® relational database management system (DBMS). The new product, SQL★Calc,® is the first to combine a mainframe-class relational DBMS with an easy-to-learn and familiar PC spreadsheet user interface.



SQL★Calc is designed for 1-2-3 users who've run out of memory, flexibility and patience. SQL★Calc allows you to put SQL database commands into spreadsheet cells...just like formulas. This permits you to access large amounts of data directly from your spreadsheet.

Like all Oracle Corporation products, SQL★Calc runs identically on mainframes, minicomputers and PCs.

SQL★Calc's foundation is the ORACLE relational DBMS, which provides users with a complete set of SQL commands through which they can create, retrieve, modify and otherwise control their data. SQL is the industry standard database command language for large computers. The SQL commands available in ORACLE are identical to the SQL commands in IBM's premier mainframe relational DBMS products, SQL/DS and DB2.

Built on this powerful DBMS foundation is a Lotus 1-2-3 compatible spreadsheet that allows users to put SQL commands into spreadsheet cells in the same way as they enter formulas. When a SQL command for data retrieval is entered into a spreadsheet cell, information is automatically retrieved from the database and placed into the spreadsheet. SQL★Calc also permits users to modify the database–and even create new database tables–directly from the spreadsheet.

SQL★Calc is easy to learn because its menu and command structure are compatible with those of Lotus 1-2-3. And SQL★Calc's ORACLE DBMS requires no supplement: It is vastly more powerful than the database components of 1-2-3, Symphony, Framework, dBase II, dBase III, or any other PC DBMS.

SQL★Calc is available immediately for IBM PC/XTs and ATs for $995.* SQL★Calc will soon be available on a wide variety of systems, including IBM mainframes, DEC, DG, and other superminis, and most UNIX systems.

For further information, or to order your copy of SQL★Calc, call 1-800-345-DBMS. Or write Oracle Corporation, Dept. CS, 20 Davis Drive, Belmont, CA 94002.

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Datablocks builds a piece at a time

From page 19

gle-board computer, you buy a development system that might run on an IBM Personal Computer or a Digital Equipment Corp. VAX. We have the whole development process take place right within the Datablocks itself, and then they can be used for the control application. Plus you can replicate a subset of those blocks that you have in the development system, and control several houses, boilers, or oil wells or whatever."

Datablocks A-II can control up to 65,000 different devices, the firm said. Because the system is based entirely on CMOS components, it can be battery operated or include battery backup.

Software developers can write programs in XYBasic, C, Assembler, or the process control language using a keyboard, a CRT and the Datablocks A-II CPU. Those programs can be stored on a floppy or hard disk or burned into PROM, the firm claimed. In addition, the system can reportedly run CP/M software.

Users are pleased with Datablocks A-II so far. Lifeboat Associates, Inc., a software developer based in Tarrytown, N.Y., is using Datablocks A-II to monitor the accuracy of data transferred over radio waves. "We needed the ability to pick up the transmitted signals, check them and determine whether they should be retransmitted before they are put in the PC," said Eddie Currie, chairman of Lifeboat.

With conventional personal computer technology, checking these data transmissions for accuracy was impossible, according to Currie. "There is no bridge to go from the PC into the real world. Datablocks, however, is a system that interfaces between an IBM PC and the real world," Currie said. "They have such a complete set of building blocks that you really don't need anything else."

Hallmark Electronics Corp., a computer products distributor in Dallas, will be selling Datablocks for specific applications. "We have developed a dedicated computer application where the firmware provides the customer with a screen on which they fill in the blanks via menus," said R. B. Fietz, systems manager for Hallmark.

Fietz used an insurance agent as an example. "When a person wants to order an insurance policy, the insurance firm may send a message to a wire service to make sure the policy is ordered. They fill in the blanks of a questionnaire on a screen that goes to the wire service. Datablocks A-II would provide the protocols for signing on and signing off the wire service system and keep track of those transactions for the insurance provider," he said. Fietz declined to disclose what applications Hallmark is developing.

Simplicity of operation is one of the key attributes of Datablocks A-II, according to Fietz. "The user doesn't have to load any software or boot up a program to activate a modem, or something like that. It can be an automatic, all-firmware-generated sequence of events for users that are not sophisticated," he said.

"PCs are just not as adaptable," Fietz continued. "You have to prototype the application, get someone to burn it into an erasable programmable read-only memory (EPROM) and buy an EPROM board." Datablocks A-II allows users to burn their own applications into PROM.

With Datablocks' voice recognition module, users can verbally command the system to monitor certain devices or take appropriate action. The $566 voice recognition block has a vocabulary of 512 words.

The Basic Development System, consisting of a central processor block, PROM/RAM combination disk block, PROM programmer, XYBasic interpreter, Artdos and heavy-duty power supply, sells for $1,600. There is an introductory discount that enables early buyers to get that configuration for $981.

Leading Edge ups PC RAM

Expandable to 768K bytes on motherboard

BOSTON — Leading Edge Hardware Products, Inc. last week enhanced its Model D Personal Computer.

The machine, which still sells for $1,495, now comes with 512K bytes of random-access memory (RAM), up from 256K bytes.

In addition, the machine is expandable to 768K bytes of memory on the motherboard, according to Leading Edge.

The Model D Personal Computer includes the Leading Edge Model L 1,200 bit/sec. internal modem, a spreadsheet and Leading Edge word processing software.

According to the vendor, the original Model D with 256K bytes of RAM and two floppy disk drives will now sell for $1,295 and will include Leading Edge word processing software.

Both systems come with a 15-month warranty and include a monochrome monitor.

Micros share peripherals via switch

EUGENE, Ore. — Crosspoint Systems today announced a line of products that allow personal computers to share peripherals.

The Crosspoint 8 is a $795 software-controlled data switch for personal computers that allows up to eight PCs or peripherals to be connected and to share or add peripheral devices. The $495 Crosspoint AB+ allows up to seven peripherals to be added to a single PC.

The products can be configured through pop-up menus, and each PC can handle up to 16 applications.

In addition, the user can define settings to make particular applications work with specific host computers, plotters or modems. For example, a user could configure the system to automatically send spreadsheet output to a dot matrix printer, graphics output to a plotter, data base output to a mainframe and communications output to a modem.

Both products work with IBM and compatible personal computers. Crosspoint 8 will be available next month. Crosspoint AB+ will be available in October.

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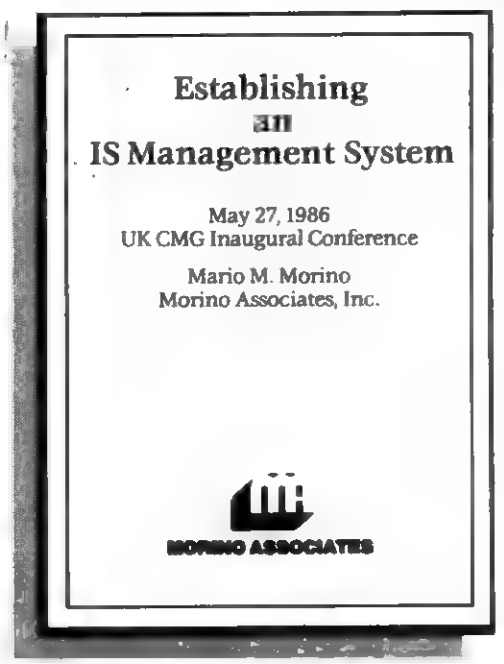
That leadership was recently reconfirmed by the keynote speech delivered by our president, Mario M. Morino, at the inaugural conference of the U.K. Computer Measurement Group (CMG).

It's a paper you need to read if MVS is now your organization's primary operating system. Or if you plan to migrate to MVS. It provides a practical, and proven, approach to *Establishing an IS Management System*—the basis for managing IS as a business. And you know the problems inherent in that task!

Yes, the speech covers the potential pitfalls. Success factors, too. Plus definitions, requirements, and recommendations. All these and more are included, and a copy is yours for the asking.

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Gold Hill to broaden line

From page 19

Gold Hill will market Acorn as a microcomputer-based alternative to developing expert systems on more expensive, dedicated symbolic processing machines. One target market will include domain experts such as engineers, doctors and financial analysts interested in developing an expert system based on their own knowledge.

A step-by-step, on-line tutorial is provided for beginners to introduce them to expert system development.

Acorn components include a complete LISP environment with interpreter, compiler, an inference engine, knowledge representation language, graphics module, interface building facilities and browser.

Technical features include forward and backward chaining, frame-based knowledge representation, power screen generation, mouse support, hooks to PC tools, certainty factors and an explanation facility.

Open architecture

Acorn's open architecture allows users to directly access data from products such as Ashton-Tate's Dbase II and Dbase III and Lotus Development Corp.'s 1-2-3. Acorn is scheduled for first-quarter 1987 availability and will be priced at $5,000.

In addition, Gold Hill will announce a product developed jointly with AI Architects, Inc. of Cambridge, Mass. Dubbed the 386 Hummingboard, the product is intended to help software developers, corporations, value-added resellers and OEMs develop and deliver large AI applications. The board comes bundled with Gold Hill's GCLisp 386 Developer and as much as 24M bytes of on-board memory.

According to officials at the two companies, the 386 Hummingboard cost-effectively converts a personal computer into a high-end LISP machine. Built around a 16-MHz Intel 80386, the board enables a PC XT or AT to run GCLisp approximately five times faster and greatly speeds the critical edit-compile-debug loop.

"The 386 Hummingboard offers an unprecedented level of LISP machine price/performance," claimed Richard Mark Soley, president of AI Architects. "Running GCLisp, the 386 Hummingboard is the first affordable LISP delivery engine powerful enough to run the most demanding applications. The 386 Hummingboard is also an excellent productivity tool for program development."

LISP applications require large memory spaces for development, said Eugene Wang, Gold Hill marketing vice-president. Therefore, the Hummingboard uses either 256K-bit or 1M-bit dynamic random-access memory chips (RAM) to bring memory up to 6M bytes or 24M bytes, respectively.

The board's 32-bit memory data paths and 2K-byte high-speed cache memory yield a processor/memory cycle time typically seen in superminicomputers, according to Wang.

When the board is used, the host PC's processor becomes an I/O processor. Included in the package is an interface for sharing memory with the host processor according to the Lotus/Intel/Microsoft Expanded Memory Specification.

Using the GCLisp Network TCP/IP that is set to be announced this week, developers can integrate their existing applications with other systems and develop distributed AI applications.

Machines expected to be included in such networks include those in Symbolics, Inc.'s 3600 family, Texas Instruments, Inc.'s Explorer line, Digital Equipment Corp.'s VAX systems and Sun Microsystems, Inc. workstations.

GCLisp Network TCP/IP will be available in the fourth quarter for $495 per node.

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IBM ASCII terminals:

The case in black and white.

Introducing a somewhat more colorful member of the family.

Meet the IBM 3164 ASCII Color Display Station.

It gives you eight foreground and eight background colors. On a 14" screen.

And because of its 8 x 16 character matrix, the 3164 gives you clear, crisp characters in color.

But is color any reason to buy IBM's 3164? It is, according to studies that indicate the use of color increases productivity, decreases errors and promotes user satisfaction.

Color, of course, is far from the sole reason for choosing the 3164. To appreciate the others, you should get to know the rest of our ASCII family.

Emulation. Another side of the family.

Our ASCII terminals are designed to fit into existing systems. Even if the systems aren't ours.

Emulation Capability	
3161	IBM 3101 Model 881 ADDS Viewpoint* Hazeltine 1500* Lear Siegler ADM-3A* Lear Siegler ADM-5* TeleVideo 910*
3163	IBM 3101 Model 881 DEC VT 52* DEC VT 100* TeleVideo 950*
3164	IBM 3101 Model 881

For example, our basic ASCII Display Station, the IBM 3161, emulates up to six terminals. And the advanced-function 3163 emulates a number of higher level ASCII data streams.

Features	3161	3163	3164
Screen size	12"	12"	14"
Lines x characters	25x80	25x80	25x80
Character matrix	8x16	8x16	8x16
Double-sized characters	No	Yes	Yes
Line drawing characters	24	24	24
Vertical scroll	Jump	Jump/ Smooth	Jump/ Smooth
Definable function keys	24	24	24
Windowing	No	Yes	Yes
Partitioning	Horiz.	Vert./ Horiz.	Vert./ Horiz.
Characters in buffer	1920	7680	7680

What's more, every one of our ASCII terminals can operate in its own function-rich native mode.

Our family is flexible.

Our unique plug-in cartridges allow for considerable flexibility in your operation. For example, simply by switching cartridges you can shift a terminal from one data stream to another.

And, in many countries cartridges are also available that go beyond emulation to let you operate your ASCII terminals in several foreign languages. Appropriate foreign language keyboards are also offered.

Enhanced ergonomics. Another family trait.

All our ASCII terminal keyboards have 102 keys. But that's not all they have in common. Every keyboard also has a low profile, gentle contour and typewriter touch.

And our keyboards have programmable function and editing keys so they can be custom-tailored to fit your application needs. The 3163 and 3164 models also have redefinable and recappable keys.

Superior ergonomic design isn't confined to the keyboard, however. All three displays tilt and swivel for maximum user satisfaction. And, of course, by making the display easy to read, we made it easier on the eyes. In addition to the 8 x 16 character matrix, we gave it an advanced non-glare etched screen, cursors, and character and field attributes like blink, reverse video, underscoring and dual intensity.

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Practicality in integration

From page 19

documents from one format to another.

The Keyword 7000 hardware includes a controller card and expansion chassis with its own power supply that can be configured to hold up to two 5¼-in. floppy disk drives along with two 8-in. floppy drives.

The software is a collection of translation routines that run on the PC and compatibles and take advantage of the hardware to offer document conversion among different formats on different media.

Keyword has succeeded in providing a practical way for user organizations employing a variety of word processing systems and software to exchange documents. The product supports a multitude of formats, including AES/Lanier; DEC Decmate; IBM Displaywrite, Displaywriter, OS/6, DCA and 5520; NBI 5¼-in. and 8-in. formats; and Wang PC MS-DOS and CP/M formats.

Conversions

Of course, conversion between different IBM and compatible PCs' 5¼-in. Microsoft Corp. MS-DOS floppy disk formats is available.

In addition to conversion routines built into many personal computer word processing systems, there are conversion tools available from third parties. Keyword itself offers Softpak, a $449 software-only alternative.

What these alternatives don't do, and what Keyword does very well, is provide conversions between physically different media.

For example, I do much of my writing on PCs, either in my office or at home. The main tool at International Data Corp., however, is an older word processing system that uses 8-in. disks.

The Keyword 7000 provides a very convenient way to move documents back and forth between the various personal computers I use and the office system.

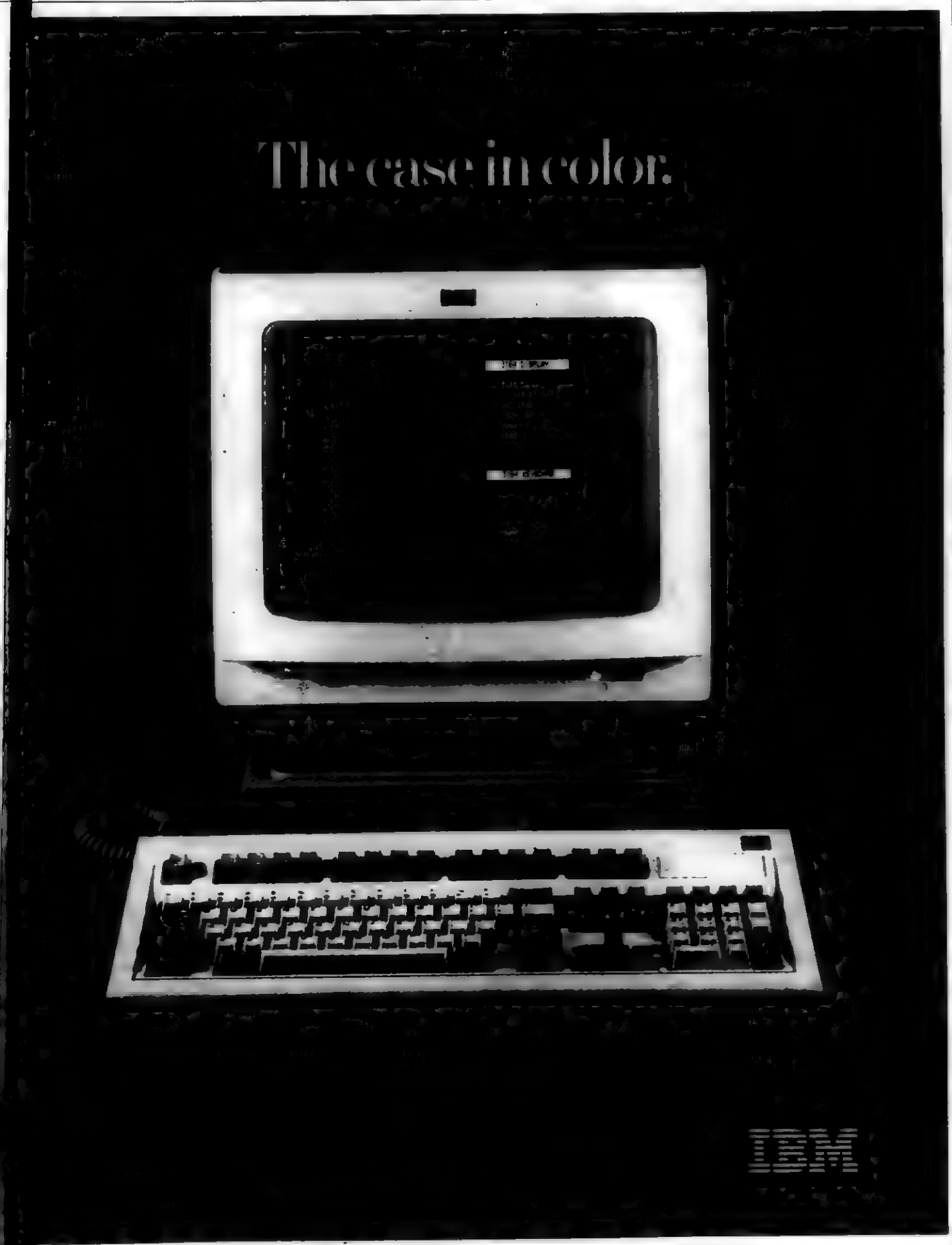
The Keyword 7000 isn't exactly sold at giveaway prices. The product starts at around $4,000 and can run to some $10,000 for a four-drive system with all the bells and whistles.

Still, if getting back and forth between different logical and physical disk formats is a requirement for your operation, the Keyword 7000 is worth considering.

In the real world, there is seldom a need for everything to talk to everything else. On the contrary, the real need is generally for a relatively limited number of specific document conversion paths, along with the ability to easily add others as required.

This reality was recognized in the configuration and pricing of the Keyword system.

You do not have to buy the everything solution at the everything price. Variable configurations make it possible to get just as much as you really need to solve the problems you really have. Additional capabilities can be added later if necessary.



HP rolls out voice manager for the office

PALO ALTO, Calif. — Hewlett-Packard Co. recently announced Office Talk, a $995 voice communications manager for the HP Vectra, IBM Personal Computer AT and compatibles.

Office Talk is based upon a software application and an I/O card and provides voice messaging, telephone management, a memo pad and an appointment diary. The system can answer the telephone, greet callers, take and forward messages and make calls.

The Office Talk software was developed by HP, and the hardware was developed by Natural Microsystems Corp. of Natick, Mass.

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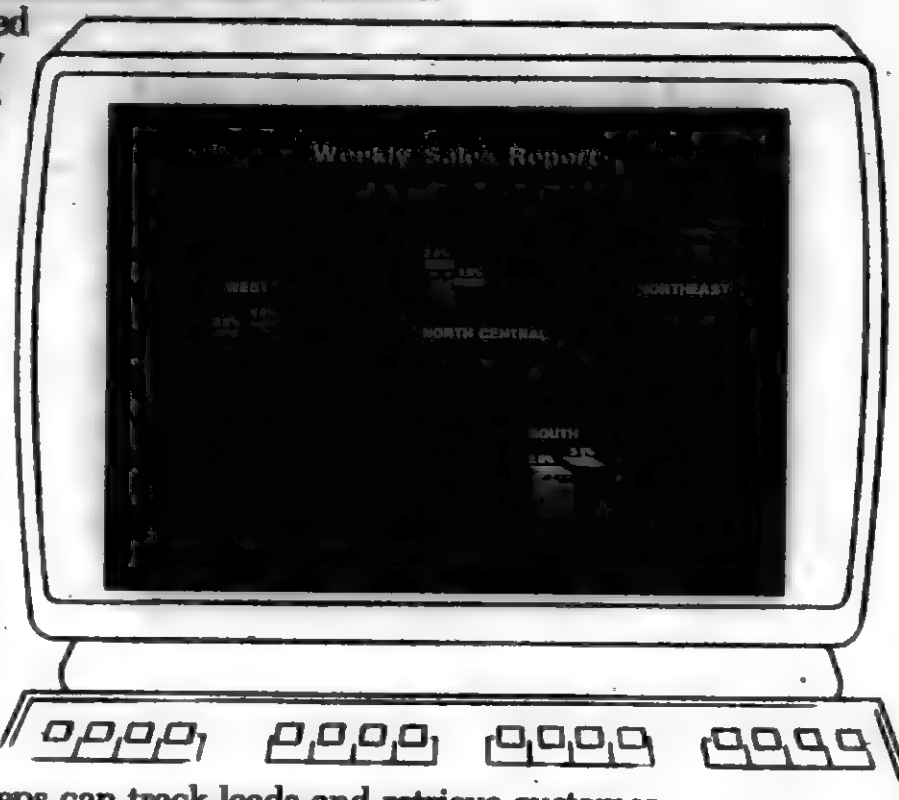
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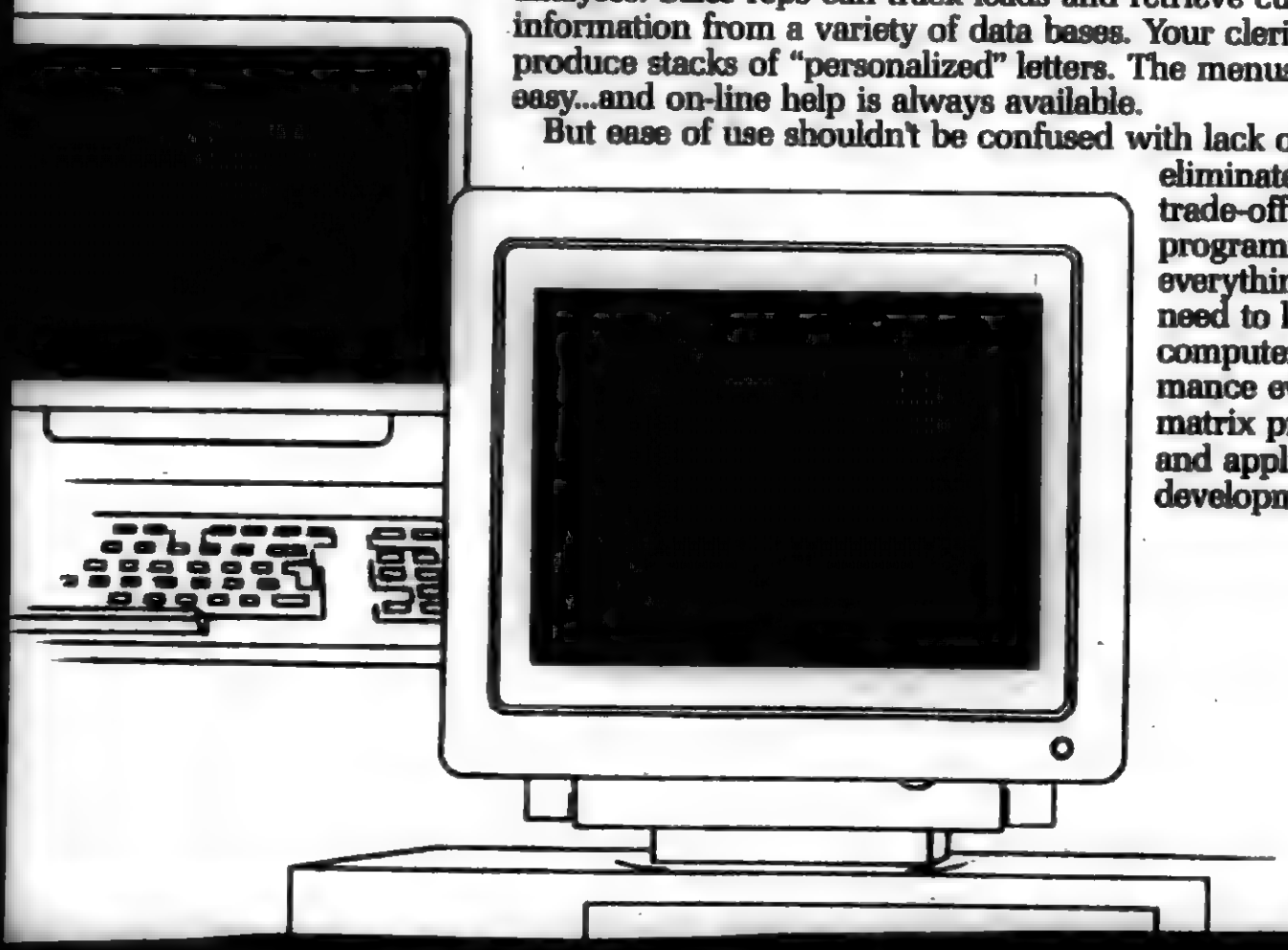
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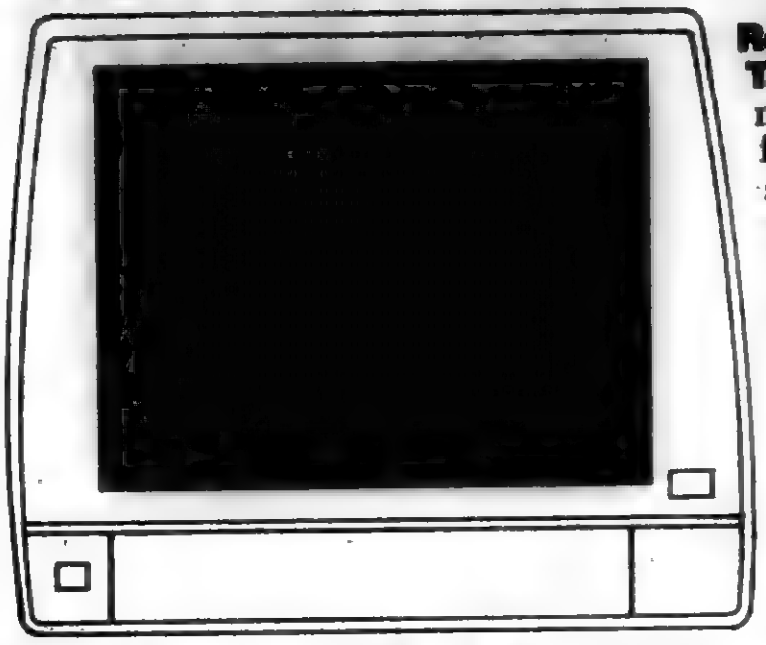


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But ease of use shouldn't be confused with lack of power. We eliminated that trade-off by giving programmers everything they need to handle computer performance evaluation, matrix programming, and applications development.



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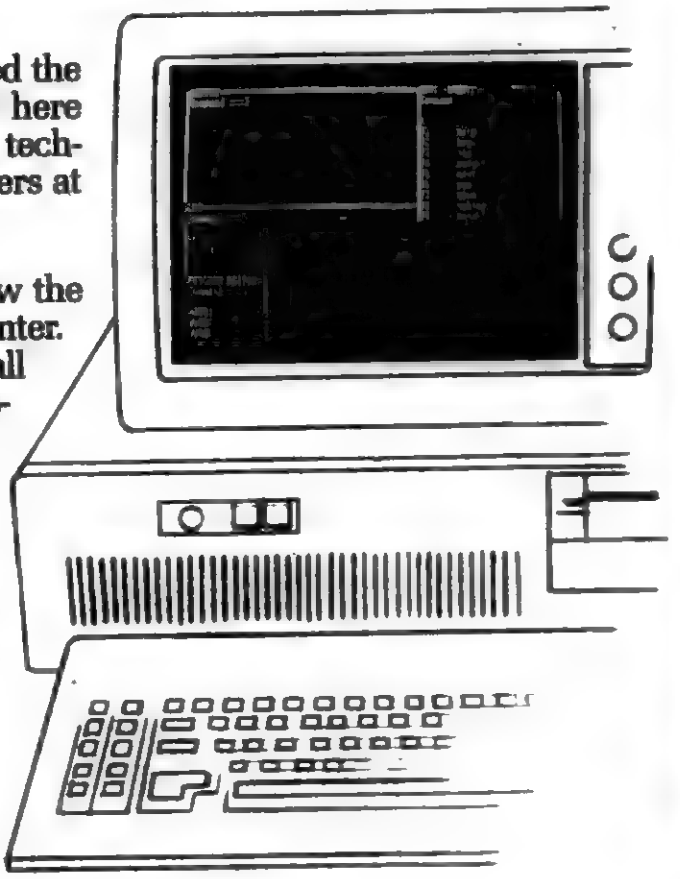


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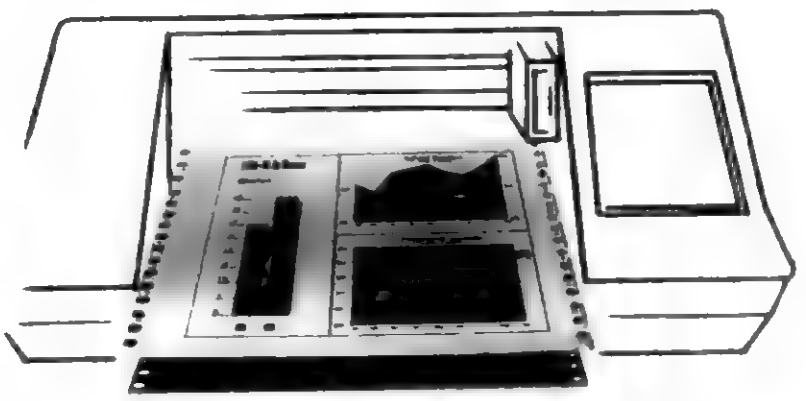
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Especially when the going gets tough. And rough. As it often does in a DOS environment.

For example, a smart cookie doesn't crumble under the pressure of too many programs and too few programmers.

A smart cookie doesn't waste dough — but picks and chooses the right ingredient to keep production on the rise.

And sometimes, even, a smart cookie has to be a mighty tough cookie. That means being on the job constantly. Keeping things running and humming. Without draining vital resources.

All of which brings us to our smart cookie: SyncSort DOS. A cut above the rest if you ever saw one. Check these delicious advantages.

BETTER PERFORMANCE

Pop one into your system and you'll see a mouthwatering difference. Immediately. SyncSort DOS will give you performance improvements like those shown in the chart on the left.

And performance features such as:

- **Automatic Secondary Allocation** — With this feature your sorts will never run out of disk space, i.e., no "sort capacity exceeded" messages.

BETTER FEATURES TO IMPROVE PROGRAMMER PRODUCTIVITY

As you begin to digest SyncSort DOS, you'll find it more and more to your liking. With ingredients that cut down to size the amount of programming time going into applications.

- **SortWriter** — A powerful tool that can produce extensive reports as a by-product of your normal sorting — without user exits and the associated programmer investment. Headers, trailers, total and sub-total capabilities provide flexible formatting.

- **Record Formatting** — Powerful features like INCLUDE/OMIT, INREC/OUTREC, SUM and others — with capabilities like data conversion, editing, insertion of literals.

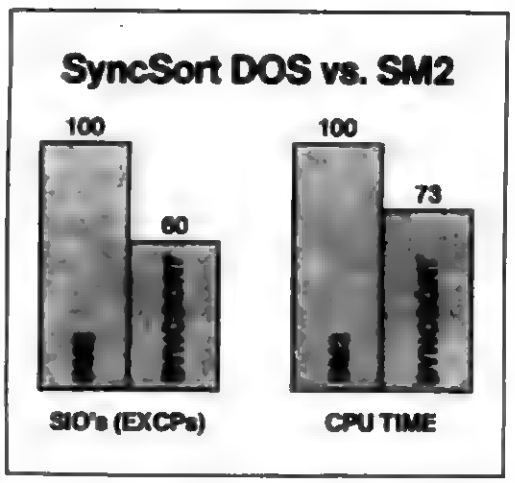
- **Multiple Output** — From a single sorted file, you can create multiple files and reports. Each can include the same or different data as determined by INCLUDE, OMIT, OUTFIL or OUTREC parameters.

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SOFTWARE & SERVICES

SOFTLINE
Paul K. Winter

Three-schema path to future

Much is being said and written about three-schema architecture. What is architecture in this context, and how does it contribute to data base management system (DBMS) design?

In the software context, architecture is a statement of general approach, principle and design philosophy. Architecture is also the layered structures and framework of software. This framework is defined in terms of standards, basic rules and functions, formats, protocols and software interfaces.

Software architecture is a relatively constant point of reference that guides software developers and insulates applications and users from the negative impact of change. The prime example of an architecture and its impact on third-party developers is IBM's Systems Network Architecture, which was announced in 1974.

In this context, then, schema means data view. Three schema suggests three views of data in a given DBMS architecture. The three-schema architecture was defined in 1977 by the American National Standards Institute/Standards and Requirements Committee Study Group on Data Base Management Systems.

In 1975, the study group was formed to investigate data base management systems to determine what DBMS aspects were candidates for the development of an industry standard. The

See THREE page 29

Winter is the manager of standards and quality assurance of the Computer Services Division, City of Toronto.

DEC hopes VAX CAE tools open mainframe site doors

By Charles Babcock

MARLBOROUGH, Mass. — Digital Equipment Corp. has teamed up with independent software suppliers to offer computer-aided software engineering tools on its VAX workstation series.

The move is intended to extend DEC's software development offerings beyond its own tools, particularly in the systems analysis and design phases.

By strengthening its product line, DEC plans to sell more VAX-based development systems to not only its own customer base but also to IBM mainframe sites.

A workstation-based development environment offers the sites the chance to move development off their mainframes, according to Michael P. Kendall, director of computer-aided software engineering marketing.

The tools being offered come from cooperative marketing agreements with Nastec Corp. of Southfield, Mich.; Tektronix, Inc. of Beaverton, Ore.; and Boston Systems Office, Inc. of Waltham, Mass.

Nastec has ported its Designaid package, a structured analysis, structured design and data modeling tool, to the DEC workstation line.

The package was previously available on a Convergent Technologies, Inc. workstation and the IBM Personal Computer AT, according to Kendall.

Programmers using Designaid may create a graphical analysis of a new system and graphically lay out its design and interconnection before coding.

It also includes a design dictionary said to ensure consistency of elements throughout the design process, Nastec officials said.

Designaid will be available in October at a price of $9,900, according to Kendall.

Tektronix has ported its Structured Analysis (SA) tools, Structured Design (SD) and Language Development Systems to the workstation line and VAX family of minicomputers.

SA includes a set of defect-prevention tools that are said to pinpoint errors before design work begins. The tools also

See DEC page 32

DATA VIEW

Leading software firms' stock outpaced industry average

Overall, software and service companies moved up an average 5.2% in April over March closing prices.

Firm	Increase
VM Software, Inc. (VMSF)	33%
Hogan Systems, Inc. (HOGN)	32%
National Data Corp., Inc. (NDTA)	21%
Cullinet Software, Inc. (CUL)	19%
Computer Associates International, Inc. (CASI)	17%

Information provided by E. F. Hutton & Co. Equity Research

Report generator develops code for D & B Nomad2

By Peggy Watt

WILTON, Conn. — D & B Computing Services, Inc. recently announced the Nomad Assistant, a report generator and front end for its Nomad2 fourth-generation language.

The Nomad Assistant provides a menu-driven system to let the user develop Nomad2 code and produce data base management system reports. The reports may be generated from the mainframe data base management systems with which Nomad2 interfaces, including IBM's IMS, SQL/DS, and DB2; Cullinet Software, Inc.'s IDMS;

See REPORT page 34

INSIDE

Henco Software announces a revision of Info DBMS to interface with Data General's CEO/**32**

VM Software performance monitor with expert system capability debuts/**32**

NEW THIS WEEK

- Expertware offers software development aid

For more on this and other new products, see pp. 77-90.

INSTANT ANALYSIS

"In case anyone had any remaining doubts, relational DBMS are taking over the data processing world. Every major DBMS vendor has announced SQL support, with the latest being Cullinet."

— Paine Webber, Inc.'s July 30 edition of "Software Industry Notes"

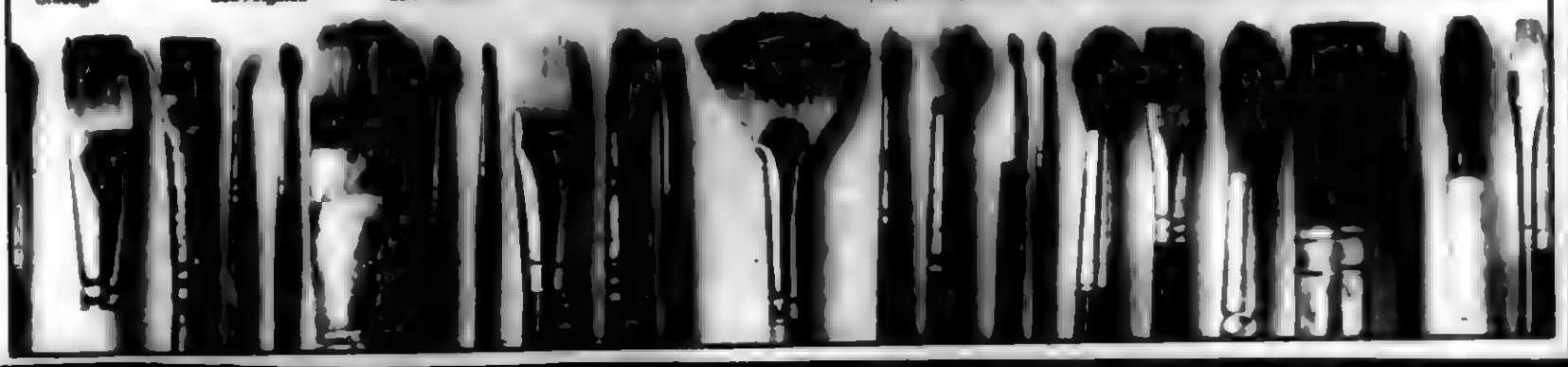
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Three-schema path to future

From page 27

membership of the study group included representatives of Eastman Kodak Co., Boeing Computer Services Co., Exxon Corp., General Electric Co., Honeywell, Inc., IBM and Cincom Systems, Inc. Significantly, the study group rejected all DBMS candidates for standardization. Instead, it published an architecture on which future DBMS development would be based. This three-schema architecture provided for full data item and data structure independence from the use of the data.

Two major areas were not addressed by the group, these being navigation and normalization. Fortunately, E. F. Codd's relational model defined a set theory-based method for navigation, and authors James Martin, C. Gane, T. Sarson and others have published works that provide useful methodologies in the domain of normalization.

Thus, these three major concepts — the three-schema architecture, the relational model and normalization — become the foundation on which DBMS designers should build if the resulting product is expected to have a significant impact on the market and users of the 1980s and early 1990s.

> ***The three-schema architecture, the relational model and normalization become the foundation on which DBMS designers should build.***

There are one-schema DBMS, for example IMS from IBM, Total from Cincom and IDMS from Cullinet Software, Inc. These are all first-generation DBMS. Essentially, the one-schema architecture consists of a stored definition of the data items and structures with a suitable data manipulation language (DML).

In this environment, the programmers became data base specialists because of the overwhelming concern with navigation and serious integrity issues. Clearly, applications received less attention than was necessary. The extensive data base navigation logic was sensitive to data structures, and performance-driven data restructuring was common. Consequently, programs and systems became highly complex, with a significantly increased maintenance burden.

The two-scheme architecture is based on a "conceptual schema," or a set of stored definitions of the logical content of the data base, and an "internal schema," which is a set of stored definitions of the physical content of the data base.

DMLs operate on the conceptual schema level. While the two-schema architecture is an improvement, programs are still dependent on the logical location of the data; that is, relational operators (such as Select, Project and Join) are still dependent upon table names. Still wanting in this system are automatic integrity, rule enforcement, data structure independence, full DML functionality and improved ease of use.

It is not surprising that the three-schema architecture comes with three schemas: conceptual, internal and external. The external schema supports derived views without limitations over the conceptual schema. The conceptual schema has the logical definition of base tables, which are independent from the internal schema. The internal schema deals with the physical data structures, including access methods (such as VSAM and BDAM), indexes, hashing, pointer access, and so on.

The significance of the three-schema architecture lies in the following:

- Full support of derived views, or data structure independence.
- Full DML capabilities (Locate/Replace for Get, Insert, Update, Delete).
- Full support of domains. (Data attribute definitions now include item type characteristics.)
- Automatic and guaranteed integrity enforcement regarding data content, structure and reference.
- An on-line directory or active dictionary.

A DBMS based on three-schema architecture has a layered design in which the first layer (first schema) the application views is independent of the second layer, the base tables (second schema). The base tables are independent of the third layer, the physical files and access methods (third schema). In this environment, all systems and programs must access and update data through the view facilities under the control of the on-line directory.

So, this architecture with the relational model offers unparalleled structure independence, data manipulation functions and automatic integrity enforcement (entity, domain and reference). This type of architecture provides the type of insulation that would allow one to implement significant teleprocessing, direct-access storage device, access method and even corporate data model changes without requiring application maintenance.

A good grasp of a software architecture enables one to predict not just the possible but also the probable software developments in the future. A DBMS based on the three-schema architecture places its vendor and users in a strong and enviable position for years to come.



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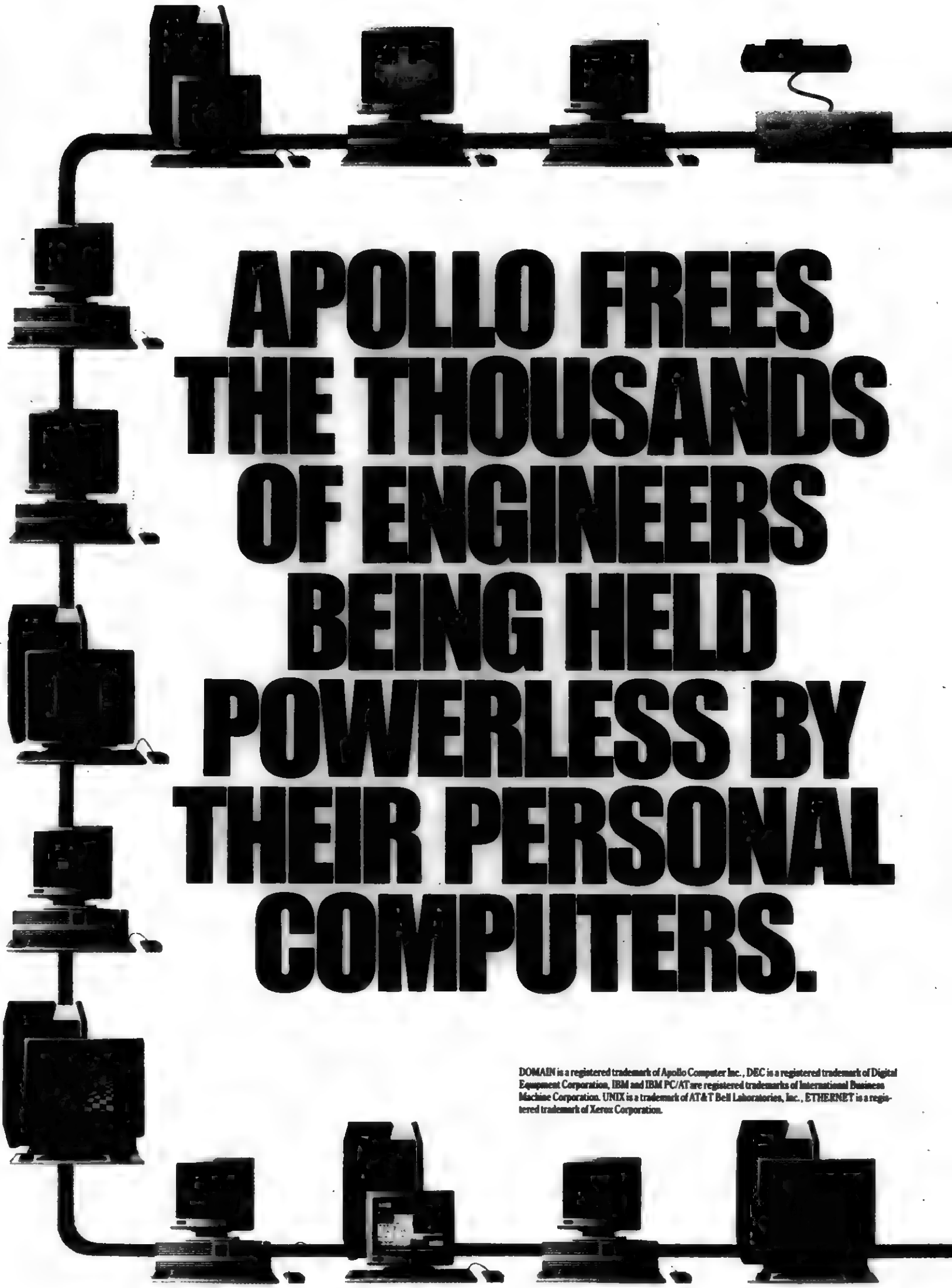
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Henco ties Info to OA system

Can interrupt DBMS, interface DG's CEO

WALTHAM, Mass. — Henco Software, Inc. is offering a release of its relational data base management system, Info, with an interface to Data General Corp.'s office automation system, Comprehensive Electronic Office (CEO).

"Users will be able to interrupt work in Info through a single keystroke to send short messages or view their electronic mail in boxes" in CEO, said Robert Steele, vice-president of sales and marketing at Henco.

Revision 9.41 also has an enhanced interface to the DG file structure, Infos II, that allows a user to read a locked record and use system variables in a key path.

With the Info interface, the following functions can be used: invoking the CEO calculator, monitoring the CEO message status from Info, storing an Info spool file in a CEO file cabinet and creating a CEO list document containing Info items for CEO List Processing.

Revision 9.41 runs on the DG Eclipse/MV series with CEO Release 2.2. It is available immediately at prices ranging from $8,600 to $40,000, depending on system size, said Paula Slotkin, Henco spokeswoman.

Real-time system monitor added to VM Software line

VIENNA, Va. — VM Software, Inc. has added VMMonitor to its product line, an expert system for evaluating VM system performance in real time.

VMMonitor is said to report system variables and analyze how to improve system performance.

The System Automatic Monitor component reportedly can offer prescriptions for performance improvements or invoke system options on its own.

Warning system

The monitor can also warn of impending problems before they cause a system outage, according to VM Software spokesman Gary McClain.

The monitor analyzes performance at three levels: system resource utilization, user analysis and device analysis.

At the user-analysis level, the monitor identifies users who may be contributing to performance problems or who are being hampered by them, a company spokesman explained.

VMMonitor is available immediately at a price of $7,000.

The price will increase to $9,000 after Oct. 31, the spokesman said.



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QUADRAM

DEC hopes CAE tools open doors

From page 27

perform many of the same automated functions as the Nastec line but do so in a manner typical of the Tektronix approach. DEC wanted both tool sets available for its workstations, Kendall said.

The Language Development Systems package includes tools for developing, debugging and integrating software modules and Pascal and C cross-compilers for high-level language programming with microprocessor-specific functions, Kendall added.

SA costs $6,000 on a DEC Vaxstation, and SD sells for $3,000. Language Development Systems is priced from $8,500 to $10,000.

> ***'The three companies make joint customer calls and share each other's expertise.'***
>
> — Michael P. Kendall
> Digital Equipment Corp.

Boston Systems Office has ported its BSO/Planner, a scheduling and planning support tool, to the workstation line and the VAX series. The BSO/Planner is available at a retail price of $2,000 on a Vaxstation.

The three companies have entered into cooperative marketing agreements with DEC, which means they make "joint customer calls and share each other's expertise," Kendall said.

The tools are offered as a complement to DEC's own software development tool kit, which includes the front-end design tool, the VAX Cobol generator and several programming productivity aids.

The set is available at a price of $4,615.

The workstation line on which the tools run is the Vaxstation series, which ranges from the $15,000 Vaxstation II/RC to the $35,000 Vaxstation II GPX.

The workstations include a high-resolution, 19-in. color monitor with mouse and keyboard and run both DEC VMS and the Ultrix version of Unix.

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Natural language query tool bows for DBMS front end

By Charles Babcock

WALTHAM, Mass. — Intellect, a natural language query system from the Artificial Intelligence Corp., is available as a front end to Digital Equipment Corp.'s relational data base management system, RDB.

The Intellect version for the VAX is written in DEC's VAX-C and runs under the VAX operating system, VMS. It is priced at $6,500 on the Microvax and $28,500 on the VAX 8800.

Users are able to specify a request for information in English-style statements to Intellect, an expert system, according to the vendor.

Intellect is then able to recognize such requests and translate them into RDB calls to retrieve the requested data and present it in a formatted report, according to Earle Martin, director of marketing at Artificial Intelligence.

Intellect is also marketed as a natural language front end for IBM mainframe query systems by IBM and Cullinet Software, Inc., according to the vendor.

Intellect has an installed base of 500 licenses, Artificial Intelligence representatives said.

Inference upgrades ART

Expert system dumps 'garbage collection'

By Charles Babcock

LOS ANGELES — Inference Corp. has announced performance improvements in an upgrade of its Automated Reasoning Tool (ART), a programming tool for developing expert systems.

So-called "garbage collection" in ART Version 3.0 has been all but eliminated, Inference spokesmen said. Garbage collection in a LISP program is that portion of the program devoted to searching for available memory.

A LISP programmer working with ART Version 3.0 allocates and releases memory as he would in using a mainstream third-generation language, leaving the ART program free to process without memory allocation, said Chuck Williams, chief technology officer at Inference.

"Performance increases are achieved through elimination of random pauses associated with batch garbage collection and the reduced virtual memory space . . . associated with incremental garbage collection," spokesmen said.

Through the elimination of memory searches and through other improvements, ART Version 3.0 is up to 30 times faster than its predecessor in certain applications, Williams said.

ART Version 3.0 will be available in the fourth quarter for Symbolics, Inc., LISP Machine, Inc., Texas Instruments, Inc.'s Explorer workstation, Digital Equipment Corp.'s VAX and Sun Microsystems, Inc.'s Sun-3. It will be priced at $65,000.

Chances are you don't currently audit your operating system—even though it's ultimately in control of information used to manage your organization. And for good reason.

For the most part, you don't audit the system because the software is just too complex. Then too, certain hard data on system controls is usually unavailable. And a manual review would take weeks to perform, require outside experts, and cost too much.

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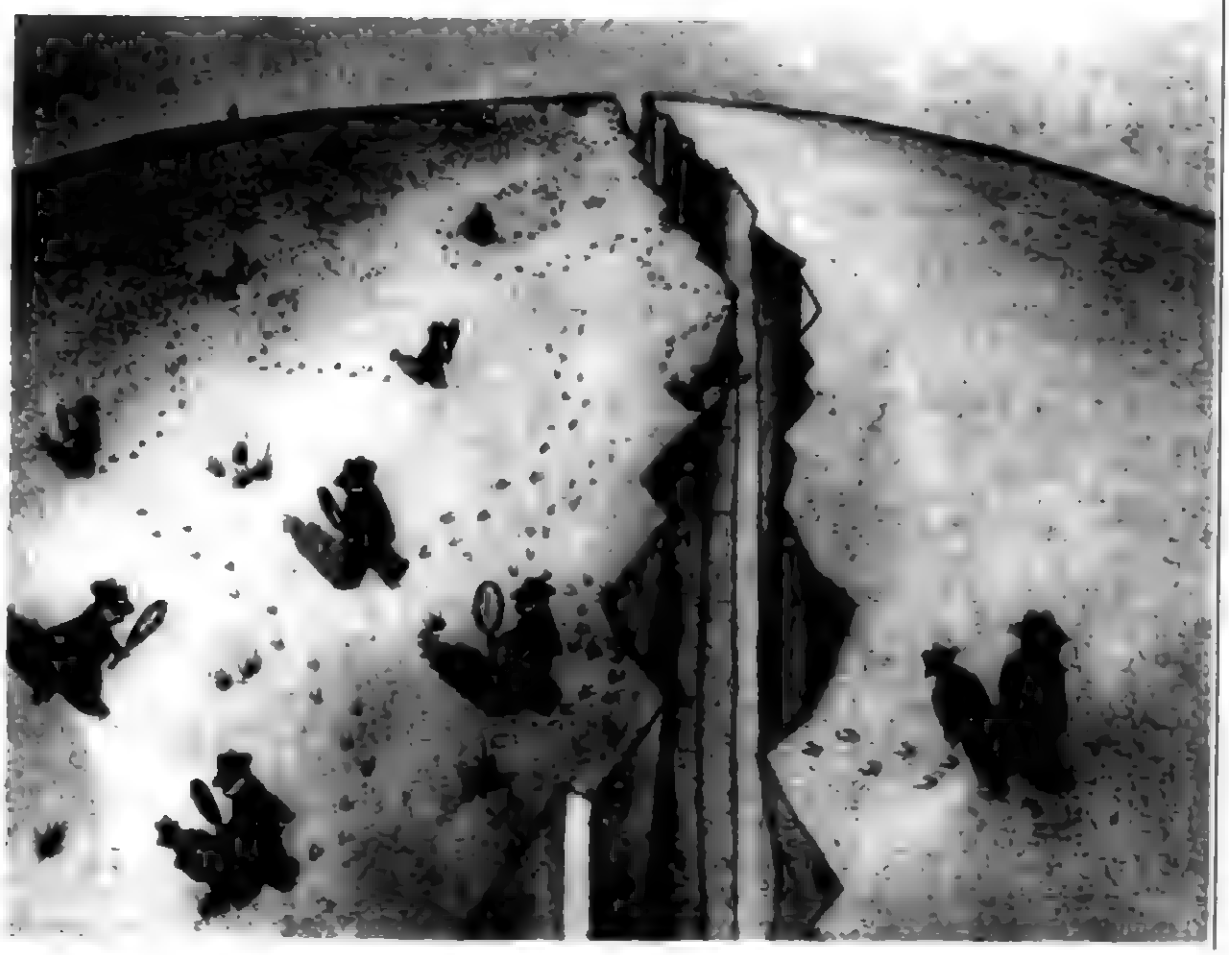
Tighter business controls, more accurate information and improved data center productivity are all key management objectives for the coming decade. AEX2-Examine/MVS software provides a tool to help you achieve these strategic objectives *today*. And positions you to meet your increasingly stringent demand for due care in the future.

For more information, contact Shawn McLaren today, at 1333 Lawrence Expressway, Santa Clara, CA 95051-3595; (415) 941-4558; Telex 357437. AEX2-Examine/MVS is developed and maintained by SKK, Inc., Rosemont, Illinois. [redacted] Examine/MVS and AEX2-Examine/MVS are trademarks of SKK, Inc.

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Report generator for Nomad2 code

From page 27

and others.

Although the user need only make menu choices, the developing program is also displayed in an adjacent window so the user can learn the code in the process, said Robert B. Vonderhaar, senior product manager.

The Nomad Assistant is scheduled to ship Oct. 1 and is intended as an enhancement to D&B's 7-year-old Nomad2, said Frank B. Lee, senior vice-president.

The Nomad Assistant is priced at $7,500 for use with the IBM VM/CMS and MVS operating systems. Nomad2 is priced at $135,000.

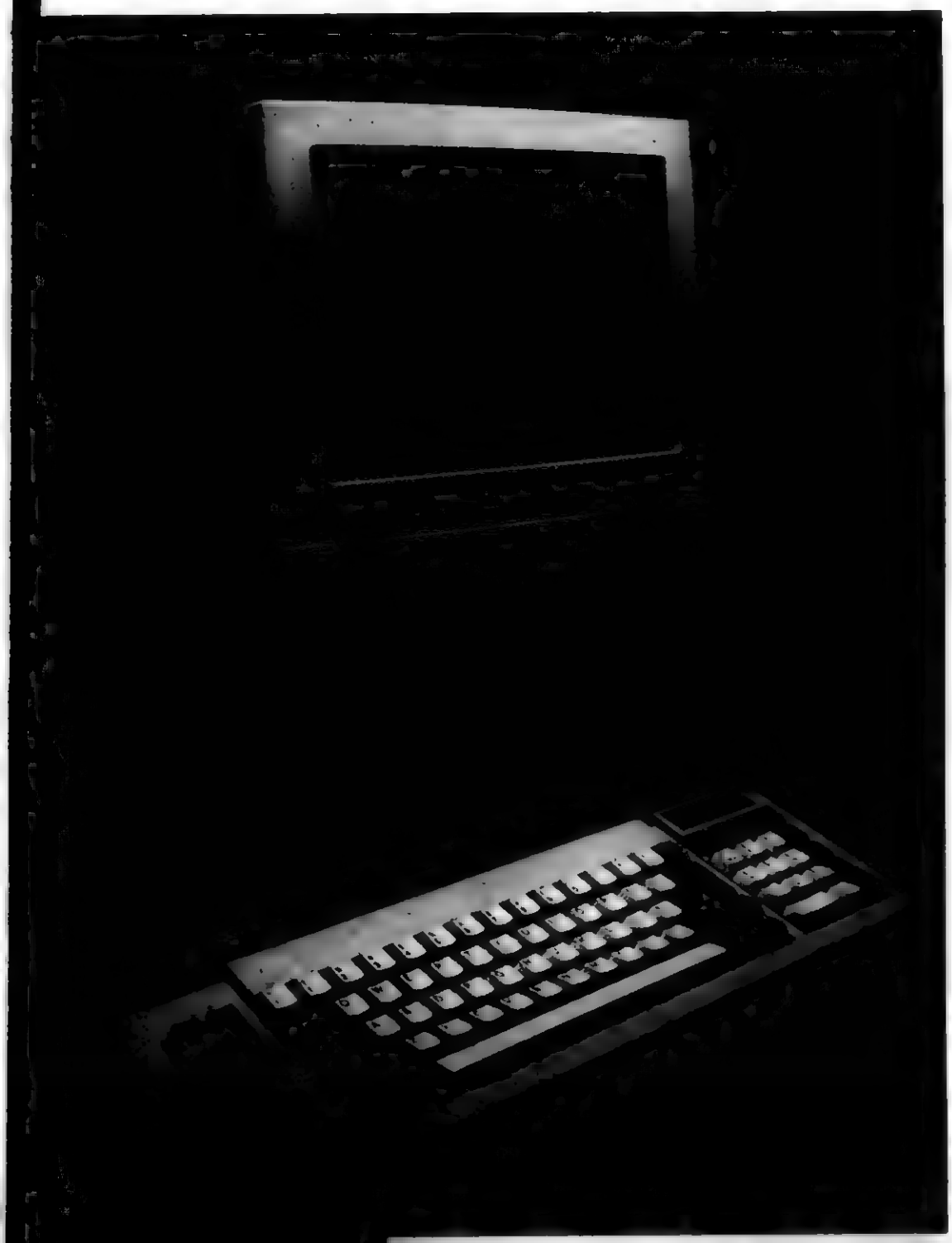
The Nomad Assistant is also different from D & B's previous report generator, EZ Nomad, released two years ago, which was also menu driven, Vonderhaar said. EZ Nomad had been free to users of Nomad2 but, with the release of the Nomad Assistant, will be licensed for $7,500.

The Nomad Assistant includes a catalog that serves as an automatic log of activity for all or any part of a session. An indefinite Undo function allows users to retrace their steps. Multiple windows are available, showing different forms of the work being done. Later revisions can be made with the same screens and commands and do not require a separate editor, according to Vonderhaar.

Also, extensive integrity checks help keep the user from writing contradictory commands or other invalid requests, Vonderhaar added. The Nomad Assistant can be customized with specific menu options or with the sequences of commonly used procedures, according to Vonderhaar.

He added that the latest offering in the Nomad line is an attempt to satisfy the spectrum of fourth-generation language users, which D & B considers to range from the experienced programmer to the user who wants a simple method of solving problems or finishing projects.

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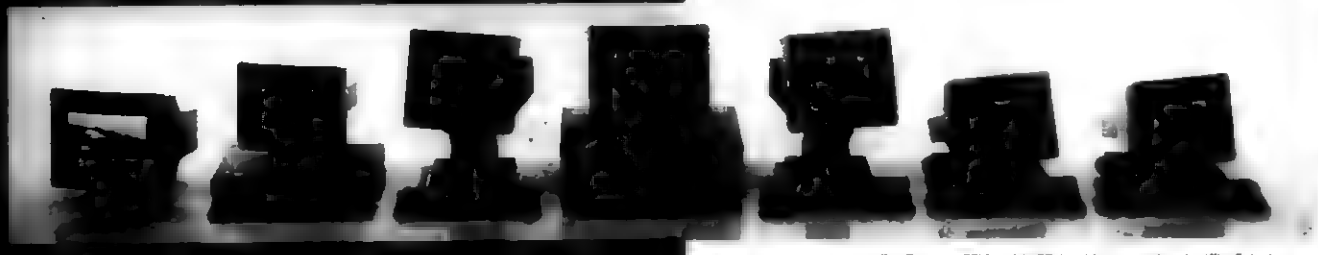
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	Sunnyvale	Oct 1
		Nov 19
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	Shreveport	Dec 10
MA	Boston	Sep 24
	Burlington	Oct 2
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MO	St. Louis	Aug 19
NC	Research Triangle Park	Oct 14
	Winston-Salem	Sep 23
NE	Omaha	Sep 24
NJ	Iselin	Sep 9
NM	Albuquerque	Aug 26
NY	Albany	Nov 5
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		Dec 9
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*1986 Computer Intelligence Corp. survey of 7000 VAX sites. Market share: INGRES 44.8%, DEC 21.6%, Oracle 21.6%.

SYSTEMS & PERIPHERALS

HARD TALK
James Connolly

Overtime on cartridge shift

What had been expected to be a long, slow transition may be moving much more quickly than computer industry analysts predicted as MIS departments continue to shift from IBM 3420-type reel-to-reel tapes to IBM 3480-type cartridge tapes.

Some tape conversion numbers coming out of a California consulting firm's research may surprise people. The numbers surprised the consultants.

"We thought people were going to move very slowly and gradually. But we found that once people get the 3480 technology in-house, they move a lot faster than anyone expected," comments David L. Bunzell, director of the Santa Clara Consulting Group of San Jose, Calif. The group is a market research firm that serves the disk and tape media storage industry and maintains a data base of user companies.

Bunzell's company examined how MIS departments throughout the U.S. and Canada are using the 3480, which was announced in early 1984 and delivered later that year. The research shows that in Canada, which Bunzell says was IBM's test market for the 3480, companies that installed the cartridge drives converted an average of 36.11% of their tape libraries by the end of 1985.

"I would say that during the 1986 to '87 time period, you are probably going to hit 50% in the U.S. and Canada and 70% by 1990," Bunzell says, noting that conversion rates in the U.S. are probably higher than in Canada and that Europe lags behind Canada.

It is that conversion pattern that suprised Santa Clara Computing, which also found that the 3480 is selling well overall. "I think a lot of people found the conversion a lot smoother than they expected, and maybe this is why it is

See OVERTIME page 44

Connolly is Computerworld's senior editor, systems & peripherals.

First user rates AS/XL 60

Grumman's NAS unit fares well against IBM 3090/200

By Eddy Goldberg

MELVILLE, N.Y. — The Grumman Data Systems Division of Grumman Corp. recently installed one of the first-shipped National Advanced Systems Corp. (NAS) AS/XL Model 60 mainframes.

The uniprocessor AS/XL Model 60 was priced at approximately $5 million and was designed to compete with IBM's dyadic 3090 Model 200.

The NAS AS/XL Model 60 that Grumman uses is equipped with 128M bytes of memory and 32 channels. It will run a network of advanced computer-aided design and manufacturing tools under IBM's MVS/XA operating system. It arrived, as scheduled, in the beginning of July and was installed quickly and without difficulty, according to Dan Larkin, Grumman's vice-president of MIS.

Larkin said the AS/XL Model 60 is performing to specification and matches the range announced by NAS. He said that the AS/XL Model 60's performance was better in some areas and worse in others compared with the IBM 3090 Model 200 in two benchmark tests and that the variation ranged about 7% in either direction. He said its price was about 15% less than that of the IBM 3090 Model 200.

When the Model 60 was announced last year [CW, March 18, 1985], NAS claimed its performance would be comparable with IBM's 3090 Model 200, which has been rated at 28 million instructions per second (MIPS). Though an NAS spokesman declined to give performance figures in terms of MIPS, he said the Model 60's

See NAS/IBM page 44

DATA VIEW

Report Card

Hewlett-Packard Co. and Digital Equipment Corp. rated highest in minicomputer support.

Troubleshooting:	Weighted Average	Number Responses
HP	3.31	291
Prime Computer, Inc.	3.30	76
DEC	3.28	364
IBM	3.14	939
NCR Corp.	3.14	92
Tandem Computers, Inc.	3.13	30
Wang Corp.	3.13	24
Education:		
HP	3.20	291
DEC	3.15	364
Tandem	3.13	30
IBM	3.09	939
NCR	3.04	92
Prime	3.03	76
Documentation:		
DEC	3.20	364
IBM	3.12	939
Tandem	3.10	30

Rankings based on a February 1986 Datapro Research Corp. survey of 2,500 users asked to rate vendors on a 1-4 scale.

System/36 still not acclaimed as PC integrator

By David Bright

Many Fortune 1,000 companies have found IBM's System/36 minicomputer to be severely lacking as an integrator of personal computers.

Although IBM announced the upgrading of its System/36 line and PC Support/36 products in June at the 1986 National Computer Conference, users interviewed recently by *Computerworld* were divided as to the System/36's effectiveness.

Linda Modiste, hardware manager at The Beacon Corp. in Boston, said that the System/36 still has a long way to go. "The System/36 is not a machine built for real heavy communication work with lots of remote connections," she said. Concerning Personal Computer integration, "IBM hasn't really done enough work to keep up with the demand," she said. "Emulation is one thing, but on making a PC an active terminal of the System/36,. IBM doesn't seem to be getting there too fast."

One data processing manager content with IBM's improvements is Terry Haise of Litton Precision Gear in Chicago. "With

See SYSTEM/36 page 42

INSIDE

Cimlinc, Inc. announces computer-integrated manufacturing workstation/**42**

General Dynamics to become exclusive reseller of Canaan Computer systems to government/**43**

NEW THIS WEEK

- Genicom introduces 1000 series dot matrix printers

For more on this and other new products, see pp. 77-90.

INSTANT ANALYSIS

"You never know what is behind something like a price increase. These are tactics that are purely designed by the bottom line."

— George Weis, analyst, Gartner Group, Inc., on Data General Corp.'s price hike for certain hardware and software systems

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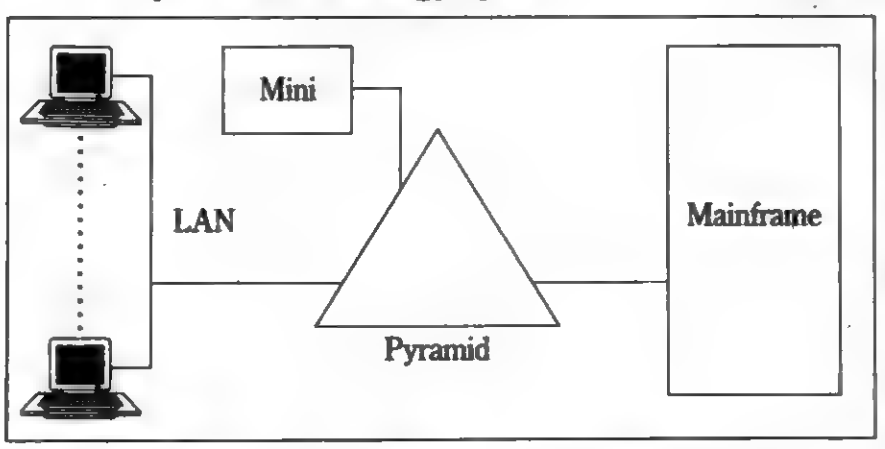
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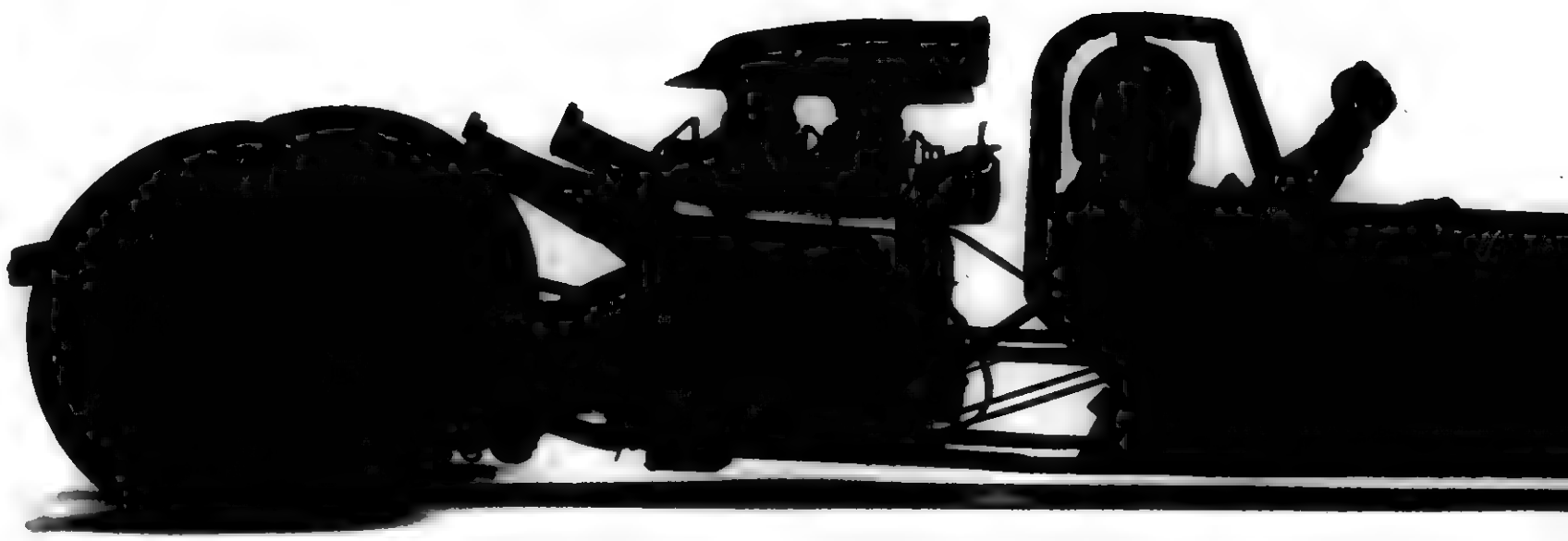
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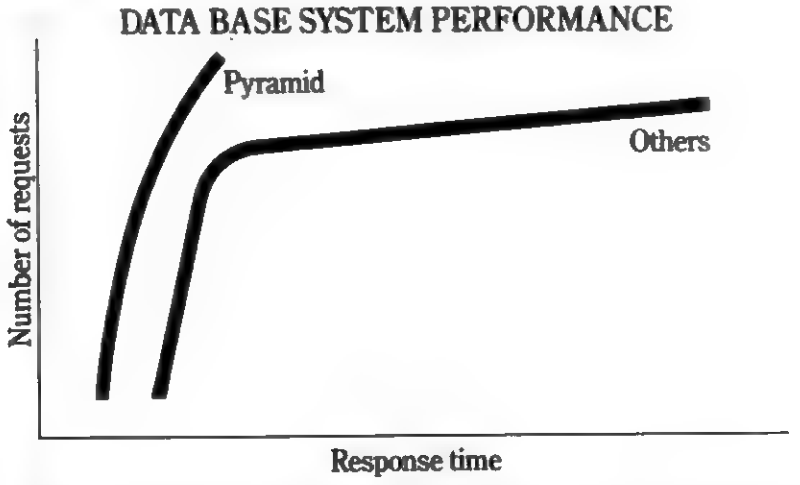
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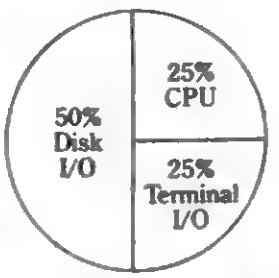
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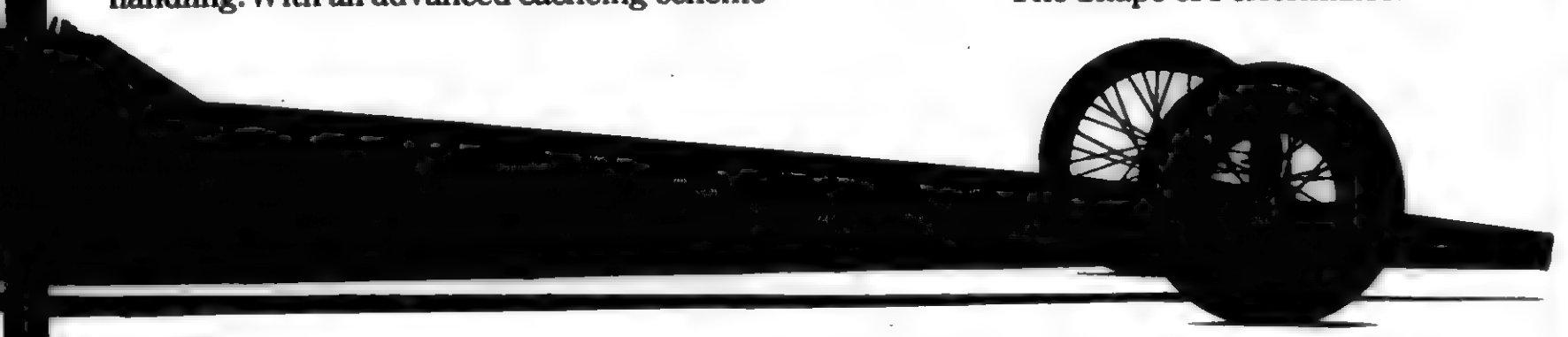
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Cimlinc bundles workstation, tools for CIM environment

By Rosemary Hamilton

ELK GROVE VILLAGE, Ill. — Cimlinc, Inc. announced last week that it is shipping a 32-bit workstation and application packages that when used together can create a computer-integrated manufacturing (CIM) environment.

Power CIM, based on the Motorola, Inc. 68020 microprocessor, is offered with a monochrome display for a starting price of $11,990 or with a color display for $15,990.

Users can add both memory and storage modules to the basic system, which includes a separate I/O processor that is based on the Motorola 68000, 4M bytes of main memory, an 86M-byte disk drive, an 11-slot Intel Corp. Multibus card cage and a floppy disk drive.

The color system accommodates up to six 4M-byte memory modules, and the monochrome version supports seven 4M-byte modules. The modules are priced at $3,200 each, according to Cimlinc President John West.

Up to seven storage modules can be added to Power CIM. A $3,995 module includes one 86M-byte disk drive and a floppy disk drive, and a $7,995 module includes two 86M-byte disk drives.

According to West, Power CIM is geared toward those users who have wanted a dedicated system but could not justify the high cost. "We cloned the workstation standard when it evolved and can now offer it at a much lower price," he said.

Applications packages available

Six applications packages — including three new packages and three upgraded ones — and communications software are available for the workstation, which operates under the University of California at Berkeley 4.3 version of Unix.

The new software packages are CIM Solid I, a three-dimensional solids modeling tool that sells for $2,995; CIM Intelligent Documentation, a $3,995 package designed to produce text and graphics documentation; and Avatar, a tool for parametric design that sells for $2,495.

The communications software, CIM COMM: SNA 3270, sells for $12,495, and a $1,495 license must be purchased for each node. According to West, the software gives Power CIM access to Ethernet networks and an IBM 3270 host. It allows the workstation to emulate either a Digital Equipment Corp. VT100 or VT200 terminal and an IBM 3270 terminal.

Upgrades will be released for CIM CAD, a computer-aided design package that sells for $3,995; CIM CAM, which sells for $6,495 and is designed for computer-aided manufacturing applications; and CIM Surf, which costs $6,495 and is used for 3-D surface modeling.

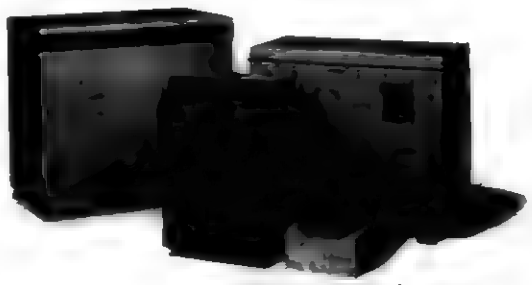
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System/36 still not acclaimed

From page 37

the new processors and PC Support/36, [PC integration] should work very well," he said.

Haise's shop has had good luck with its Model B, but it is his understanding that even a current Model C is "more than healthy enough" in most cases. For the most demanding situations, the new processors should do the trick, he said.

The extent of the dissatisfaction was revealed in a report released earlier this year by Forrester Research, Inc., a Cambridge, Mass., market research and consulting firm specializing in departmental computing. According to that report, other minicomputer companies will benefit from the System/36's shortcomings.

Of 300 Fortune 1,000 sites surveyed, 35% of the respondents rated the System/36 "unworkable" as a PC integrator, while a mere 5% said it was a "good solution." Of the remaining respondents, 20% said the System/36 was usable as a PC integrator, although "not perfect," and 40% were not familiar enough with the system to comment.

Seeming to answer some of its critics, IBM at NCC announced increased throughput, memory and storage capacities within its System/36 line in addition to an enhancement of its PC Support/36 functions.

IBM's upgrades may help a little, but the real improvements are expected later this year when IBM introduces its low-end 4300 and a controller, said John McCarthy, research manager at Forrester Research.

Additionally, McCarthy pointed out that the new products generally will not be available until early next year. By that time, the "baby 4300," used with the new controller, could provide a better solution, he said.

While IBM works out its mid-range problems, minicomputers from Digital Equipment Corp., Wang Laboratories, Inc. and Hewlett-Packard Co. may gain popularity as PC integrators, McCarthy noted.

"We have found that the System/36 does not have sufficient power, ease of use or functionality to meet users' needs," McCarthy said. "Users seem to view it as just another incompatible, short-term, mid-range offering from IBM."

General Dynamics contracts to sell Canaan machines

By Rosemary Hamilton

TRUMBULL, Conn. — Following a joint marketing agreement announced late last year, Canaan Computer Corp. and General Dynamics Corp. last month announced a second agreement in which General Dynamics will be the exclusive reseller of the Tempest version and primary reseller of the commercial version of Canaan's IBM VM/CMS-compatible departmental computers to the federal government.

General Dynamics would not specify the value of the four-year contract, but according to the agreement, the firm is committed to purchasing at least 40 systems from Canaan.

A General Dynamics spokesman would not provide pricing or delivery information.

The defense contractor will resell the Tempest and commercial versions of the Canaan DCS 5400 and the commercial version of the Canaan DCS 5800.

Canaan introduced the DCS 5800, an enhanced version of its DCS 5400, earlier this year. Both are designed as IBM-compatible departmental hosts and reportedly run unmodified IBM VM/CMS applications.

The DCS 5400, introduced in November 1984, is based on a proprietary processor and can accommodate up to eight users. A basic system comes with 2M bytes of main memory, expandable to 8M bytes, and an 85M-byte disk.

> ***The Model 5000 and 5000T will be bundled with a General Dynamics relational data base and office automation package.***

The DCS 5800 has three times the system throughput as the 5400, a Canaan spokesman said. It can accommodate up to 36 users. A basic system includes 2M bytes of main memory, expandable to 12M bytes, and an 85M-byte disk, expandable to 664M bytes of storage.

The Model 5000 and 5000T run the General Dynamics operating system Multos and will be bundled with a General Dynamics relational data base and office automation package.

In September 1985, General Dynamics said it would be selling both the Model 5000 and the Model 5000T, based on the Canaan systems, to the federal government, marking the first time the company offered what it calls departmental mainframes.

HARDWARE NOTES

Tandem inks fast food pact

Tandem Computers, Inc. has landed contracts with **Kentucky Fried Chicken Corp.** (KFC) and **Safeway Stores, Inc.** The chicken purveyor, headquartered in Louisville, Ky., bought a sales reporting system, a Tandem spokesman said. A Tandem Nonstop EXT will be online by September to collect daily sales figures from KFC's 1,224 co-owned restaurants in the U.S.

The system, using software from LeRoux, Pitts & Associates of Clearwater, Fla., will dial up the restaurants' electronic cash registers overnight to collect sales data. The system is a replacement for another, but neither Tandem nor KFC would say whose system it replaces.

Tandem also sold two systems to Safeway for a pilot implementation for order processing, warehousing and communications applications to be used within Safeway. Neither Tandem nor Safeway would comment further.

■

Wang Laboratories, Inc. released figures on sales and rentals of its **Digital Voice Exchange** (DVX) voice mail product for the fiscal year. The company sold 300 voice mail systems and rented 20,000 DVX voice mail boxes through its Wang Information Services Corp., a firm which was set up last summer to market the DVX product that was introduced in 1981.

■

Six engineering schools have received grants from **Control Data Corp.** The vendor's **Engineering Center Network Program**, designed to aid in cooperative research, technology and education projects, now includes the U.S. Air Force Academy, Bradley University, Montana State University, New Mexico State University, New York University, Courant Institute and Texas A & M University.

These schools will join roughly 17 other schools that have received approximately $11 million in the past year toward the purchase of hardware and software products from CDC.

■

Advanced Micro Devices, Inc. says that its AM29332, a 32-bit arithmetic logic unit, is now in production. The company claims that the unit speeds throughput with a parallel processing feature, executing in a single cycle instructions that previously required several cycles.

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Overtime on cartridge shift

From page 37

going faster. There are few glitches," Bunzell says.

However, Bunzell also notes that there have been some companies that have acquired no 3480s, leading to reports that IBM does not believe that 3480 sales are meeting projection and that IBM is looking for ways to stimulate sales.

Some of the reluctance to buy 3480s is on the part of customers who now use reel-to-reel drives supplied by plug-compatible vendors such as Storage Technology Corp., Bunzell says.

He notes that some customers are waiting for Storage Technology and other vendors to announce their versions of the 3480 in hopes that the plug-compatible manufacturer drives will be cheaper and will include more features, particularly a 6,000-cartridge automated tape library that Storage Technology has hinted will be announced this year.

Financial firms first to commit

One interesting trend revealed in Santa Clara Consulting's review of the worldwide market for the 3480 is that the banking and financial industries were among the first to commit to the cartridge drives.

But in the year-end study of Canadian conversions, banks using 3480s were slower than education and other market sectors in transferring their libraries from reels to cartridges.

Santa Clara Consulting also pronounced a finding that can be nothing but good news for users.

The researchers noticed that manufacturers new to the data storage market — companies such as video cassette and precision plastics companies — are entering the ¼-in. tape cartridge market.

That threat of competition already has forced companies such as IBM to lower their prices for cartridges, and it will force prices down still more between now and 1990.

The researchers estimated that costs for North American customers could fall 50% by 1990.

This fact bodes well for user companies that are seeking to convert thousands of 10½-in. reels to 5-in. cartridges while trying to find ways to pay for all of those cartridges.

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EXECUCOM

User rates AS/XL 60

From page 37

performance range is 1.44 to 1.81 times that of the IBM 3081 Model KX, while the IBM 3090 Model 200's range is 1.5 to 1.9 times that of the 3081 Model KX.

In other words, promised performance gains for the NAS AS/XL Model 60 are 4% to 5% less than comparable claims for the 3090 Model 200 when both are compared with the 3081 Model KX.

The AS/XL Model 60 and the more powerful AS/XL Model 80 are intended as a migration path for the NAS AS/9000 processors for large corporate customers that need more computing power. Though it is not field upgradable, it runs the same software, and the changeover is transparent, according to Larkin. The AS/XL Model 60 is replacing an NAS 9060, some of an Amdahl Corp. 5840 and will accommodate planned growth during the next six months.

Performance, savings cited

Grumman's reasons for selecting the AS/XL Model 60 included the need for increased performance and additional capacity, plus the savings from only one software license needed with the larger machine.

Also, since the AS/XL Model 60 is air cooled, as opposed to the water-cooled IBM 3090s, no plumbing installation was required.

The AS/XL Model 60 corresponds to the M-680H uniprocessor from Hitachi Ltd., which supplies NAS's hardware. It is part of the AS/XL family, which is formed entirely of very large-scale integration circuitry and reportedly uses 2,000 and 5,000 gate/chip emitter-coupled logic (ECL) devices with switching speeds of 200 and 250 picoseconds. Its ECL chips are reportedly 3.5 times denser than corresponding ECL circuitry in the IBM 3090 series.



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70. Medical/Legal/Accounting/Mgmt.
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B. Minicomputers/Small Business Computers
C. Microcomputers/Desktops
D. Communications Systems
E. Office Automation Systems

3317-8832

COMMUNICATIONS

DATA STREAM
Elisabeth Horwitt

Ask 'what if?' prior to change

At a recent users conference, I heard a fascinating talk about network performance management by Thomas W. McDonald, founding partner of Waltham, Mass., network performance consulting company MGT Technology Group, Inc. I'd like to pass on some of his main points, with a few interpretations and emendations of my own.

McDonald outlined a three-part strategy for achieving effective network performance management. First, the manager needs to attain network awareness — to know where his network performance levels are today in order to plan for tomorrow.

The second key element is optimization and tuning: taking existing resources and squeezing the best performance out of them. Third is capacity planning, which ensures good operation in the future, given changes in hardware, applications, user population and, of course, available network technologies.

Various tools can help the network manager move toward his goal. Monitoring systems boost network awareness by tracking network performance in terms of level of component operation, transmission error rates, traffic patterns and the like.

Monitoring operations ensures that hardware and software is up, modems synchronized and lines operational. Component utilization monitoring helps identify potential spikes — sudden dips in response time that occur when com-

See ASK page 46

Horwitt is Computerworld's senior editor, communications.

Order from network chaos

Tool helps Grumman manage software code

By Elisabeth Horwitt

CALVERTON, N.Y. — A centralized network resource management product from Digital Equipment Corp. helped Grumman Corp.'s aircraft equipment testing facility "solve a network manager's nightmare," according to systems technology project manager Robert Meihofer.

Over the past two years, Meihofer's group has set up an in-house telemetry system, which performs real-time collection and processing of data generated during tests of aerospace equipment. The distributed system, which became operational approximately six months ago, consists of three linked clusters, with two more to be installed in the near future.

Each cluster is made up of two DEC VAXs and eight Microvax IIs connected on an Ethernet local-area network. The Microvaxes collect the test data and convert it into graphic representations. The VAXs acquire, store and process the data.

The testing facility's systems staff realized it needed a centralized network management system to "enable us to meet a number of challenges, such as system software management and maintenance and preserving data integrity and consistency of software updates at the remote nodes," Meihofer said. Ideally, a network manager at one central location would be able to coordinate and support distributed systems, not only on the local Ethernet but also across a fiber-optic link to another building or across satellite and microwave connections to facilities in other cities and states.

Meihofer's staff had just about decided to develop the management software in-house when they learned DEC was about to release its own product, Remote System Manager (RSM). RSM is composed of two types of software, a server that runs on a

See ORDER page 47

LAN servers can swap files

By Elisabeth Horwitt

PALO ALTO, Calif. — A growing number of IBM Personal Computer local-area network (LAN) vendors are starting to provide a feature that analysts claim is crucial for large electronic mail installations: a store-and-forward capability that enables file servers to exchange documents and electronic mail.

Without store-and-forward functionality, most LAN systems cannot effectively provide electronic mail to large installations of 100 users or more, claimed PCC/Systems Vice-President Phillip Whalen Jr. Many server products limit the number of users that can concurrently log on to the system.

With IBM's PC Network and Ungermann-Bass, Inc.'s Net/One, the limit is 32 concurrent users, according to Whalen.

See LAN page 50

Stratus connnects its fault-tolerant systems with PCs

By Stanley Gibson

MARLBORO, Mass. — PC/Connect software, recently unveiled by Stratus Computer, Inc., allows users of IBM Personal Computers and compatibles to access and exchange information with a Stratus Continuous Processing system over a dial-up or dedicated link.

"IBM connectivity has always been part of our product strategy," said Stratus spokeswoman Anne Phaneuf. Many Stratus installations also have "a lot of PC users that need to access the fault-tolerant computers' data and resources," she added. The product works with all Stratus computers, including the System/88 computer, which is made by Stratus and resold by IBM. However, PC/Connect is not being

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INSIDE

PCLink turns VAXs into Macintosh file servers/47

NEW THIS WEEK

- Western Union offers Memory Mail on Easylink service
- Raycom announces 5110 series fiber-optic multiplexer

For more on these and other new products, see pp. 77-90.

INSTANT ANALYSIS

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Ask 'what if?' prior to change

From page 45

ponent use exceeds a certain level. Spikes often occur before a component is being used to full capacity, McDonald says. Careful tracking of utilization levels helps the manager plan for component upgrades.

Once the manager has an accurate picture of the network, including possible bottlenecks, response-time spikes and traffic patterns, he can begin tuning the network to optimize resource usage and do capacity planning.

Here the manager might make use of network modeling tools that simulate network performance under different scenarios of components and work loads. More managers are constructing a model of the network and performing "what-if" analyses: If I change this or add that, what will that do to overall response time?

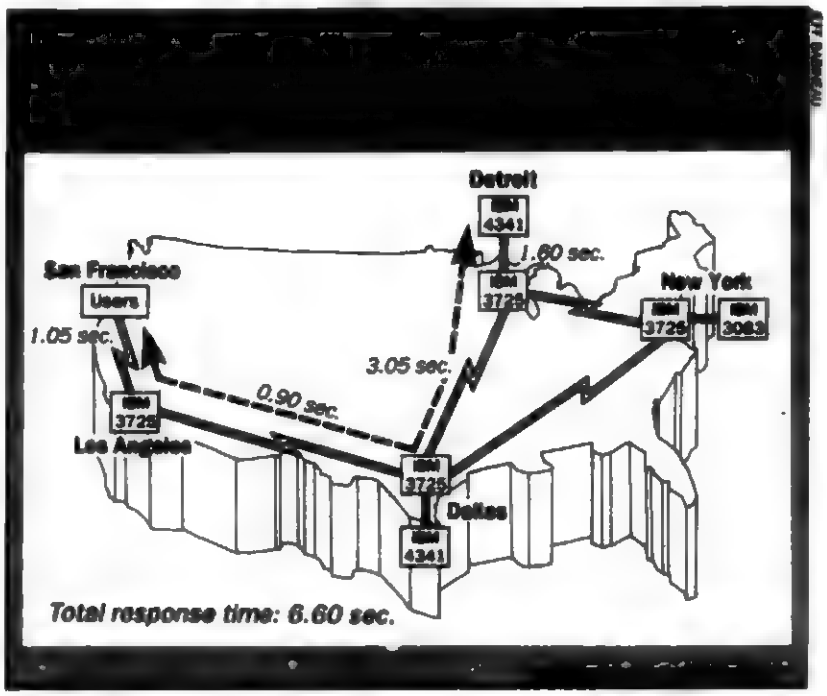
The program simulates a given network configuration, including message arrival rate, message size, terminals and control units, data rates, protocols, distances, modem delays and data flow control parameters. It may also have to include network parameters such as routing, prioritization and so on.

Once the model is in place, the manager enters a proposed change. For example, what if I add or delete resources (controllers, terminals, PCs, multiplexers, protocol converters, remote front-end processors)? What if I redesign the application software? What if I change routing patterns or priorities?

Using a model to simulate a new network configuration enables the manager to determine whether the change will make response time better or worse — and more important, to assign costs to proposed changes.

During his talk, McDonald presented a composite scenario embodying several cases he worked on as a consultant.

A company has an IBM 4341 in Detroit, another 4341 in Dallas and an IBM 3083 in New York. A group of users in Los Angeles access the Detroit mainframe through a link to Dallas (see diagram this page).



Response-time problems develop when a new group of users in San Francisco begin accessing the Detroit mainframe via the Los Angeles-Dallas connection. Monitoring shows that average response time for the San Francisco node is 6.6 seconds. Maximum acceptable response time, according to corporate MIS policy, is 6 seconds.

According to McDonald, it is not the network manager's job to figure out how to reduce San Francisco users' response time to acceptable levels. Rather, he should analyze different solutions in terms of response-time levels vs. cost and leave the final decision up to the managers responsible for balancing budget constraints against user service-level priorities.

Using modeling software, the network manager can compare different possible solutions with the problem — without going to the trouble and expense of actual implementation. He might, for example, query the system: What if we increased the number of 9.6K bit/sec. leased lines between Dallas and Detroit from two to three? The system might give the following results: San Francisco node average response time: 5.45 seconds. Increase in cost: $1,500/month.

Another possible scenario the manager might try: What if we reconfigure the system so that San Francisco users access the Detroit mainframe by way of the Dallas-New York-Detroit links instead of through the (currently overburdened) Dallas-Detroit link? System's response: San Francisco node average response time: 6.15 seconds.

See ASK page 47

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Order from network chaos

From page 45

VAX or Microvax host and a client that runs on Microvax or Vaxstation II workstations.

Once installed on the test facility's Ethernet-based clusters, RSM helped the technical support staff cope with "the tremendous logistical and management problem" of maintaining operating system and application code configurations, Meihofer said.

Traditionally, the staff would perform periodic software updates at each user station, using a local hardware device. This involved time-consuming direct file-to-file transfer using Decnet communications software. "We have 40 Microvax IIs; providing backup archiving hardware with a 50M- to 100M-byte capacity for each station would cost us $120,000 or more," Meihofer said.

The staff also found it difficult to maintain consistency of software updates over a distributed system. "We wanted to ensure that when an engineering decision decreed a change in the software, it would be implemented at all user sites," Meihofer noted.

With each user maintaining software on local disk, there was no way to ensure that applications software updates made by users were implemented throughout the installation.

"Users are so wrapped up in their work, and mass storage devices so reliable, that they don't always do backups," Meihofer said. "Then when a hardware failure does occur, they lose useful updates."

With the implementation of RSM, network managers can maintain one consistent version of the operating system and application code at a central storage facility. Software can be downloaded to remote stations "with a few type-ins," according to Meihofer. The need for individual backup storage devices is eliminated, along with the danger of losing new updates through user carelessness.

The facility's systems staff began testing RSM approximately two months ago and is now satisfied that it works, Meihofer reported. "It has saved us from developing the functional equivalent ourselves."

Ask 'what if?' prior to change

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Increase in costs: zero.

The manager can then present these trade-offs to his superiors, leaving them to decide whether the company can live with a 6.15-sec. response time or whether it is worth paying $1,500/month more to get response time down to 5.45 seconds.

The tools and procedures outlined above make the network manager's job easier in two ways, according to McDonald. First of all, he avoids crises by doing proactive rather than reactive network management. Second, he is forearmed with more complete knowledge of the network, which enables him to make more effective decisions and to "take a firm stance, no matter what his company hits him with."

Software lets Mac users store files on VAX

Pacer PCLink update offers direct, remote transfer capabilities

By Rosemary Hamilton

LA JOLLA, Calif. — Apple Computer, Inc. Macintosh users can store and access files on a VAX minicomputer from Digital Equipment Corp., using PCLink Version 3.0 from Pacer Software, Inc.

The recently introduced version of Macintosh-to-VAX communications software enables users to create virtual disks on a VAX or Microvax II, then access the data as though it resided on a local disk, according to Pacer. A user can activate a virtual disk capability and create up to four 1.6M-byte virtual disk files on the VAX. The Macintosh considers the disk files to be separate storage devices.

PCLink Version 3.0 includes Version 2.0's DEC VT100 and VT200 and Televideo, Inc. 950 terminal-emulation capabilities. Files can be transferred between the Macintosh and VAX systems via a direct RS-232 terminal connection; remotely via a Hayes Microcomputer Products, Inc.-compatible modem; or over Omninet, a local-area network from Corvus Systems, Inc.

The software has a command file function, giving the user the option of customizing communications applications, the vendor said. With the command file, a user can establish a predetermined time in which the Macintosh will automatically dial up a host, log on and then upload files to a designated directory.

Version 3.0, which is currently available, is licensed at a starting price of $2,000 per VAX. Only the VAX portion of the software is licensed, allowing unlimited distribution of the micro software portion.

The vendor also markets an IBM Personal Computer version of its PCLink. It has a similar virtual disk feature, allowing IBM PC users to create virtual disk files on the VAX.

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LAN servers can swap files

From page 45

This can result in access bottlenecks and delays when the system is overburdened by too many users seeking to send or access electronic mail, he noted.

For Ungermann-Bass, the 32-user limit is a function of the number of networking software features supported on a server's network card, according to product manager Mark Hawkins. The company plans to expand the number of concurrent users supported, he added. Novell, Inc. is said to have raised its limit from 32 to 100 users per Netware server.

A common way around the limitation is to "create separate post offices on different servers," Whalen noted. But if mail cannot be forwarded from one server to another, users wishing to send electronic mail must first log on to the server on which the recipient's mailbox resides. "Say you want to send the same set of five documents to managers whose mailboxes are located on three different servers," Whalen said. "You have to set up the transmission and log on to a different server three times."

Store-and-forward capabilities

PCC/Systems' latest version of CC:Mail Dialout, announced in late July, provides store-and-forward capabilities for any network system that supports the IBM PC-DOS 3.1 operating system. The product works in conjunction with the vendor's electronic mail package, CC:Mail. A dedicated PC running Dialout acts as postmaster for a group of servers, periodically scanning their mailboxes and transferring remotely addressed mail to the right server.

The older version of CC:Mail Dialout featured document exchange between servers on different LANs connected by a dial-up remote link. The newer version, priced at $995, provides that capability plus document exchange among multiple servers on the same LAN.

Store and forward is a "very important feature that is still missing from Novell's Netware and IBM's PC Network electronic mail systems," said David Terrie, president of Boston-based Newport Consulting.

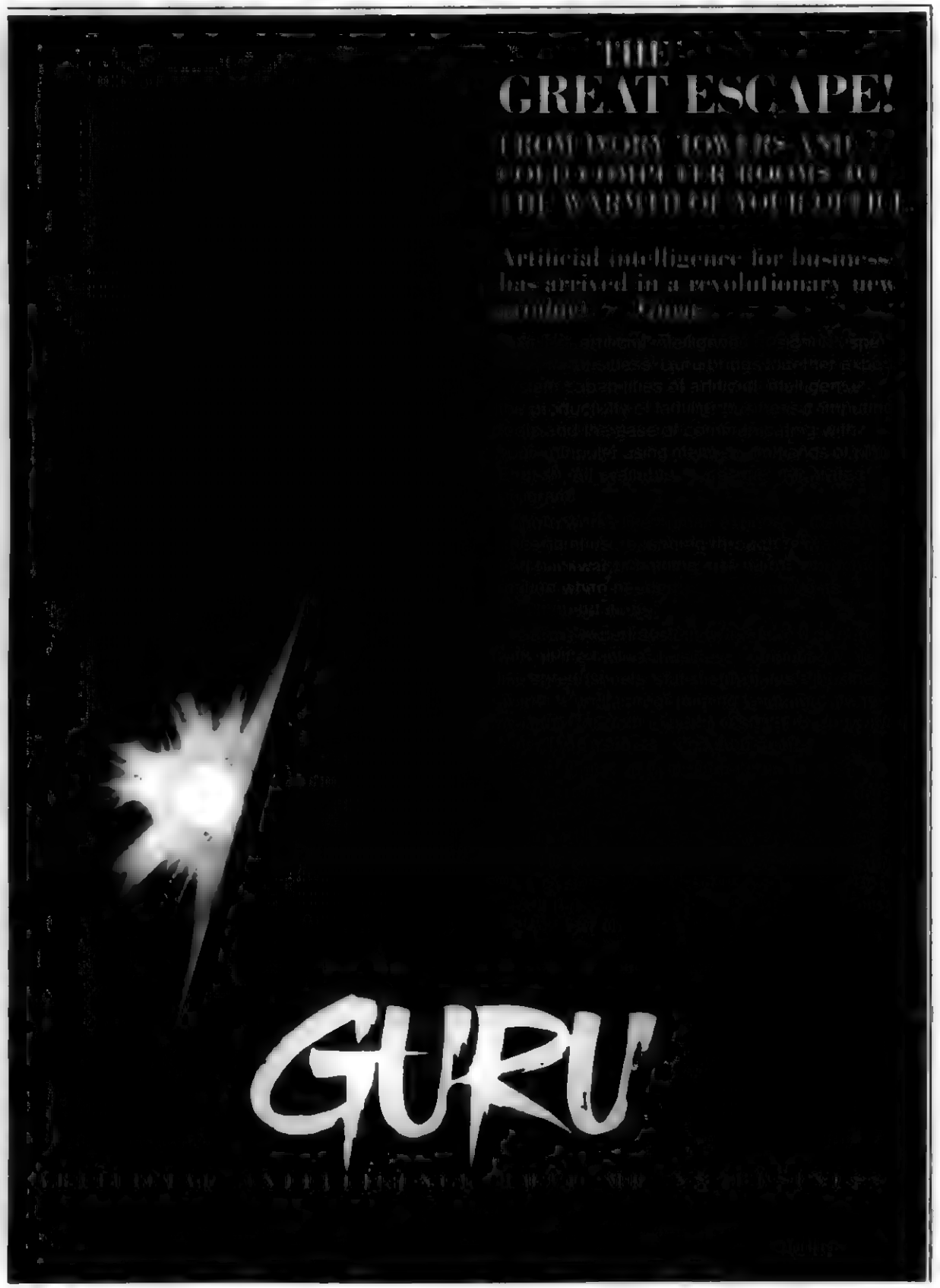
"With Novell, a user still has to log on to his server in order to pick up mail, even if he happens to be on the opposite side of the country," Terrie said. With store and forward, a user traveling to another company site would find his mail waiting for him when he arrived. Banyan Systems, Inc.'s Virtual Networking Software (Vines) and 3Com Corp.'s 3+ both offer store-and-forward capabilities for their file-server software.

Directory management

Both Vines and 3+ offer directory management capabilities that CC:Mail lacks, however. "Internetworking can generate some nasty problems when it is not coupled with the ability to keep track of address changes without continually having to do global network directory updates," Terrie said. This is especially important for extensive installations that consist of multiple LANs linked over distance, he added.

While 3Com's 3+ also requires periodic global network updates to keep track of user relocations, it provides a way for mail to be automatically forwarded from a user's old location to the new one.

Under the Vines distributed naming scheme from Banyan, users do not log on to a particular server. Rather, they log on to the network and call up network services without having to specify which server it resides on. Servers exchange information about relocations of network resources, so access requests can be routed over remote links to the LAN where the correct server resides.



Stratus connects systems with PCs

From page 45

sold through IBM, Phaneuf said.

"It allows users to access Stratus files and send PC files to Stratus and store them under fault tolerance," Phaneuf said. Some users may want to store files in a fault-tolerant computer because they would be more secure and available there than in a PC, she added.

PC/Connect consists of PC-resident software, called Stratus PC/Connect Term, and host-resident software, called Stratus PC/Connect Host. PC/Connect Term allows PC users to log in to Stratus' VOS operating system and operate as a Stratus terminal with access to a complete range of applications. A set of 10 PC/Connect Term diskettes costs $1,000.

PC/Connect Host enables IBM PCs to perform file transfer and other PC functions while still connected to the Stratus host in terminal mode. Under PC/Connect Host a PC can list the contents of a PC directory, store and retrieve PC files to VOS and display disk volume label and current directory for any disk drive while still in a VOS terminal mode.

Users can also temporarily suspend an operation taking place under the Stratus VOS operating system and run a PC application. PC/Host is priced at $2,000 per system.

PC/Connect is available under a site licensing agreement that allows unlimited copying of the diskettes for use on a single site, according to Larry Sherman, Stratus manager of product support programs.

The product may be used with any Stratus system running VOS Release 5.0 or above and any PC running IBM PC-DOS Versions 2.0 through 3.1

Executive Report

Edited by Janet Fiderio and Becky Batcha



ILLUSTRATION BY ROB SAUNDERS

INSIDE

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***How to maintain high-quality service as a center takes on new tasks*/62**

Information centers

Their choice: Justify existence or go out of business

By JOANNE KELLEHER

Most information centers started out with the goals of creating some order amid the chaos of unsupervised microcomputer acquisitions and educating unskilled users in elementary applications. Now that many of them have fulfilled their original calling, however, information centers are arriving at a juncture, a point that either signifies the beginning of their true vocation or the end of their organizational usefulness.

Starting up an information center is not all that difficult, says Katie Kuryla, project manager of the information center at Ryder Truck Rental, Inc. in Miami. "At least a lot of people have done it before, and you can follow their lead to some extent." The real problems crop up later, she says, when MIS is no longer selling the concept of end-user computing to management but needs to demonstrate the solid benefits time and time again.

Kuryla and her peers in information centers everywhere are meeting the challenge through a variety of means, and their efforts serve as examples for others. No guidelines exist on how to successfully manage a maturing information center, because the first generation is only now beginning to come of age. As it does, the forerunners frequently find themselves challenged operationally, economically and politically.

Operationally, mature information centers confront issues such as how to serve an increasingly divided user base and how to avoid being left in the shallows of micro installation and training while the corporation moves ahead toward the deeper waters of strategic information management.

Waning MIS support for funding on faith forces information centers to prove their economic and strategic worth within the corporate structure.

"There are a good number of information centers today that are either being dissolved or are dissolving themselves," says Randy Casto, head of the Casto Group, Inc., a consulting firm in Lenexa, Kan., that specializes in information centers and office automation. Casto says these information centers "get caught up in a vicious cycle of installing PCs and delivering basic training and overlook the need to identify strategic corporate requirements."

Economically, information centers that pass beyond the honeymoon phase often find themselves caught between escalating user demands for resources and dwindling management enthusiasm for funding on faith.

Kelleher is a Boston-based free-lance writer who specializes in high technology.

Justify existence or go out of business

Continued from previous page

"The problem," says Don Faistl, manager of information resource planning at International Flavors and Fragrances (IFF) in Hazlet, N.J., "is that, as you reach the point where you almost become a utility for users, you can't quantify the benefits of what you are doing." Unlike traditional data processing shops, he says, information centers create no tangible resources. "So there's no real basis for saying that you are saving X amount per year."

Politically, the managers of some information centers find that, after two or three years, their original platform will no longer support them.

One particularly shaky plank is the concept of using information centers to reduce the data processing backlog. "Most information centers rated that as a very high priority when they were set up," says Eric Rolfe Greenberg, project director for the American Management Association's (AMA) "1986 AMA Report on Information Centers," produced in cooperation with *Information Center* magazine.

When information centers rated their success in meeting objectives, Greenberg notes, "That one wound up just about at the bottom of the list," well behind achievements in training employees to use software, improving relations between DP and end users and standardizing microcomputer hardware.

Gary Livingston, of Livingston & Associates, a Lakewood, Ohio, consulting firm specializing in the development and management of information centers, says he sees a backlash — similar to the one that rubbed out quality circles in many manufacturing firms — developing against information centers. "The very name has become anathema to some companies that set them up too quickly and just because everyone else was doing it," he says.

Livingston has already been cautioned at one client company not to talk about the department he works with as an information center, because upper management wants nothing to do with one of those. "They told me, 'We're doing all the same things you're talking about, but please don't say information center,' " he recalls.

Despite all the obstacles, many mature information centers have managed to survive and thrive — usually without having to change their names. There is no master blueprint for how to succeed, not only because the elapsed time and numbers are not sufficient for retrospective evaluation but also because successful centers do not so much grow according to a pattern as evolve to fit the unique requirements of their organizations. But managers whose information centers are approaching maturity can look to the examples set by others in the same position.

The 3¼-year-old information center at Cordis Corp., a Miami-based manufacturer of pacemakers, provides a good example. "I'd say there's been a 200-degree shift in our role over the last year and a half," says Dale Delaney, associate manager of the information center. "Functions like training and support for basic spreadsheet and word processing applications are now a minimal part of our work."

Those functions constituted a large part of the center's work during the early days, she says. But she and the information center staff now concentrate more on technical projects such as manufacturing support and communications research. "Because those are the things that are most important in terms of corporate goals."

Delaney has not abandoned novice end users. She has, however, managed to branch into new areas while reducing the number of information center personnel by two.

Her methods, in this case, included a heavier than usual reliance on manuals, a shift to group training for basic skills and a strong emphasis on information sharing among staff members and end users. In the future, she says, the job of supporting beginners should get even easier. "There are so many self-training aids and tutorials coming out now that, before long, basic users will be pretty much self-supporting."

Delaney does not stand alone in her great expectations for self-training tools. The AMA's recent information center report noted an increased reliance on computer-based training (CBT), either for self-instruction or as a component in a training program. The report predicted a 16.4% increase in the number of information centers making some use of CBT and a jump of 60.6% in the number of trainees using tutorial disks during 1986.

MATURING GRACEFULLY: OLDER INFORMATION CENTERS FACE THREE CHALLENGES

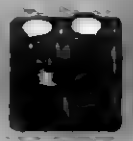
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The organizational challenge: Avoiding dissolution. Once an information center raises end users from a state of computer illiteracy, it needs to find a new reason for being. Many mature centers set their sights on strategic issues in end-user computing — applications that affect the bottom line.



The economic challenge: Proving effectiveness. Whereas young information centers can get by as cost centers, many older ones need to carry their own weight. Chargeback is becoming popular, but it raises the risk of alienating users. Many managers prefer to prove their centers' worth more subtly, by winning friends in high places.



The political challenge: Fulfilling promises. Information centers have failed to meet some of the goals they once set for themselves. Few, for example, have made a dent in the application backlog they vowed to help eliminate. Managers are narrowing their strategies and turning increasingly toward tasks such as executive training in which they feel more confident of success.

If CBT can help to free information centers from some of their training responsibilities, its usefulness will bear great significance. By all accounts, one of the keys to continued vitality of an information center is a shift from production line training to support and orchestration of more sophisticated applications.

"At first you can open the doors and take all comers," says Ed Katterson, vice-president and manager of the 3-year-old information center at Manufacturers National Bank of Detroit. "Later on you have to be more selective because, after all, there's only so much that you can do at the lower levels to improve productivity. The payback really comes in the managerial and professional computing levels."

Besides reaping paybacks in productivity, information centers that put their resources behind strategic business applications also consolidate some political power. At Goodyear Aerospace Corp. in Litchfield, Ariz., for example, the information center gained four new staff members and a lot of exposure when it took on responsibility for administering a pilot project in the use of IBM's Professional Office System.

"It was a management decision to try this on a pilot basis, and when the project fell into the lap of the MIS manager, he decided to push it over to our group," explains Bob Uecker, senior information center specialist.

Until this project came up, Uecker says, the information center — which consisted of him and one other person — had spent most of its time training finance personnel to use a mainframe editor and application programs that ran in batch mode on an IBM 4341 and introducing a few users to the operation of six microcomputers.

The new assignment, however, involved surveying work areas to select pilot participants, making presentations to top managers and training executive managers, all of whom participated in the experiment. "All of this meant that the information center was moved into a very high-visibility role," Uecker says.

Achieving high visibility is nothing less than a survival skill for information centers, according to Faistl at IFF. "You don't want to spend all your resources supporting someone who isn't a rising star or a department that doesn't have high visibility," he says. Faistl set up the company's information center in 1983 and

Continued on page 54

Expert's Opinion

So who needs info centers?

By NAOMI KARTEN



Karten

Now that training users to insert diskettes label-side up is no longer the name of the game in most companies, some MIS managers are beginning to question whether the information center is an organization with a finite — and rather short — life cycle.

Once users outgrow introductory courses and a pat on the back for hitting the right combination of keystrokes, these managers wonder, does the need for an information center continue?

Absolutely. As users' skills and expectations increase, the information center's role actually needs to expand. Now that business people have overcome the fear that their keyboards will self-destruct, information centers will retain their vitality by leading the way toward the application of end-user technology to business problems.

Peter Potthoff, assistant vice-president and information center director at Liberty Mutual Insurance Co. in Boston, feels that the task of guiding end users to strategic computing will fall to the information center for two reasons. "Traditional MIS doesn't necessarily have this vision," Potthoff says, "and information centers are the ones involved in the introduction of new technologies."

In order to carry out their mandate, information center staffs will offer training in three critical areas:

- **Problem analysis.** The presence of a personal computer on an end user's desk means nothing on its own. Most users know very little about how best to use their machines. They tend to reach for the nearest familiar product, regardless of how well it suits the problem at hand. Helping employees match their computer skills to business problems contributes to more effective PC operation.
- **Data usage.** As users access and manipulate increasing amounts of corporate data, they need to learn more about data concepts and appropriate data usage. One of the information center's prime roles in the future will be to help users understand the differences among raw data, aggregate data and summary data and choose the information that best suits their needs.
- **Validation.** Program testing comes as second nature to programmers but not to casual end users,

See KARTEN page 54

Karten is president of Karten Associates, a consulting firm in Randolph, Mass., that specializes in end-user computing.

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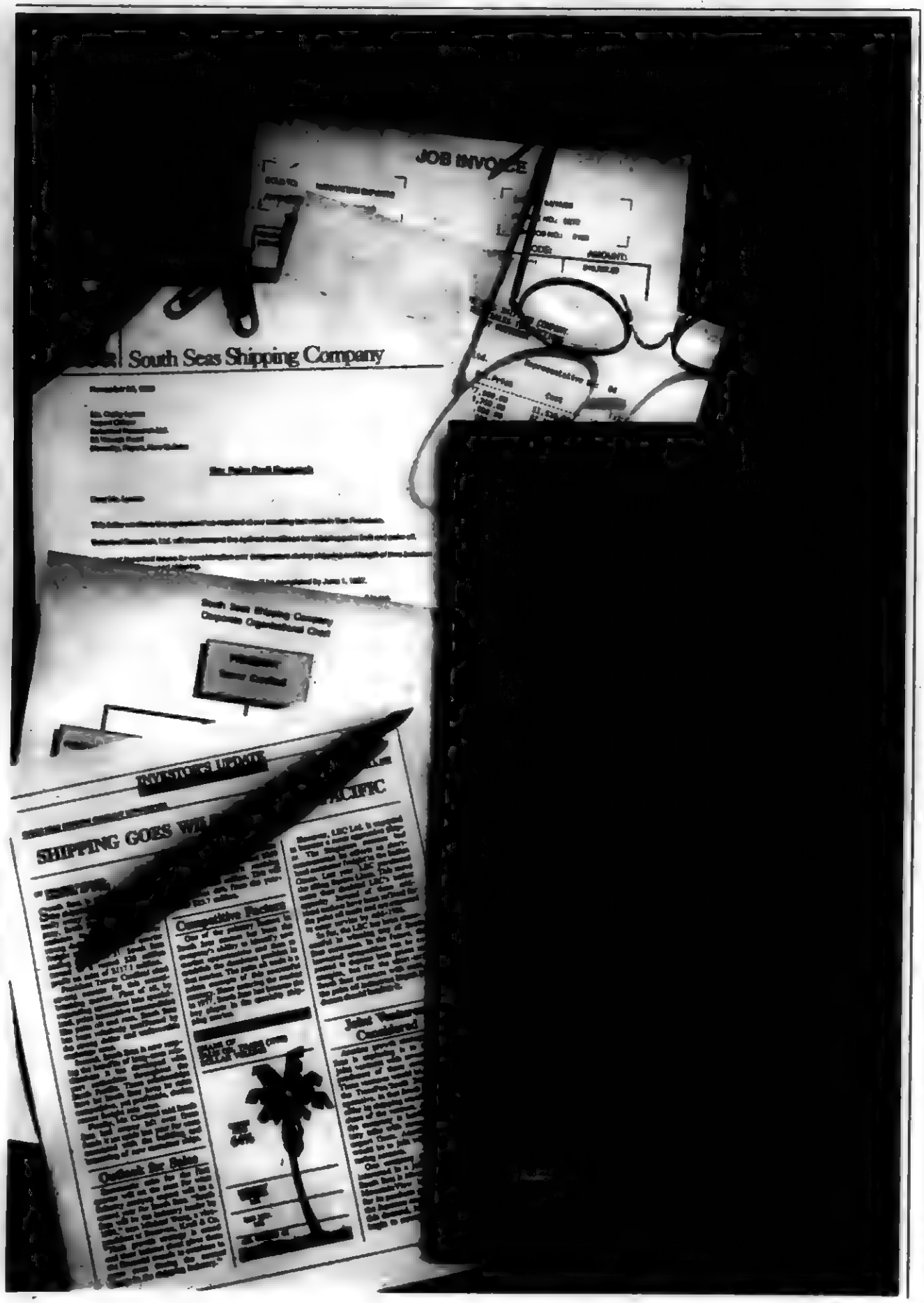
KARTEN from page 52
who typically consider an application complete as soon as they plug in the final formula. Many errors stay hidden until they contribute to an ill-advised business decision; some remain undetected forever. If managers are to place any confidence in computer-generated results, they will need to understand the techniques for validating an application's integrity.

Information center managers realize that they will have to adapt if they are to hold on to their jobs and their staffs, and they have begun to change accordingly. The agenda for this year's Information Center Conference, which took place last month in Anaheim, Calif., illustrates their progress.

Conference sessions emphasized issues such as measuring and communicating to top management the benefits that information centers provide. By contrast, the first Information Center Conference, held two years ago, revolved around the basics of information centers and the implications of this thing called end-user computing.

The current topics reflect a growth of both technological and organizational maturity in end-user computing. They also speak to the growing role of the information center and the continued need for that organization.

As John Bucher, information center manager at the University of Kansas in Lawrence, points out, information centers will continue to thrive, because they perform one indispensable role: They come to the aid of users whose needs MIS does not consider important enough to address. "There will always be a need for a group to coordinate training, work with vendors and keep users informed," he says. ■



Continued from page 52
still retains overall responsibility for it in his current position.

"A lot of the reason why information centers run into problems," he says, "is that usually the first thing they want to do is go out and beat the bushes for a lot of users." Before long, what they have, he continues, is an overly large group of people who think of the information center as a free resource. "Far better to keep the growth deliberately slow and concentrate on creating some powerful proponents who can help you to sell your programs at budget time."

Budgets often become an increasingly sticky issue for information centers as they mature. The phenomenon is fairly easy to understand if one looks at a few numbers.

In a study conducted during 1985, Crwth Computer Coursewares, a vendor of CBT training programs, found that more than two-thirds of all mature information centers — those that have been around for more than three years — support more than 200 users. In contrast, more than half of all pilot information centers — those that are less than 1 year old — support fewer than 25 end users.

As an organization's end users increase in number and diversity, the number of tools and trainers it must acquire to support them must also increase. What's more, mature information centers generally retain responsibility for supporting mainframe applications users, whereas younger centers deal only with micro users.

All information centers, according to AMA's survey projections, face a 24.1% increase in their training loads during 1986, with the heaviest burden falling on mature centers. Well-established information centers, the report says, will soon encounter a second wave of training requests, "more sophisticated than the first and more central to the organization's business function."

That the budgetary implications of this phenomenon are not always expected or welcomed by those with sign-off responsibility becomes clear when one speaks with information center managers like Terry Hart. Hart heads up a 4-year-old, six-person center serving a user population of 350 to 400 in Upjohn Co.'s Division of Medical Affairs in Kalamazoo, Mich.

To justify requests that she makes for additional staff members, Hart needs to remind upper management that the firm's user base is not standing still. "Even though our number of users

Continued on page 58

Utility's info center frees DP staff for sophisticated projects

Chargeback setup spurs users to solve problems

By MICHAEL SULLIVAN-TRAINOR

At San Diego Gas and Electric Co., the data processing department has not only recognized the legitimacy of the information center, but managers there use the center to free department programmers for strategic DP tasks.

"Because of the information center, the end user is able to do tasks that we had to provide in the past," says Tom Ilas, Information Systems supervisor. "We used to have to be a jack-of-all-trades, taking the applications idea, developing it and working with end users to define the requirements. Now users identify the need and develop the actual business case, as well as the detailed requirements for new systems."

As a result, the data processing staff has been freed from what Ilas calls "basic" backlog items such as reporting from the data base. Instead, programmers can spend their time on more sophisticated projects — like refining the data base or developing a complex tracking application — that will increase the productivity of the company as a whole.

> ***"Users understand that they pay more to have data processing develop their applications than to do it themselves."***

San Diego Gas and Electric's data processing department, called Information Services, is an IBM shop utilizing a full chargeback system. Users pay for every service, including mainframe usage, workstation or personal computer operation and disk storage space.

The charges are made in the form of rates for each type of service. Labor costs for data processing staff time spent developing applications and information center training courses are directly reflected in the end user's bill.

However, the information center staff's time, with the exception of training, is considered part of overhead, along with other indirect data processing costs, and therefore is not apparent as a line item on the user's monthly bill. Instead, overhead is spread across the rates for each type of service.

Chargebacks for DP services are used as incentives for the end users to work through the information center to learn how to access the data base or develop applications prototypes themselves.

The impact of this, according to Ilas, is that users understand that they pay more to have data processing develop their applications than to do it themselves.

With the chargeback system, Information Services is required to track the computer usage for different types of computers and programs. The results of this tracking are reported back to end-user managers, who have the responsibility for cost-justifying the usage of computer services.

"We don't attempt to be the policeman, we try to be the traffic cop. We try to direct people to the services we think are consistent with our architecture and strategy," Ilas explains.

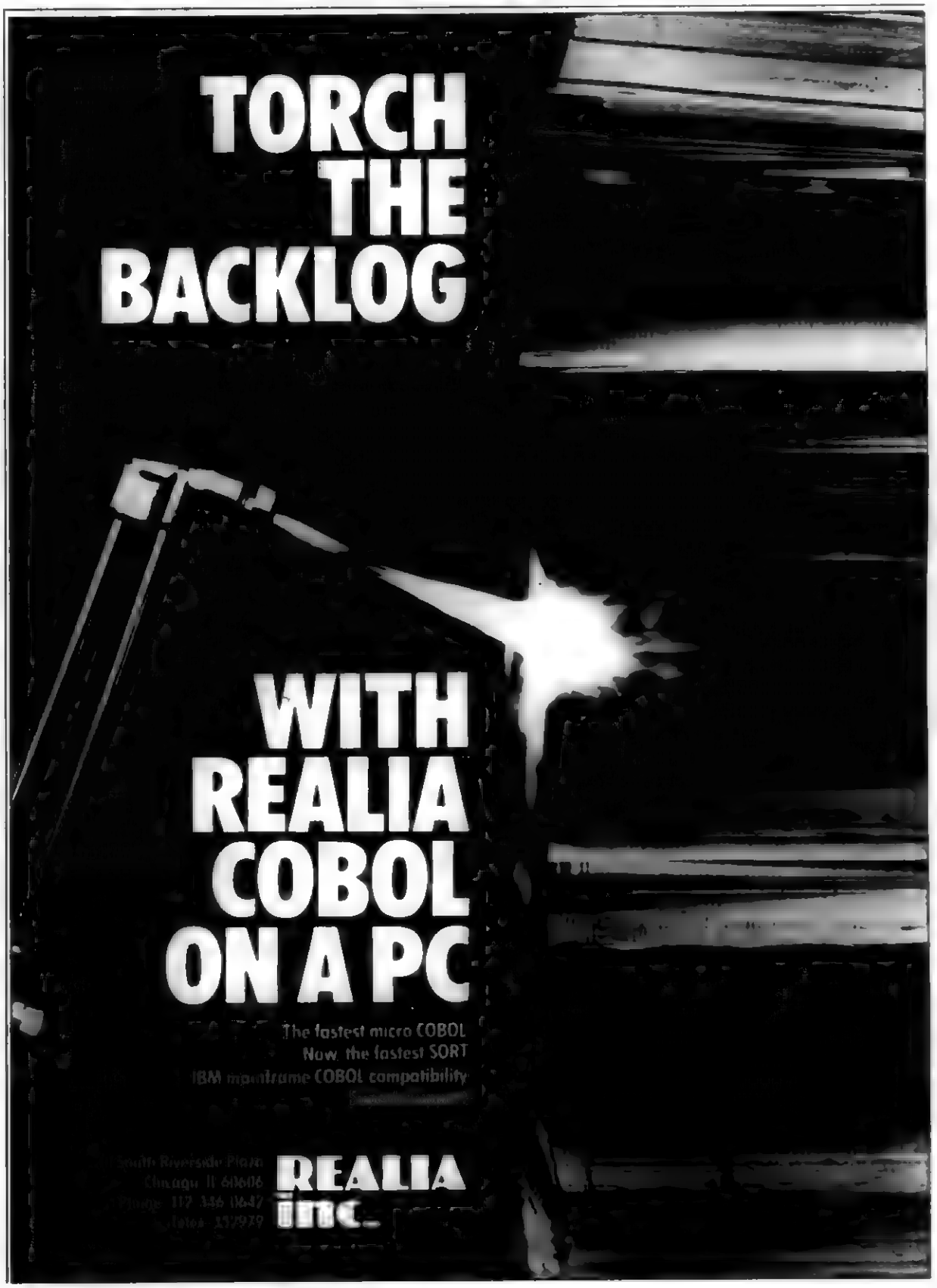
The information center's 12-person staff supports about 2,500 users who operate workstations, terminals and personal computers to run a wide range of applications from electronic spreadsheets to engineering and accounting studies. With their equipment, users can access two IBM 3081s, one of which runs the VM operating system and the other of which runs the MVS operating system.

IBM's TSO is used to allow workstations and personal computers to communicate with the mainframes. There are about 1,200 workstations and 230 IBM Personal Computers located within the company. Eighty percent of the PCs operate as standalone devices.

A consequence of giving the users so much freedom is that an overzealous user can spend his department's budget and the information center's resources automating a process that should not have been automated in the first place. In these cases, upper management can place the blame on the shoulders of Information Services, despite the chargeback system.

"Management sometimes looks to Information Services to say that all the systems work is cost-justified," Ilas says. "We're saying that a lot of that is now under the direct scrutiny of a line function." ■

Sullivan-Trainor is a Computerworld senior writer.



Continued from page 54

hasn't increased substantially," she says, "the number of calls for help that we're getting has continued to climb . . . and so has the variety of requests."

In the past, budget battles usually involved information managers answering to DP/MIS managers, but the scenario now seems to be changing. According to the AMA's Greenberg, the organization's survey this year showed a trend toward budgetary independence for information centers. Thirty-eight percent of all respondents indicated that their budgets were on a separate reporting line from the DP/MIS department.

Independence may, however, turn out to be a mixed blessing. Despite all the grumbling that information center managers have done about territorial jealousy on the part of MIS departments, they may find that justifying themselves to corporate management is actually a lot harder than they might have imagined.

In a report based on its 1985 survey, Crwth Coursewares noted that top management's resistance to information centers actually increased with the age of the centers. The number of mature information centers reporting management resistance as an obstacle was 11% higher than the number of pilot centers making that complaint — 38% to 27%.

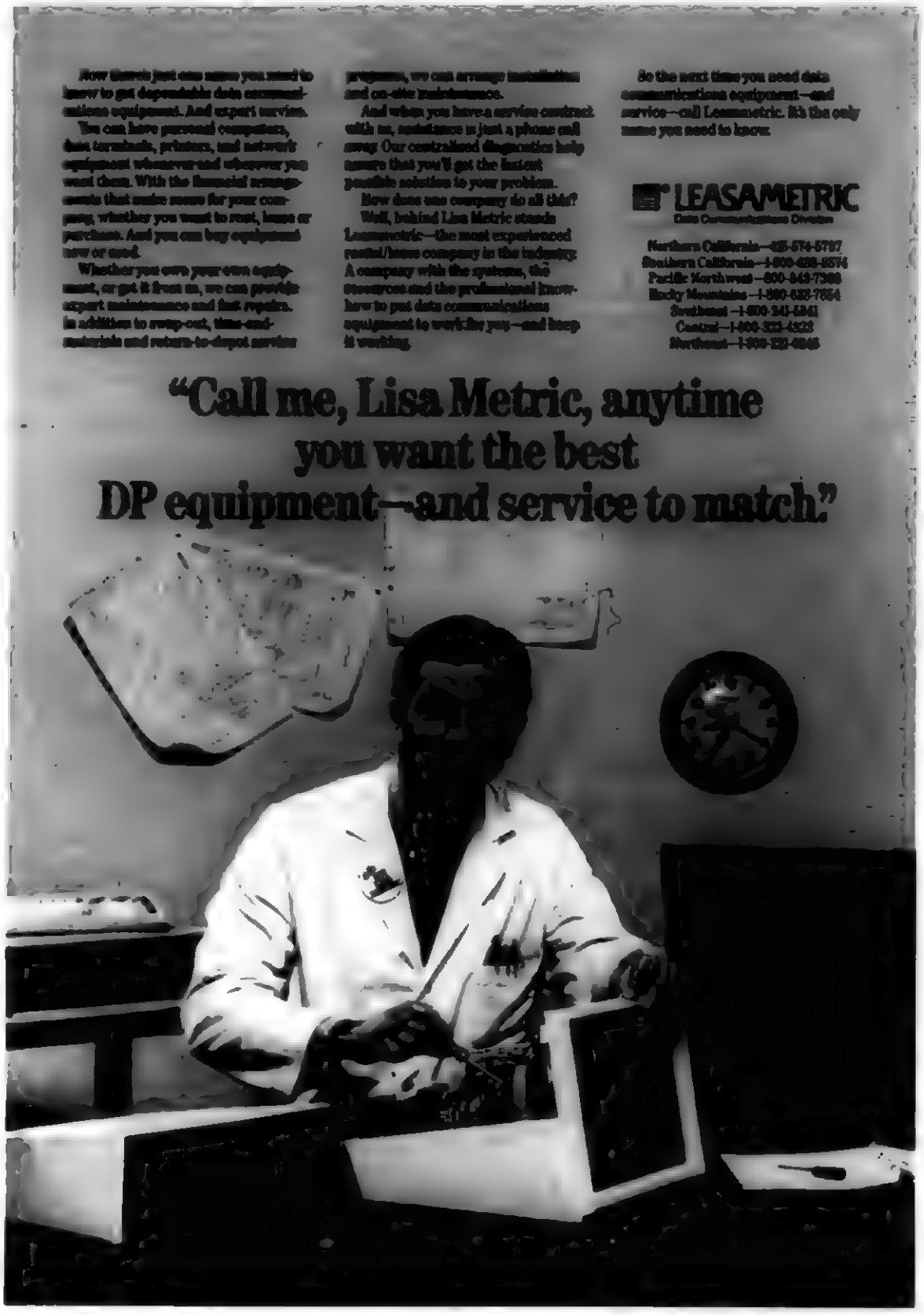
The response surprised the report's author, Beatrice Garcia, director of marketing at Cwrth. "We had expected there would be more management acceptance of information centers as they matured and proved themselves valuable," Garcia says.

But information center managers never had an easy time documenting value, a problem most likely complicated by their technical backgrounds. "Information center managers tend to come from data processing rather than business," Garcia notes, "and, as a result, don't tend to think in terms of business plans."

Two ways to justify a center's existence

To improve their chances of coming out on top in business negotiations, information center managers often transfer to end users some of the responsibility for justifying a

Continued on page 58



Centers prove their worth

Managers keep close performance records

Even though their efforts rarely translate into anything as concrete as budget and staff increases, many managers of mature information centers keep strict records to document their staff's performance. Individual managers recommend a variety of different measures.

"We don't really do cost/benefit analyses," says Katie Kuryla, project manager of the 3-year-old information center at Ryder Truck Rental, Inc. in Miami. "What we do talk about a lot is whether we can show that people are becoming more effective by looking at hiring rates."

She does not tally specific numbers, preferring to offer end-user departments general evidence of the information center's usefulness. Kuryla might point out to a department head, for example, that widespread use of personal computer programs may be one of the reasons his department has been able to forestall some staff increases.

In addition, she has taken note of the fact that in Ryder's finance department, where users started developing some of their own applications after information center staff members taught them how, the demand for APL programmers has declined. Kuryla says she would not feel comfortable tying the decreased demand directly to the information center's work, and she has never used it as an argument for the center's effectiveness. But she knows her staff is in some way responsible.

Kuryla concedes that Ryder's information center probably suffers from less bottom-line pressure than many of its peers. She meets quarterly with an executive review committee, composed of the company's top managers, which approves budgets for both MIS and the information center.

The attitude of these managers is not one that demands a heavy sell, she says. "It is a given here that end-user computing is good."

Ed Katterson, vice-president and manager of the 3-year-old information center at Manufacturers National Bank of Detroit, structures his cost analyses a bit more rigidly. For the past two years, Katterson has compiled a lengthy activities and benefits report to document the information center's value to individual users groups.

The report, a 50-page condensation of information collected through interviews, lists end users' major computing activities and details the benefits the users feel they derive.

Interviewers ask their subjects to calculate benefits in dollars whenever possible. They point out, for example, that the amount of time a fourth-generation language saves a manager is worth a specific amount of money to the firm, and they urge the user department to calculate an approximate figure. Interviewers

also allow users to indicate intangible improvements like increased productivity and better decision making.

Katterson summarizes information from the interviews in various ways. He totals the sums of money that each user department saves and highlights the major functions being performed with the assistance of the information center staff.

Although his immediate boss and his boss's boss get copies of the full report and occasionally comment on it, Katterson feels that the summaries are his most useful documentation tool. Copies of the sections that deal with individual departments are sent to those departments, where managers sometimes use them to justify requests for additional computing equipment.

Dale Delaney, associate manager of the 3½-year-old information center at Cordis Corp., a manufacturing firm in Miami, prefers a different sort of documentation. She relies heavily on telephone logs that track the number and type of problems that her information center staff members solve for users.

Staff members log information in a variety of ways, depending on the seriousness of the user's problem:

- For problems that get resolved over the phone in less than 15 minutes, staff members simply note the user's department, the type of problem and the suggested resolution.
- For any situation that requires more extensive attention, they enter into an on-line tracking system more detailed information about the work they have performed. The tracking system runs on a central mainframe and serves all MIS groups — not just the information center.

Every month, Delaney summarizes the data entered into the on-line system according to the system involved, the type of problem, the user department and the amount of time spent in problem resolution. She presents these summaries to management to show what the information center does and how well it performs.

Such detailed reports cut both ways, however. They sometimes further the information center's budgetary goals, Delaney says, but are more apt to raise questions about why the center took so long to resolve a specific problem.

Terry Hart, who heads up a 4-year-old center at Upjohn Co.'s Division of Medical Affairs in Kalamazoo, Mich., also uses telephone logs. Keeping track of help-line calls actually serves two purposes, she says.

First, it can help justify the information center's operations, Hart says. "With this kind of record, although I may have to do some estimating, I can come up with pretty accurate figures on the amount of time we're saving for users."

Second, the logs help indicate system problems. A pattern of calls concerning a word processing package, for example, might point to bugs in the software. Hart checks the logs every month to uncover such glitches; when she finds one, she alerts the MIS group that is responsible for maintaining the program's operation.

> ***Detailed reports cut both ways. They sometimes further the information center's budgetary goals but are more apt to raise questions about why the center took so long to resolve a specific problem.***

Delaney says that even with records, information centers have a hard time proving their effectiveness.

"And that," she says, "is one very good reason for concentrating on areas that are company goals. That's how you get good visibility."

Eric Rolfe Greenberg, project manager for the American Management Association's "1986 AMA Report on Information Centers," says other common measures for impressing top management include the following:

- Comparing the cost of applications developed by programmers against the cost of those developed by end users who have received help from the information center staff.
- Counting the sheer number of applications that users develop for themselves.
- Tracking staff reductions that can be attributed directly to the rise in end-user computing.
- Showing increases or decreases in the amount of CPU time that end users log before they come to the information center and the amount they log afterward. Increases might indicate that the information center has chosen a software package that users like and feel comfortable with. Decreases may prove that users are becoming more efficient at a specific task.

Greenberg says he has even encountered one organization that counts keystrokes and removes equipment if users do not meet specified quotas. But, he adds, very few information centers attempt that degree of regimentation.

— JOANNE KELLEHER

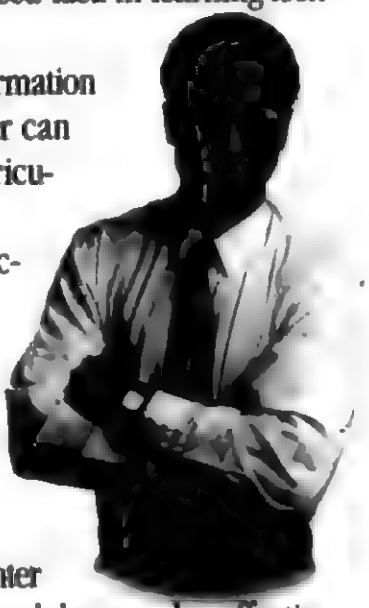
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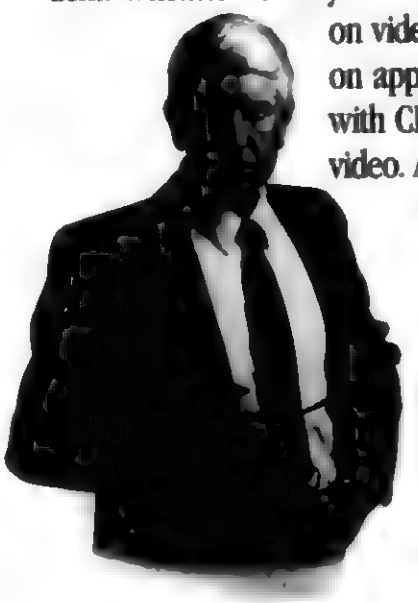
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center's existence and maintaining its funding.

One of their main means of delegating responsibility is a chargeback policy, wherein user departments pay for the equipment they use, the support and training they receive and, frequently, a share of the center's overhead. The second method is to cultivate proponents at top management levels.

Chargeback policies are gaining popularity, because information center managers regard them as a means to both shift the onus of justification away from themselves and reduce the amount of nonproductive user requests.

In its 1986 report, the AMA notes that about half of the information centers it contacted in a similar study a year earlier relied on chargebacks to help cover the cost of hardware and software purchases. One-third charged user departments for installation and hookup costs, and one-fourth billed users for data storage, mainframe connect time, maintenance and repair. Some also charged user departments for overhead and consultation time.

As convenient as chargeback seems, it can pose a tremendous risk: The transition from free access to fee access can be a politically tricky passage.

One information center, whose former manager requests anonymity, was quite literally killed by the backlash. In this case, the center never operated as a free service but rather began its existence as a profit center. Nevertheless, the fact that no MIS group in the firm had ever allocated costs for anything but raw computing power was enough to make the idea "political dynamite," according to the center's manager.

"People were used to being charged for processing but not for development or consulting," the manager says, "and it was perceived as a strange way to operate."

About a year and a half into its existence, the information center lost its toehold and "got dropped off the bottom of the list," the manager says.

The center had run popular training programs and made some decent money, with fees on the order of $50 per hour for consulting and $100 per hour for development. Considering these successes, the manager deduced that users' opposition to the chargeback system was the only possible cause of the center's demise. "At the time," he points out, "there was still considerable uproar from people who objected to being charged."

IFF's Faistl says his company's users would show the same resistance if he tried to institute a chargeback policy for information center services.

In theory, Faistl is already a proponent of chargeback. "Users should justify the information center, instead of the information center having to prove its own worth," he says. "Besides, unless you can get into the mode where you are charging back, users are going to think of you as a free resource and use you accordingly."

But, practically speaking, he cannot see the concept working for the information center under his supervision — at least not yet. "If we implemented a chargeback system now, it wouldn't be regarded as a positive thing," he says. "It would be viewed as taking money out of our right pocket to put in our left."

> ***'The best thing an information center can do to keep the heat off itself is to let the users become its proponents.'***
>
> — Don Faistl
> International Flavors and Fragrances

Perhaps by next year, when the center will be 4 years old, Faistl says, it will have grown enough and become established enough to overcome resistance to the idea of chargeback.

Katterson at Manufacturers National Bank of Detroit was delivered from the necessity of worrying about acceptance. Just as he began to consider charging users for information center services, the bank's top managers announced a companywide policy of cost accountability.

The system has been in place since Jan. 1, and Katterson already notices a slowdown in user requests. Results are not so pronounced in the ledger books, however. Training and consulting revenues, combined with a base fee per user, still fall short of the center's original expectations. "We're still not getting enough to meet costs," Katterson says, "so we still have some tuning to do."

Another, albeit partial, solution to the problem of justifying an information center's operations is to cultivate partisans in end-user departments. "Information center managers need to get out and practice some management by walking around," says consultant Livingston. "What they want is to establish a foothold in some department and find a champion there."

IFF's Faistl calls them proponents, but the idea is the same. "The best thing an information center can do to keep the heat off itself is to let the users become its proponents," he says. "Tell them to make sure their bosses know how whatever you are working on has helped them. That

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way, when it comes time to pay out some pesos, there is already an awareness of how effective the information center has been."

By the time information centers have reached maturity, many managers discover the value of word of mouth.

Ryder's Kuryla, for example, credits its end users with a large measure of her information center's success. "People in end-user departments have been pretty effective in telling their managers how wonderful it is," she says.

And Goodyear Aerospace's Uecker makes sure that both he and his staff wander around in user departments to pick up information about employees' needs and to cultivate an awareness of the information center.

Information center managers can and should apply the same principle to upper management, according to consultant Casto of the Casto Group. If the centers hope to remain vital, he says, they must find ways to foster liaisons within their companies' business units and to make direct contact with top executives.

> ***The risk with chargeback is that the transition from free access to fee access can be a politically tricky passage.***

Casto suggests one method that not only allows information centers to gain positive visibility but also helps them decipher strategic corporate goals: hosting a series of executive seminars. These events should not focus on recitations of information center successes but should provide top managers with just what they need to know about the risks and exposures associated with end-user computing.

As a side benefit, executive forums can provide information center managers with insights into possible new markets for their services, Casto says.

He and many other observers believe that information centers are most likely to falter when they make the mistake of defining end-user computing and their charter in connection with it too narrowly. "They let themselves become so overrun with user demands," says Casto, "that they can't see the strategic view for all the users in front of them."

IFF's Faistl shares the opinion. He maintains that the information center can and should serve as the focal point and direction setter not just for micros, but for mainframe-based end-user computing, office automation and systems development as well.

His convictions, in fact, prompted him to retain control over the information center when he got promoted to manager of information resource planning. "I've know for a long time," he says, "that that's where the action would be."

Rocco Maggiatto, a vice-president and manager of information and data management services at Marine Midland Banks, Inc.'s corporate office in New York, recently reached a similar conclusion.

Marine Midland's information center, established five years ago, encompasses a broader scope than most departments that operate under that title, Maggiatto says. With a staff of 40 employees, the center handles acquisition, installation, training, decision support consulting and maintenance negotiations for personal computers, office automation workstations and time-sharing terminals and administers an extensive electronic mail system.

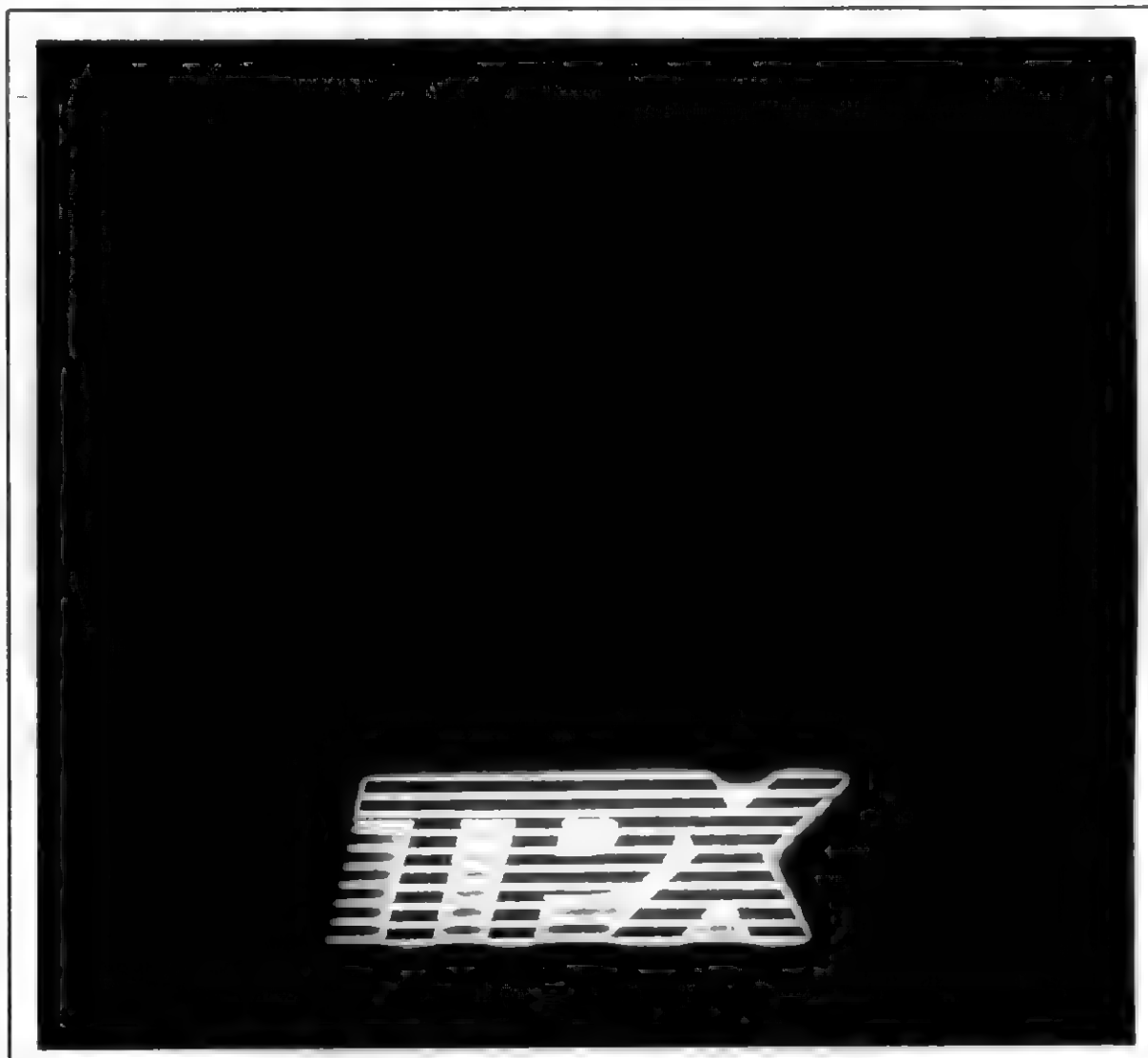
Although Maggiatto favors the concept of a broad charter, he says Marine Midland's information center may have gone a step too far. He feels that the time has come for the center's staff to apply its know-how more selectively.

As the center established itself as a far-reaching concern, he explains, it began to get bogged down in the piles of administrative paperwork that seem to go hand in hand with end-user computing. The bureaucracy started becoming so cumbersome, in fact, that users began to view the information center as an obstacle rather than an aid.

In turn, Maggiatto has begun to rewrite the center's charter, turning the organization into an engine for several targeted, strategic efforts. Under his direction, he says, the information center will "establish a strategic framework for engineering the workplace, establish a data management framework and provide support within a common framework to a variety of mini information centers that have sprung up throughout the bank."

The priorities now, Maggiatto says, are projects such as figuring out what users do with data and how they can do it better. He is careful to note that, because of its broad background, the information center at Marine Midland is probably more qualified than most to take on such a pivotal role.

Still, Maggiatto's plans for his company's information center closely resemble what many observers see as the inevitable route for these entities. IFF's Faistl states the matter succinctly: "The information center is changing its role, moving away from direct responsibility and toward orchestration." ■



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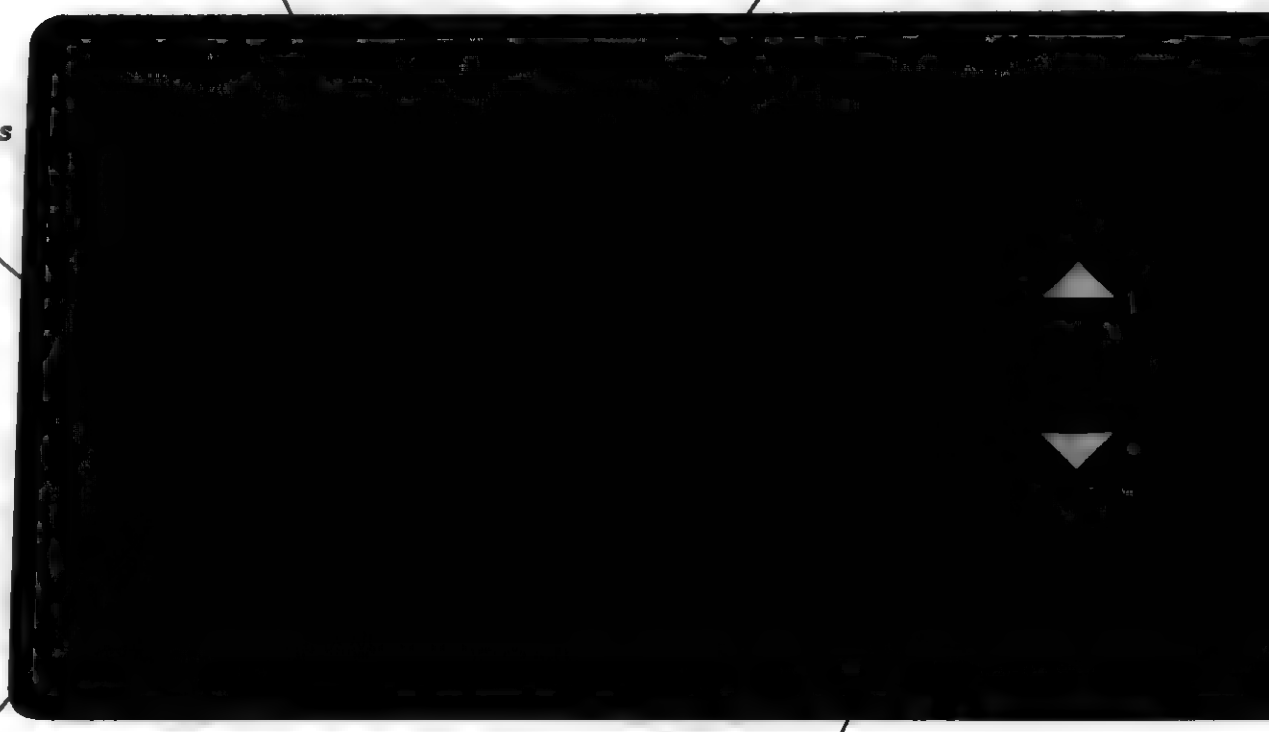
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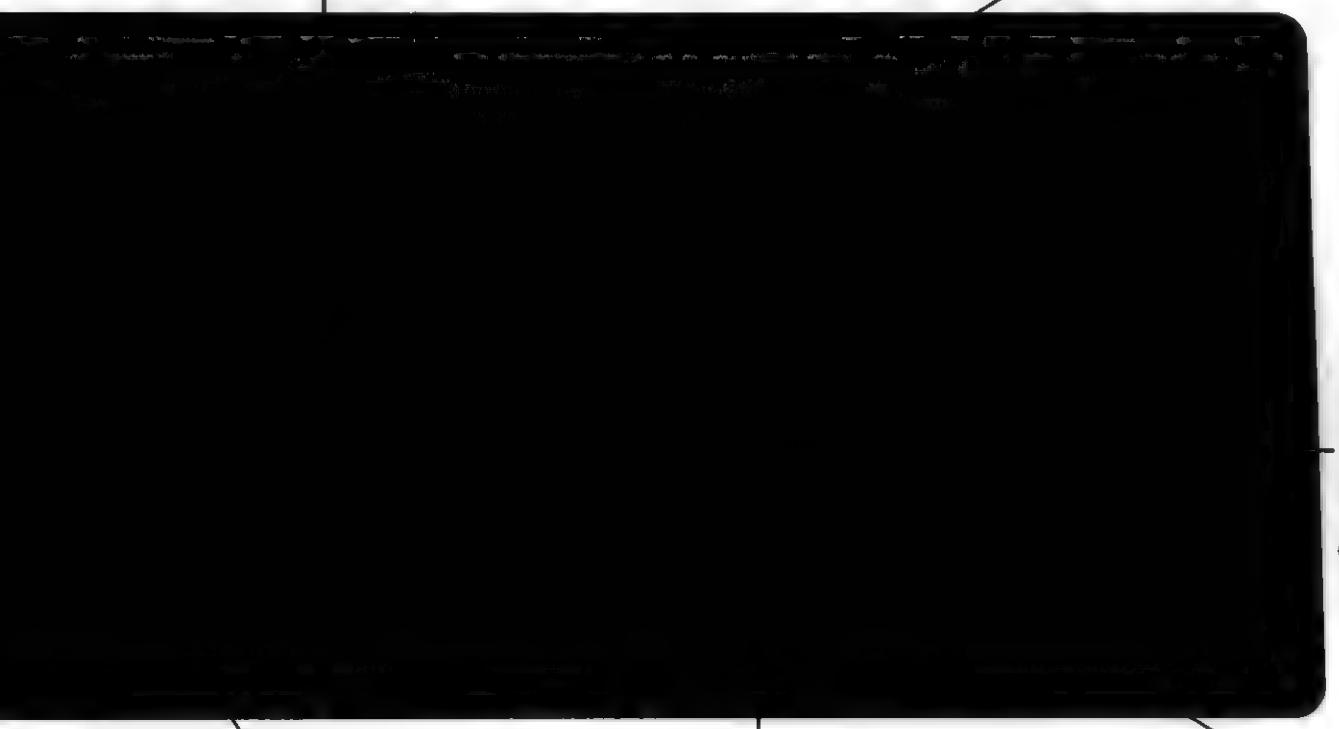
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How to maintain quality as the center assumes new roles

By FRED L. FORMAN and GARY A. CURTIS

As an information center moves into maturity, it needs to own up to the fact that it cannot be all things to all end users — that it needs to set limits as to the quality and quantity of service that it can provide.

The following four guidelines will help keep any growing information center on track:

1. Keep tabs on users' changing needs. In its start-up phase, an information center can easily satisfy the needs of the few users who want help. As the center attracts more users, however, staff members find it more difficult to meet everyone's needs.

Three concrete actions will help the center remain responsive:

- Institute a help desk to meet the demands of the growing user base. The desk should be staffed by information center staff members who enjoy solving users' pressing problems.
- Publish a newsletter to dispel users' technical fears and promote goodwill. Newsletters are also the perfect medium for showing off what's new in the information center: new data bases, new development tools, increased storage capacity and so on.
- Conduct monthly meetings to bring together information center staff members and their end-user clients. Two-hour meetings — with one hour devoted to presentations from the staff and one hour free for questions from the floor — work especially well.

2. Charge users for services rendered. Like any other business sector in a company, the established information center must demonstrate to top management its ability to meet financial and performance goals and to provide cost-effective service. It can acomplish neither if it works for free.

Maturing information centers need to institute fair charges, based on actual usage.

To ensure that the center bills its users fairly, managers should compare their prices with those charged by commercial service bureaus. The two should be about the same.

3. Build everything around a strategic plan. A strategic plan sets forth the information center's mission by depicting the center as a business organization within the corporation.

As such, the plan should encompass every aspect of information center management: budgets, financial goals and projections of client needs as well as hardware, software and networking concerns.

Without the solid foundation of a strategic plan, an information center is little more than a hodgepodge of software and files and can never reach maturity.

4. Stay on the edge, but don't go overboard. New products show up all the time, and information center managers always feel tempted to load up on tools.

Users, on the other hand, invariably cling to the one or two products they like and show a reluctance to try new ones.

Managers of maturing information centers should take steps to alert and inform end users of new products and their potential benefits.

The only products approved for use, however, should be those whose capabilities can change the way users conduct their business and improve the bottom line. ■

Forman and Curtis are vice-presidents in the Corporate Technology Group of American Management Systems, Inc., a consulting firm based in Arlington, Va.

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In Depth

Case History

E. F. Hutton: MIS, end users unite to take on Wall Street

By ALAN ALPER

In the mid-1970s, E. F. Hutton & Co. realized that a corporatewide information system could not continue to grow haphazardly. So the 82-year-old brokerage house took painstaking efforts to plan its communications and computing architecture from the top down, creating an information systems network spanning its regional and branch offices worldwide.

In essence, recalls Bernard Weinstein, E. F. Hutton's vice-president of communications, branch information systems and programming, the firm wanted to create "one network for information flow," enabling all 18,000 employees to have access to data relevant to their jobs.

"We didn't want a piecemeal approach — something that would put a finger in the DP dike," he notes. "We wanted an architecture for the long haul."

Moreover, E. F. Hutton hoped to increase the productivity of its account executives by 50% within three years, Weinstein adds. "We wanted the system to be used as a competitive weapon," he asserts. "Some companies just talk about it, but we wanted to do it."

In a departure from the day's prevailing wisdom, the firm established committees — groups composed of corporate users and information systems specialists — to identify long-range requirements. By incorporating the input of relatively unsophisticated users and knowledgeable professionals, E. F. Hutton hoped to avoid being saddled with obsolete equipment — a situation to be averted at all costs in the fast-track world of Wall Street.

> ***'Some companies say, "Just put some PCs on people's desks and build support behind it." We built the support first and made it flexible, with enough capability to suit our needs for some time.'***
>
> — Bernard Weinstein, E. F. Hutton

The committees' recommendations particularly emphasized remaining flexible enough to take advantage of any technological opportunity that arose. Required was an all-encompassing system that would enable users, regardless of their location, to access a multiplicity of data in real time.

Data such as on-line stock quotes, financial news, analytical models and research reports had to be available at the stroke of a key or two. In addition, the system had to perform a variety of office automation tasks, such as word processing and electronic mail for executives and support personnel.

Alper is Computerworld's Mid-Atlantic correspondent.

More control at the right time

In light of E. F. Hutton's guilty plea to U.S. Department of Justice charges last summer of inappropriately maintaining its checking accounts (see story page 66), perhaps the firm's automation strategy was too effective in helping to hone that competitive weapon.

But, like its competitors, E. F. Hutton was seeking to provide management with a better way of exercising tighter controls over the firm's assets and monitoring the performance of the various financial services it provides to its customers.

"The issue is how to provide better control and report capabilities to give management a better view of how policy is executed," notes Marshall Caro, chairman and chief executive of Programit, a New York data processing consulting firm that has worked with many financial concerns on Wall Street, although not with E. F. Hutton.

Adds Weinstein, "We're looking to improve the time and place value of the information. It's more useful to our people if it is in the right place at the right time."

Because E. F. Hutton is a retail-oriented brokerage house, meaning much of its revenue is derived from individual investors rather than institutions, efficiency is pivotal. As the variety of financial services that brokerages offer broadens to include mutual funds, municipal bonds and money market accounts, the competition for individual investors has heated up, forcing E. F. Hutton and its peers to attempt to provide their brokers with an automated advantage.



CW PHOTO BY DEBORAH FICKLING

"You can't have a broker running to the back office for a Standard & Poor's report or going to the other side of the office for news and then having to call one of our research analysts while he has a client on the phone," Weinstein explains.

"We wanted to make it easier for our people to find data within the monolith of Hutton. What we had was similar to going to the library and wanting to find something without the Dewey decimal system."

So E. F. Hutton constructed a four-level hardware and software environment tied together via a private terrestrial network and satellite communications system. Hardware consists of a host and alternate site complex of IBM 3080 and 3090 mainframes; Data General Corp. Eclipse and MV minicomputers at regional and branch offices, respectively; and soon-

> ***'We've sugar-coated the whole thing, so users can use as much data as they want. There's a bypass button, so if an individual wants some type of data, it will go right to his in-box. Users won't even have to look at it on the screen.'***
>
> — Bernard Weinstein
> E. F. Hutton & Co.

to-be unveiled IBM Personal Computer-compatible workstations to replace decade-old Bunker Ramo Corp. dumb terminals.

The workstations will provide local processing capability for 10,000 brokers and executives.

When work is completed, the $3.1 billion brokerage firm will have spent $100 million on the project. The purchases will include workstations, a satellite system, office automation software for the branch offices, software licenses and system maintenance, Weinstein says.

One hundred million dollars, he adds, is not a lot of money when you consider that the firm spends that much annually on its telephone calls.

"The $100 million was spread out over seven years," Weinstein explains. "A typical firm spends approximately 1% of sales on its DP budget. But, for us, since we're more information-dependent, we have to spend more."

History of decentralization

In 1978, its IBM mainframes already in place at a host complex located in the heart of New York's financial district, E. F. Hutton was looking for a way to provide more powerful processing to its regional offices without siphoning capability from its headquarters facility.

The firm installed DG Eclipse minicomputers at its 20 — now 40 — regional offices, representing what it says was the first distributed DP system on Wall Street.

"It was a tremendous departure from what was going on," Weinstein explains. "IBM had not recognized distributed data processing — its approach was to build up the host."

In early 1984, E. F. Hutton further decentralized its DP load by installing DG's MV-class machines, running DG's Comprehensive Electronic Office (CEO) software, at its branch offices (see story page 69). Called the Branch Information Processing System (BIPS), the computers provide local office automation and DP functionality.

The various mainframe and minicomputer systems are connected via a private leased terrestrial line, which permits communications at speeds up to 19.2K bit/sec. Via the network, known as Compass, brokers and executives can maintain real-time access to stock quotes, a variety of technical analyses of securities, portfolio performance, customer account information and E. F. Hutton's own financial news service as well as the Dow Jones News/Retrieval service.

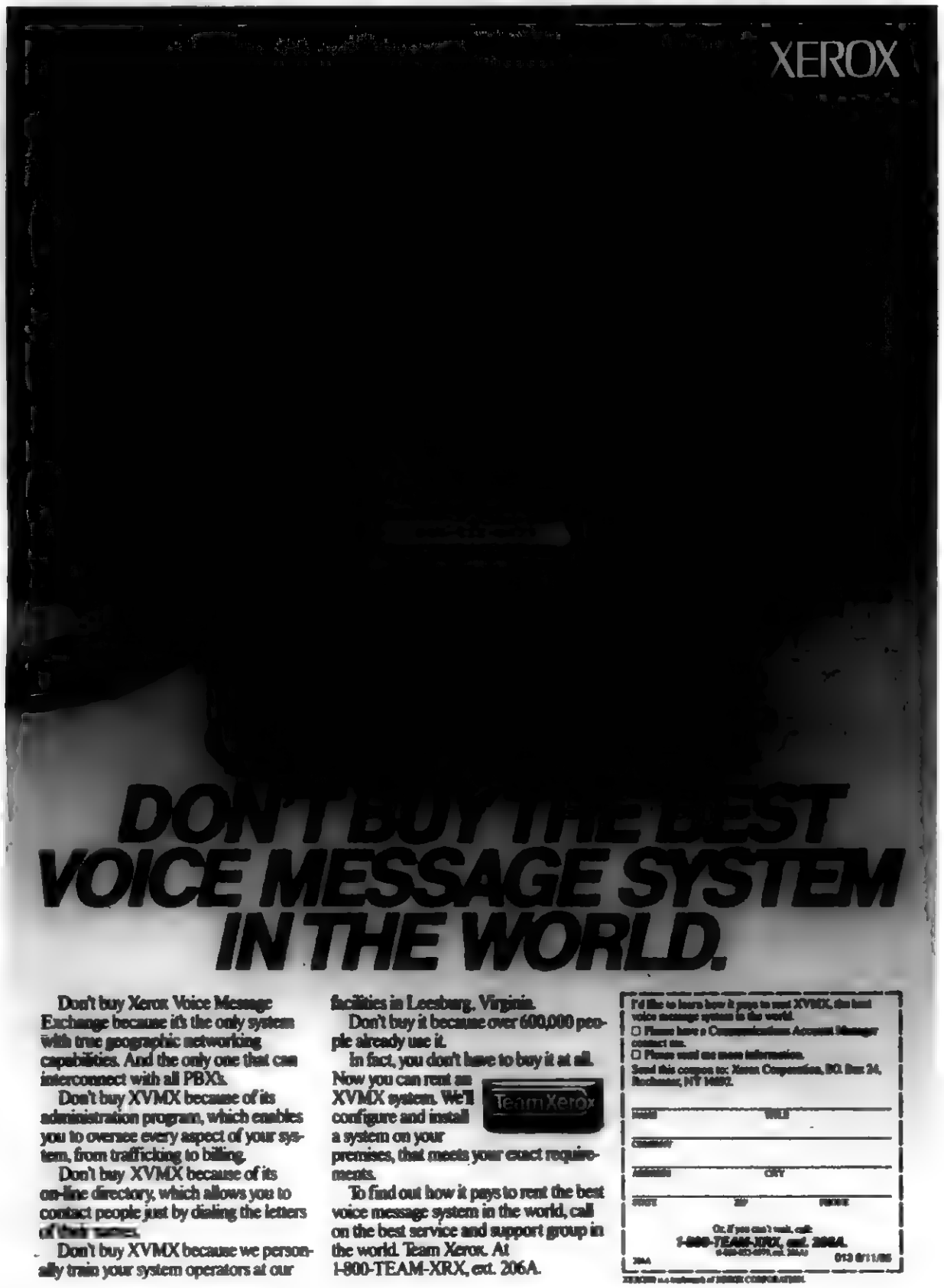
For security reasons, data applicable to each E. F. Hutton office is available only to that facility. Each user has an identification code that enables him to gain entry to the system. Each employee also has a password to allow access to job-specific data.

"A cashier, for instance, would have reason to get at certain data. His user ID and password, however, would only work on his machine. He can't log on using an account executive's machine," Weinstein explains.

Access to the network will also change when E. F. Hutton installs the 10,000 IBM PC-compatible workstations. At press time, the company had not disclosed the name of the vendor that will supply the workstations, which will also run DG's CEO.

Dubbed Advanced Workstation for the Executive (AWE) by the firm, the microcomputer-based workstation will enable brokers and management alike to run Lotus Development Corp.'s 1-2-3 as easily as they access the E. F. Hutton data bases.

AWE will provide graphic



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presentations of stock market data and will be easier to use than the Bunker Ramo terminal it is replacing. Such ease of use will not only facilitate what employees are already doing but also will open new vistas.

The workstation will enable brokers to access information, such as the Securities & Exchange Commission's listing of insider trading, that previously was technologically infeasible.

"We've sugar-coated the whole thing, so users can use as much as they want. There's a bypass button so if an individual wants some type of data, it will go right to his in box. Users won't even have to look at it on the screen," Weinstein says.

"You can do things with one button on a PC that take numerous keystrokes with the Bunker Ramo terminal," he adds, pointing to the access of E. F. Hutton's analysts' reports as an example. "Because the PC's intelligent, it also tells you when you've hit the wrong key."

Weinstein says that unlike other brokerage firms, E. F. Hutton did not jump on the PC bandwagon because it was in vogue.

"Some companies say, 'Just put some PCs on people's desks and build support behind it,' " Weinstein explains. "We built the support structure first and made it flexible and modular and with enough capability to suit our needs for some time."

Toward that end, E. F. Hutton has also recently embellished its communications infrastructure. It is in the final throes of installing its own satellite communications system to transmit voice and data to all of its 404 locations worldwide.

At each location, E. F. Hutton is installing a 2-foot, $2,000 satellite dish supplied by Equatorial Communications Co. in Mountain View, Calif., and has purchased its own transponder at a cost of $2.5 million. Voice and data are transmitted over C-band, a bandwidth not affected by sunspots or atmospheric conditions, Weinstein notes. The brokerage firm is using Spread Spectrum, an encryption technique that prevents computer pirates from decoding or jamming the signals being sent.

At a total cost of $3.5 million, Weinstein says, the satellite communications system paid for itself within the first six or seven months of operation.

"Over 30% of Hutton's traffic is of the broadcast variety," he explains. "We found that it's more cost-effective to send data and voice to all of

BIPS abuses close loopholes

It was E. F. Hutton & Co.'s Branch Information Processing System (BIPS) at which the U.S. Department of Justice pointed an accusatory finger when it charged the brokerage firm with federal mail and wire fraud violations that concerned the way in which certain checking accounts were maintained from July 1980 through January 1982.

While E. F. Hutton pleaded guilty to the charges and paid a $2 million fine plus $750,000 to cover government investigatory costs, many observers contend the scandal was a poignant illustration of a strategic use of information systems.

Bernard Weinstein, E. F. Hutton's vice-president of communications, branch information systems and programming declines comment on the situation.

E. F. Hutton insiders, however, say that in theory, BIPS' drawdown facility should have prevented managers of the broker dealer subsidiary from maintaining zero or in some cases negative balances in the checking accounts in question — a situation that freed additional assets for investment purposes.

"There were loopholes that enabled managers to circumvent the accepted procedures," recalls one E. F. Hutton source who asked that he not be identified. "It was a problem of lack of controls."

Changes, more control

Hutton has since enhanced BIPS' cashiering and draw-down facilities to prevent further abuses. Better management controls have also been instituted, enabling corporate executives to monitor the cash position of each branch's accounts, sources say.

"Each branch used to operate as an independent entity," one source explains. "Now, each is audited much more closely."

According to Paul Beehler, Hutton's senior vice-president and treasury manager, the brokerage made a number of organizational changes as well as modifications to BIPS to prevent the improprieties from recurring.

First, the firm established a formal treasury function under Beehler that reports directly to the chief financial officer. "We moved to a central treasury management philosophy from a decentralized one," Beehler says, a move that enabled the corporate suite to more closely audit the firm's cash position.

Also employed was a computer facility that enabled Beehler to monitor the firm's daily cash flow of more than $1 billion from the firm's 400-plus branch offices to its New York treasury department.

"In addition, we developed a system that controls and tracks all aspects of Hutton's relationships with the various banks that it does business with," Beehler says.

— ALAN ALPER



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our locations in one transmission."

Among the various communications sent via satellite are E. F. Hutton's "Morning Market Letter," which updates brokers on stock market conditions, and "Profitline," a pep talk covering sales strategies and economic conditions. "At 48K bit/sec., the voice on 'Profitline' sounds real good, not like Mickey or Minnie Mouse," Weinstein says.

E. F. Hutton even uses the satellite to transmit software updates to all of its regional offices. Rather than risking sending numerous tapes through the firm's internal mail, one satellite transmission ensures that each location has received the new software, he adds.

Citing prohibitive costs, the firm does not intend to transmit video via satellite. "Although it's very sexy, it's also very expensive," Weinstein says. "If there were a breakthrough in the economics of satellite conferencing and the technique could be sold as a substitute for travel, we'd consider it. But it's obvious that people still want to go eyeball-to-eyeball."

With the system's infrastructure in place, E. F. Hutton is looking to further optimize its communications by using local-area networks within its branch offices.

While a decision has not yet been made, Weinstein is leaning toward AT&T's Starlan network because of its speed, simplified cabling scheme and compatibility with software already in use, such as Lotus products and other IBM PC-compatible software. "We would like to install it when we roll out the AWE workstation in first-quarter 1987," he says.

Software and AI

E. F. Hutton employs 200 programmers, although the firm does not attempt to write all of its own code, Weinstein says. The brokerage house uses many off-the-shelf packages, some provided by small software vendors, and adapts them to meet its own requirements.

"We used to do all our own programming in-house, but now we use a lot of software vendors and some of the small boutiques where much of the more creative work is done," Weinstein says.

Although risky, Weinstein emphasizes that E. F. Hutton goes to all extremes with the small software houses to make sure the firm is protected in the event that a vendor goes out of business. "It would be a shame not to use them because they were small," he concludes.

E. F. Hutton is contemplating grafting expert systems capabilities onto AWE. The company is working with Palo Alto, Calif.-based Teknowledge, Inc. on an expert system that would enable AWE, without prompting, to alert brokers to market trends and breaking information that affect securities trading.

"The system would have triggers — such as heavy insider trading on a particular stock, updated market research or breaking news — that will ask the user if he wants more information," Weinstein explains. "It also would be used to lead users through the system. It would improve the utilization of the systems for experts and for those just starting out."

Implementation of the expert system, while evaluated in conjunction with AWE, probably will not occur until after the workstations are put on-line in early 1987. "We've just not looked at it in detail yet, but it probably will be available in some form sometime next year," he estimates.

Programit's Caro contends

> ***'People in this business are inundated with information and have to choose between options presented on the screen. There has to be some mechanism to enhance decision support and make people more effective. You can call it AI or anything you want.'***
>
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Strategy, software sway Hutton vendor choice

Data General Corp., E. F. Hutton & Co.'s supplier of branch and regional processors and Comprehensive Electronic Office (CEO) office automation software, won the brokerage house's contract in February 1983 after a two-year bidding process.

Tom Kelly, a member of the DG sales team involved in the E. F. Hutton sale, says DG's bid probably was the highest. DG's advantage, he contends, was its ability to supply all the hardware and software E. F. Hutton required plus a strong systems integration service.

Weinstein says E. F. Hutton went with DG initially, in 1978, because of the vendor's distributed DP strategy, an approach that IBM did not recognize at the time. "We looked at the processor costs coming down the pike; line costs, which would not increase as steeply; and the ability to network this all together so the system could all work in concert."

Five years after the initial installation, he went back to DG when developing what is now known as the Branch Information Processing System because he wanted "the ability to put DP power at the branch level." He was also attracted by CEO, which he describes as "the most powerful office automation package available."

E. F. Hutton's need for a versatile vendor was another factor, Kelly notes. "They wanted to be able to take advantage of technology as it moved forward. Believe me, they've taken advantage of new technology."

— ALAN ALPER

that many Wall Street firms are embracing various strains of what is called AI. "People in this business are expected to make real-time decisions. They are being inundated with information and have to choose between options presented on the screen."

"There has to be some mechanism to reduce the amount of data and enhance decision support to make people more effective. You can call it artificial intelligence or anything you want," Caro says.

Productivity via automation

Depth of view and committment to an architecture is how E. F. Hutton's automation strategy differs from most companies', says Tom Kelly, a member of the DG sales team that sold the brokerage house the bulk of its computer equipment. "They knew exactly what they wanted; that's very unusual, given what goes on in the industry," he notes.

Weinstein says his firm seeks to increase its brokers' productivity without having to hire additional support personnel. Through automation, "People said that we could add seven more brokers and get more productivity from each without needing any more secretaries."

According to Caro, the goal of many brokerages is to make do with fewer traders. "If you look at it in those terms, it's a classic case of labor automation, although most people don't want to call it that."■

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EXECUTIVE REPORTS

Special Editorial Features

Every issue of Computerworld presents either a Product Spotlight or Executive Report. For advertisers, it's still not too late to take advantage of the hot topics set for September!

Manufacturing Automation Protocol (Executive Report, September 1) Takes a close look at the manufacturing automation protocol marketplace (MAP), with a focus on General Motors' use of MAP. Also discusses which vendors are supplying which MAP products. This report will help users determine if the time is right for implementing computer-integrated manufacturing and MAP. Closing date August 15.

Computer Leasing (Executive Report, September 8) Focuses on the state of the leasing industry, how vendors are reacting, why leasing can be better than buying and what to expect in the future. Also, an examination of the growth of leasing — plus, pros and cons of leasing versus buying and a look at lease negotiating. Closing date August 22.

Financial Modeling Packages for Micros (Product Spotlight, September 15) Examines how standalone spreadsheets are fast disappearing and being replaced by integrated programs or financial modeling packages. The main article looks at what users can do after outgrowing their spreadsheets, and presents the use of a financial modeling package as one solution. Closing date August 29.

Communication Standards (Executive Report, September 22) Focuses on electronic data exchange protocol (EDI), which allows for the direct computer to computer exchange of standard business forms. This report studies the value of EDI in the transmission of purchase orders, invoices and other important documents in various industries. Also, a look at how EDI is strengthening the trade relationships between customers and suppliers. Closing date September 5.

On-line Computing (Executive Report, September 29) Explores the fact that although on-line transaction processing (OLTP) has been around since the 1960s, the market is now heating up with IBM and some BUNCH companies battling a group of young companies for the bulk of the market. This report examines on-line computing with a look at the major players, the current state of the art, and what users want. Closing date September 12.

And it doesn't stop there! Important and pertinent Executive Reports and Product Spotlights topics continue through October and November.

ISSUE	TOPIC	CLOSING DATE
October 6	Hardware Roundup/Large & Medium-scale Systems (Product Spotlight)	September 19
October 13	Hardware Roundup/Small-scale Systems (Product Spotlight)	September 26
October 20	Hardware Roundup/Microcomputers (Product Spotlight)	October 3
October 27	Decision Support Systems (Executive Report)	October 10
November 3	*1000th Issue/40th Anniversary of the Computer*	October 10
November 10	PC Graphics Hardware (Product Spotlight)	October 24
November 12	*Computerworld Focus on Microcomputing *	October 3
November 17	Systems Integrators (Executive Report)	October 31
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PRODUCT SPOTLIGHTS

MANAGEMENT

TAKING CHARGE
Donald Prentice

MIS: Chip off the old block

Today's organizations spend considerable resources trying to overcome chronic problems with the information systems function. Management sees great potential that is not being realized. A wide variety of prescriptions for success are offered, with the common approach of seeking to strengthen the tie between the conduct of the business and the development of information systems.

Often, expectations are not met despite effort and the apparent validity of the prescriptions. The reason is clear when the prescriptions are viewed in the context of a simple, basic principle: Information systems necessarily reflect the character of the organization they support.

MIS is not the organizational problem child, but merely the identifiable patient. The situation is similar to that of young Johnny being brought to a family counselor for therapy because he is disrupting the family and his parents can't do anything about it. It is true that Johnny has problems, but he is not *the* problem. The whole family is the problem. Johnny is the identifiable patient. True therapy begins only when the entire family, including Johnny, owns up to this.

Information systems are not *the* problem. The whole organization is the problem. The real issue is how to redefine the organization in response to present-day business challenges and in alignment with the impact of the infor-

See MIS page 72

Prentice is vice-president of the Information Group, Inc., a Santa Clara, Calif., consulting firm.

Ford seeks compatibility

Exec says unified systems approach spurred IBM pick

By Alan Alper

DEARBORN, Mich. — Ford Motor Co. picked IBM to devise a comprehensive office automation strategy for its North American operations [CW, July 28] to address inefficiencies caused by incompatible computer systems, according to a top Ford executive.


Ford's Gilman

Ford said it chose IBM over archrivals Digital Equipment Corp. and Wang Laboratories, Inc. because it felt Big Blue could provide the unified systems approach needed to remedy the situation.

"We felt IBM was best able to meet our requirements," explained S. I. Gilman, Ford's executive director of information systems. "They already have the largest installed base in Ford and are known for their support and service."

If a contract can be negotiated, Ford plans to purchase between $300 million and $400 million worth of OA products and services, including 30,000 workstations, during the next five years. The No. 2 auto maker expects to conclude its negotiations with IBM, which center around terms, conditions and technology requirements, within the next three months, Gilman noted.

While many groups within Ford's North American operation have standardized around specific hardware and software, few can effectively share data with one another, Gilman said. Sales organizations, for example, use Wang systems, whereas credit and engineering organizations use DEC and Fortune Systems Corp. computers, he noted. The balance of computer use within the operation is divided primarily between IBM and Wang.

"We felt we needed to standardize hardware and software around one brand," Gil-

See FORD page 74

Measuring DP efficiency, quality

By David A. Ludlum

TAMPA, Fla. — At GTE Data Services, Inc., numeric measurements of the quality of new computer systems and of the efficiency of their development uncovered several problem areas, according to a quality assurance specialist there.

The problems, which included inaccurate reporting of workers' time and a lack of reporting of defects that had been uncovered, were due to insufficient training and a misallocation of resources, said the specialist, Robert Coull.

With corporations tightening budgets and putting greater emphasis on pleasing their computer users, more and more system development managers are turning to quality and productivity measurements such as those used by GTE.

"It's relatively new in data processing because data processing is a new area. It's part of a normal maturization of the profession," said Diane Beal, quality assurance manager at First Data Resources, Inc. of Omaha, a service bureau specializing in transaction processing.

Data processing "is not so much an art anymore," said Beal. "It's something we can look at and quantify."

A recent study by the Quality Assurance Institute of Orlando, Fla., states that numeric measurement of data processing quality and productivity is the most important tool for improving those areas.

"Management in data processing doesn't have the same types of numbers that it has in other corporate operations. They have to make many of their decisions intuitively," said William E. Perry, executive director of the Quality Assurance Institute. "If you don't know your defect

See MEASURING page 74

INSIDE

Calendar: Shows, conferences, seminars/73

INSTANT ANALYSIS

"Once you realize your own limitations, it is only natural for you to surround yourself with men and women of greater capacity than your own. Then, and only then, will exciting things really start to happen."

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MIS: Chip off the old block

From page 71

mation revolution.

Information systems are not and cannot be any better or worse than the organizational context in which they function. Their performance is determined by the clarity of purpose, coherence of structure and consistency of operations in the parent organization. In fact, information systems might be revealing a lack of organizational integration rather than causing one.

Various information-oriented prescriptions, such as enterprise modeling and stages of growth analysis, are put forth to improve information systems. But the insights they generate must first be used to change the business and organizational processes. Until this is done, information systems cannot be improved.

Principle and application

A few specific cases illustrate the principle and its application:

• A major corporation endured long-term frustration with the information systems function. IBM's Business Systems Planning (BSP) seemed to address the right issues. With suitable executive involvement and appropriate fanfare, a BSP study was launched. A certain enthusiasm attended the effort and resulted in an impressive report. The executive committee responded favorably to the report and the final presentation.

Two years later, the report remained on the shelf. The business and its information systems department went on exactly as they always had, except that the information systems executive had left for greener pastures.

• Another corporation was in a similar situation. In this case, a number of people attended seminars and read books by a leading guru. Having glimpsed the promised land, top management hired a consulting firm specializing in the guru's methods to lead them through the information and data wilderness.

The results were even more detailed and impressive (and expensive) than in the case above. They were accompanied by enterprise models, logical data models, subject data bases and data affinity analyses. It had been hard work, but deliverance for the information systems function seemed at hand.

Two years later, the materials were on a shelf. The business and its information systems went on exactly as they had, except that the information systems department hired a data administrator and the MIS executive left to become a consultant in the guru's methodologies.

• A third corporation was in a particularly frustrating situation. It had been trying to develop an information system for production planning and control for seven years. After a few million dollars, several project managers, two MIS executives and three prematurely declared successes, the project floundered.

Because the system was so critical to the company, management persisted with the project, preferring to defer consideration of a BSP or other methodologies until the immediate need (if seven years can be defined as immediate) was solved.

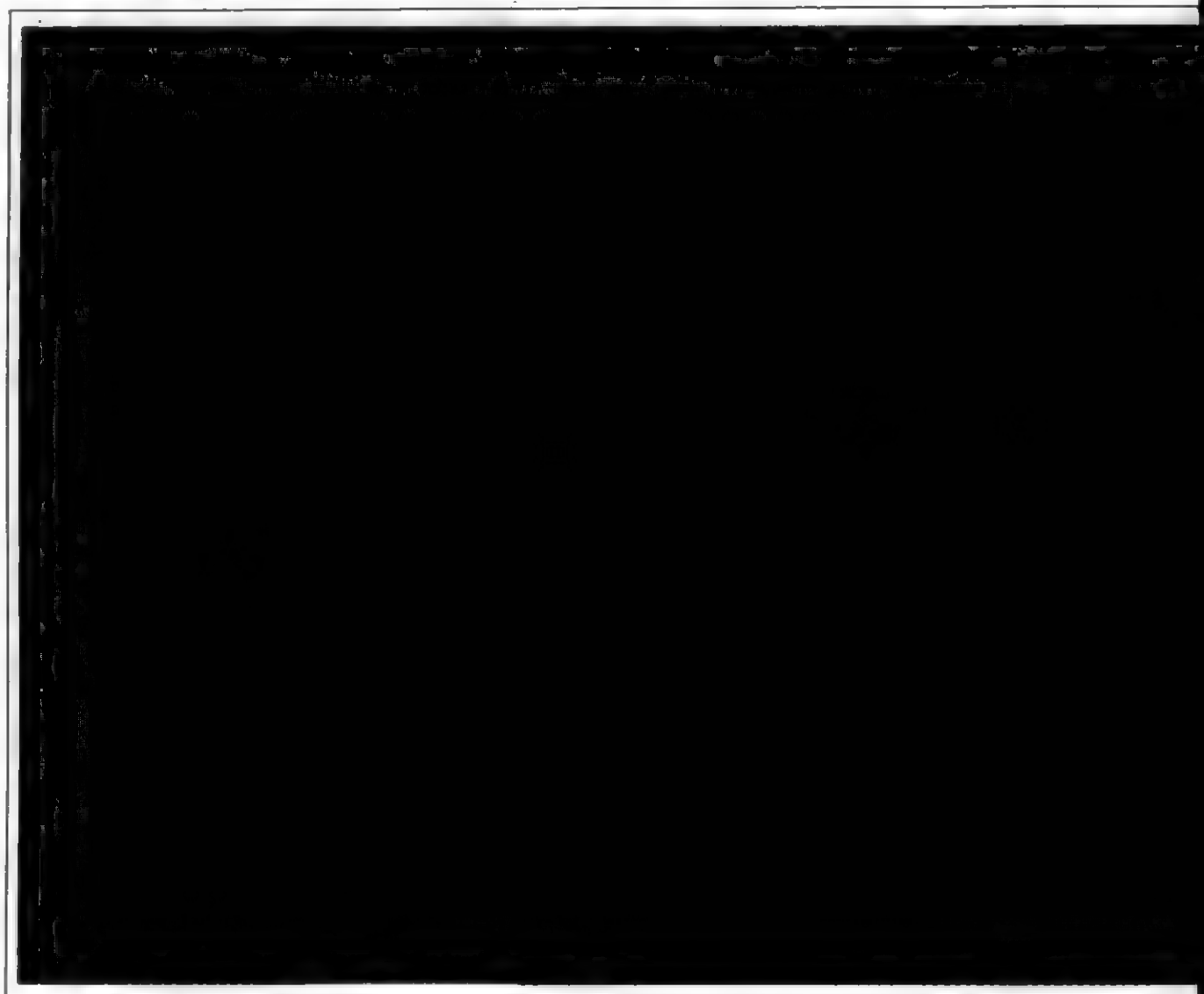
From the viewpoint of the corporate executives, the methods and the project management processes were flawed, although they couldn't have told you how or why. The MIS people were incompetent, having once again failed, even with the involvement and support of the executives. Or, as Hardy was fond of saying to Laurel, "Here's another fine mess you've gotten us into."

But when one applies the principle that the information systems function necessarily reflects the character of the organization it supports, a different picture emerges.

With regard to the first case, two of the principles underlying BSP are that information systems should support corporate objectives and should, in the interest of flexibility, be designed independent of any organizational structure.

The corporation doing a BSP did not do formal strategic planning; this resulted in cultural territorialism, and the information systems department was forced to adhere to the idiosyncracies of

See MIS page 73



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The Institute on Artificial Intelligence and Expert Systems. Waltham, Mass., Aug. 18-22 — Contact: Joan Merrick, Seminar Coordination Office, Suite 415, 850 Boylston St., Chestnut Hill, Mass. 02167. Also being held Sept. 29 to Oct. 3 in Chicago.

Advanced Communications Architectures Seminar. Washington, D.C., Aug. 19-20 — Contact: Communications Solutions, Inc., 992 S. Saratoga-Sunnyvale Road, San Jose, Calif. 95129.

DEC: The Next Five Years. New York, Aug. 19-20 — Contact: The Yankee Group, Seminar Division, 14th Floor, 89 Broad St., Boston, Mass. 02110.

Second Annual Physical and Electronic Security Symposium and Exposition. Philadelphia, Aug. 19-21 — Contact: Michael C. Otten, Booz, Allen and Hamilton, Inc., 4330 East-West Highway, Bethesda, Md. 20814.

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The Third International Congress on Advances in Non-Impact Printing Technologies. San Francisco, Aug. 24-28 — Contact: Society of Photographic Scientists and Engineers, 7003 Kilworth Lane, Springfield, Va. 22151.

Interconnect '86. San Mateo, Calif., Aug. 26-28 — Contact: Agnes M. Pavel, U.S. Telecommunications Suppliers Association, Suite 1618, 333 N. Michigan Ave., Chicago, Ill. 60601.

MIS: Chip off the old block

From page 72

the various organizational units. BSP did not work in this case because the conditions for it to succeed were counter to the corporate culture.

In the second case, the guru's methods required shared, controlled data. This assumed cooperation and controls that cross horizontally over organizational boundaries. But the firm was fragmented and territorial. People found it hard to communicate meaningfully among functions. Managers were certainly not going to let a corporate function, especially information systems, tell them what to do with their data. Again, the underlying assumptions of the methodology required an organizational environment that did not exist.

In the never ending project case, the production planning and control function was constantly battling with multiple product lines competing for control of the shared manufacturing capacity.

This was complicated by a sales function that was opportunistic, undisciplined and determined to do its own thing. The information systems project was at the mercy of organizational practices that did not cooperate toward a common goal.

In each case, the approach to information systems was not wrong. The desired results were not achieved because the intentions were incompatible with the corporate culture. The results reflected the character of the organization, not the method.

Results of a different order would require a basic change in each of the corporations. The only way to improve information systems is to improve the parent organization, because the information systems function necessarily reflects the character of the organization it supports.

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SIECOR

Ford looks for compatibility

From page 71

man said. "We wanted to improve communications, and we felt office automation would be more effective for Ford if there was a simplified systems environment."

Problems arise in Ford's current approach when there is a department that needs to communicate with a number of groups. "Say there is a group that has partial responsibility for sales and engineering. Should it have a Wang or a Fortune system?," Gilman rhetorically asked.

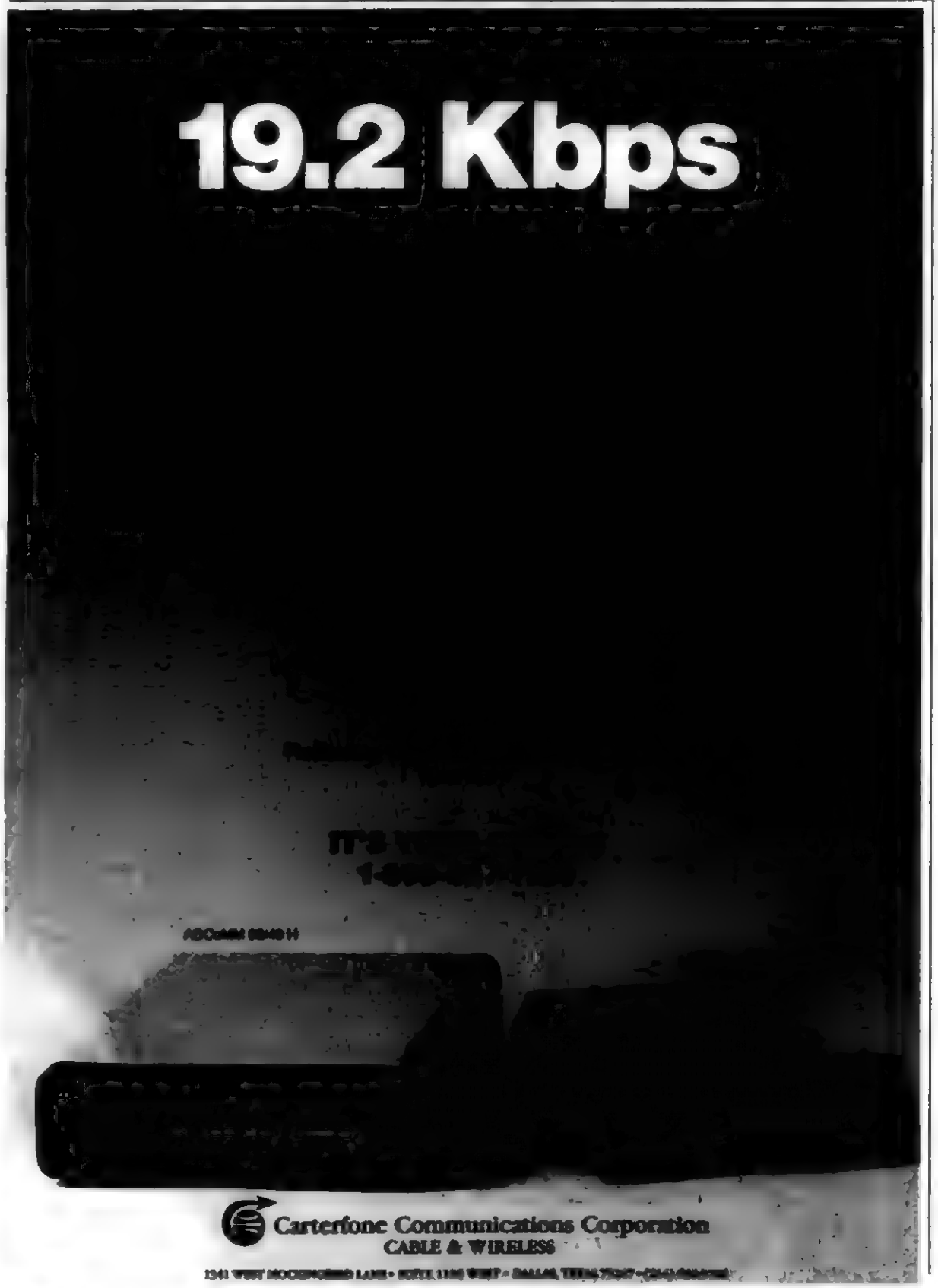
Although Ford is reasonably happy with the equipment it has installed, the bridges built to link the departments are not fully functional. "Things such as file transfer and revisablity of text either can't be done or are difficult to do," Gilman said.

> ***Constant software updates and maintenance have caused fissures in some of the bridges.***

Constant software updates and maintenance have caused fissures in some of the bridges, Gilman said. "So much of our systems people's time is being taken up by keeping the bridges working. Every time a new release of software comes out, our people have to rework the bridges all over again."

Despite the magnitude of the equipment and services Ford intends to procure over the next five years, Gilman said the decision to negotiate with IBM "was not the world's most important decision."

He said projects crucial to Ford's ability to retain an edge in the highly competitive automotive industry include development of a program to let engineers draft and transmit new product designs worldwide, development of a new generation of computer-aided design systems, enhancements to its telecommunication network and a recently launched effort to bring the management of all manufacturing operations under one system.



Measuring DP efficiency, quality

From page 71

rate, it's hard to improve it."

In fact, many data processing managers do not even know what they should be measuring, Perry said. "We hear the statement, 'If it's not broken don't fix it.' We perceive that management doesn't even know if it's broken," he said.

The goal of the institute's study, which involved 60 large corporations, was to select the five best measures of data processing quality and productivity. Culled from 120 candidates, the best were the following:

1) Functional quality — a quantitative rating by users.

2) Function points per man-month — a productivity measure, originated by IBM, of functional value per man-month of development work.

3) Customer satisfaction — a user rating emphasizing data center services.

4) Production batch jobs processed without a problem.

5) Project quality — a measure of conformance to requirements.

Perry said user dissatisfaction and cost-cutting are the principal forces behind interest in such measurements.

But there are others. Along with reducing costs, First Data Resources hopes to maintain the quality of its systems while growing at a fairly fast rate, Beal said.

Air Force measures for software quality

At the Grumman Data Systems division of Grumman Corp. in Bethpage, N.Y., a systems integrator dealing chiefly with military projects, software quality is being measured due to U.S. Air Force guidelines for future projects, said Roscoe Mack, the division's manager of design and product assurance.

Grumman is still researching measurements. First Data Resources is also in initial stages of measurement, classifying quality assurance costs according to whether they crop up during design or development or after delivery.

GTE Data Services, which does most of its development for other units of its parent company, GTE Corp. of Stamford, Conn., has worked with measurements for two years, Coull said.

The division's management has changed about 60% of the procedures it has investigated as a result of measurements, but "whether the changes are for the better, we don't know yet," he said.

Major difficulties

One of the major difficulties in assessing system quality and development productivity is generating data on old systems for comparison, Mack said. "It takes a couple of years to get quality historical data."

Another difficulty is finding workers with strong statistical skills to do the measuring, he said.

GTE workers have been concerened that measurements could be used to single out unproductive employees, but Coull said the aim is to expose bad processses, not workers.

"If we find an individual problem we just mention that on the side to the person so he can clear it up," he said.

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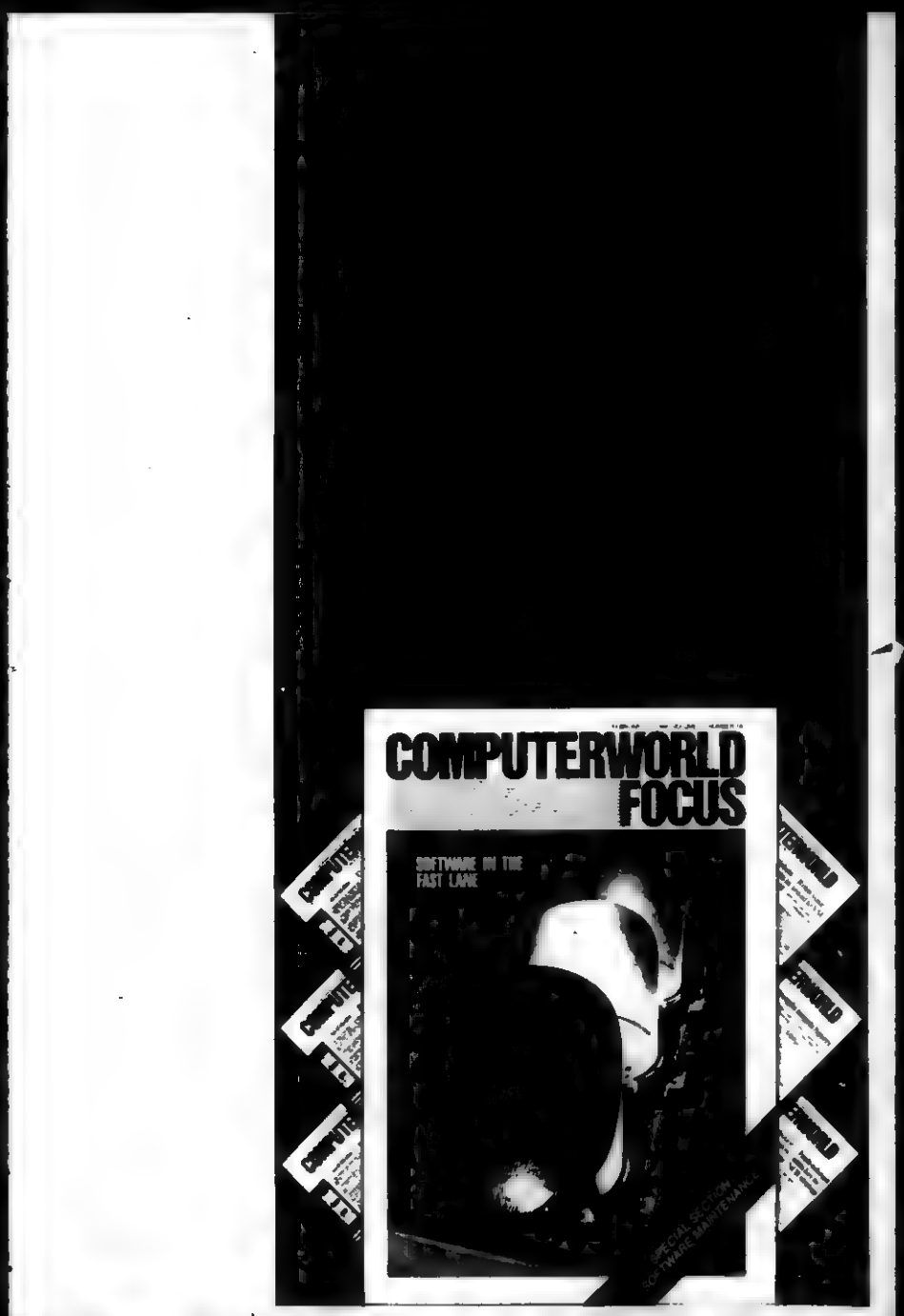
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NEW PRODUCTS

Smart LPT tests LAN performance

The Smart LAN Performance Test program (LPT) has been released by Innovative Software, Inc. of Lenexa, Kan.

Smart LPT allows users to compare performances among various local-area network (LAN) systems, as well as among different configurations of the same system. According to a spokesman for the company, the Smart LPT runs real business application software on each workstation and then performs the tests on the last, or Nth, network node. It measures both the throughput of the LAN and the productivity levels that can be anticipated in actual usage.

Outlining typical procedure, the spokesman said the tester selects an application from the menu — such as a data base, word processing or spreadsheet program — and the level of usage — whether light, medium or heavy.

The application selected will run in a loop on each station until the tester chooses to stop. After each workstation is "busied out," the tester selects the control test option, and the Smart LPT performs timed tests, the spokesman stated. The tester can also run the Smart LPT on a single-user personal computer to establish a baseline timing for comparison. During the test, the program generates a test data disk to be used later for reporting.

Once the test has been completed, the tester can print the timed test results for each LAN in spreadsheet form or in a bar chart. The single-user PC test results are included in the graph for comparison. The results of several tests may also be combined into one graph for comparison by time. The comparison can be made either in terms of seconds or by a single-number rating that is calculated by the Smart LPT as a performance factor of the LAN against the single-user PC results, according to the company.

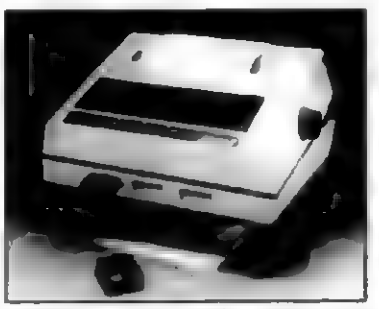
The test program can be used on any LAN operating system compatible with IBM Netbios and DOS Call 3.1 or higher. Smart LPT costs $49.95 and comes with the test program, documentation and Smart Demo Pack.

Genicom unveils printer duo

Desktops emulate popular printers' 'personalities'

Genicom Corp. of Waynesboro, Va., has released its 1000 series of serial dot matrix desktop printers, the Model 1020 with an 80-col. narrow carriage and the Model 1025 with a 136-col. wide carriage.

Both the Model 1020 and the Model 1025 have print speeds of 100 char./sec. in letter-quality mode and 200 char./sec. in draft mode. Both printers are said to contain identical performance capabilities and design features, including user-installable personality and font cartridges, versatile paper handling, built-in printer stand and optional color upgrade kit. The Model 1020 is priced at $899, and the Model 1025 is priced at $699.



Genicom's dot matrix printer can take three font cartridges

According to the vendor, hardware and software compatibility is achieved through the personality cartridges, which plug into the back of the computer. Cartridges are available to emulate a number of printers, including the IBM Graphics Printer and Color Printer, the Epson America, Inc. FX series, the Diablo Systems, Inc. Diablo 630 and the Genicom 3000 series.

It is said that up to three plug-in font cartridges can be inserted and on-line simultaneously at the front of the printers.

Type style is user-selected and interchangable on the same document by a software command or by pushing a button on the printer control panel.

A starter kit, containing a Courier font cartridge and choice of one personality cartridge, is available for $99. Additional font cartridges cost $35 each, and personality cartridges are priced at $85 each. Data cables are not included.

The printers offer bi-directional, emphasized, double-strike, expanded, bold, compressed, underscored and proportional printing. A paper-out sensor with audible alarm and alert light, allowing for remote location operation, is one of the user convenience features of the printers.

Each printer, rated at 55 dba, has a standard 2K-byte buffer, with 8K-byte and 64K-byte buffers optional, according to the vendor.

Both printers feature a tilt-back clamshell design. Continuous fanfold paper is fed through the printer from bottom to top. Paper loading for bottom feed is achieved by tilting back the top of the printer.

An optional, dealer-installable color upgrade kit is available for $149.

PCs, compatibles get AST printer

AST Research, Inc. of Irvine, Calif., has unveiled its Turbolaser printer for IBM Personal Computers, Personal Computers XTs, ATs and compatibles.

The Turbolaser is said to be capable of printing both copies and originals at a rate of 8 page/min. It reportedly provides full 300 dot/in. graphics, running most available PC-based hardware application software programs. The Turbolaser printer is priced at $4,995.

The printer's Laser Printer Controller features 1.5M bytes of random-access memory (RAM). Of this total, 512K bytes are used to store the printer/plotter emulations, the page description package and the printer's resident fonts.

According to the company, a variety of bit-mapped fonts, including fixed-pitch, proportionally spaced type styles, portrait and landscape, are resident on the Turbolaser. The fonts are loaded into the RAM after host power-up and remain in memory, providing instant access. An optional Bitstream, Inc. Bestseller Library of fonts is available on disk for Turbolaser

INSIDE

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Price Reductions/90

PC/Reporter given Dbase III link, interface to file formats

Martin Marietta Data Systems, of Princeton, N.J., has announced PC/Reporter Release 1.1.

PC/Reporter provides reporting capabilities on a personal computer using mainframe and PC data file sources. The program incorporates an open architecture that is said to allow users to create reports from a variety of data formats. PC/Reporter Release 1.1 is available now and is priced at $350.

Release 1.1 of PC/Reporter includes a direct link to Ashton-Tate Dbase III files, a pop-up menu and a user interface for creating reports from a variety of PC and mainframe file formats without having knowledge of programming languages or special protocol, according to a company spokesman.

Other enhancements in Release 1.1 include a larger input window, increased report size capability, greater request editing functionality and enhanced Help facilities.

The PC/Reporter eliminates intermediate conversion steps that most other programs need to work with data formats unlike their own, a spokesman from Martin Marietta stated. It reads and reports directly from the Dbase III data files, according to the vendor.

The product's pop-up menu design masks the conversion process, simplifies request generation and provides the user with all of the choices needed to compile and format both simple and complex reports.

Other data formats are supported, including data files created by Martin Marietta's Ramis II, the mainframe data base management system, and Keepit, its PC data base management system.

According to the vendor, in addition to the pop-up, menu-driven, report-building interface, PC/Reporter provides users with the option of generating requests in syntax similar to mainframe Ramis II.

When used with the company's Ramlink communications software, PC/Reporter can be used to create and test report requests on the PC to run against any mainframe data file accessible through Ramis II.

In this way, PC/Reporter is said to provide Ramis users with a method of prototyping reports using a PC or IBM 3270 Personal Computer terminal.

As a stand-alone program, PC/Reporter executes requests against data stored on the PC or data that has been downloaded from a mainframe. On-line, context-sensitive Help screens are provided at every step, and report output can be directed to a PC's printer, an ASCII file or a PC's monitor screen, where it can be scrolled one line or one page at a time, a spokesman from the company stated.

PC/Reporter runs on IBM Personal Computer, Personal Computer XT, AT and compatible computers and supports both monochrome and color monitors.

SOFTWARE & SERVICES

Systems software

BMC Software, Inc. has announced **Delta IMS Version 2.0**, said to allow installations to configure IMS/VS on-line.

With Version 2.0, data bases, application programs, transactions and VTAM terminals can be added or modified while IMS is running.

Delta IMS Version 2.0 costs $25,000 and leases for $1,390/mo.

BMC Software, P.O. Box 2002, Sugar Land, Texas 77487.

Applications packages

BBN Software Products Corp. has announced **Release 2** of its **RS/1** scientific and engineering data analysis software.

Release 2 reportedly offers additional graphing functionality and analytical tools as well as greater speed.

Other features include table and graph editing, a money format, and an interface to other programs.

Release 2 of RS/1 was designed for use on Digital Equipment Corp.'s VAX and Microvax computers.

Available in October, Release 2 is priced from $6,000 to $69,000.

BBN Software Products, 10 Fawcett St., Cambridge, Mass. 02238.

■

Data Management Services has released the **MLRLIB** mailing system for the IBM System/36 and System/36 Personal Computer.

Features of MLRLIB include a letter writer, labels, post cards, speedy mailers, phone index cards, continuous #7 or #10 envelopes and reports.

The MLRLIB system costs $750 for the initial CPU and $100 each for additional CPUs under the same license.

Data Management Services, P.O. Box 150, Prosser, Wash. 99350.

■

Mentor Graphics Corp., has introduced **Remedi**, an interactive schematic-to-layout debugging module.

Remedi operates with the company's Chipgraph very large-scale integration (VLSI) layout editor and Dracula II layout verification package.

Remedi is said to integrate schematic connectivity information with the physical layout of a custom VLSI circuit and to graphically display the results in windows containing schematic and layout representations. Used in conjunction with Chipgraph, Remedi allows users to detect and correct errors in a physical layout in the same program environment.

Remedi is priced at $14,900.

Mentor Graphics, 8500 S.W. Creekside Place, Beaverton, Ore. 97005.

Utilities

Interlink Computer Sciences, Inc. has added two bidirectional **Electronic Mail Bridges** to its 3711 and 3711S Gateway VM.

The first provides a link between IBM's Professional Office System (Profs) and VM Note Mail Systems and Digital Equipment Corp.'s VAX Mail. The second allows users of IBM's Profs and VM Note to send and receive mail messages to and from users of DEC's All-in-1 office package.

The 3711 Gateway bidirectional Profs/VM Note to VAX Mail Electronic Mail Bridge costs $6,950. The bidirectional Profs/VM Note to All-in-1 Electronic Mail Bridge costs $9,950. For the 3711S Gateway, the prices are $5,950 and $8,950, respectively.

Interlink, 39055 Hastings St., Fremont, Calif. 94538.

■

BMC Software, Inc. has announced its **3270 Superoptimizer/IMS**.

Superoptimizer/IMS is said to reduce the size of data streams going from IMS/VS to IBM 3270-family screens and printers and back again. It allows additional terminals and printers to be added to a single cluster controller without overloading.

Superoptimizer/IMS costs from $19,000 to $39,000 on the first CPU.

BMC Software, P.O. Box 2002, Sugar Land, Texas 77487.

■

Data/Ware Development, Inc. has introduced its **Model DW300 channel monitor.**

The Model DW300 channel monitor is a logic analysis tool for monitoring the IBM and compatible mainframe I/O channels.

The DW300 is said to speed error tracing by providing multilevel triggering either by user-programmed line states or by standard preprogrammed IBM macro sequences.

The Model DW300 costs $9,595, and an RS-232 option card costs $395.

Data/Ware Development, 4204 Sorrento Valley Blvd., San Diego, Calif. 92121.

■

Aida Corp. has announced **Automatic Test Pattern Generation.**

Automatic Test Pattern Generation is said to combine high-speed fault simulation as well as a path-tracing algorithm in order to produce high-coverage test vectors for single "stuck-at" faults in scannable designs.

According to the vendor, the Aida Design System reportedly utilizes the Automatic Test Pattern Generation product to automatically generate test vectors for scannable designs.

Automatic Test Pattern Generation costs $45,000.

Aida, Suite 340, 3375 Scott Blvd., Santa Clara, Calif. 95054.

■

Expertware, Inc. has introduced **CMT**, a software development aid.

The CMT software system reportedly automates the functions of configuration control, release management, problem reporting and tracking and versions/releases documentation.

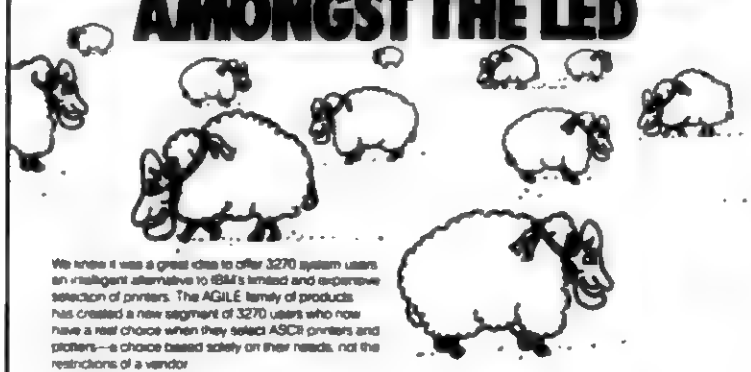
The CMT development system also is said to allow the user to automate the sharing of software and documentation among different configurations.

According to Expertware officials, CMT runs on the IBM Personal Computer AT and mainframes using Unix or Digital Equipment Corp.'s Ultrix operating systems, as well as DEC VAX machines running VMS.

CMT is priced at $35,000 for the multiuser version.

Expertware, Suite 1209, 2685 Marine Way, Mountain View, Calif. 94043.

HOW TO SPOT THE LEADER AMONGST THE LED



We knew it was a great idea to offer 3270 system users an intelligent alternative to IBM's limited and expensive selection of printers. The AGILE family of products has created a new segment of 3270 users who now have a real choice when they select ASCII printers and plotters—a choice based solely on their needs, not the restrictions of a vendor.

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However, as a printer/plotter protocol converter, the engineering and design excellence of the AGILE 6287 is difficult to impersonate. The 6287 supports full feature emulation of most IBM 3270 printer applications, including APL. It provides built-in diagnostics, internal power supply, and fan cooling. The 6287 is backed by a full two-year warranty and AGILE's commitment to individual service and reliable customer support.

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AGILE

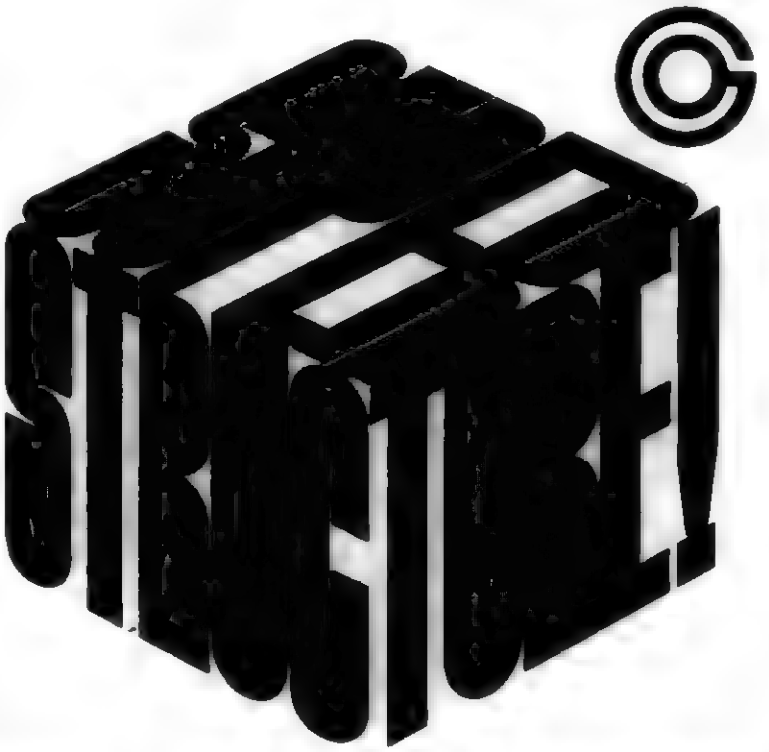
4041 Pike Lane, Concord, California 94520
(415) 825-9220 Outside California (800) 538-1634

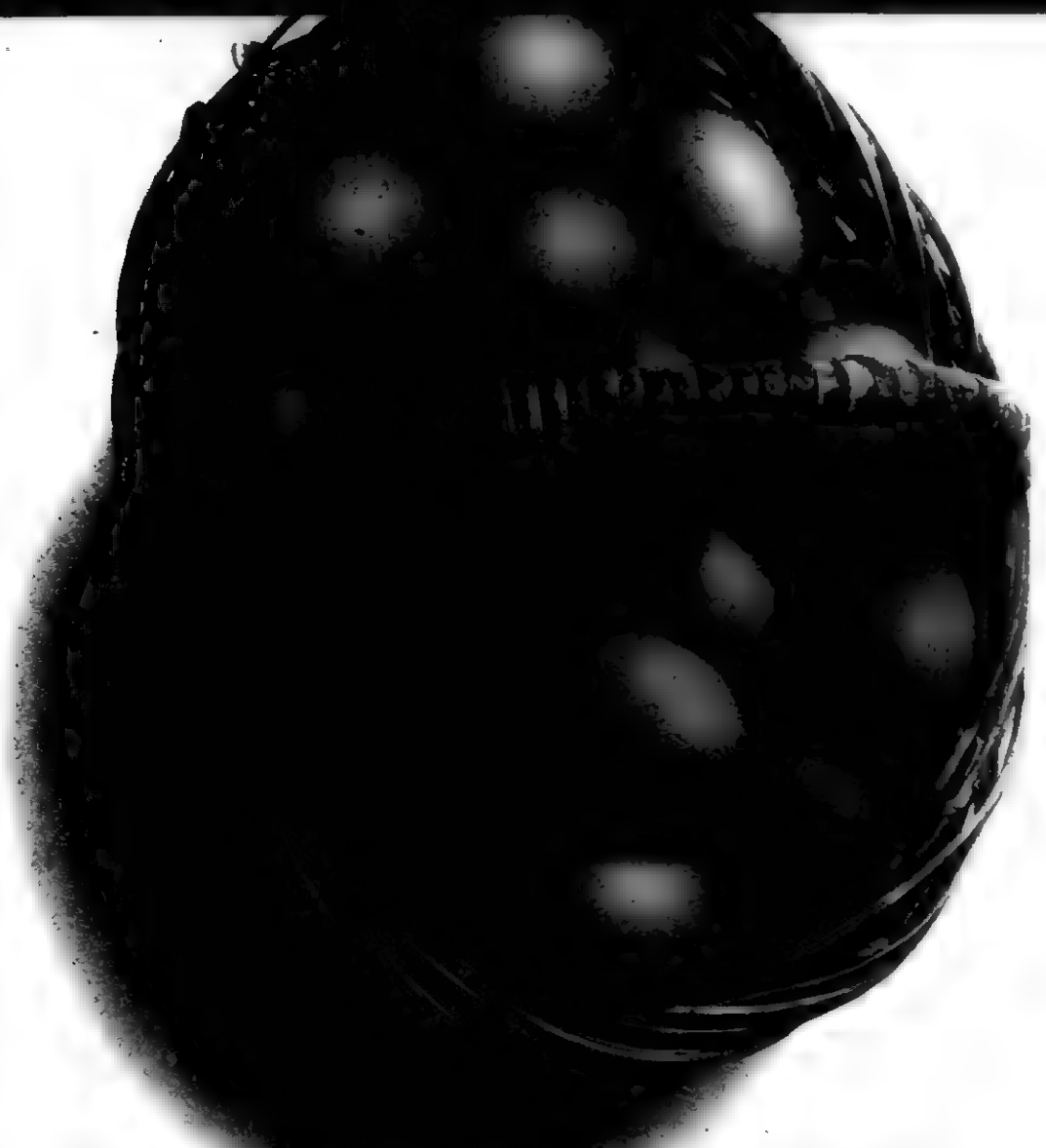
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The Director of Data Processing, John Zebracki adds, "By maximizing access to our central files, we manage the use of PCs, and at the same time streamline operations in such critical departments as Fire, Police, Water, Engineering, Collections, and Inspections."

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★★★★	8.1	Paradox	1.0	■	■	■	■	■	...2K	$695	✓
								■	320K	$700	✓
★★★	7.3	The Smart Data Manager	2.00			■	■	■	256K	$495	✓
★★★	7.1	dBase III Plus	1.0				■	■	256K	$695	✓
★★★	7.0	PractiBase	1.14	■	■			■	256K	$70	✓
★★★	7.0	Dataease	Pre. 2.5					■	384K	$600	✓
★★	6.9	Power-base	2.10	■	■	■	■	■	320K	$349	✓

■ 7.0-9.9 5.0-6.9 ■ under 5.0

Software Digest **RATINGS NEWSLETTER**

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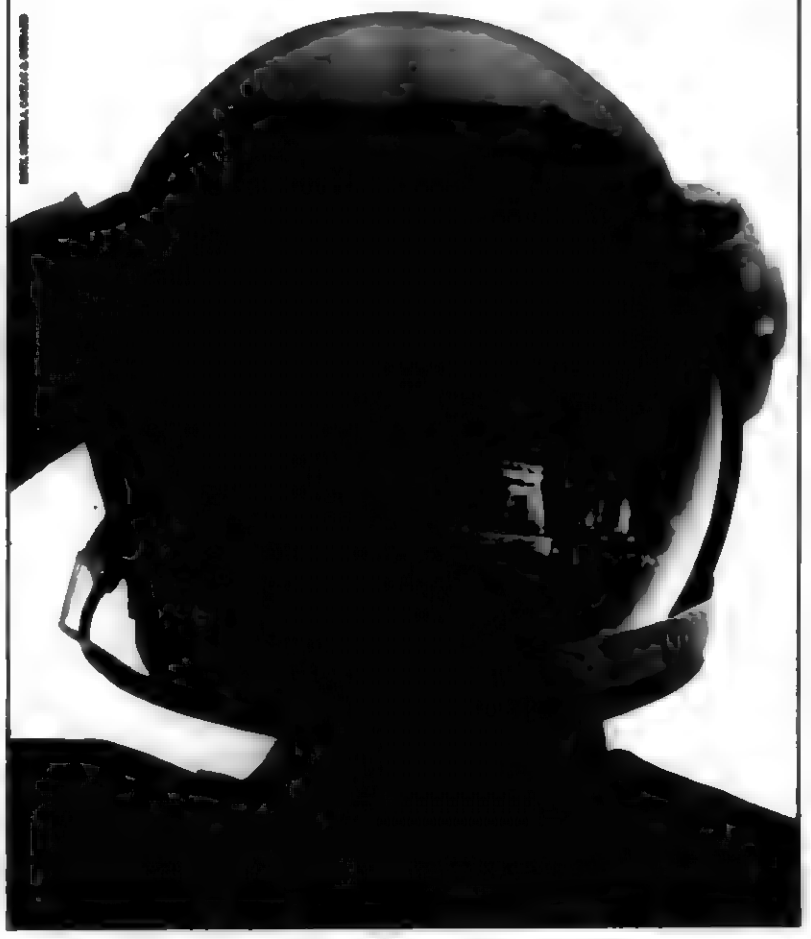
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MICROCOMPUTERS

Systems

Process & Instrumentation Design, Inc. has introduced a kit that allows **Prodoc**, an off-line program development and documentation software for Allen-Bradley Co.'s and Gould, Inc. Modicon Division's programmable logic controllers (PLC), to be used on IBM Personal Computers.

The kit is said to expand the PC's capability to provide multitasking. It also provides the ability to view PLC ladder logic with full reference documentation and to edit documentation while viewing the ladder logic.

The kit consists of a coprocessor board with 1M byte of random-access memory, a Prodoc keyboard and Prodoc software, and it costs $9,995.

Process & Instrumentation Design, Suite 110, 1700 Enterprise Way, Marietta, Ga. 30067.

Software applications packages

CEO Software & Leasing has introduced **Facility Scheduler** software, designed for scheduling meetings at hospitals.

Facility Scheduler allows scheduling for meetings to be done on a 24-hour basis, in one-minute intervals, up to one year in advance. Room availability is displayed by time and date, along with room specifications such as capacity, physical size, location and cost.

Facility Scheduler costs $4,800.

CEO Software, 2153 E. Juanita St., Tucson, Ariz. 85719.

■

Lowell Corp. has announced **Computer Assisted Marketing Program** (CAMP), which was designed for use on IBM Personal Computers and compatibles.

CAMP is said to provide multilevel sales lead management, media evaluation, letter writing and marketing development. It provides reports for targeting accounts and measuring selling effectiveness.

The package has three modules and includes a library said to have a capacity for more than 100 letters.

CAMP costs $495.95 per module.

Lowell, P.O. Box 158, 97 Temple St., Worcester, Mass. 01613.

Software utilities

Burr-Brown Corp. has introduced **PCI-20046S-2** C language and **PCI-20046S-3** Turbo Pascal language support packages for data acquisition and measurement on the IBM Personal Computer, Personal Computer XT, AT and compatibles.

The PCI-20046S-2 and PCI-20046S-3 packages both interface between programmers and the PCI-2000 system for data acquisition, test, measurement and control products.

The PCI-20046S-2 and the PCI-20046S-3 each cost $225.

Burr-Brown, P.O. Box 1140, International Airport Industrial Park, Tucson, Ariz. 85734.



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NEW PRODUCTS/MICROCOMPUTERS

Popular Programs, Inc. has introduced **Pop-Up Partner**, an outline processor desk tool program for IBM Personal Computers and compatibles.

Pop-Up Partner features pull-down menus and intuitive commands and uses random-access memory-resident technology.

Pop-Up Partner also comes with built-in outlines that work as flexible desktop tools.

Included in the pull-down menus are reference files for IBM's PC-DOS or Microsoft Corp.'s MS-DOS commands, area codes and time zones.

Pop-Up Partner is priced at $99.97.

Popular Programs, Suite 180, 135 Lake St., Kirkland, Wash. 98033.

Software enhancements

Texas Instruments, Inc. has announced that its Microsoft Corp. Xenix V-based, multiuser version **Business-Pro** computer now supports Samna Corp.'s **Samna+** word processing software.

Samna+ combines word processing capabilities with a fully integrated spreadsheet. It provides capabilities such as data interchange format file translation, floating cells and the ability to print to multiple printers.

Samna+ for the Business-Pro costs $1,295.

TI, Data Systems Group, P.O. Box 809063, H-869, Dallas, Texas 75380.

Communications

Corporate Microsystems, Inc. has released **Version 5.0** of its **Mlink** data communications system.

Added features in Version 5.0 include application script development, session capture, Digital Equipment Corp. VT100 terminal emulation on the IBM Personal Computer, the Kermit protocol, the vendor's own sliding frame protocol and enhancements to the Mlink script language.

Mlink was designed for asynchronous data communications for IBM PC-DOS, Microsoft Corp. MS-DOS and Xenix, Unix and Digital Research Inc.'s CP/M-based systems. It is priced from $195 to $2,500.

Corporate Microsystems, P.O. Box 277, Etna, N.H. 03750.

Data storage

Tallgrass Technologies Corp. has added the **TG-1020e** and the **TG-2025e** external units to its line of mass storage subsystems.

The TG-1020e is a 20M-byte tape drive backup system. The TG-2025e is a 25M-byte hard disk with a 20M-byte tape drive backup system. Both utilize the DC-2000 tape cartridge and fit next to a monitor on top of a personal computer.

Both systems include Backtrack, the vendor's automatic hard disk backup system, and Xtree, a menu-driven file and directory management software program.

The TG-1020e costs $1,295. The TG-2025e costs $2,295.

Tallgrass Technologies, 11100 W. 82nd St., Overland Park, Kan. 66214.

Printers/Plotters/Peripherals

Epson America, Inc. has introduced the **EX-800**, a dot matrix printer featuring a color option.

The EX-800 is a 9-pin printer. It prints at 300 char./sec. in draft mode and 54 char./sec. in near-letter-quality mode. The 80-col. printer offers an 8-button type-style selection panel and features IBM printer emulation as well as built-in serial and parallel interfaces.

There is a built-in bidirectional push-feed tractor, an automatic sheet load feature and an optional single-bin cut-sheet feeder.

The EX-800 is priced at $749.

Epson America, Suite 450, 1901 Avenue of the Stars, Los Angeles, Calif. 90067.

■

Hanzon Data, Inc. has introduced **LP-3000**, a laser printer with full-page bit-map graphics.

Some features of the LP-3000 include printer status, emulation, page orientation and fonts. The LP-3000 offers fonts including Courier 10, Prestige Elite and the IBM character set. The LP-3000 is said to operate at 8 page/min, and the output is automatically collated in document order.

The LP-3000 features printer emulations for Hewlett-Packard Co.'s Laserjet and Laserjet Plus and Epson America, Inc.'s FX-80.

The 512K-byte version of the LP-3000 costs $3,990; the 2M-byte version costs $4,995.

Hanzon Data, 18732 142nd Ave. N.E., Woodinville, Wash. 98072.

Board-level devices

Kamerman Labs, Inc. has introduced **Slotmachine**, a hard disk drive on a card that fits in a single expansion slot of an IBM Personal Computer, Personal Computer XT or compatible computer.

Designed to support an optional second hard disk drive, the Slotmachine is shock mounted and offers low power consumption, plated media, a built-in disk testing microprocessor, a 5M bit/sec. transfer rate and an access time of 75msec.

The Slotmachine costs $499.

Kamerman Labs, 7861 S.W. Cirrus Drive, Beaverton, Ore. 97005.

■

STB Systems, Inc. has introduced its **Serial/Parallel adapter**, which provides a serial port, a parallel port and a clock/calendar option for IBM Personal Computers, Personal Computer XTs, ATs and compatibles.

According to the vendor, the Serial/Parallel adapter provides the serial port needed for interfacing with asynchronous communication de-

WANTED

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Last Seen: In a rapidly increasing number of DOS shops around the world. Known to be headed toward a DIA/DCA, VM and PC connection.

Aliases: "THE MONEY SAVER ... we saved over $200,000 in the first year"
"THE ANSWER to Electronic Mail"
"THE BEST Available Mail System"

Known Acquaintances: Runs with CICS. Seen talking to CMS and leaving notes to TSO.

Additional Identifying Marks: Direct screen flow, forms creation, carbon copies, multiple mailing lists, optional Telex Interface, MRO/ISC, tickler files, and many more.

*SYSM (DOS) published price is $17,000. Maintenance in second and subsequent years is based upon published price.

SYSM (OS) is available at $19,000.

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P. O. Box 4795 • Boise, Idaho 83711-4795

vices. The serial port can be used to connect a personal computer to a modem or to a serial printer.

The Serial/Parallel adapter costs $139.

STB Systems, Suite 125, 601 N. Glenville, Richardson, Texas 75081.

COMMUNICATIONS

Controllers

DY-4 Systems, Inc. has introduced the **DVME-704** serial communications controller.

The DVME-704 is said to support high-speed data links up to 1M bit/sec., using on-board direct memory access and local buffer space in dual-port memory. All memory devices are dual-ported for message and data passing without double handling.

DVME-704 runs at 10 MHz and offers RS-422 on all channels and optional RS-423 on one channel. It features two four-channel direct memory access controllers, four full-duplex serial I/O channels and asynchronous/synchronous capabilities.

The DVME-704 is priced at $2,565.

DY-4 Systems, Suite 202, 1475 S. Bascom Ave., Campbell, Calif. 95008.

Voice/data communications

RAD Data Communications, Inc. has announced **Miniature Data Over Voice** (MDV), said to allow a user to simultaneously transmit both voice and data over the existing telephone network.

MDV operates asynchronously at speeds up to 9.6K bit/sec. for distances up to one mile in full duplex and connects to all types of telephones without affecting their functions, according to the vendor. MDV is available in two models, one for use with twisted pairs and the other for use with cables with the RJ-11 plug. It operates without AC power.

The MDV is priced at $149.

Rad Data Communications, 40 N. Van Brunt St., Englewood, N.J. 07631.

Multiplexers/Modems

Raycom Systems, Inc. has announced the **5110 series** fiber-optic multiplexer and the **5100-Sync** multiplexer.

Equipped with four I/O modules, the Model 5110 handles up to 144 RS-232 channels, 16 T1 channels, 32 V.35 channels or combinations of these signals. All I/O channels are multiplexed into a 28M bit/sec. aggregate data stream.

The Model 5110 costs from $3,750 to $10,500; the 5100-Sync costs from $3,700 to $6,000.

Raycom Systems, 6395 Gunpark Drive, Boulder, Colo. 80301.

■

Micom Systems, Inc. has introduced the **Instabus 1080** direct host attachment that provides a multichannel interface between Digital Equipment Corp.'s VAX computers and Micom's data private automatic branch exchange.

Instabus 1080 allows VAX/VMS users to multiplex data from up to 120 asynchronous channels over a T1 line consisting of two twisted pairs.

The Instabus 1080 provides access for up to five VAX systems on a single cable. Instabus 1080 makes it possible to transmit 9.6K bit/sec. on up to 120 channels in the full-duplex mode.

The 120-channel Instabus 1080 costs $5,000.

Micom Systems, P.O. Box 8100, 4100 Los Angeles Ave., Simi Valley, Calif. 93062.

Network services

Western Union has announced the availability of its **Memory Mail service** on the company's Easylink electronic communications service.

The Memory Mail service is said to allow users to send messages to up to 100,000 addresses from their computers and terminals. It offers text storage capability and hard-copy options.

Memory Mail is available for a one-time setup fee of $50. For each connect session, the first minute is free, and subsequent charges are 35 cents per minute.

Western Union, One Lake St., Upper Saddle River, N.J. 07458.

Test equipment

Systems Strategies, Inc. has introduced **TestSNA/3270** systems network architecture (SNA) and **TestBSC/3270** binary synchronous communications (BSC), products for testing the communications function of IBM's 3270 series computer products and systems.

TestSNA has 190 programmable test scenarios for SNA 3270 testing. TestBSC/3270 has 79 scenarios that test control unit data link control.

TestSNA/3270 costs $10,000, and TestBSC/3270 costs $8,000.

Systems Strategies, 225 W. 34th St., New York, N.Y. 10001.

Electronic Industries Association has announced **EIA-455-95 fiber-optic test procedure** for fibers and cables.

The EIA-455-95 test procedure describes a method for determining the total optical power emanating from an optical fiber.

According to the vendor, the procedure can be used for, but is not limited to, measuring such things as the attenuation of the fiber or cable. The EIA fiber-optic test procedure can also be used for measuring loss of terminating devices or methods, the amount of optical power coupled into the fiber by a source or the optical power at the system receiver.

The EIA-455-95 fiber-optic test procedure costs $5 per copy.

Electronic Industries Association, 2001 Eye St. N.W., Washington, D.C. 20006.

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SIM3278 is a software communications package which provides complete 3270 emulation for IBM PCs and over 50 different types of inexpensive ASCII terminals.

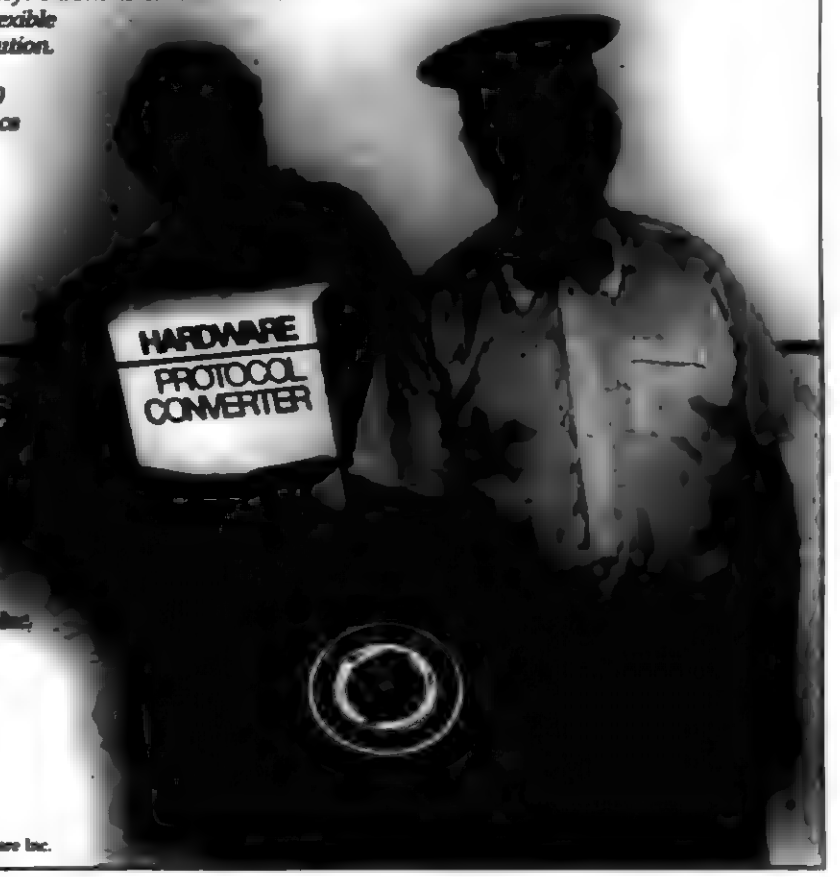
All that is required for SIM3278 is an IBM mainframe running either VM/SP or MVS/VTAM and a communications front-end processor such as a 3705 or equivalent, that supports ASCII terminals.

SIM3278 installs in minutes and reduces costs through asynchronous communications, X.25 networks and Simware's unique screen writing techniques.

More than just a protocol converter, SIM3278 operates without any additional hardware or software modifications. Features such as on-line help, PC support, a multiple session manager and the ability to use inexpensive asynchronous communications make SIM3278 an extremely flexible and cost effective software solution.

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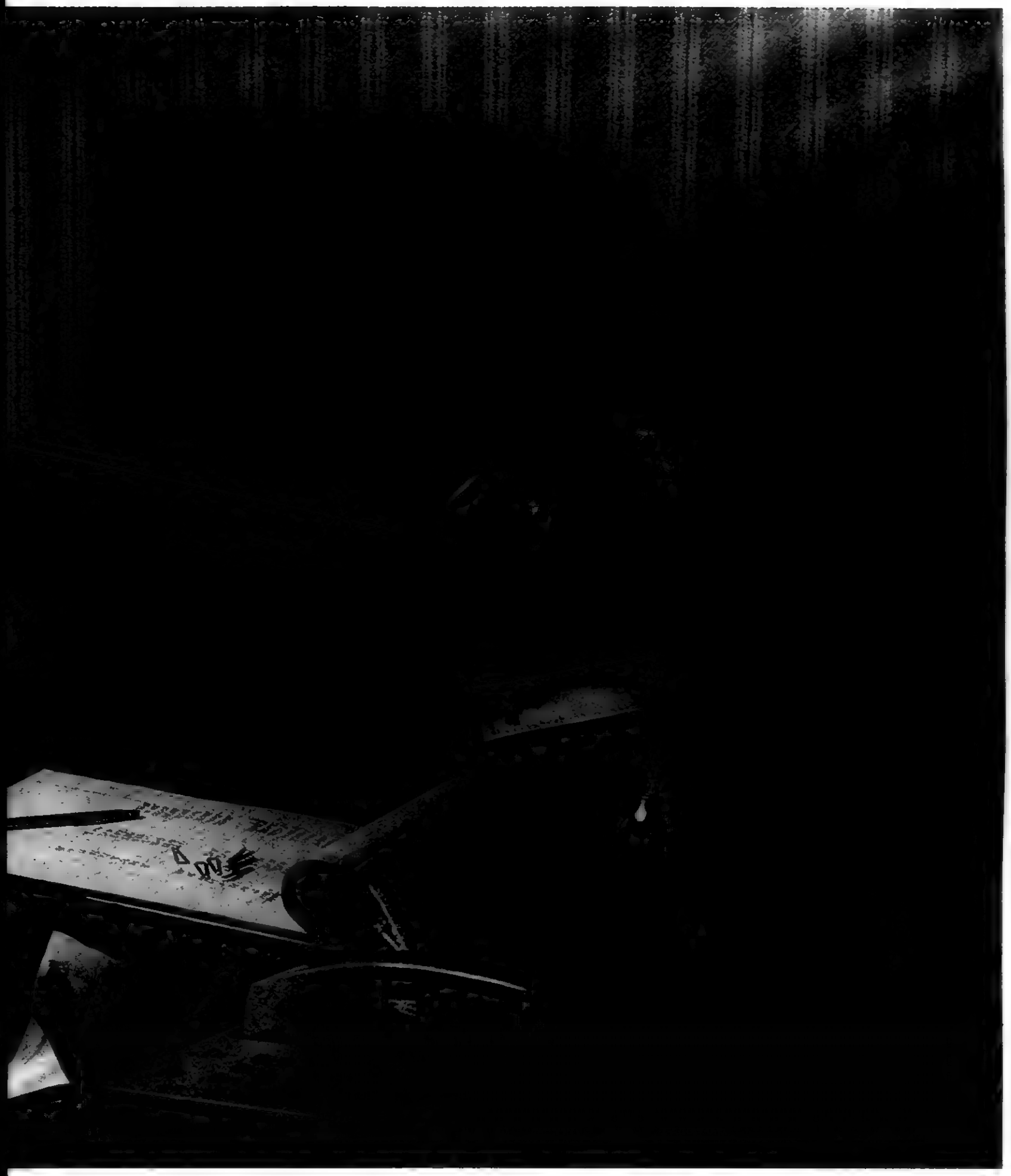
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NEW PRODUCTS/COMMUNICATIONS

Auxiliary equipment

Cylix Corp. has announced its **MTJ** line of modular telephone jack protectors.

The MTJ line provides protection from transient overvoltages caused by lightning and other sources for modems, intelligent telephones, facsimile machines and other equipment utilizing RJ-11 and RJ-45.

Protection for dial-up lines is standard but can also be supplied for additional applications, including dedicated lines, RS-232 and others. The MTJ has two- and four-wire protectors.

The MTJ costs from $59 to $79.

Cylix, 550 Smithtown Bypass, Smithtown, N.Y. 11787.

■

Comverse Technology, Inc. has released its **Trilogue** advanced message management system.

Trilogue enables a standard Touch-Tone telephone to access a range of applications such as voice mail; automated attendant, which provides direct extension dialing from both outside and inside voice mail; call screening; audiotex; as well as text-mail integration, according to the vendor.

Trilogue is priced from $35,000 to $185,000.

Comverse Technology, 400 Crossway Park Drive, Woodbury, N.Y. 11797.

SYSTEMS & PERIPHERALS

Graphics systems

Tektronix, Inc. has announced the **4132 workstation**, an upgrade of its 6130 Intelligent Graphics Workstation.

The 4132 incorporates the Unix-based Tektronix Utek operating system and Ethernet local-area network. It offers up to 24M bytes of hard-disk storage and has two direct memory access serial ports.

The 4132 also provides a small computer systems interface port and includes an IBM Personal Computer AT-compatible 1.2M-byte disk drive.

The 4132 costs $12,950.

Tektronix, P.O. Box 1000, Wilsonville, Ore. 97070.

Data storage

EMC Corp. has announced their **Dia-MVXII** off-line memory diagnostic package for use in Digital Equipment Corp.'s Microvax II systems.

Dia-MVXII is said to provide complete diagnostics of all memory arrays down to the chip level. It also offers the user the ability to test individual Microvax II memory arrays and to isolate trouble spots or necessary repairs.

The Dia-MVXII is priced at $750. Dia-MVXII is free of charge to existing EMC VAX customers.

EMC, 12 Mercer Road, Natick, Mass. 01760.

■

Honeywell, Inc. has added an **Event Precursor recorder** function to its line of VP 131 Versaprint reporters.

The Event Precursor recorder is said to permanently acquire and store data in solid-state memory. When an event-triggering condition occurs, the recorder downloads onto the chart the last process data with the accompanying messages, time lines, range markings and channel markings. The recorder, a removable chart cassette, carries all mechanical and electrical assemblies for printing.

The Event Precursor recorder is priced from $2,900.

Honeywell, 1100 Virginia Drive, Fort Washington, Pa. 19034.

Printers/Plotters

BDT Products, Inc. has announced its three-bin **Laserfeeder.**

The Laserfeeder provides four paper bins and has the ability to automatically feed envelopes. Users who desire an automatic collator can purchase an optional automatic collator from BDT.

The Laserfeeder is compatible with Hewlett-Packard Co.'s Laserjet and Laserjet Plus and Canon U.S.A., Inc.'s LBP-8 series.

The Laserfeeder costs $4,690. The automatic collator costs $200.

BDT Products, 17152 Armstrong Ave., Irvine, Calif. 92714.

■

Sperry Corp. has introduced the **Sperry 0770-II** printer for its 1100 series computer systems.

Continued on page 90



The Silent 700™ Data Terminal Series from Texas Instruments.

It pays to get good connections.

TI's line of portable data terminals leads the market in keeping people connected to their operations no matter where they are, or where they're going.

For 15 years, whether you've needed to keep in touch with satellite offices, supply your field sales force with communications tools, access a remote data base or eliminate telephone tag, TI has always had the right data terminals for the job. They're easy to operate. Rugged. Self-contained. Lightweight. Affordable. And quiet.

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The latest addition to the Silent 700 Series brings the convenience of both a desktop display and printer to a portable terminal. The TravelMate comes with built-in editing capability, and an easy-to-read, pop-up LCD display so you can see what's happening before you transmit, or as you receive. Its printer control key allows you to print selectively on its quiet printer. Of course, all the communications capabilities are built-in, and you can choose a 300 or 300/1200 baud internal modem. There's even a model designed for direct connection to your computer.



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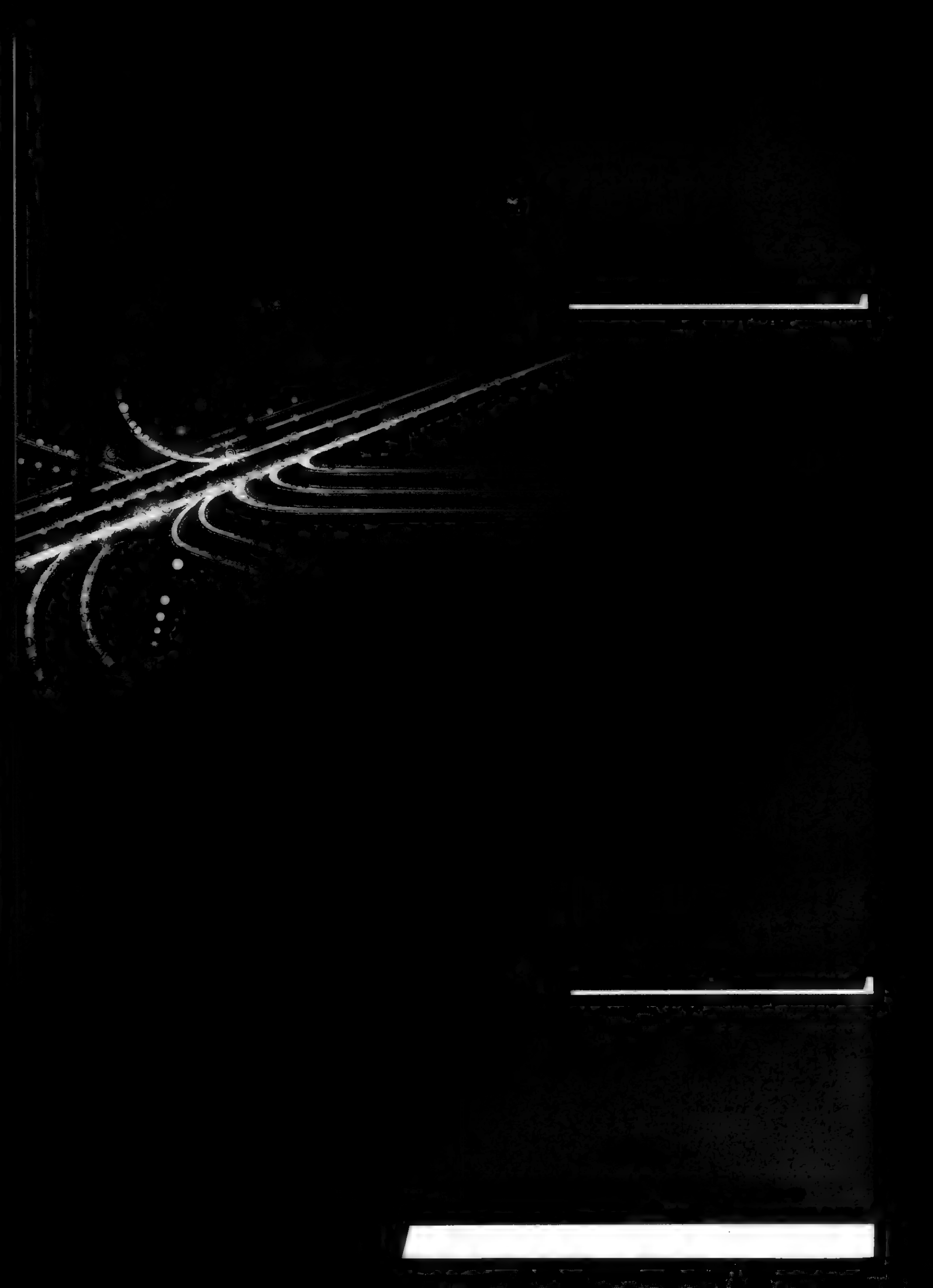
Personalized Application Cartridges are what make TI terminals customizable. They can be programmed with features and functions that satisfy your specific communications, data entry and retrieval needs. Application-specific cartridges can be developed for remote sales automation, data base inquiry, or electronic mail, to name a few.

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TEXAS INSTRUMENTS

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NEW PRODUCTS/SYSTEMS & PERIPHERALS

Continued from page 88

Key features include 2,000 line/min. printing, reduction in footprint size to 10.8 sq ft, an internal vacuum system, front and rear operator panels and the capability to use a variety of print bands.

Available in fourth-quarter 1986, the 0770-II printer costs $60,000.

Sperry, World Headquarters, Blue Bell, Pa. 19424.

■

Printware, Inc. has introduced the **720IQ laser imager** printer and the **1200HD and 600HD image processors** that serve as controllers for the 720IQ.

The 720IQ laser imager delivers 1,200 by 600 dot/in. output at 8 page/min. According to the vendor, the 720IQ's resolution is capable of reproductions of typographic fonts, imaging graphics and halftones. The 720IQ also allows users to print in red, blue or brown.

The 1200HD image processor supports 1,200 by 1,200 dot/in. resolution while executing a full set of typographic and graphic functions. The 600HD supports 600 by 600 dot/in. resolution.

The 720IQ laser imager costs $9,990; the 1200HD image processor costs $2,990; and the 600HD costs $790.

Printware, #103, 1408 Northland Drive, St. Paul, Minn. 55120.

Auxiliary equipment

Ohm Electronics, Inc. has added **Models AB25, AB36, ABC25** and **ABC36** to its family of Scooter data switches.

The switches permit the user to put any of two or three compatible peripherals on-line by pushing a button. They do not require any power and are available with either two or three switch connections.

Model AB25, serial, and Model AB36, parallel, offer two push-button switches and two rear-mounted peripheral connections. Model ABC25, serial, and Model ABC36, parallel, offer switching and connection features.

Model AB25 costs $79; Model AB36 costs $85; Model ABC25 costs $84 and Model ABC36 costs $96.

Ohm Electronics, 746 Vermont St., Palatine, Ill. 60067.

■

Genicom Corp. has introduced the **Genicom bar code package** for use on the company's 4000 series of shuttle matrix line printers.

The Genicom bar code package includes 17 popular domestic and European bar codes, variable height and width, human-readable codes printed or not printed, characters expandable up to eight times their original height and width, a set of line drawing characters, a variety of character styles and pitches and letter-quality characters.

The Genicom bar code package is priced at $395.

Genicom, Waynesboro, Va. 22980.

PRICE REDUCTIONS

Televideo Systems, Inc. has reduced the price of its **Tele-286** IBM Personal Computer AT-compatible computers and its **Personal Mini file server products.**

The Tele-286 Model I AT-compatible computer has been reduced from $3,395 to $2,695, and the Tele-286 Model II has been reduced from $5,795 to $4,995.

The Personal Mini family of file server products included in the reductions are as follows: The PM 16T file server has been reduced to $8,995, the PM 16T/85 has been reduced to $10,995, and the PM Workstation has been reduced to $1,095.

Televideo Systems, P.O. Box 3568, 1170 Morse Ave., Sunnyvale, Calif. 94088.

■

Microdirect, Inc. has reduced the price of its **SST 286 PC-AT.**

The SST 286 PC-AT includes a 1.2M-byte floppy disk drive, IBM DOS 3.1 operating system, monochrome monitor, monochrome adapter and 512K memory, according to the vendor.

The SST 286 PC-AT has been reduced from $4,995 to $2,770. The reduced price also includes first year on-site maintenance, according to the vendor.

Microdirect, 180 Bent St., Cambridge, Mass. 02141.

■

Borland International, Inc. has bundled its **Turbo Pascal language development system** for IBM Personal Computers and compatibles with **binary coded decimals** and **support for the 8087 math coprocessor**, reducing the cost of the complete package.

The bundling with binary coded decimals allows development of business applications, such as spreadsheets, where a high degree of numeric accuracy is important, according to the vendor.

The Turbo Pascal with the binary coded decimals and support for the 8087 is priced at $99.95, the vendor said.

Borland International, 4585 Scotts Valley Drive, Scotts Valley, Calif. 95066.

■

Goldata Computer Services, Inc. has reduced the price of its data base management package **Goldatabase Version 4.0.**

Goldatabase has been reduced from $595 to $124.95, according to the company.

Goldata Computer Services, Two Bryn Mawr Ave., Bryn Mawr, Pa. 19010.

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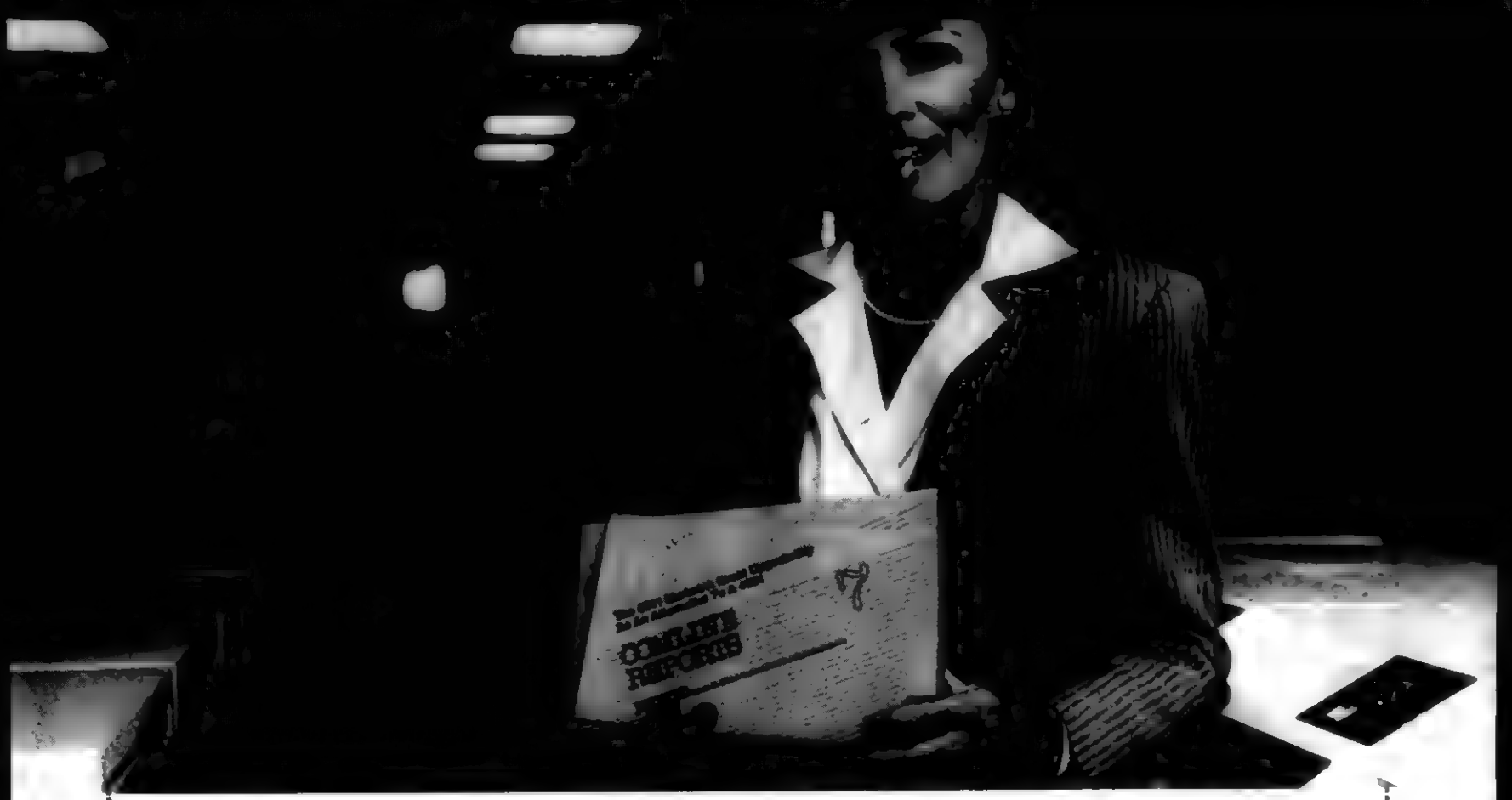
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COMPUTER INDUSTRY

Section begins on page 118

Once leader of low-end mart, NCR's ADDS reverses course

Targets value-added terminals at end users

By Alan Alper

HAUPPAUGE, N.Y. — In 1981, NCR Corp.'s Applied Digital Data Systems (ADDS) subsidiary was considered the price/performance leader in the ASCII terminal marketplace. The company had just introduced a no-frills terminal that listed for $650 and appeared poised to overtake market leader Lear Siegler, Inc., whose Data Products Division had been the first to crack the $1,000 price barrier.

Five years later, ADDS is in the final throes of a complete strategic reversal. It no longer covets the low end of the terminals business, now characterized by steep price erosion (33% during the last three years), slim unit-shipment growth (only 7.2% last year) and little or no product differentiation.

"We're not interested in fighting it out in the trenches with low-priced, low-featured machines," asserts David Laws, who joined ADDS as president in 1983 after 31 years with NCR, which purchased the company for $60.9 million in 1980.

"That's not to say we won't have a basic-style terminal in the line, but our major thrust will be on value-added products, products that tend to be higher priced and more attuned to distributor and end-user needs."

ADDS first lost its pace-setting position to Televideo Systems, Inc. in 1982, which was summarily overtaken by Wyse Technology, Inc. two years later [CW, July 7]. Both competitors borrowed concepts from the evolving microcomputer and, unlike ADDS, made propitious use of offshore manufacturing to keep costs down. Moreover, shrinking profit margins began cutting into research and development expenditures, making it difficult for ADDS to keep its product line current.



ADDS' President Laws

"People were wondering what happened to them," recalls Diane Farrell, a research analyst at International Data Corp. in Framingham, Mass. "They introduced relatively few new products over the last few years, with the exception of a Digital Equipment Corp. VT220 emulator."

ADDS, with an installed base of 750,000 units, also diversified into the IBM Personal Computer-compatible market by remarketing microcomputers made by NCR and Multitech Systems, Inc. of Taiwan. ADDS did so, observers say, while losing momentum in its mainstay ASCII market segment.

Still ranked as the No. 2 independent ASCII terminal manufacturer, ADDS was responsible for about 10% of the 850,000 units shipped last year, according to market research firm Dataquest, Inc. in San Jose, Calif. But in 1984, ADDS shipped about 100,000 terminals, accounting for almost 13% of the market, Dataquest estimates.

"They've lost share, as has everyone else, to Wyse," notes Dataquest's Robert Sanekoff.

ADDS is pinning its turnaround hopes on a new generation of feature-rich products. Leading off the new generation is the recently introduced Model 2020, said to provide crisper characters and flicker-free viewing. It also emulates the Wyse 50, a variety of top-selling Televideo terminals and ADDS's own models, making it usable in "90% to 95% of the marketplace without alteration," Laws says.

Priced at $695, $100 more than the popular Wyse 50, critics say the 2020 may be too expensive for its own good. Laws contends that the meticulous attention paid to stability of display and feel of the keyboard make the 2020 worth the premium.

Laws says ADDS' Display Terminal Division has been able to remain "very" profitable. The division reduced its 430-member work force by 250 during the last year, and its move to total offshore production has saved roughly 25% on product costs, Laws claims. Laws strongly denies rumors that NCR is considering folding ADDS into its corporate infrastructure to achieve further cost savings. Noting that ADDS makes more use of NCR staff departments than ever before, Laws says the marketing advantage of ADDS' name and reputation would be muted by a melding.

But one former executive points out that the percentage of revenue that ADDS derives from its parent is increasing.

While NCR at one time accounted for 10% to 15% of ADDS revenue, that has increased to more than 20%, he says, owing, in part, to declining orders by outside customers.

"Since they are a product-driven company, unless they can spur the customer side of their business, they are in danger of being folded into the parent company," the former insider says. "They could become just another plant for NCR."

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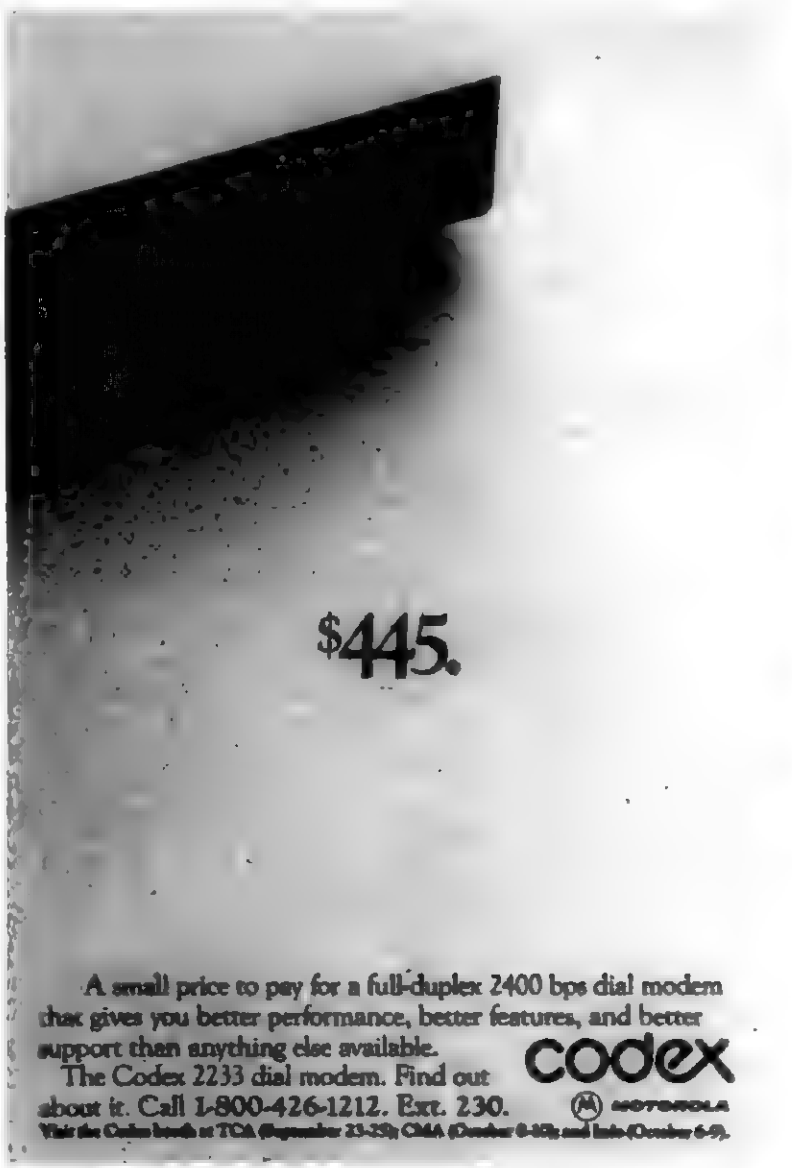
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Ford falls prey to fist of FUD

From page 118

given in the first week of June, Ford found a minimal difference between the archrivals, according to S. I. Gilman, Ford's executive director of information systems.

The three vendors were evaluated by three committees. One committee of gurus measured the technical aspects of the proposals; one group of purchasing and financial types looked at business terms and conditions; and an executive steering committee of high-level DP and user management assessed which company would be best to deal with.

Interestingly, all three firms graded evenly on technical issues as well as on business terms and conditions, Gilman says. Only the third committee gave IBM the edge.

"After a short but intensive review, we went with IBM by using a Ouija board," Gilman quips.

In a more serious vein, he adds, "The decision was based on intangibles: the comfort level of the executives we dealt with, long-term viability and willingness and capability of support and service."

The recommendation to negotiate with IBM was taken through the Ford hierarchy to its management committee, which, according to Gilman, "challenged it, questioned it and eventually accepted it."

FUD strikes again.

Yet, if you were to have looked at Ford's major technical requirement — the need for departmental processors to exchange data with one another via personal workstations — it might have appeared that DEC had a leg up. DEC's VAX architecture runs the same software from top to bottom. IBM, with its multiplicity of mid-range architectures, seems to offer a confused approach.

"DEC's All-In-1 office automation software is not that great, but it's still better than the Professional Office System or Disoss, IBM's office automation software," adds George Colony, president of Cambridge, Mass.-based Forrester Research, Inc.

DEC also seemed to have leverage in the "intangibles" area: Its founder, Kenneth Olsen, sits on Ford's board of directors. Ford's former chairman, Philip Caldwell, has been a DEC director since 1980. But these were no match for FUD.

Plainly, Ford took the safe approach by choosing IBM. In the event of a problem, no one within the firm's management could question the choice. Selecting DEC or Wang would have allowed for too much second-guessing the minute something went wrong.

Big Blue, apparently, still has pull. Should someone check Ford's Ouija board?

Ashton-Tate gets business graphics

From page 118

many years, Ashton-Tate has reinforced its policy of buying firms with strong product lines. In the past two years, Ashton-Tate has acquired word processing leader Multimate International Corp. and Framework developer Forefront Corp.

Ashton-Tate will pay approximately $13 million for Decision Resources, whose products include Chart-Master and Signmaster for the IBM Personal Computer.

Founded in 1981, Decision Resources' sales grew from $9.6 million to $13 million in the fiscal year ended June 30. "We were at the point where we could not generate enough capital to fund our projected growth," President and cofounder Sean O'Connor said. "I knew the company was likely to grow faster with Ashton-Tate than if we went public."

The acquisition is likely to mean the addition of enhanced graphics capabilities for Ashton-Tate's Dbase data base management system and Multimate word processing packages.

Europe criticizes U.S.-Japan pact

From page 118

pressure on prices elsewhere," said Jean Caillot, president of the antidumping working group of the European Electronics Components Manufacturers Association.

"Europe is going to hurt," agreed Murray V. Duffin, corporate vice-president and director of strategic planning at SGS-Ates, Italy's state-owned semiconductor maker.

In a statement, European Community trade commissioner Willy de Clerq and industry commissioner Karl Heinz Narjes said the Commission of the European Community accepted the parts of the settlement "[that] are intended to eliminate dumping in the U.S. market."

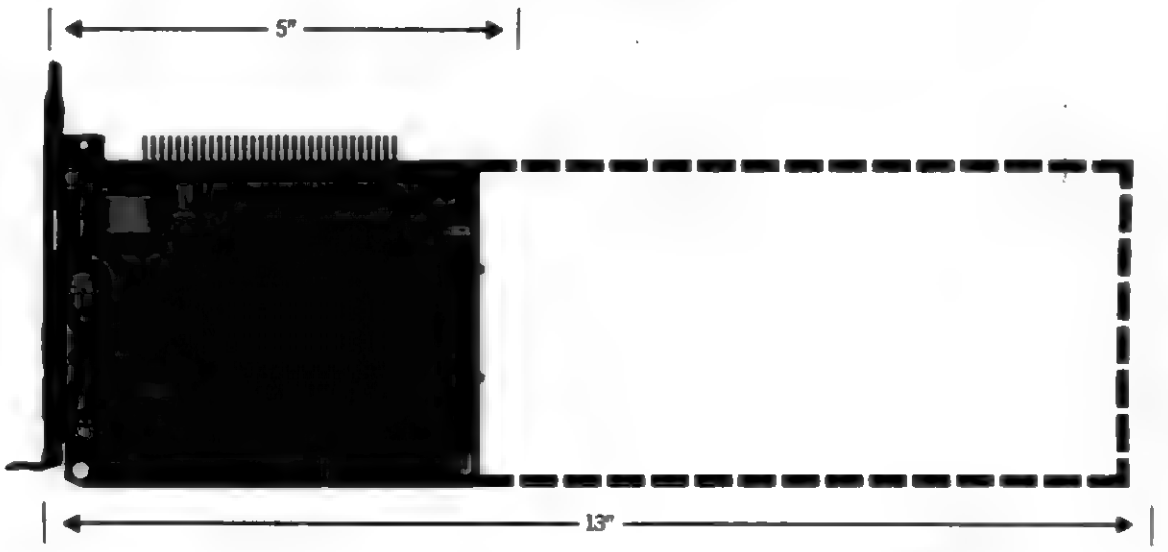
The two officials also emphasized their concern that U.S. firms' semiconductor products may gain favored access to the Japanese market, which would be to the detriment of European products.

The U.S.-Japan accord stipulates that Japan will help redress the semiconductor trade imbalance between the two countries, although the pact does not specify figures.

But a commission official, who declined to be named, suggested that access to the Japanese market is not a major issue in Europe, because, "European manufacturers are so far behind anyway, the Japanese don't want our products."

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Two Comdisco salesmen barred from using 'proprietary' data

Sungard charges former employees

By Alan Alper

PHILADELPHIA — Two salesmen for the Comdisco Disaster Recovery Services subsidiary of Comdisco, Inc. have been barred from using proprietary information allegedly taken from their former employer, Sungard Recovery Services of Wayne, Pa.

A Philadelphia Court of Common Pleas judge has issued a permanent injunction against Comdisco and the two salesmen.

According to a complaint filed by Sungard July 11, former Sungard salesmen Ronald VanderKamp and T. Scott Rumer allegedly took documents that contained price lists, business cards and current customer lists after resigning June 30 to work for Sungard's competitor, Comdisco Disaster Recovery Services.

The permanent injunction, issued July 17, orders the two salesmen to provide Sungard with a list and status report on all companies they contacted between Jan. 1 and June 30.

Contact restrictions

The two men are also prohibited for a period of six months from contacting current Sungard customers, their affiliates and certain prospects of Sungard Recovery Services in the Northeast.

A Comdisco Disaster Recovery Services spokesman said the firm agreed to the injunction to avoid a prolonged and costly lawsuit. "We felt we could have won, since all the information they claimed was stolen was public knowledge, but we settled for the sake of expediency," the spokesman said.

Sungard said it filed suit against Rosemont, Ill.-based Comdisco because the two men had taken information generated while they were employed by Sungard.

"Also, VanderKamp was our top salesman in the area," a Sungard spokesman noted.

5¢ 10¢ NICKELS AND DIMES

MAI/Basic Four, Inc. reported revenue for the third quarter ended June 30 of $69.5 million, compared with $59.3 million a year ago. Profits were $4 million, or 25 cents per share, compared with $2.8 million, or 21 cents per share, in the comparable period a year ago.

■

Ask Computer Systems, Inc. announced revenue for the year ended June 30 of $76 million, compared with $79.2 million in the previous year. Profits were $5.9 million, or 46 cents per share, compared with $7.9 million, or 65 cents per share, in the like period last year.

For the fourth quarter, revenue was $26.6 million, compared with $20.8 million for the like period last year. Profits were $2 million, or 15 cents per share, compared with $2.3 million, or $18 cents per share, in the prior year.

■

Maxstor Systems Corp. reported net income of $252,000, or 2 cents per share, on revenue of $9.3 million in the second quarter ended June 30. This compares with a net loss of $3.4 million, or 21 cents per share, on revenue of $8.1 million reported in the like period last year.

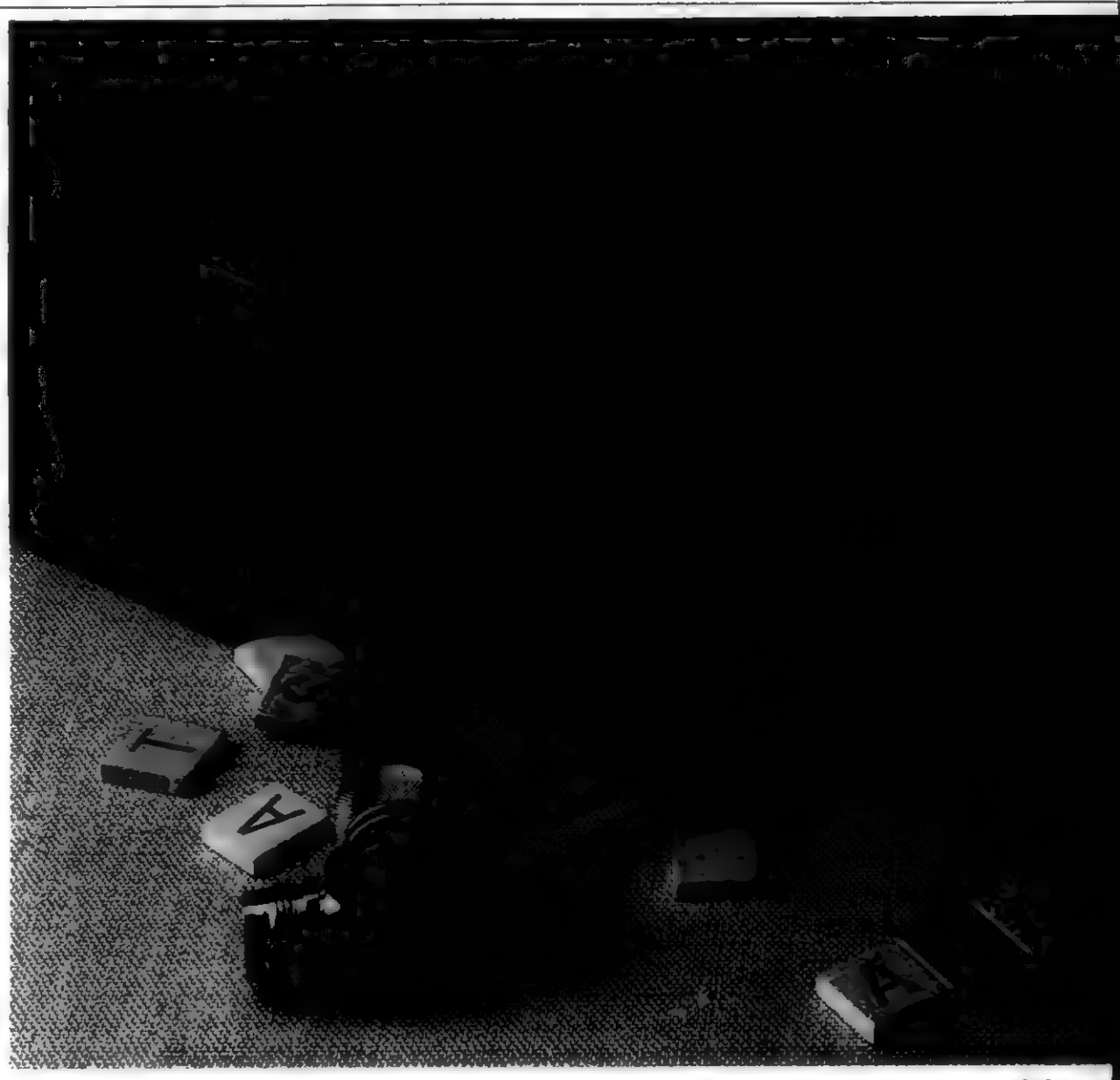
■

Zenith Electronics Corp. reported a loss for the second quarter of $9.9 million, or 43 cents per share, compared with a loss of $4.5 million, or 20 cents per share, in the like period a year ago. Revenue was $381 million, compared with $357 million for the second quarter a year ago.

■

Mentor Graphics Corp. announced revenue for the second quarter ended June

See NICKELS page 97



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COMPUTER INDUSTRY

NICKELS from page 96

30 of $42.1 million, compared with $33.5 million in the like period a year ago. Profits were $2.3 million, or 14 cents per share, compared with $1.8 million, or 12 cents per share, in the previous year's second quarter.

■

Interleaf, Inc. announced revenue for the first quarter ended June 30 of $6.4 million, compared with $2.8 million for the first quarter last year. Net loss was $1.2 million, or 13 cents per share, compared with $1.4 million, or 16 cents per share, for the like quarter a year ago.

■

Gould, Inc. reported revenue for the second quarter ended June 30 of $321.3 million, compared with $355.9 million in the previous year. Net income was $4.3 million, or 10 cents per share, compared with a net loss of $144.7 million, or $3.30 per share, in the like quarter last year.

Daisy Systems Corp. announced a net loss of $1.8 million, or 10 cents per share, on revenue of $23.1 million for the third quarter, which ended June 30. For the like quarter a year ago, the company reported net income of $5.5 million, or 31 cents per share, on revenue of $32.5 million.

■

Information Resources, Inc. announced revenue for the second quarter ended June 30 of $21.8 million, compared with $18.3 million in the previous year. Profits were $2.5 million, or 15 cents per share, compared with $2.1 million, or 13 cents per share, in the like period a year ago.

■

VLSI Technology, Inc. announced revenue for the second quarter of $26 million, compared with $19.6 million one year ago. Profits were $159,000, or 1 cent per share, compared with $115,000, also 1 cent per share, in the previous year.

■

Silicon Systems, Inc. reported revenue for the third quarter ended June 28 of $19.7 million, up 77% from the $11.1 million reported in the like quarter a year ago. Profits for the quarter were $556,000, or 8 cents per share, compared with $261,000, or 4 cents per share, in the prior year.

■

Scientific Micro Systems, Inc. announced revenue for the second quarter ended June 30 of $15.9 million, compared with $8.5 million a year ago. Net income for the quarter was $617,000, or 8 cents per share, compared with a net loss of $740,000, or 10 cents per share, in the comparable period one year ago.

■

Xyvision, Inc. announced net income for the first quarter ended June 28 of $834,000, or 22 cents per share, compared with a loss of $814,000, or 22 cents per share, for the first quarter of last year. Revenue was $5.1 million, compared with $1.9 million for the same period a year ago.

■

Avant-Garde Computing, Inc. reported a loss of $5.2 million, or $1.40 per share, on revenue of $16.3 million for the year ended April 30. This compares with net income of $875,000, or 24 cents per share, on revenue of $20.4 million for fiscal 1985.

The company reported fourth-quarter revenue of $4 million, compared with $3.7 million in the like quarter a year ago. Net loss was $2.3 million, or 62 cents per share, compared with a loss of $392,000, or 11 cents per share, for the same quarter a year ago.

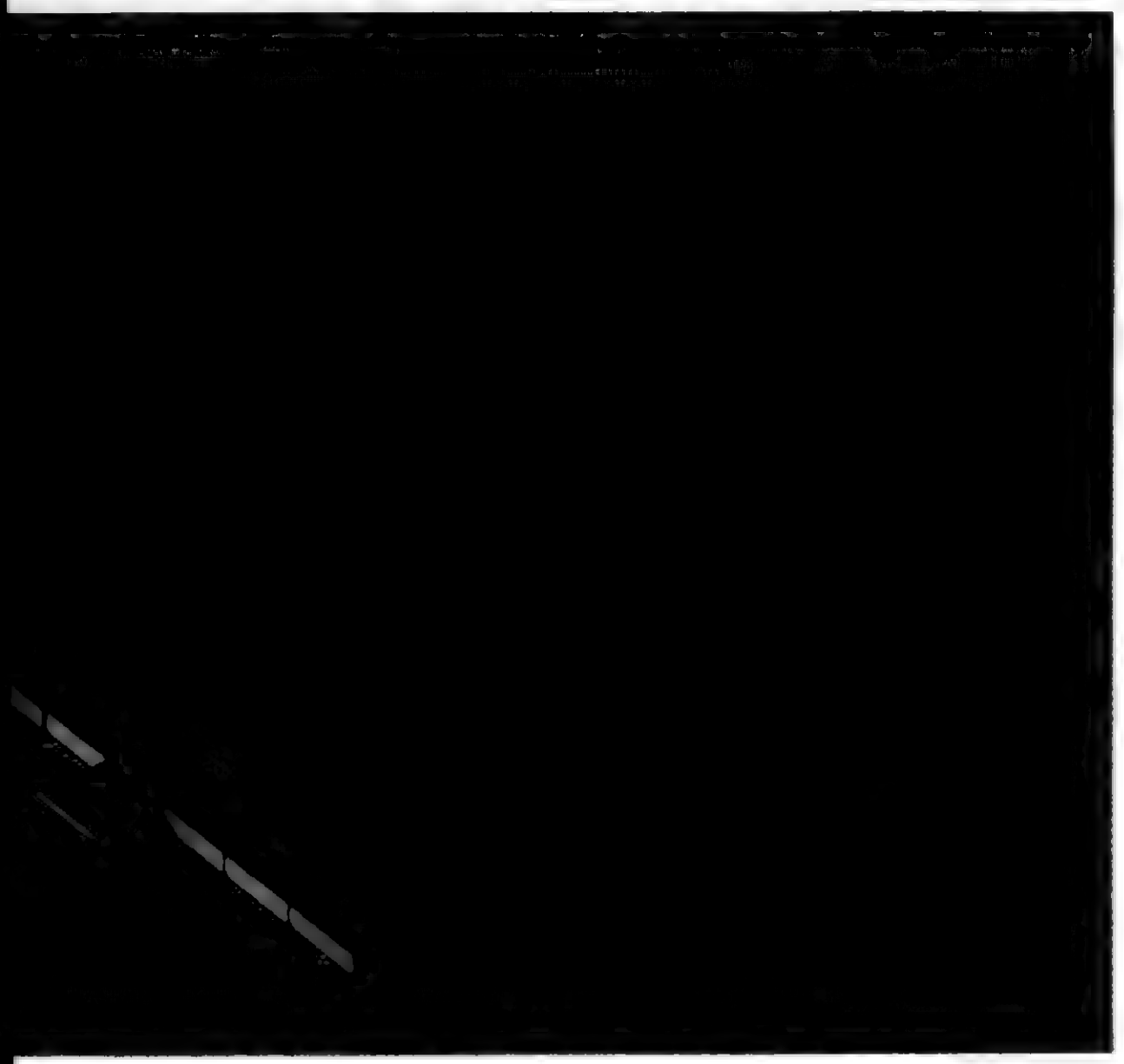
■

Xidex Corp. announced revenue for the year ended June 30 of $432.3 million, a 67% increase over the $259.5 million reported for the previous year. Profits for the year were $32.2 million, or 75 cents per share, compared with $24.5 million, or 81 cents per share, in the previous year.

For the fourth quarter, the company reported revenue of $141.2 million, compared with $88.4 million a year ago. Profits for the quarter were $11.1 million, or 25 cents per share, compared with $7.9 million, or 19 cents per share, in the like period a year ago.

■

Valid Logic Systems, Inc. reported revenue for the second quarter ended June 30 of $15.1 million, compared with $14.6 million in the prior year. Profits for the quarter were $220,000, or 2 cents per share, compared with $626,000, or 5 cents per share, in the like period a year ago.



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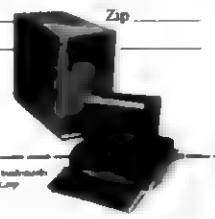
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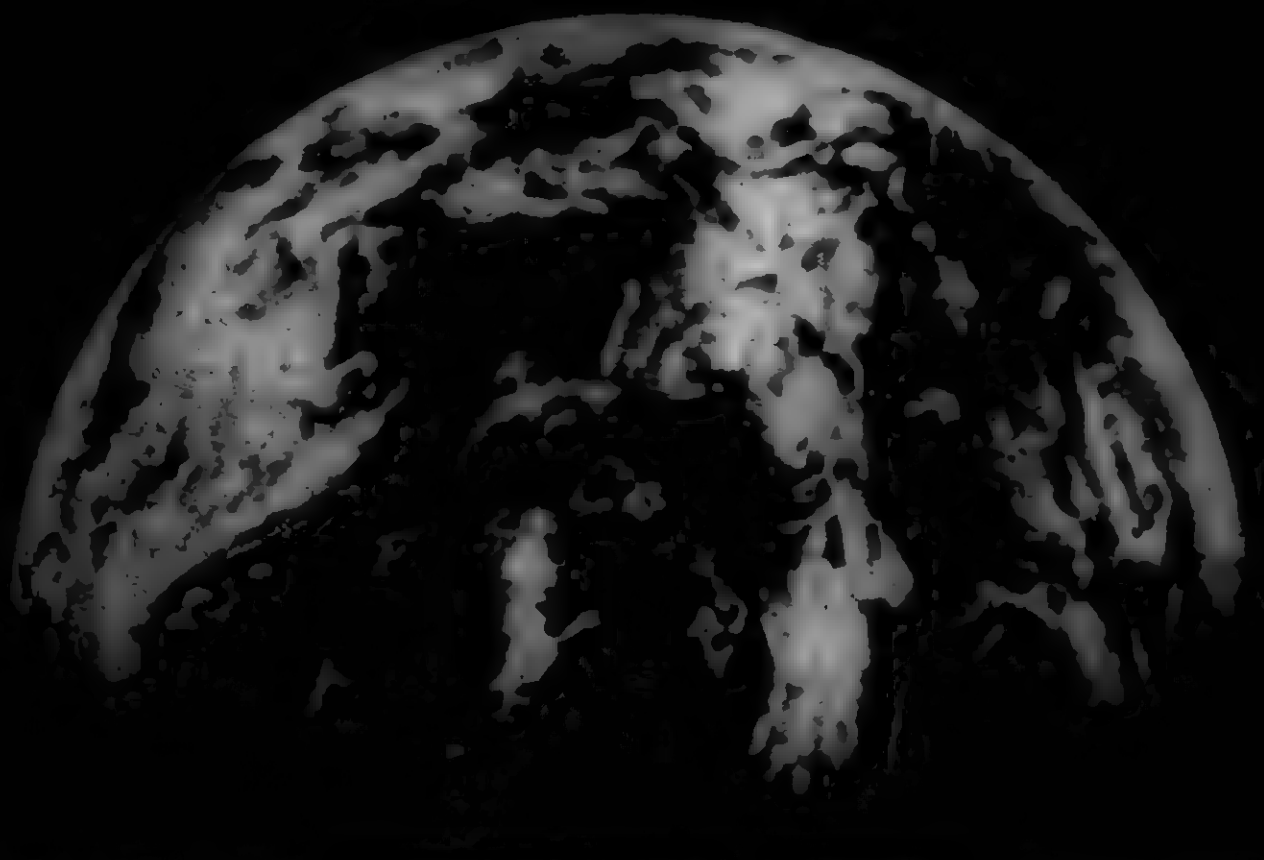
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The New York City Housing Authority will receive sealed proposals at 250 Broadway, New York, N.Y. 10007, in Room 711 on the 7th Floor from 9:00 A.M. to 4:30 P.M. daily until 12:00 Noon of Monday, September 8, 1986, thereafter these bids are to be submitted in Room 2403A on the 24th Floor until 2:00 P.M., of September 8, 1986 after which time no further bids will be accepted for an ENERGY MANAGEMENT INFORMATION SYSTEM.

The deliverables will include further definition of Business Systems Design, the Computer System Design, Coding, Testing and Implementation.

Proposals will be publicly opened and read at the office of the New York City Housing Authority at 2:00 P.M. in Room 2403-A on the 24th Floor, on Monday, September 8, 1986.

The selection will be made on or about September 24, 1986, after all properly submitted proposals have been evaluated, rated, and adjusted in accordance with the terms of the request.

Requests for Proposal (R.F.P.) can be obtained daily at New York City Authority offices, 250 Broadway, in Room #711 on the 7th Floor during the business hours of 9:00 A.M. to 4:30 P.M., weekdays from Mr. Wm. Steinmann or from Mr. Nicholas Calace.

A bidders meeting will be held in the New York City Housing Authority offices at 250 Broadway, New York, N.Y. 10007 in Room 2403-A on the 24th Floor on August 27, 1986 at 2:00 P.M.

Inquiries regarding this R.F.P. may be made by calling Mr. William Steinmann at (212) 306-3721 or Mr. Nicholas Calace at (212) 306-3705.

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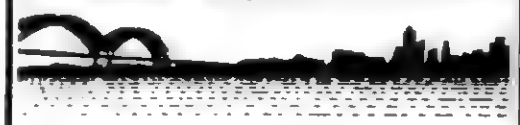
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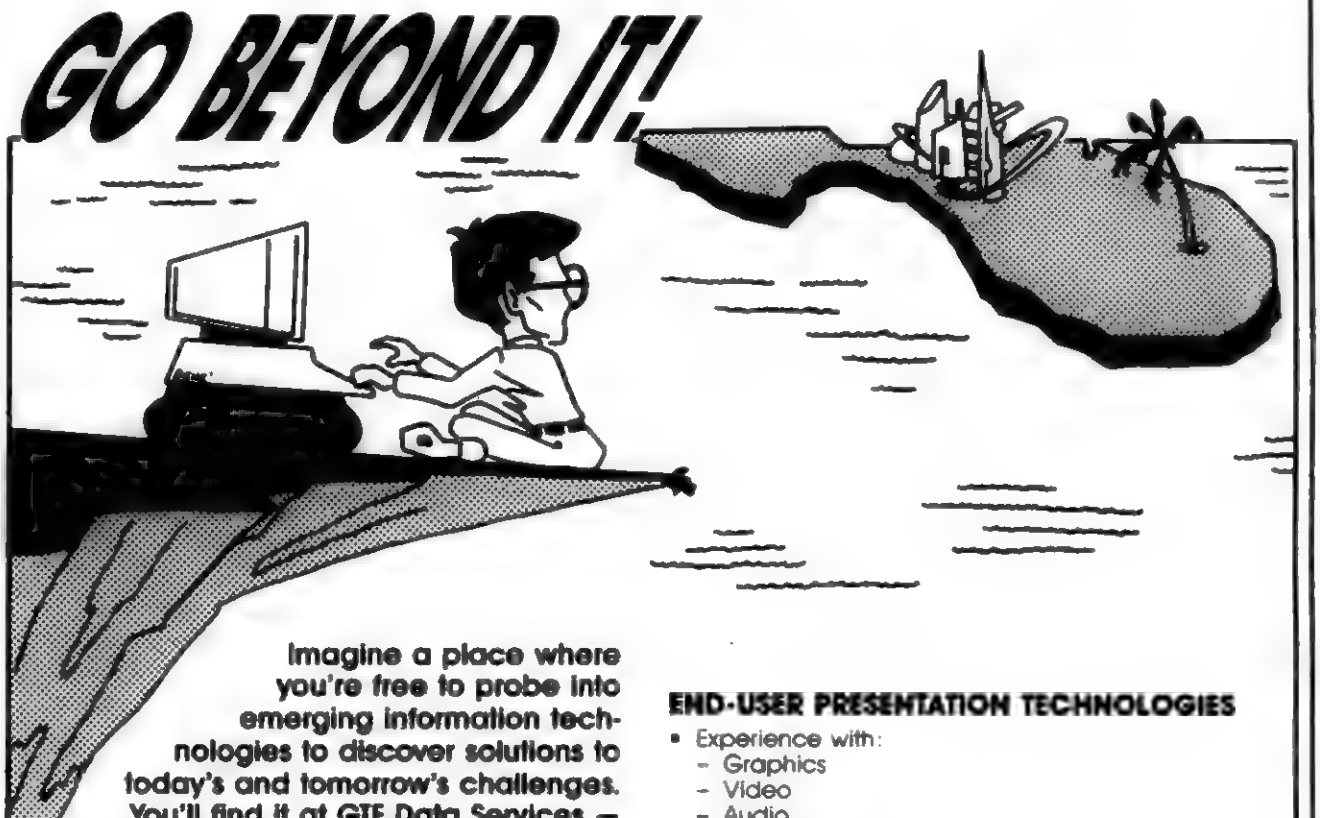
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Systems Development Consultants

Arthur Young & Company is an international "Big Eight" Public Accounting and Management Consulting firm with offices throughout the United States. Our Seattle Office has immediate openings for systems development consultants with experience developing business applications systems using major database management software on IBM mainframes.

Candidates should have university degrees in computer science, business administration, or related fields and at least two years intensive experience using the following software under MVS/TSO or VM/CMS:

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In addition to excellent technical credentials, we also seek above-average communications skills, a high energy level, and strong motivation to succeed.

Consultants in our Seattle Office are involved in projects for clients in the Pacific Northwest, Alaska, and throughout the West. We offer a stimulating, entrepreneurial atmosphere with excellent opportunities for professional career growth and competitive compensation. Seattle and the Pacific Northwest offer an unparalleled environment for personal enjoyment in a cosmopolitan city with outstanding cultural and sports amenities just minutes from lakes, mountains, and other recreational areas for sailing, skiing, hiking, camping, or simply enjoying the great outdoors.

Please send your resume and salary history in confidence to: **Arthur Young & Company, Information Technology Consulting, 2200 One Union Square, Seattle, Washington 98101.** Or call **Mr. John Elliott at (206) 623-9900** for a telephone interview. AY is an Equal Opportunity Employer M/F.

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LAI offers a comprehensive benefit package and competitive salaries. Projects are performed at varying client and LAI sites. For consideration, send your resume to:

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Attn: Staffing-CW

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RESEARCH STAFF MEMBER: Research very HI performance computer graphics systems. Preliminary witnessing in part graphics architectures & strengths & weaknesses of each system. Exp w/use of custom VLSI tools for chip layout, logic simulation, circuit extraction & testing. Very hp custom chip design (over 25,000 transistors) exp in both, NMOS & CMOS technologies. Graphics hrdware design exp for pc's & workstations. Understanding of existing 3D graphics pkages & ability to dev above pkages for realtime interactive computer animation. Familiarity w/UNIX & C prog langs & ability to dev graphics device drivers in above environments. Must be able to conduct individual research at state-of-the-art level in hi perf graphics hrdware & others as well as leading designers in dev & implementing such systems. K/parallel, multiprocessor & systolic computer architectures req'd. Must be able to effectively communicate results of work for presentation & publication. PhD elec eng +2 yrs in job or 2 yrs resrch in realtime computer graphics req'd. 40 hrs/wk, 8:30am-5:12pm, $80,000/yr. SOE Resume to: NYS Job Svc, 55 Church St, White Plains, NY 10601. Include JO-#0705218, DOT 099-081.010

ADABAS/ NATURAL

Large east coast consulting firm seeks a Training Consultant with strong ADABAS/NATURAL background and ability to field questions. Generous benefits; travel necessary; int'l opportunities. Send resume in strictest confidence to:

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Box 9171
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SYSTEMS PROGRAMMER

Arlington County, Virginia

Arlington County, Virginia is looking for a Systems Programmer with experience in the installation and maintenance of multiple DOS/VSE systems running under VM on an IBM 4381 as well as experience installing, maintaining and tuning CICS. Experience is also required in installing and maintaining a variety of operation system-related packages, such as DYNAMO, DYNAMVT, Guarding, TMON, PVM and RSCS. This person must be familiar with data communications under VM and VSE and with ALC and COBOL. Application programming, computer operations and SNA experience are desirable. Salary up to $40,000 with excellent benefits. Official Arlington County application form required. To request application material or additional information call Clarence McGill at (703) 558-2167. Announcement #1226-8A. Arlington County Personnel Dept., 2100 N. 14th St., Arlington County, VA 22201. Deadline filing date 8/21/86. EOE M/F/H

Job Title: Assistant Vice President. Consult with clients and direct research and design staff in technical analysis of design and application of AI programs for industry; develop expert systems including frame-based and object oriented programming languages with user defined inheritance capabilities, natural language parsers based on semantic theories and pattern-matching algorithms, exercise wide latitude of discretionary decision-making in negotiating contracts for AI programs. Minimum Requirements: MS/Computer Science, 6 months in position or 6 months as Director of Design of Industrial AI frame-based and object-oriented programming languages with user defined inheritance capabilities, natural language parsers based on semantic theories and pattern matching algorithms. Working knowledge of business French. Salary: $70,000.00 per year. Job Site: Los Angeles, CA. Send this ad and a resume to Job #FC8005, P.O. Box 9580, Sacramento, CA. 95823-0580, not later than August 20, 1986.

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Director of Human Resources Novatronics Division
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RESEARCH PROGRAMMER

Research Computing Facility
Department of Computer Science
University of Illinois at Urbana-Champaign, Illinois

This position requires ability and experience in developing, documenting, and maintaining system software in a large, networked, computer system consisting of multiple mini-computers and a large variety of workstations used for computer science research in a continuously evolving computing environment. The person will be expected to work with and interact with a large number of research faculty, graduate students, and other facility staff members.

A bachelor's degree in computer science, computer engineering, or a related scientific field, and two years of relevant systems software experience is a minimum requirement. At least one year of experience with the Unix operating system and the C programming language is also required. Of particular interest for this position is experience and interest in working with high performance graphics systems, multi-processor systems, graphics workstations, and computer networks.

The position is academic/professional. The salary is open and will be competitive and appropriate to the qualifications and experience presented. The position is available immediately. It is desired that the position be filled by November 1, 1986, or earlier. In order to ensure full consideration, applications should be received by September 30, 1986. Interviewing will take place during the application period but no final decision will be made until after deadline for applications. Interested persons should send a complete resume and three letters of reference to William J. Kubitz, Associate Head, Department of Computer Science, University of Illinois at Urbana-Champaign, 1304 West Springfield Avenue, Urbana, Illinois 61801, phone: (217) 333-6340

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Charlotte, NC 28281

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The University of the South needs a Programmer/Analyst for its administrative computing section. Responsibilities include systems design, database design/creation, program and system testing, documentation and user training. Heavy emphasis on H-P's IMAGE database system.

Qualifications include a bachelor's degree plus 3 years of concurrent experience in databases and system design. COBOL programming experience is required and familiarity with POWERHOUSE tools is helpful. Higher education applications experience is preferred. Send resume to:

Director of Personnel
The University of the South
Sewanee, TN 37375
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PROGRAMMER ANALYST

BS degree, 3 years plus experience in a manufacturing environment with RPGIII.

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Paul Schatz
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P.O. Box 218057
Houston, TX 77218
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8834 Capital of Texas Highway North
Suite 160
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P.O. Box 751
Butler, PA 16003-0751

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Personnel Supervisor
1100 Circle 75 Parkway
Suite 1500
Atlanta, GA 30339

Equal Opportunity Employer

Senior Systems Programmer
Assistant MAPPER Coordinator

Walt Disney World Co., currently in a period of tremendous growth and expansion, has immediate positions available in our MIS division for a Senior Systems Programmer and an Assistant MAPPER Coordinator.

Qualified candidates for the Senior Systems Programmer will have a B.S. in Computer Science and a minimum of two years programming experience. Familiarity with Cache disk sub systems and Level 39 of the Sperry 1100 operating system is desired.

Applicants for the Assistant MAPPER Coordinator position should have a B.S. in Computer Science and a strong knowledge of MAPPER run writing, preferably Level 32R1. Good communication skills along with the ability to coordinate diverse activities and to function independently, are required.

Qualified candidates interested in a company that provides a challenging environment, excellent benefits and competitive salaries, please send resume, with salary requirements, to:

Walt Disney World Co.
Professional Staffing - MIS - 5
P.O. Box 10090
Lake Buena Vista, FL 32830



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PROJECT MANAGER
Engineering School — Dartmouth College

Master's degree in Engineering, Computer Science or very related field with 3 years of experience in networking, software engineering and/or graphics, or the equivalent. Demonstrated understanding of engineering curriculum and computer applications to that curriculum. Very good interpersonal and supervisory skills. Commitment to continually keeping abreast of new technology and to representing the College at outside professional meetings. Manages all operational aspects of Project Northstar, a school-wide project in integration of workstation technology into an interdisciplinary, non-departmentalized Engineering curriculum. The project requires integration of hardware, software, and specialized networking within the Dartmouth College campus-wide network with applications in five major areas, i.e. Scientific Computer, Data Acquisition, Computer-Aided Design, Decision Analysis, and Computer Engineering. Review of resumes to begin August 15, 1986.

Send resumes to:

Search Committee
Project Manager
Thayer School of Engineering
DARTMOUTH COLLEGE
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DATA PROCESSING CAREER OPPORTUNITIES

Fortune 200 Company has opened a new data center in Richmond, Indiana. The following position is available:

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Position for senior CICS Systems Programmer to install and maintain CICS 1.6.1 and 1.7 in an MVS/SP and MVS/XA JES2 environment. Experience with IMS/DB and/or IDMS under CICS a plus. Requires 4+ years experience in CICS systems programming. Position reports to Technical Support Manager.

Interested and qualified applicants please send resume and salary history in confidence to:

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First Federal Savings and Loan Association of Rochester
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- UNIX/C
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617 235-3633

1018 W. Ninth Ave.
King of Prussia, PA 19406
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1725 Jeff Davis Hwy #406
Arlington, VA 22202
703-892-0212

DIRECTOR, INFORMATION AND TELECOMMUNICATION SYSTEMS

Oakland Community College seeks qualified candidates for the position of Director, Information and Telecommunication Systems, who shall act as advisor and consultant to the Chancellor. The position is responsible for planning, organizing and evaluating all computer and information systems operations of the College. Special attention will be given to integration of operations with UNIX and persons to assure the success of the whole system. Administrative and academic support services are to be provided. Emphasis on the evaluation of services, software and hardware is expected. Leadership for staff in the computer center is an essential prerequisite for these activities. Qualifications: the college is looking for an innovative leader for all aspects of its operations in the information systems. An appropriate advanced degree is preferred. Extensive experience of at least 10 years in academic or business settings is expected. Demonstrated experience as a Manager of an Information and Telecommunication System. Oakland Community College is a public institution located in suburban Detroit, Michigan serving 26,000 students in almost 100 programs most of which lead to associate degrees. Salary for this position is competitive for the area, experience and responsibilities outlined. Working conditions and benefits are exceptional. Resumes should be sent by August 29, 1986 to:

Personnel Department
Oakland Community College
Director, Information and Telecommunication System Application
2480 Opdyke Road
P.O. Box 512
Bloomfield Hills, MI 48013

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RESEARCH STAFF MEMBER: Conduct research to solve difficult entry & interchange problems in the office workstation environment, dev other that is flexible & simple to use; improve productivity in business offices. Expertise in "C" programming, VM, PC ASSEMBLER, generic markup & document formatting algorithms &/& sensitivity to language/cultural differences in Latin alphabet languages/Indo-European; & user friendly human factor approaches. 1/3 exp in operating systems. Theory & dvlpmnt of interactive text processing tools for work-station environment. Masters elec eng or comp sci + 6 yrs in job or 5 yrs as Systems Eng-design/dev of comp system interface & operating systems req'd. 40 hr/wk, 8:00 - 4:42. $53,500/yr. EOE. Resume to: NYS Job Svc, 55 Church St, White Plains, NY 10601. JO#0701748. DOT 033.167.082

Systems Analyst, EDP. Develop & write computer program for co. In interm. shipping indust. Analyze bus. & operating procedures of clients, study navig. problems such as ship's stability. Convert data into software, adapt general programs for spec. needs, revise and correct programs. Do special studies and investigations re: developm. of new info systems. Must know Basic and C languages, use foam data base. 35 hrs/wk; hrs: 9-12 am, 1-5 pm. B.A. Comp. Sci. and 1 yr's exp. req. $23,000/yr. Mail resumes to: NYS Job Service JO #NY8021828, 175 Remsen St., 2nd Floor, Brooklyn, NY 11201. DOT Code 012167066

RESEARCH STAFF MEMBER: Reserch Expert System Shells or Environments: Extend current versions of OPS5 lang. using LISP/VM. Investigate & dev advances in improved pattern matching, k/representation & acquisition, inferencing, controlling problem solving, integrate concepts into unified lang & environment; exh w/users to validate concepts. In-depth k/exp in AI, expert systems, langs, compilers, user interfaces req'd. Demonstrated ability to carry out leading edge rsrch in these areas as reflected in publications & rsrch. Ability to use VM/CMS operating system, in-depth k/& fluency in LISP lang & OPS5 prod system lang; exp writing + debugging large LISP programs involving pattern matching algorithms req'd. Ability to effectively communicate, write-up & present results of theoretical wk for intern'l & ntrnl pub. PhD Comp Sci or Elec Eng + 1 yr ex job or 1 yr teaching comp sci & elec eng req'd. 40 hr/wk; 8:30am-5:12pm; $50,000/yr. EOE. Resume to NYS Job Svc, 55 Church St, White Plains, NY 10601, include JO-#0705100. DOT 033.061.010

Console Operator – Initiate job runs within the ACP/TPF computer systems, including hardware switching and other prescribe processes. Requires 2 months training on IBM's ACP Operating Systems. 3 years experience in job offered or 3 years experience as computer operator on on-line, multi-console systems, i.e. ACP. Must have experience in airline computer operations; must have experience and be able to operate 3 to 4 computer systems at a time; must have experience in using T-BAR, Data Switch, CC85's and 9000 series computers; must pass Computer Operations aptitude test, and must be able to distinguish between hardware and software failures and take immediate action to resolve them. Job site Denver, Colorado. 40 hrs/wk. $1670. per mo. Application by resume. Apply at nearest Job Service Center, referring to J.O #CO2734128.

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SYSTEMS ANALYST

Design IMS banking systems. Require BS in math, data processing or computer science and 3 years experience including IMS, COBOL, CICS, DL/1 and banking systems experience. Salary is $36,000 per annum. Job in Los Angeles.

Reply to CW-B4819,
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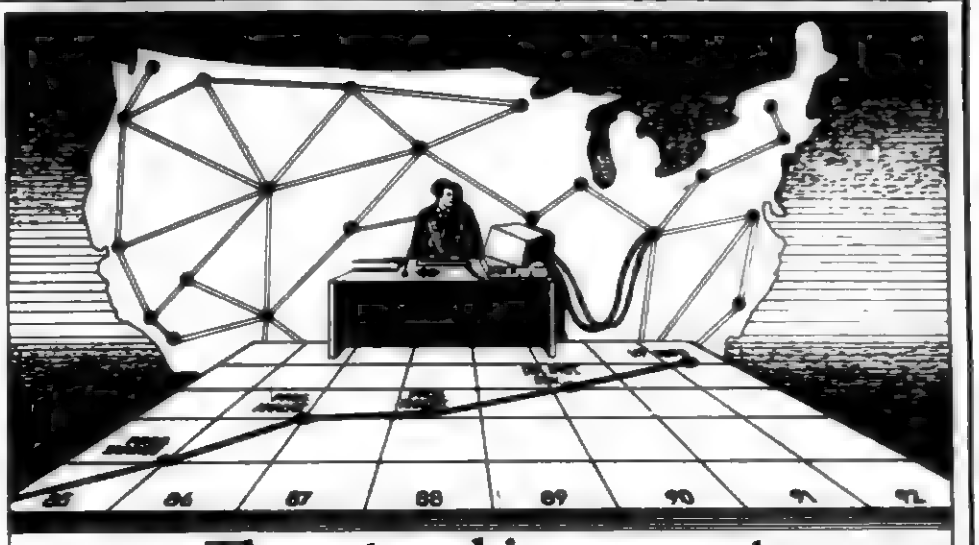
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Foreign Editorial/ Sales Offices

Argentina: Ruben Argento, Computerworld Argentina, Av. Belgrano 406-Piso 9, CP 1092 Buenos Aires. Phone: 34-5583/5584. Telex: 22644.

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INDUSTRY NOTES

Intel announces layoffs, shutdowns

Intel Corp. announced layoffs totaling 1,320 employees at two Caribbean manufacturing operations. The chip maker will close its Barbados plant employing 900 people and will reduce its Puerto Rico work force by about 50%.

Intel Chairman Gordon Moore said that "substantial excess capacity" contributed to Intel's $42.5 million loss in the first half of this year. The company will take a charge of $35 million to $45 million in the third quarter as a result of the actions.

■

Convergent Technologies, Inc. said it will acquire two Uccel Corp. divisions selling to the accounting market. For $28.5 million in cash, Convergent will buy Uccel's Pensacola, Fla.-based Digital Systems Division, which supplies turnkey systems, and Open Systems, Inc. of Minneapolis, a Uccel supplier of microcomputer accounting software.

Since last November, Convergent Technologies has also acquired vendors of turnkey systems to the legal and dealer/distributor vertical markets.

Separately, Uccel said its income from continuing operations rose 55% to $3.3 million, or 19 cents per share, for the second quarter ended June 30. Revenue increased 15% to $38 million.

■

In a move that will result in the layoff of 225 employees and the furlough of 270 more, **Tandon Corp.** announced it will discontinue operations at its San Jose, Calif., Microtek Storage subsidiary, consolidating most manufacturing of its Winchester hard disk drives in Singapore, according to a Tandon representative.

Tandon says it anticipates a "substantial net loss" for the quarter ended June 29.

■

Harris Corp. split its Information Systems Sector into two sectors in order to "increase market focus and improve operating results," a spokesman said.

The Systems Sector previously was a combination of the Business Information Systems Sector, now spun off and renamed the Lanier Business Products Sector, and the Information Systems Sector, which includes the five product and marketing divisions as before, the company said. No changes in product strategy or marketing efforts are anticipated, and no layoffs are expected, the company said.

■

Eagle Computer, Inc. ceased operations and filed for liquidation under Chapter 7 of the Federal Bankruptcy Code recently, after it was unable to reach agreement on a reorganization plan with its creditors.

The microcomputer manufacturer had been in Chapter 11 proceedings for more than a year, owing creditors more than $7 million in secured and unsecured debt.

Honeywell prospects strong if economy turns around



ACTIVE ISSUES
Kathy Porteus

When the stock market tumbled in early July, Honeywell, Inc. (HON — 64) fell head over heels.

Less than two months ago, Honeywell traded around 79 and was considered a favorite among mainframe analysts. But growing investor uneasiness about the economy, which drove down many computer stocks, more harshly affected Honeywell because of the company's ultrasensitivity to economic conditions.

Yet according to analysts, such sensitivity is what will quickly propel Honeywell shares when investors regain confidence in the economy.

"Honeywell has everything going for it but too much exposure to the economy," says Peter Labe, mainframe analyst with Drexel Burnham Lambert, Inc. According to Labe, the company is well managed, financially sound and brings good returns on assets and equity. Despite his praise for the company, Labe remains neutral on Honeywell stock because continued economic sluggishness will keep a lid on earnings growth.

During its second quarter ended June 30, Honeywell earned 80 cents per share on $1.73 billion in revenue, down from $1.14 per share a year ago. Unlike companies like NCR Corp. and IBM, which derive nearly half of their revenue from international sales, Honeywell makes fewer than one-third of its sales in foreign markets. Therefore, the effect of the weaker U.S. dollar is not significant to Honeywell's results, according to Barry Bosak, analyst with Eberstadt Fleming & Co.

Although Honeywell is still considered the H in the BUNCH, the dated acronym for mainframe competitors to IBM, analysts say interest in Honeywell has grown because it is more of an industrial-controls firm than a computer company. Steven Milunovich, analyst with the First Boston Corp., says the "weakness in today's market points out that the more one competes against IBM, the tougher it's going to be down the road."

By becoming leaders in process control systems and products, Honeywell has reduced its exposure to computer industry conditions and positioned itself for the anticipated high growth in factory automation. Honeywell's computer business currently represents roughly 25% of corporate revenue and assets.

However, supplying control systems for factories and newly constructed commercial buildings is more economically sensitive. Therefore, analysts suggest Honeywell as a good place to "play" when signs of an economic upturn emerge.

Milunovich recommends purchase of Honeywell because of the stock's current "cheapness" and its limited downside, owing to the company's stock-buyback program and book value of $56. Nevertheless, Milunovich acknowledges that Honeywell represents a long-term investment owing to the unknown timing of an economic rebound.

Milunovich estimates the company will earn $5.20 per share in fiscal 1986, ending Dec. 31, vs. $6.02 last year. He expects Honeywell to earn $6.50 per share in fiscal 1987.

While the economy continues to dictate near-term prospects, Honeywell, according to Drexel's Labe, continues to gracefully and gradually de-emphasize its computer business.

"Nobody is going to buy its [computer] business," Labe says, "so the company must, one, satisfy its installed base with new products; two, increasingly transfer that overseas and become, in effect, a distributor; and three, perform a couple of special applications well." To this end, Labe adds, "Honeywell is playing its cards very well."

Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

DG ordered to end bundling

From page 118

with," says attorney James Marcellino of Gaston Snow. "It diminishes somewhat the business prerogatives of those marketing software.

"It's one thing to say you can't tie it and quite another to say you must make it available to qualified applicants," Marcellino adds.

Patel's order follows last year's U.S. Supreme Court decision not to hear the case.

That decision reaffirmed a 1984 decision that DG's license restrictions were against federal antitrust laws.

A trial held in order to determine damages in the case is expected to open in San Francisco in the first half of 1987.

DEC licenses VAX to Raytheon

From page 118

military computer marketplace is worth billions of dollars per year.

He would not say what portion of that market Raytheon hopes to garner with the VAX-based systems, but other companies in the market are receiving military computer orders worth between $100 million and $200 million per year, he said.

Raytheon will rebuild and market the VAX-based systems to meet military specifications and a range of real-time processing needs, such as command and control, ground, airborne and shipboard military applications.

Ruggedizing equipment for military use requires making it capable of withstanding various environmental factors, such as extreme heat and cold and nuclear radiation, according to Walter Stowell, general manager of Raytheon's Equipment Division, which will develop the systems.

The resulting computer family will consist of several VAX processor configurations, each supporting high-performance military and commercial I/O channels.

The units will run under DEC's VAX VMS operating system, and they will support all of DEC's existing VAX software, according to a DEC spokesman.

Units are expected to be available in 1988. All of DEC's VAX software will be sold through Raytheon for the military systems customers, Stowell said.

Some of the new system's circuitry will be manufactured by Raytheon's Microelectronics Center in Andover, Mass., a $37 million unit opened last year to build very high speed integrated circuit CMOS chips.

VAR sues Burroughs over printer

By Clinton Wilder

TAMPA, Fla. — A Tampa-based value-added reseller has filed a $40 million federal lawsuit against Burroughs Corp., alleging that Burroughs fraudulently misrepresented the capabilities of its 9290-30 laser printer.

Plaintiff Megacom, Inc., seeking $10 million in actual and $30 million in punitive damages, claims the product cannot produce the 750,000 impressions per month promised by Burroughs and that the impression quality is "deplorable."

Megacom President John Nelson said his company essentially staked its future on reselling the 9290-30 and now faces severe financial pressures because the product does not perform as promised by Burroughs.

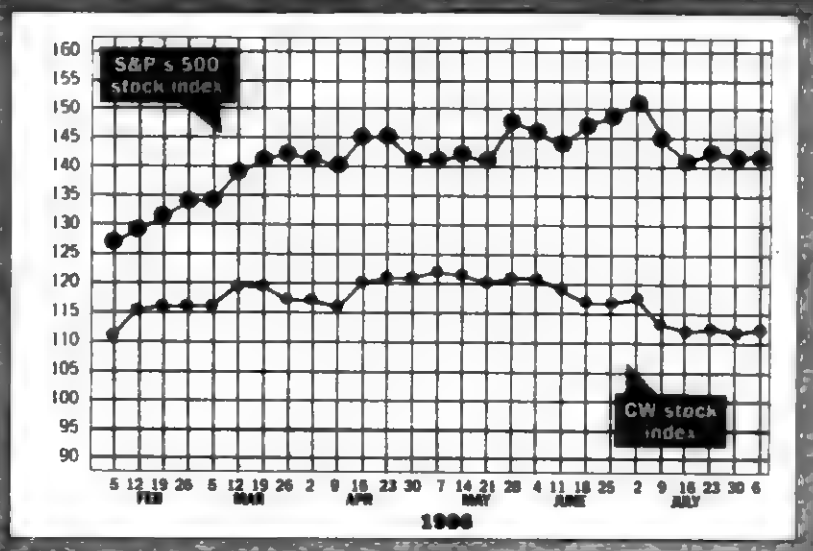
"We went public in June 1985 and included Burroughs' product representations in our prospectus as the central focus of our business plan," Nelson said. "We relied on positions that they took on the printer's capability and speeds. We have found the printer to be substandard in the market."

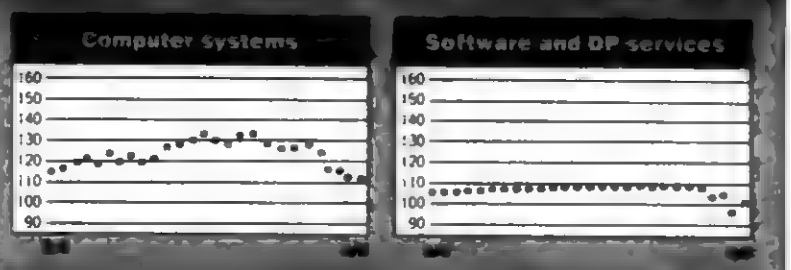
A spokeswoman for Detroit-based Burroughs said the vendor had not yet reviewed the suit and declined to comment.

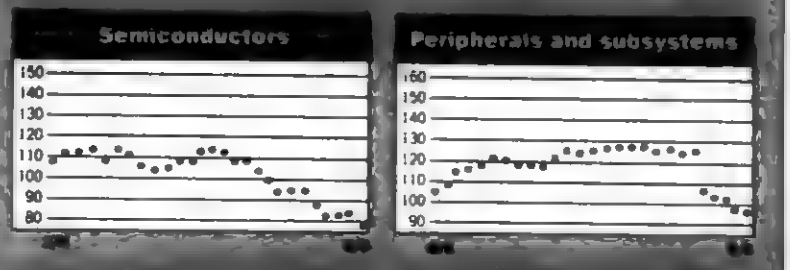
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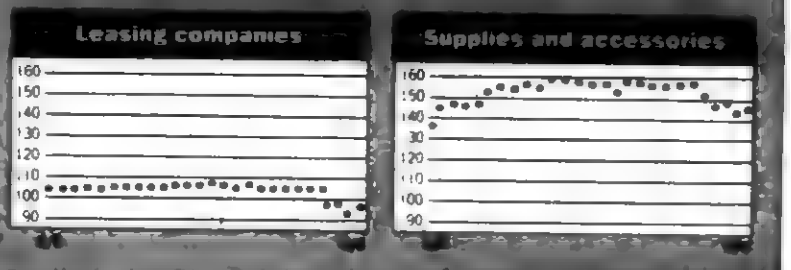
MITCHELL J. HAYES

Computerworld stock trading index









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Software and DP services	97.3	**100.2**
Peripherals and subsystems	99.3	**98.5**
Supplies and accessories	143.3	**146.8**
Semiconductors	81.6	**75.0**
Leasing companies	93.0	**97.9**
CW stock index	112.2	**112.6**
Standard and Poor's 500 stock index	141.5	**141.6**

Computerworld stock trading summary

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EXCH		52-WEEK RANGE (1)		PRICE CLOSE AUGUST 6 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS					
O	ALPHA MICROSYSTEMS	8	4	4.50	-0.5	-10.0
O	ALTOS COMPUTER SYS	19	10	10.75	-2.1	-16.5
A	AMDAHL CORP	19	10	17.38	+0.8	+4.5
O	APOLLO COMPUTER INC	19	9	10.00	-0.4	-3.8
O	APPLE COMPUTER INC	39	14	31.13	+0.6	+2.0
N	AT&T	28	20	24.00	+0.1	+0.5
R	BURROUGHS CORP	72	52	66.63	-0.3	-0.4
O	C P T CORP	7	4	4.25	+0.1	+3.0
N	COMPAQ COMPUTER CORP	18	8	13.63	+0.3	+1.9
A	COMPUTER CONSOLES INC	12	6	7.50	-0.5	-6.3
O	CONCURRENT COMP CORP	25	1	11.50	-0.9	-7.1
N	CONTROL DATA CORP DEL	27	15	20.88	+0.1	+0.6
O	CONVERGENT TECH	14	6	6.25	+0.1	+2.0
N	CRAY RESH INC	100	44	80.75	-6.1	-7.1
O	DAISY SYS CORP	32	8	8.50	-0.6	-6.8
N	DATA GEN CORP	50	30	31.50	-1.6	-4.9
N	DATAPOINT CORP	13	5	7.25	+0.3	+3.6
N	DIGITAL EQUIP CORP	94	50	88.75	-2.3	-2.4
N	ELECTRONIC ASSOC INC	7	4	3.75	-0.1	-3.2
N	FLOATING POINT SYS INC	46	14	14.50	-2.1	-12.8
N	GOULD INC	38	15	19.63	+2.9	+17.2
N	HARRIS CORP DEL	38	22	27.75	-0.8	-2.6
N	HEWLETT PACKARD CO	48	29	39.88	+0.6	+1.6
N	HONEYWELL INC	87	58	63.88	+1.4	+2.2
N	IBM	162	122	131.13	-1.1	-0.9
O	IPL SYS INC	4	1	2.75	-0.3	-8.3
N	ITT CORP	60	32	50.38	-3.6	-6.7
N	M A COM INC	21	13	16.13	+1.4	+9.3
N	MATSUSHITA ELEC INDL LTD	100	48	82.63	+1.0	+1.2
O	MENTOR GRAPHICS CORP	21	11	11.38	-1.6	-12.5
N	MODULAR COMPUTER SYS	9	6	8.88	+0.0	+0.0
N	MOHAWK DATA SCI CORP	4	1	1.88	-0.4	-16.7
N	MSI INC	17	9	9.38	-0.4	-3.8
N	NCR CORP	57	31	50.00	+0.3	+0.5
N	PRIME COMPUTER INC	28	15	19.50	+0.1	+0.8
N	SPERRY CORP	78	46	75.25	+0.0	+0.0
O	STRATUS COMPUTER	28	15	19.50	+1.3	+6.8
O	SYMBOLICS INC	16	7	8.88	-0.8	-8.3
O	TANDEM COMPUTERS INC	35	13	33.50	+0.1	+0.4
N	TANDY CORP	46	32	34.63	-1.9	-5.1
N	TEXAS INSTRS INC	148	88	103.63	-5.4	-4.9
A	ULTIMATE CORP	35	11	14.50	-1.0	-6.5
A	WANG LABS INC — B	23	12	13.25	-1.1	-7.8
A	WANG LABS INC — C	23	11	13.13	-1.6	-11.0
N	XEROX CORP	72	46	52.13	-1.3	-2.3
	SUPPLIES & ACCESSORIES					
N	AMER BUSINESS PRODS	37	25	30.38	-0.4	-1.2
N	BARRY WRIGHT CORP	25	17	19.00	+0.8	+4.1
A	DUPLEX PRODS INC	23	17	20.13	+0.4	+1.9
N	ENNIS BUSINESS FORMS INC	28	19	24.00	+1.0	+4.3
N	3M CO	115	74	109.75	-1.5	-1.3
N	MOORE LTD	28	18	25.00	-0.5	-2.0
O	STANDARD REGISTER CO	50	30	37.25	+0.5	+1.4
N	WALLACE COMPUTER SVCS	50	33	48.00	+0.1	+0.3
	SOFTWARE & DP SERVICES					
O	ADVANCED COMP TECH	7	3	5.25	+0.0	+0.0
N	ADVANCED SYS INC	20	11	15.75	-0.4	-2.3
N	AGS COMPUTERS INC	25	14	17.25	-0.3	-1.4
O	AMERICAN MGMT SYS INC	20	7	17.50	+0.8	+4.5
O	AMERICAN SOFTWARE INC	15	9	11.50	+0.0	+0.0
N	AMACOMP INC	7	3	4.50	-0.5	-10.0
O	ANALYSTS INTL CORP	10	4	4.75	+0.0	+0.0
O	ASHTON TATE	34	10	22.88	+1.0	+4.6
O	ASK COMPUTER SYS INC	15	7	10.13	-0.6	-5.8
O	ASTRADYNE COMP IND	3	1	1.41	+0.1	+7.2
N	AUTOMATIC DATA PROC	39	28	29.75	-1.5	-4.8
O	COMPUTER ASSOC INTL INC	25	10	22.50	+0.0	+0.0
O	COMPUTER HORIZONS CORP	15	10	10.13	-0.3	-2.4
O	COMPUTER NETWORK TECH	10	2	6.81	+1.8	+34.6
N	COMPUTER SCIENCES CORP	40	20	34.38	+1.3	+3.8
O	COMPUTER TASK GROUP INC	19	12	11.75	-0.8	-6.0
O	COMPUTONE SYS INC	8	1	1.88	+0.0	+0.0
O	COMSHARE INC	13	9	12.25	+0.4	+3.2
N	CULLINET SOFTWARE INC	20	8	7.88	-0.3	-3.1
O	CYCARE SYS INC	17	10	12.13	+0.1	+1.0
O	DUQUESNE SYS INC	34	11	28.50	-1.0	-3.4
N	GENERAL ELEC CO	83	56	73.50	-0.4	-0.5
N	GENERAL MTRS CORP	50	33	41.25	-2.1	-4.9
N	GTE CORP	57	38	54.63	+0.5	+0.9
O	HOGAN SYS INC	12	4	10.00	+0.0	+0.0
O	INFORMATION SCIENCES INC	4	1	2.50	-0.5	-16.7
O	INFOTRON SYS CORP	23	12	12.25	-0.3	-2.0
O	KEANE INC	18	7	7.50	+0.5	+7.1
N	LOGICON INC	43	27	28.00	+1.0	+3.7
O	LOTUS DEV CORP	39	15	29.00	2.5	-7.9
O	MANAGEMENT SCI AMER	16	8	13.13	-0.3	-1.9
O	MCI COMM CORP	13	8	8.00	-1.0	11.1
O	MICOM SYS INC	23	11	11.25	+0.3	+2.3
O	MICRO PRO INTL CORP	4	2	2.19	-0.1	-5.4
O	MICROSOFT CORP	36	26	27.75	-1.0	-3.5
O	NATIONAL DATA CORP	26	11	18.13	-0.3	1.4
O	ON LINE SOFTWARE INT	16	8	11.75	-0.3	-2.1
O	ORACLE SYS CORP	29	15	14.88	-1.1	-7.0
N	PANSOPHIC SYS INC	28	18	26.63	+0.4	+1.4
N	PLANNING RESH CORP	24	14	20.25	+1.9	+10.2
O	POLICY MGMT SYS CORP	24	15	15.75	-1.0	-6.0
O	PROGRAMMING & SYS INC	11	5	9.25	+0.1	+1.4
O	REYNOLDS & REYNOLDS CO	35	18	32.75	+0.0	+0.0
O	SCIENTIFIC COMPUTERS INC	8	4	4.00	-0.4	-8.6
O	SEI CORP	28	15	15.75	+0.0	+0.0
O	SHARED MED SYS CORP	41	29	34.38	+0.6	+1.9
O	SOFTWARE AG SYSTEMS INC	22	13	17.00	-0.3	-1.4
O	SOFTWARE PUBG CORP	11	6	5.88	-0.1	-2.1
A	STERLING SOFTWARE INC	21	7	16.38	-0.6	-3.7
N	UCCEL CORP	23	13	19.50	-0.4	1.9
N	URS CORP	18	10	15.25	-0.9	-5.4
O	VM SOFTWARE INC	32	17	24.25	+0.0	+0.0
	SEMICONDUCTORS					
N	ADVANCED MICRO DEV	34	14	14.63	-1.6	-10.0
N	ANALOG DEVICES INC	25	14	16.75	-0.8	-4.3
O	ANALOGIC CORP	18	10	10.25	-0.6	-5.7
N	APPLIED MAGNETICS CORP	20	12	14.75	+0.3	+1.7
O	AMARTEK INC	24	18	15.75	-0.8	-4.5
O	MADCO CORP	7	4	4.19	-0.4	6.4
O	INTEL CORP	32	16	17.00	-2.3	-11.7
O	MICRO MASK INC	8	3	3.25	-0.5	-13.3
N	MOTOROLA INC	80	29	37.00	-0.8	-2.0
N	NATIONAL SEMICONDUCTOR	16	9	8.75	-0.9	-9.1
N	TERADYNE INC	30	17	18.63	-0.4	-2.0
	PERIPHERALS & SUBSYSTEMS					
A	AM INTL INC	9	3	6.50	+0.1	+2.0
A	ANDERSON JACOBSON INC	3	2	2.13	+0.0	+0.0
O	AST RESH INC	33	11	11.38	+0.4	+3.4
O	AUTOTROL CORP	10	6	7.50	+0.3	+3.4
O	AVANT GRADE COMPUTING	9	3	3.69	-0.1	-3.3
O	BANCTEC INC	13	7	7.25	+0.0	+0.0
N	BOLT BERANEK & NEWMAN	48	28	39.13	+1.5	+4.0
O	CAMBEX CORP	2	1	1.00	+0.0	+0.0
N	CENTRONICS DATA COMP	8	4	7.00	+0.0	+0.0
A	CETEC CORP	9	6	6.13	-0.4	-5.8
A	COGNITRONICS CORP	6	4	3.88	-0.1	-3.3
N	COMPUGRAPHIC CORP	29	18	17.88	1.4	7.1
N	COMPUTERVISION CORP	19	9	11.50	0.5	4.2
N	CONRAC CORP	18	11	14.50	-0.5	3.3
A	DATAPRODUCTS CORP	18	11	13.38	-0.3	1.8
A	DATARAM CORP	18	5	7.50	-0.5	-6.3
O	DATA SWITCH CORP	9	4	5.38	-0.3	-4.4
O	DATUM INC	7	5	5.38	-0.4	-6.5
N	DECISION INDS CORP	15	9	9.00	+0.0	+0.0
O	ENDATA INC	8	3	5.38	-0.3	-4.4
O	EVANS & SUTHERLAND	27	16	21.63	-0.5	2.3
N	FLOATING POINT SYS INC	46	14	14.50	2.1	-12.8
O	GAMDALF TECHNOLOGIES	8	5	6.13	-0.1	-2.0
N	GENERAL DATACOMM IND	15	8	9.38	-0.9	-8.5
N	HAZELTINE CORP	29	16	16.88	-0.8	-4.3
O	ICOT CORP	13	6	9.13	-0.6	-6.4
O	INFORMATION INTL INC	18	10	15.13	-0.6	-4.0
O	INTECOM INC	7	3	4.75	-0.3	-5.0
O	INTERLEAF INC	15	8	8.00	-0.6	7.2
O	MEGADATA CORP	5	3	3.25	-0.1	-3.7
A	MSI DATA CORP	14	8	10.13	-0.9	-8.0
N	NASHUA CORP	28	12	25.75	1.0	3.7
O	NETWORK SYS CORP	26	10	11.75	-0.3	2.1
N	NORTH AMERN PHILIPS CORP	48	32	36.13	-0.9	-2.4
N	NORTHERN TELECOM LTD	38	25	28.63	+0.4	+1.3
O	NOVELL INC	21	10	17.25	-0.5	2.8
O	OMEX	1	0	0.38	+0.0	+0.0
N	PARADYNE CORP	13	6	6.63	-0.1	1.9
A	PENRIL CORP	9	5	5.13	-0.4	-6.8
N	PLESSEY PLC	38	19	29.50	-0.1	-0.4
O	PRINTRONIX INC	15	11	11.88	1.0	-7.8
O	QMS INC	16	8	14.25	+1.3	+9.6
O	RAMTEK CORP	7	2	5.38	+0.1	+2.4
N	RECOGNITION EQUIP INC	17	9	11.38	+0.9	+8.3
N	SANDERS ASSOC INC	63	29	59.88	+0.1	+0.2
O	SCAN TRON CORP	24	12	16.25	-0.3	1.5
N	SCIENTIFIC ATLANTA INC	15	9	8.63	-0.5	-5.5
O	SEAGATE TECHNOLOGY	14	5	11.25	+0.0	+0.0
N	STORAGE TECHNOLOGY	7	1	2.75	+0.0	+0.0
O	SUN MICROSYSTEM INC	20	11	12.25	-3.0	-19.7
A	T-BAR INC	7	5	8.25	+0.4	+6.4
A	TAB PRODS CO	15	10	14.25	+0.0	+0.0
O	TANDON CORP	8	3	3.13	1.4	-30.6
A	TEC INC	10	4	5.00	+0.3	+5.3
N	TEKTRONIX INC	86	47	56.75	-0.5	-0.9
O	TELEVIDEO SYS INC	4	2	2.63	-0.3	-8.7
N	TELEX CORP	89	40	54.25	1.1	2.0
N	TIMEPLEX INC	24	14	14.75	-1.0	-6.3
N	TITAN CORP	12	5	9.00	+0.6	+7.5
O	VISUAL TECHNOLOGY INC	2	0	0.56	-0.1	10.1
O	WYSE TECH	19	7	13.50	+0.1	+0.9
	LEASING COMPANIES					
N	COMDISCO INC	25	11	17.75	-0.3	1.4
N	CONTINENTAL INFO SYS	12	5	9.50	-0.6	-6.2
O	FINALCO GROUP INC	5	3	3.13	-0.1	3.8
O	PHOENIX AMERN INC	6	2	3.88	+0.1	+3.3
O	SELECTERM INC	12	6	9.38	+0.4	+7.5
N	U.S LEASING	46	32	38.25	+1.5	+4.0

EXCH: N—NEW YORK; A—AMERICAN; P—PACIFIC; B—BOSTON; I—NATIONAL; M—MIDWEST; O—OVER-THE-COUNTER; S—SPLIT

O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
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COMPUTER INDUSTRY

INSIDE

With its market share eroding, NCR's ADDS subsidiary refocuses on high-end, value-added terminals/93

Two Comdisco salesmen have been barred from using information obtained from their former employer, Sungard Recovery Services/96

Still plagued by excess chip-making capacity, Intel lays off 1,320 workers in the Caribbean/116

INSTANT ANALYSIS

"Nothing communicates the importance of a message more effectively than having the founder and CEO of the company deliver it in person."

— An Wang, Chairman and CEO, Wang Laboratories, Inc., from his upcoming book, *Lessons: An Autobiography*

DG ordered to end bundling

Ruling may alter software license restriction practice

By Maura McEnaney

SAN FRANCISCO — Computer industry legal observers believe a recent court action against Data General Corp. is another step toward prohibiting vendor bundling of hardware and operating system software.

The ruling represents another turn against DG in its 8-year-old legal battle with Digidyne Corp. and Fairchild Semiconductor Corp., which has since been acquired by Schlumberger, Ltd. U.S. District Court Judge Marilyn Hall Patel enjoined DG from tying the use of its RDOS operating system software to the sale of its Nova minicomputer line.

"The companies that will be delighted with the case are those that want to build look-alikes," says Susan Nycum, an attorney with the law firm of Kadison, Pfaelzer, Woodard, Quinn & Rossi in Palo Alto, Calif. "It forces people to unbundle their software," she says.

The DG case was initiated by Fairchild and hardware manufacturer Digidyne in 1978 after DG refused to license the RDOS operating system for the manufacture of Nova-compatible machines. The court is giving DG 60 days to comply with the terms of the order.

Dexter Kenfield, an attorney with Gaston Snow & Ely Bartlett in Boston, says the case will require vendors to carefully structure their software and hardware sales. "Everyone is going to continue to look at their marketing arrangement to see if they pass muster in light of this decision," he notes.

Patel's decision also requires DG to make its software available on nondiscriminatory terms to all qualified applicants and to make its line of Eclipse software products available with non-DG hardware. Some observers say the "qualified applicants" wording could have critical marketing implications in the industry.

"It may shave back the discretion of the companies to see who they do business

See DG page 116

Ashton-Tate follows trend, acquires line of business graphics

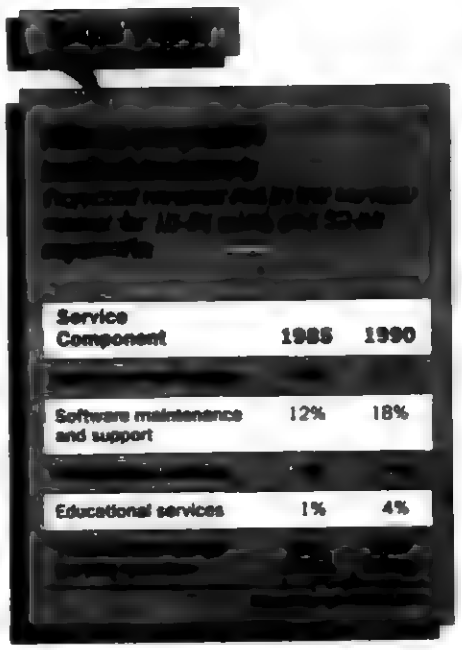
By Maura McEnaney

TORRANCE, Calif. — Ashton-Tate added to its collection of leading software packages last week when it announced plans to acquire Decision Resources, Inc., a business graphics software vendor in Westport, Conn.

The acquisition adds Ashton-Tate to the list of leading independent microcomputer software vendors that have recently expanded their product lines into business graphics packages. Lotus Development Corp. recently acquired Graphics Communications, Inc. of Waltham, Mass. [CW, June 2].

In its latest acquisition, the third in as

See ASHTON-TATE page 95



Service Component	1985	1990
Software maintenance and support	12%	18%
Educational services	1%	4%

INDUSTRY INSIGHT
Alan Alper

Ford falls prey to fist of FUD

FUD is back in the news. Not Elmer's last name, but the oft-used acronym meaning the fear, uncertainty and doubt that corporations experience when considering the purchase of non-IBM computer equipment. FUD does not seem to be dissipating as rapidly as some Big Blue competitors would like to say it is.

Ford Motor Co.'s recent selection of IBM as the designated supplier to its North American operation, for which at least $300 million worth of office automation products and services will be purchased over the next five years [CW, July 28], serves as a striking example of FUD in action.

After invoking a 90-day moratorium on the purchase of computer equipment in April, Ford asked its three largest suppliers — IBM, Digital Equipment Corp. and Wang Laboratories, Inc. — to submit proposals to overhaul its entire North American operation's office automation and communications scheme. The operation was suffering from a weighty problem: Computer systems, purchased by its numerous departments from a variety of vendors, were incompatible and could not communicate with one another except over the crudest of bridges.

Ford hoped that, by selecting one vendor whose products spoke in a like tongue, it could bring effective data communications to an operation that, in many ways, resembled the Tower of Babel.

In evaluating the three proposals

See FORD page 95

Alper is Computerworld's Mid-Atlantic correspondent.

Europe criticizes U.S.-Japan accord, fears chip price war

BRUSSELS — The Commission of the European Community has warned that it could take action under international trade regulations against the agreement reached July 31 between Japan and the U.S. on trade in semiconductors.

The commission said it "cannot accept that Japan and the U.S. determine prices to be paid by European users."

Officials said action might be considered under Article 23 of the General Agreement on Tariffs and Trade, which are international trade regulations designed to protect trading interests.

The U.S.-Japan accord [CW, Aug. 4] calls for the creation of a monitoring system by which Japan would report price and production data concerning its semiconductor industry to the U.S. Department of Commerce. The U.S. convinced Japan to extend the monitoring system to sales made to "third countries," which would include Europe.

European semiconductor makers complained in July to the commission about alleged Japanese dumping of chips in Europe. European vendors are particularly concerned that semiconductor price protection in the U.S. will make Europe the site of the next chip price war.

"With a rise in prices on the U.S. market, automatically, there will be a

See EUROPE page 95

DEC licenses VAX to Raytheon, strengthens stature in military mart

By Deena Raisanoff

LEXINGTON, Mass. — Digital Equipment Corp. moved to increase its sales in the military market last week by signing a licensing agreement with major defense contractor Raytheon Co.

Raytheon will use DEC's VAX technology to produce computers for military use, with DEC receiving license fees plus royalties on sales. DEC has a similar licensing arrangement with Norden Systems, Inc. of Merrimack, N.H., which has been building military systems with DEC equipment for about 10 years.

"We do a considerable amount of government business now," a DEC spokesman said. "The Raytheon deal will increase our exposure in the military marketplace."

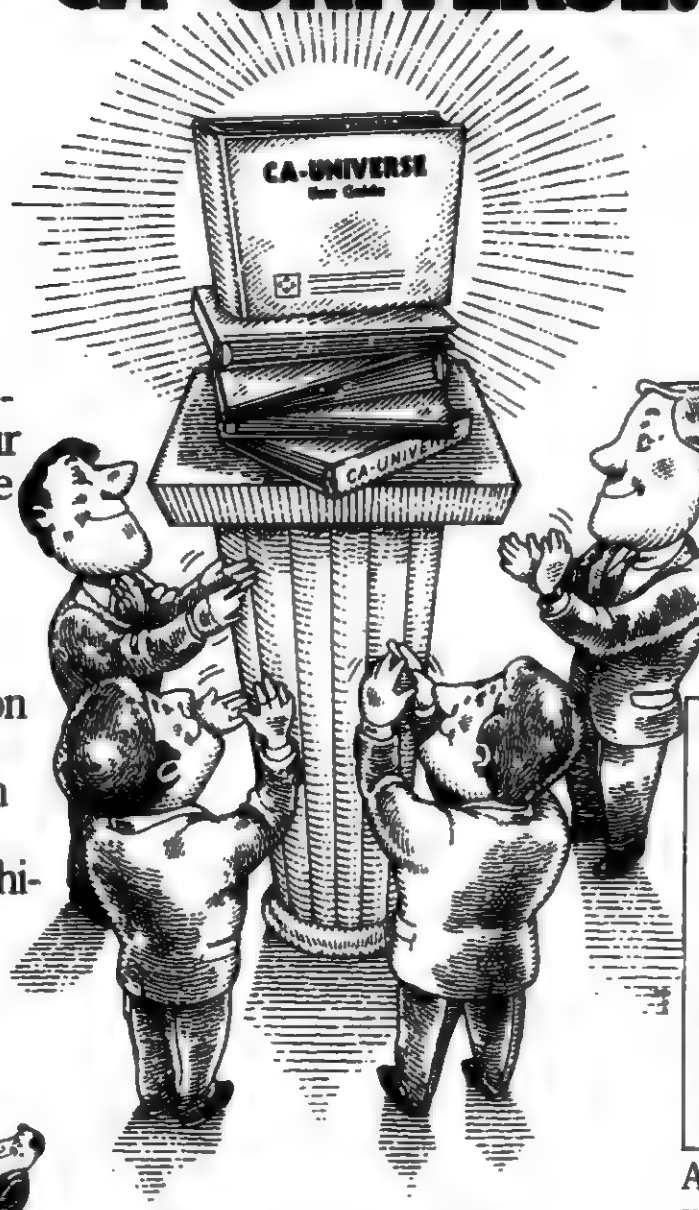
Under terms of the licensing and technology transfer agreement, Raytheon will obtain DEC's VAX computer and chip technologies, including the proprietary VAXBI bus technology, along with DEC's Ada language. Ada is the only language that meets the Department of Defense's critical software requirements, Raytheon said.

Although DEC and Raytheon refused comment on the dollar value of the arrangement, the license fees are reportedly minimal. However, DEC has the potential to gain considerable revenue from royalties on Raytheon's sales to the military.

A Raytheon spokesman said the

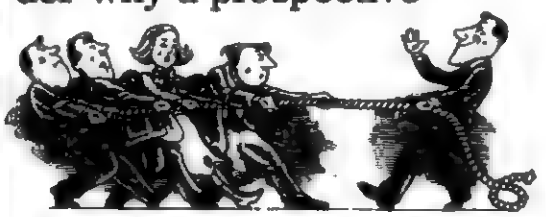
See DEC page 116

DB2, IDMS/R, DATACOM/DB, SUPRA-Combine their advantages into one DBMS and what have you got-CA-UNIVERSE.™*



Some say that the major factor influencing your DBMS decision should be adherence to a true implementation of the relational model. Others advocate application development and production database capabilities. Some promote migration capabilities and others promote a 3-schema architecture and referential integrity.

While each argument has its merits, we wonder why a prospective DBMS buyer must choose between which of these functions are important to him when he can have them all in one product. CA-UNIVERSE offers a practical implementation of the relational model, a true 3-schema architecture, procedural and non-procedural application development capabilities and advanced migration facilities. The others, each has its strengths, each has its weaknesses. But none will fulfill all your needs like CA-UNIVERSE.



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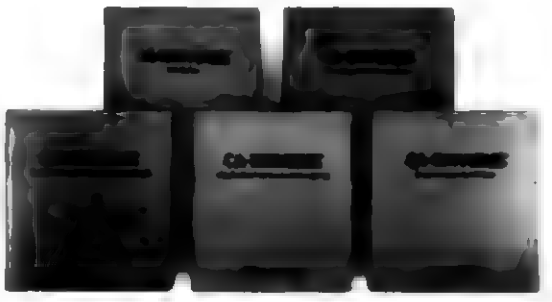
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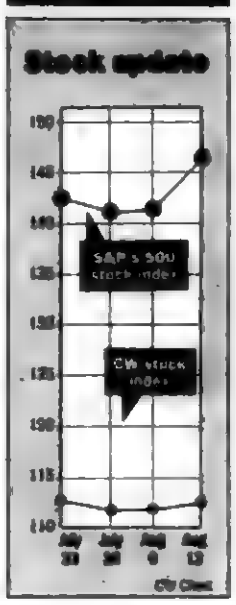
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Stock update



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TOP OF THE NEWS

Pledging major resources to help market Dbase Mac, Apple stands with Ashton-Tate. **Page 10.**

■

Attempting to address financial woes, Convergent Technologies axes 25% of its staff, cuts executive salaries. **Page 108.**

■

Burroughs bridges workstations and resource processors to Disoss. **Page 14.**

■

Turbo versions of Apollo's engineering workstations debut. **Page 6.**

■

Floating Point Systems moves its minisupercomputers from the computer room to the office environment. **Page 37.**

■

Ashton-Tate's Aug. 19 corporate pricing announcement is scheduled to include charges for a technical support hot line, technical newsletters and provisions for the removal of copy protection for large customers. Unlike Lotus's recently announced plan, Ashton-Tate will not sell direct to corporations. The firm will not offer site licensing. All existing products, including Dbase Mac, will be immediately covered by the plan, sources said.

■

Adding more confusion to IBM's mid-range strategy, an IBM observer claims officials in IBM's Marketing Assistance Program revealed that the IBM 4300 family — small mainframes and minicomputers that have been key elements of

See **NEWS** page 7

Coming this week:

FOCUS

Unix operating system trends and issues will be targeted in *Computerworld Focus*, due out Aug. 20. *Focus* will analyze the Unix marketplace, explore leading product implementations, probe the MS-DOS/Unix connection and talk to users who have taken the Unix plunge.

Military acts to speed OSI

DOD push for tools to cut costs spurs development

By Elisabeth Horwitt

A Department of Defense cost-cutting mandate for its divisions to buy off-the-shelf communications systems will spur rapid commercial availability of Open Systems Interconnect (OSI) connectivity tools, observers say.

The department is supporting private-sector development of commercial OSI products in order to save military organizations from having to duplicate that work internally using proprietary protocols. "We want to avoid reinventing the wheel," says Rhoda Mancher, associate director of information resource management for the Naval Operations Systems Division.

See **MILITARY** page 4

IBM recovery system delayed

By Charles Babcock

RYE BROOK, N.Y. — An important IBM recovery product for large-scale data base management systems has run into testing snags and may be as much as a year away from general availability.

IBM first acknowledged the delay in an unusual statement earlier this month in which it confirmed product difficulties and said general availability had been rescheduled, but it did not specify a release date. The product, called Extended Recovery Facility, was designed to provide an instantaneous backup to IBM's widely installed IMS data base management

See **IBM** page 12

Largest users win Lotus concessions

By Douglas Barney

CAMBRIDGE, Mass. — Major corporations received a long-awaited and much-demanded concession from Lotus Development Corp. last week, with the firm at least partially acceding to user demands for site licensing and volume purchase programs on its popular software.

Promising it will be Lotus's major announcement for 1986, company Chairman Jim Manzi said the plan "establishes a new kind of relationship between us and our customers." The program, however, drew a mixed reaction because it only provides direct sales and free high-level support to the very largest Lotus customers.

Called the Multi-Value Plan, the program offers a variety of purchasing and distribution options and provides a means for the elimination of copy protection (see story page 8). The bulk of the programs that make up MVP are currently available.

One element, Lotus's Corporate Access, provides direct sales only to firms that order 500 or more packages that are sent to a single location. These sales can be made through the Special Bids program, under which the firm negotiates a price with Lotus and receives the contracted number of packages, or through the Electronic Distribution program, under which users can download the software from their mainframe.

"If you believe that MIS/DP is taking over more control, by nature MIS/DP likes to deal with vendors directly," said Stephen J. Crummey, vice-president of sales and service for Lotus. So far, 23 firms have signed up for the Special Bids program.

Those customers seeking the removal of copy protection must have an officer of the company sign a written contract stating that the firm has a policy prohib-

See **LARGEST** page 8

CW INSIGHT

Gates talks: The 386 machines, a new MS-DOS and beyond

By Douglas Barney

Microsoft Corp. Chairman and MS-DOS crusader Bill Gates is not afraid to stick his neck out. He announced the development of a product called Windows when it was but a gleam in a programmer's eye and personal computers lacked the power to even run such a product effectively.

But Gates pressed on and is finally beginning to see his faith in Windows bear fruit. Three years after the original announcement, Lotus Development Corp. has promised to develop for Windows, and Ashton-Tate has given a cautious endorsement.

Now, Gates, who says he will not rest until he sees a microcomputer on every desktop, has shifted his attention to the development of a new version of MS-DOS. Due in 1987 at the latest, the upgrade will unlock the immense address space of the latest generation of micros based on Intel Corp.'s 80286 chip, as well as that of the still-to-come 80386 machines.



Chairman Gates

Gates sat down with *Computerworld* in Boston last week and spoke about the new MS-DOS, his microcomputer software competition, Microsoft's ties to key software developers and his tips for personal computer buyers.

CW: Should corporations buy 286-based machines today, or wait until 386 machines are available later in the year?

GATES: First, we've been encouraging people not to buy 8088-based machines. They're going to run out of gas on a performance basis alone, not to mention the memory address space problem. I think the 286 machines have the performance, and with the right version of DOS, they have the 16M bytes, so people should feel pretty good about having a 286.

CW: And the 386?

GATES: It's even better. When these machines finally come out, users will have

See **GATES** page 6

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NEWSPAPER

Sluggish NCC forces AFIPS layoffs, donation cutbacks

By David A. Ludlum

RESTON, Va. — Stung by disappointing attendance at its National Computer Conference this year, the American Federation of Information Processing Societies (AFIPS) is laying off approximately one-half its headquarters staff. The cutbacks will leave AFIPS with a staff of 25, down from approximately 50 earlier this year, federation President Jack Moshman said last week.

AFIPS is also halting its charitable donations to such institutions as the Boston Computer Museum; *Computer Chronicles*, a public television program; and the Charles Babbage Institute, a computer archive at the University of Minnesota.

AFIPS is a nonprofit federation of 11 computer users organizations, including the Data Processing Management Association, Association for Computing Machinery and the Computer Society of the Institute of Electrical and Electronic Engineers.

While unexpectedly slack attendance at the 1986 NCC, held in Las Vegas in June, has presented AFIPS with a budget crisis, the group is not cutting back on support staff for NCC or for its NCC Telecommunications Conference, to be held in Philadelphia next month, Moshman said.

"NCC absolutely is not going to be reduced in importance. We look for telecommunications to be an important and growing part" of AFIPS' activities, he said.

AFIPS has reduced its conference support staff slightly because of the federation's abandonment earlier this year of the annual Office Automation Conference, the other major gathering AFIPS had sponsored, Moshman said.

The federation also will not cut back staff for its publishing division, which issues proceedings of conferences, monographs and computer-related subjects; its Washington, D.C., office, which provides information on trends in technology for legislators and other government officials; or support for the International Federation of Information Processing Societies, according to Moshman.

AFIPS had donated roughly $100,000 a year to *Computer Chronicles* and provided "fairly sizable [advisory] staff backup" for the show, Moshman said.

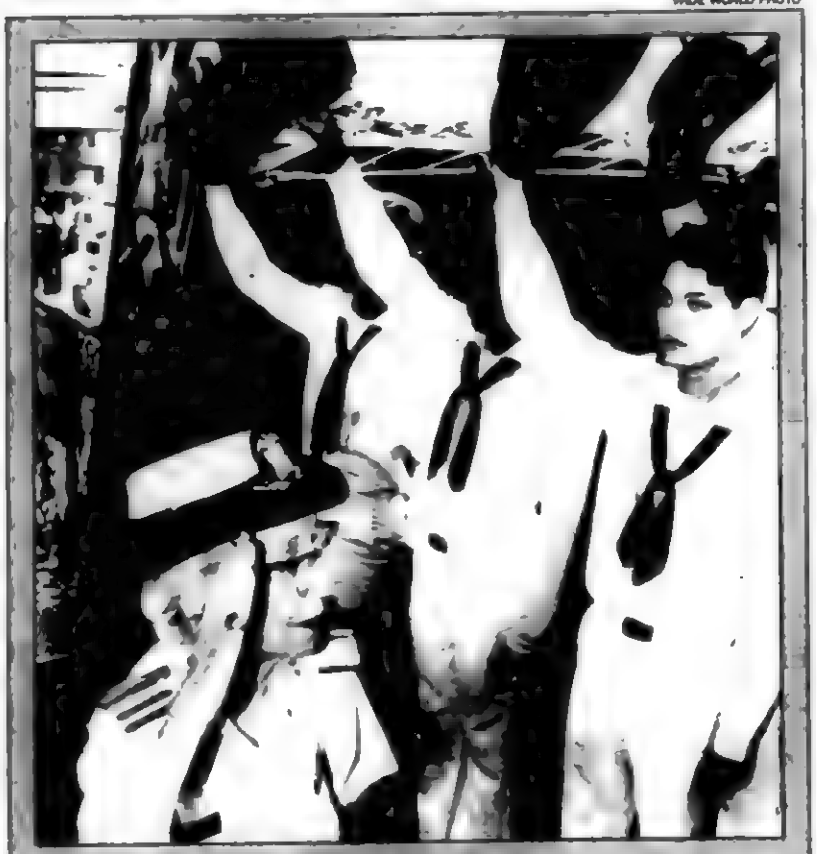
AFIPS budgets operations on the basis of projected attendance at its major conferences, which generate most of the income and tend to come late in its fiscal year, Moshman said.

"We were frankly surprised this year at the reduction. We don't have all the numbers yet. From head counts and so on, we know it is less than we thought it would be," Moshman said of attendance during the current fiscal year.

He declined to provide estimates of federation revenue or the decline this year from 1985. He said the drop-off was "enough to make us sit up and take notice."

The layoffs and cutbacks stem from the federation's conservative estimate of its revenue for the upcoming fiscal year, which begins Oct. 1, Moshman said.

WIDE WORLD PHOTO



End of an era

The U.S. Navy lifted its cap to Rear Adm. Grace M. Hopper last week when the 79-year-old codeveloper of Cobol retired in ceremonies aboard the 188-year-old USS Constitution in Boston. Hopper, who had been retained on active duty since reaching official retirement age, was presented the Distinguished Service Medal by Navy Secretary John F. Lehman Jr.

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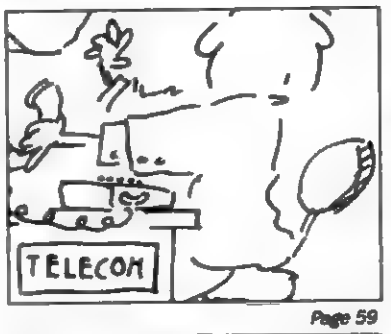
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Military acts to speed OSI

From page 1

Historically, the DOD has used Transmission Control Protocol/Internet Protocol (TCP/IP), a set of communications protocols developed specifically for military networks. A 1985 report jointly produced by the DOD and the National Bureau of Standards (NBS) estimated that buying off-the-shelf OSI products would be between 30% and 80% less expensive for the military than if it developed its own equivalent TCP/IP products.

The military also favors standards such as OSI and Integrated Services Digital Network (ISDN), because these would provide a common interface between Defense Data Network sites in the U.S. and overseas. The two standards are gaining support from a growing number of foreign businesses as well as international bodies, such as the North American Treaty Organization, which has announced support for OSI.

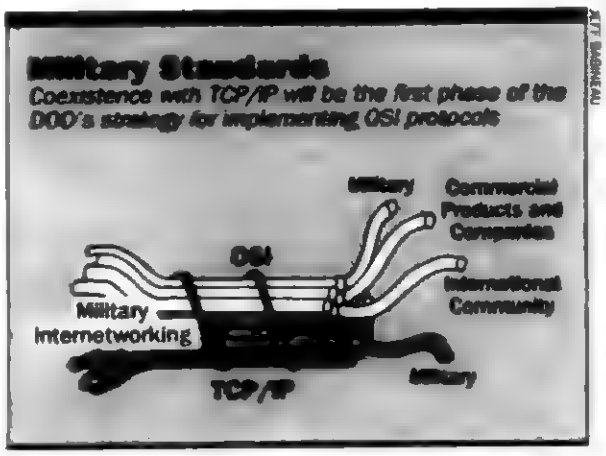
According to Mancher, various divisions of the armed forces only recently began looking for a viable internetworking standard, because they are beginning to hook up their own largely autonomous communications systems to the Defense Data Network. "We don't want a strategy that will be out of date by the time we implement it. Frankly, we need an effective way to link ISDN before we're really ready to fight World War III," she says.

"Everyone wants to see the DOD convert to OSI," says John Haefner, chief of the NBS's systems and network architecture division. "But in order for them to maintain operations during the five to seven-year conversion period, they need gateways between the new OSI systems and their current systems that use TCP/IP."

Hence, military-funded development of OSI gateways will also be of use to private-sector users who have been using TCP/IP. This standard, the military's current de facto standard, is also the closest thing to a multivendor networking system that is currently available.

While it has not yet committed to phasing out TCP/IP completely, the DOD has decided to use the OSI standards, currently being developed by the International Standards Organization (ISO), "whenever international standards are available and can be used to support military requirements," Assistant Secretary of Defense Donald Latham said in an official statement more than a year ago.

Latham's directive reflects the U.S. military's realization that OSI, not TCP/IP, will become the international communications standard. The recent surge of TCP/IP product introductions "is a trickle compared with what computer vendors are doing behind the scenes with OSI," according to Haefner. "The new TCP/IP products are primarily bids from smaller companies for a niche in the DOD market. In contrast, vendors are implementing OSI across the board.



Even the DOD hasn't got a big enough stick to get that kind of support for TCP/IP."

Haefner predicted that, while it may take 20 years for OSI to reach the same kind of functionality as proprietary network systems like Digital Equipment Corp.'s Decnet and IBM's Systems Network Architecture, "enough of OSI will be in place for useful products to become available by next year."

The DOD's participation will certainly accelerate this trend, Haefner claims. The fruits of recently initiated projects, jointly funded by computer vendors, the NBS and various military organizations, "will certainly be made available to commercial users," he says. The following efforts are among those currently under way.

The Defense Communications Agency, the NBS, IBM and other vendors who are part of the OSInet project [CW, Aug. 11] are jointly funding the developing application-level gateways between OSI and TCP/IP as well as systems to test the gateways' performance. The tests will be run on OSInet, a prototype network currently being created by an alliance of 25 vendor and user organizations.

One gateway, which DEC reportedly is working on, will link the DOD's electronic mail protocol, Simple Message Transfer Protocol, with the equivalent OSI protocol, X.400. Similar projects will produce gateways between the military's File Transfer Protocol and OSI's File Transfer Access Method and between the military's Telnet and OSI's Virtual Terminal Protocol. These bridges should be available within the next 18 months, a DOD spokesman said.

The Naval Data Automation Command is working with the NBS on a performance testing system for OSI directory services protocols, which still have to be agreed on by the CCITT and ISO and finalized at an NBS implementation workshop. The directory services, which translate names to addresses for routing purposes, are "extremely important for organizations like the U.S. Navy who have to link up local networks to networks overseas," Mancher says.

The U.S. Air Force is working with the NBS to come up with OSI network management specifications, "which are currently not very far along or right, we feel," NBS's Haefner says. "Rather than wave our arms, we are looking at how network management is performed by existing systems such as IBM's Systems Network Architecture and the Defense Data Network."

Defining specifications

Finally, the DOD is in the process of defining Military Specification Supplements that define which options and subsets of OSI protocols are best suited to its needs.

"The ISO protocols can be characterized as having many optional features and user requirements," says Martin A. Thompson, associate director for the DCA Interoperability and Standards Office. "It must be emphasized that the objective is not to create DOD-unique versions of commercial protocols, but to define an options set."

The Defense Data Network already conforms to the bottom three OSI layers, but it is only recently that the upper layers have solidified enough for the DOD to begin evaluating their potential in military internetworking. As recently as last year, the DOD's Latham noted that Transport Protocol-4 — the furthest along of the upper four layers of the OSI model — was then unavailable "as a proven commercial offering."

Military communications organizations such as the DCA and the Naval Data Automation Command — both of which became charter members of OSInet earlier this month — have since taken an expanding role in monitoring and accelerating the industry's progress toward viable commercial OSI products. Users should begin to feel the effect of this participation before too long.

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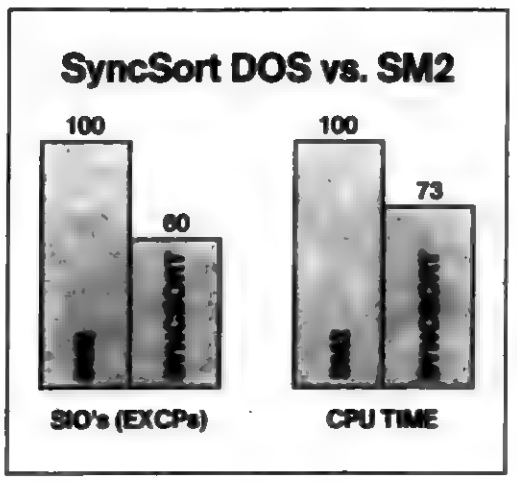
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Apollo, DEC bolster lines in hot engineering terminal mart

DG joins fray with software packages

By Rosemary Hamilton

CHELMSFORD, Mass. — Apollo Computer, Inc. last week rolled out two workstations that are based on and slated to replace the mid-range and high-end models the company introduced earlier this year.

Also last week, Digital Equipment Corp. cut prices and added enhancements to its workstation line.

In a further development last week in the hotly competitive engineering workstation market, Data General Corp., which has not been a significant factor in the engineering workstation market, jumped further into the fray by announcing two engineering software packages.

The Apollo DN570 Turbo and DN580 Turbo use a redesigned CPU and include expanded main memory and disk storage. Apollo will likely discontinue the current DN570 and DN580 models next year, according to Edward Zander, vice-president of marketing, although a final decision has not been made.

The DN570, designed for two-dimensional applications, and the DN580, designed for three-dimensional, graphics-intensive applications, were replacements themselves for earlier Apollo models.

For current DN570 and DN580 customers, a Turbo Performance Package is available to upgrade to either Turbo model.

The DN570 Turbo has a base price of $43,900, and the DN580 Turbo's price starts at $57,900. Pricing for the upgrade package starts at $12,500. Both Turbo models will be shipping in November.

Apollo said the new CPU, based on a Motorola, Inc. 68020 microprocessor, and other system enhancements have boosted the Turbo models' graphics performance by 30% to 50% over the current performance of the DN570 and DN580 models.

The Turbos feature a new, no-wait-state CPU with a 16K-byte physical cache memory and a 32-bit system bus, instead of the 16-bit bus used with the current models.

Integrating the CPU with the cache memory allows programs to access instructions in a no-wait state, while the new bus provides for faster communications between the CPU and other system devices, according to Helen Fuller, high-end workstations product marketing manager at Apollo.

Memory capacity

The new systems will be offered with a minimum of 8M bytes of main memory, expandable to 16M bytes, while the DN570 and DN580 systems have a minimum configuration of 2M bytes. Disk capacity has been expanded to 2G bytes from 308M bytes.

Last week, DEC revamped three workstation models by boosting their minimum memory configurations from 3M bytes to 5M bytes and cutting prices on two of the models.

The company also added a $995 graphics tablet for the GPX series that allows users to input freehand sketches. The new GPX systems and tablet are currently available, the vendor said.

Both color and gray-scale versions of the four-plane models were also reduced in price by nearly $10,000. The color eight-plane model will continue to sell for $39,950.

Data General's two packages, TEO/Electronics and TEO/3D, were designed for DG's DS7500 engineering workstations, although they can also run on the vendor's full line of superminicomputers. The packages are part of the vendor's Technical Electronic Office (TEO) product line, which is modeled after its Comprehensive Electronic Office (CEO) software.

TEO/Electronics was designed for computer-aided engineering (CAE) applications and is made up of four separate components that will be sold separately and will range in price from $1,500 to $15,000. TEO/3D, which ranges in price from $25,000 to $170,000, depending on the number of users, was designed for three-dimensional modeling applications.

Gates talks: 386 machines

From page 1

to look at the price differential to decide whether the 286 or 386 makes sense. The 386 has more capabilities, so if the premium is small, I would go for the 386.

CW: What will extra address space give the user?
GATES: They can use applications that let them look up any document they might have written in the past three or four years, try to find patterns in their office procedures and suggest common procedures, execute SQL on the fly or run multiple applications at the same time — any type of scientific application or artifical intelligence. Even the new operating system will eat a lot of memory.

CW: How has the PC changed?
GATES: In the last couple of years, it has been recognized that dedicated word processors are a thing of the past and that general-purpose machines are now the choice for everything from technical publishing, circuit layout, to all the office productivity-type needs. The IBM Personal Computer or compatible is the most general because there are a lot of those out there.

The range of software that sits on top of MS-DOS is far greater than that that sits on top of mainframes. The state of the art for applications is really on the PC.

The state of the art in user interfaces is there; the state of the art in high productivity language tools is there. We have reached the frontier where microcomputer software companies are the innovators.

CW: Yet, it still seems that software development is lagging behind the development of hardware.
GATES: In 1981, we convinced IBM that they should use a 16-bit micro even though they were tempted, in order to meet their schedule and get it done, to use an 8-bit micro. So starting in early 1982, people were moving up to 16-bit, and for a couple of years people were learning how to take advantage of that machine.

Then a year ago, people started to hit the memory barrier. There are things the memory barrier is preventing people from doing. There is this bank switching stuff, the so-called expanded memory specifications that lets them get beyond that a little bit, but it is not as nice as having a large address space.

There will be advances in the operating system to support those new modes in DOS specifically. In the near future, you will see 386 machines, and those support address space of 4G bytes, which is larger than the largest IBM mainframe address space.

In order for applications to do major things, you have to have improvements first at the hardware level and then at the systems software level. Because of the nature of the 286, that was very difficult to do. There won't be the same kind of lag time for the 80386. Applications will be able to get at an incredible amount of power and performance. The 80386 is more powerful than most of the minicomputers out there today.

CW: What can you tell us about your work with Intel Corp. on the 80486?
GATES: It is so far off that there is nothing concrete at this stage. We have some ideas about how to advance the state of the art in microprocessors based on using some of our compiler technology.

CW: Do the other large micro software companies have an advantage because Microsoft is more willing to share development information with them?
GATES: When we do a new product development, we have to protect ourselves; we just can't go out and publicly talk about the specs and things like that.

A lot of the people you want to work with early on are the ones whose feedback will help you to make the product better. Some of these large companies do have good R&D people. Lotus has [Ed] Belove, a very smart guy; Ashton-Tate has [Robert] Carr, who is also a very smart guy. It is true that we sometimes show things early to those guys to get their feedback. There is an economic benefit to us there.

CW: Some software developers have charged that when Microsoft says that writing for Windows is much like writing for DOS, and that's a way of coercing developers into writing for Windows.
GATES: The memory management and multitasking approach used inside Windows is the same as is used in future versions of DOS. Working with Windows memory management prepares you for working with the new version of DOS.

It is not to say that the new version of DOS has all of Windows in it. It doesn't have an embedded graphical user interface.

Should we have made them different? It is the same code. There is no pressure on anyone to develop for either Windows or the new version of DOS. I hope people decide to do it.

CW: Do you expect any problems in running the next version of DOS on IBM Personal Computer AT compatibles?
GATES: If something is truly, truly compatible, put the disk in and you're going. Every new piece of software has the potential to reveal areas where compatibles aren't compatible, and DOS 286 is no different. It actually has high potential to reveal incompatibities.

CW: Is there any way for a corporation with compatibles to know which ones will be compatible?
GATES: Not today. Does it make sense to have a 286 DOS that doesn't run on popular machines? To the degree that those machines are out there, and can be tested — hey, let's be compatible.

CW: What should IBM do to prevent losing more market share to the clones?
GATES: IBM's best bet is to advance the state of the art aggressivley. Some of the elements with which they advance the state of the art, whether it be custom chips or special communications software, should be things that can't be easily duplicated.

CW: What challenges does Apple face over the next year in establishing the Macintosh as a "second standard"?
GATES: They have to deliver on connectivity. It is technically possible to connect these wires together, but there are some software pieces that are missing. They have got to evolve the product line.

If a company wants to run some application that only exists on DOS, you have to make it possible for those five people to run their application. I think Apple can solve that. But if you have a hundred people who want DOS machines, there will never be a reason to call Apple.

CW: Will MS-DOS ever become multiuser?
GATES: We think DOS is much better for doing networking and multitasking, particularly when you look at things like graphics user interface. Having everybody on a shared processor can lead to unpredictable performance; that also doesn't lead to good expandability, and it is not going to save you that much.

CW: What do you have to do to keep maintain the dominance of DOS?
GATES: We have to be as good as minicomputer operating systems have been, and we have to be upwardly compatible.

CW: Do you see any competition coming in that area?
GATES: How could you get developers interested in doing software for something that wasn't compatible with DOS?

Users say workstation war small factor in purchase decisions

Budget cycles overrule vendors' repositioning

By Rosemary Hamilton

Engineering workstation vendors last week were embroiled in the second round of product repositioning of the year, but the frenzy appeared not to make the intended impact on the market. Users contacted by *Computerworld* claimed they have adjusted to the competitive atmosphere and will make purchase decisions based not on vendor claims, but on internal business concerns.

In a 24-hour span last week, Apollo Computer, Inc. introduced enhanced mid-range and high-end systems, Digital Equipment Corp. cut prices by nearly $10,000 on two Vaxstation II/GPXs and added enhancements to its workstation line and Data General Corp. rolled out engineering software for its workstation offerings (see story page 6). The announcements came one week after a major product debut from Sun Microsystems, Inc.

"We're getting used to this activity," said Thomas Heim, manager of the engineering computation center at the Space and Technology Group of TRW, Inc. "Our purchasing goes according to the corporate capital cycle more than anything else. We get the best bang for the buck at the time the money is allocated."

Like Heim, other users interviewed said the leapfrogging in workstation price and performance is not a major concern in purchasing decisions. Instead, users cited corporate budgets, vendor loyalities and the ability to match available systems to particular needs as the major factors in making purchases.

"Up front, I'll tell you I'm a big fan of Sun Microsystems," said Robert Judd, group leader of the computer graphics group at the Los Alamos National Laboratories, a research center in Los Alamos, N.M. "I think it's more important to buy into a vendor's philosophy rather than a particular item that's the rage this week."

Standard to put in a change order

TRW's Heim said it has become standard procedure at his firm to "put in a purchase order and then expect to put in a change notice." That way, he said, "we end up taking delivery of the latest product."

At AT&T's Bell Laboratories' facility in Murray Hill, N.J., Mark Plotnick, a member of the technical support staff, said the vendor activity makes it "kind of challenging to order something.

"We get a workstation at the exact time when somebody needs it," Plotnick said. "We can't delay these decisions arbitrarily. Sure, almost by the time it's arrived there will be something that's a better value. But that's the nature of this market right now," he said.

"It's the same old story in the workstation market as in any other industry," summed up Richard Shaffer, editor and publisher of "The Computer Letter." "If you can cost-justify a machine now, you go ahead and purchase it. Actually, I think the users are getting a hell of a deal because the prices on the hardware keep coming down."

TOP OF THE NEWS

NEWS from page 1

IBM's DP market strategy since 1979 — soon may be targeted strictly at the scientific and engineering markets and restricted from the commercial data processing market.

The source reported that customers of the 4300 will be steered toward the IBM System/38 product line. But other industry analysts said they had not heard the reports and doubted that IBM would take an affirmative action to pull the 4300s out of a specific market.

However, those same analysts conceded that concentrating 4361 and 4381 sales efforts in the scientific and engineering markets is part of IBM's current strategy.

■

Troubled Daisy Systems Corp. reported a major management shake-up late last week. Daisy's cofounder, President and CEO Aryeh Finegold and Chairman Frederick Adler resigned from the slumping Mountain View, Calif., engineering workstation firm.

Board member Max Palevsky took over the positions of chairman and CEO, and Executive Vice-President Harvey Jones was named president and chief operating officer.

Jones, 33, cofounded Daisy with Finegold and David Stamm, who rejoined the company as executive vice-president after recently resigning from that post.

■

AT&T Information Systems will market Oracle Corp.'s IBM SQL-based relational data base management system on its personal computer line in the last quarter of the year.

The DBMS will run on the AT&T 6300, 6300 Plus and Unix PC. No pricing has been set yet, AT&T spokesmen said.

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Largest users win Lotus concessions

From page 1

iting software piracy and that the prohibition is enforced. In addition, the firm must have the latest releases, Lotus 1-2-3 Release 2 or Symphony 1.1. If these conditions are met, Lotus will send the firm a utility that will remove software protection from existing disks. The utility will not be available for Lotus 1-2-3 Release 1A.

Smaller firms can have copy protection removed through the Extended Value Program. Those firms must have at least 100 users upgraded to the latest versions of Lotus software, and company officials must sign antipiracy contracts similar to those of Corporate Access customers.

Larger customers tended to applaud Lotus's efforts to remove copy protection and sell direct. Others complained about the large volumes required to get direct sales, the high cost of support for smaller firms and the remaining limitations on the removal of copy protection.

User reaction

Despite the stringent requirements, some users were pleased with the removal of copy protection. "I am very much in favor of Lotus's approach to copy protection. If a company is not committed to not pirating, they shouldn't get unprotected software," said Alan Gross, chairman of the Microcomputer Managers Association in New York.

Many, however, were displeased by requirements of the antipiracy program. "It is extreme. The requirement of having the latest version is a financial burden. They are locking people into upgrades," said Steve Roth, manager of decision support systems for Manufacturers Hanover Leasing Corp. in New York.

The plans for the removal of copy protection are aimed at getting more corporations to upgrade to the latest version of Lotus products, Crummey admitted.

Like Special Bids, electronic distribution of 1-2-3 from a mainframe is available only to large Lotus customers.

"Today electronic distribution is for 1-2-3, but the intention is to have all Lotus products available on the mainframe," Crummey said. Electronic distribution is available for systems running IBM's VM. Distribution on an IBM MVS-based system is currently in development. Lotus will deliver a tape with the software to be loaded onto the mainframe and will use a similar approach for product upgrades and maintenance releases.

Up to 50 firms interested

"Ten to 15, to 20, growing to 50 firms have expressed interest in it. Those are the ones that are wired and connected," Manzi said.

Some users were concerned with the large purchases required to qualify for Special Bids and electronic distribution.

"My objections to the way they handle these situations is that they tend to eliminate whole areas of their user base when they make these kinds of announcements," said a micro manager who asked not to be identified.

Others were less critical. "It may be too high, but keep in mind that this a beginning, an initial stab. There is nothing restricting them from lowering that level," said Ted Klein, president of the Boston Systems Group, Inc., a management consulting firm familiar with the program. Other sources indicated that Lotus will lower the 500-unit requirement for direct sales and free support.

Small firms pay for support

Debate also centered around Lotus's charging smaller firms for support. Under the Lotus Prompt program, smaller customers pay $150 per year per user for the same level of support that Corporate Access customers receive free.

"I don't like that at all. We have a staff here that is already familiar with Lotus, and we already provide the support," said Bob Duste, information center section manager at Charles Schwab & Co.

"It is more than a little bit steep. You have got vendors out there like Corporate Software, Inc. that give you support free. We have a corporate expert who knows Lotus products intimately. He is available at a much lower cost to our users," Manufacturers Hanover's Roth said.

■

Quantity buyers get perks

Summary of Multi-Value Plan components and Lotus Development Corp. announcements:

• Corporate Access involves firms eligible for direct sales through special bids or electronic distribution.

These customers order 500 or more Lotus packages per year and are assigned a dedicated account team, sales representative, systems engineer, training contact and product specialist. Support, provided for free, includes a toll-free telephone hot line (in which the number of contacts is based upon the size of the organization and the account), free invitations to Lotus-sponsored seminars and conferences, executive briefings, product prerelease programs, "Update" (a quarterly newsletter) and a technical handbook updated semiannually. The corporations themselves are also eligible for limited liability contracts. Updates are sold direct.

• Special Bids involves the placing of volume orders direct to Lotus, and it requires a minimum of 500 units to be shipped to a single location. The corporation is responsible for distributing the packages to users.

• Electronic Distribution requires an IBM 370 mainframe or compatible and personal computers with IBM 3270 emulation. It is available for firms purchasing 500 or more units, and the corporation is responsible for downloading and distributing documentation.

• Lotus Prompt, a $150 support program that provides special toll-free phone support (eight calls per contract to senior technical staff, quicker response), a quarterly newsletter, 50% discount on any two different Lotus companion products and maintenance and upgrade packages.

Smaller firms essentially pay for the same level of support that larger customers receive free.

• Extended Value Program is available to approximately 400 firms that have upgraded at least 100 users to the latest version of 1-2-3 or Symphony. It provides discounts on Lotus companion products and the ability to remove copy protection from those upgraded units. Lotus declined to disclose the program's price.

• Lotus Direct is a business unit that provides direct sales to any size corporation of Lotus companion products. All sales are at full retail price.

• Lotus will form a Lotus Corporate Council based upon 12 major customers to meet twice annually to discuss "business issues."

• Unprotected versions of 1-2-3 will be made available to U.S. government agencies. Lotus has been locked out of many government bids based on the copy protection. Availability is scheduled for Nov. 15, the company said.

• Lotus announced five authorized training centers to provide "high-quality training."

• Lotus created the Application Services group to assist corporate customers in developing specialized applications.

Initially available in New York and Reston, the service will spread to most other major cities by mid-1987.

• Later this year, Lotus will announce another companion product designed to speed the use of its spreadsheet software, according to Michael E. Kolowich, corporate vice-president of marketing and business development for the company.

Networker puts 1-2-3, Symphony on file server

Lotus Development Corp. last week also announced the Networker, a package that will allow 1-2-3 and Symphony to be installed on a file server and accessed by users on personal computers tied in via a local-area network.

The software can then be loaded onto PCs without a key disk. Via the Networker's Network File Access Program, networked users can retrieve shared work sheet files and lock other users out from the file while it is in use.

The product works only with the most current versions of 1-2-3 and Symphony but will not be available until the first quarter of next year. Customers will be billed on the number of packages used.

"We are talking about server-based management of the software. The idea is to have a network authorization package sitting on the server, which has a counter which counts the number of software packages installed on the server and counts against that the number of simultaneous users who are using the software at any given time," said Michael E. Kolowich, corporate vice-president of marketing and business development for Lotus. "A true networking product will have to wait for the maturation of the networking operating systems and other operating systems in order to truly provide a good group productivity solution in the spreadsheet world."

HP software uses idle MIPS, pushes OA functions to micros

By Charles Babcock

PALO ALTO, Calif. — Hewlett-Packard Co. last week said it is offering added functionality on its Personal Productivity Center minicomputer package and pushing function down to the level of personal computers.

As one of the top three office automation companies in the U.S., according to Framingham, Mass.-based International Data Corp., HP is directing its strategy toward making use of the idle million instructions per second on micros, according to Pete Shepherd, product manager of HP's Office Productivity Division in Wokingham, England.

HP is introducing Advancemail, a $395 electronic mail service that resides on an IBM Personal Computer or HP compatible and connects to the HP Deskmanager, an existing application manager resident on the HP 3000 minicomputer.

In addition, HP announced Version B of Deskmanager for $4,800 to $12,000; HP File/Library, an optional package for community filing and archiving for $2,800 to $7,000; and HP Schedule, an option for scheduling meetings and use of resources for $1,200 to $3,000, the company said.

With Advancemail, users can compose messages, including files, on personal computers and transfer them to the Deskmanager for distribution. Advancemail can direct messages to be stored on the HP 3000 until called for.

Because the micro, rather than the minicomputer, processes these functions, the number of users who can be supported by one HP Personal Productivity Center is doubled, Shepherd said.

Once messages are sent to the Deskmanager, the mini-based software can forward them to other Deskmanager units or IBM's Professional Office System and Distributed Office Support System office automation systems, he said.

Version B of the Deskmanager includes enhancements to electronic mail, word processing, electronic filing and time management functions.

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iebcopy	9 min. 14 sec.	1 min. 20 sec.	10,792	$18.47
PDSFAST	48 sec.	.7 sec.	122	$1.75
47 cyl. PDS Unload to Tape				
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SOFTWARE ENGINEERING OF AMERICA SEA

Dbase Mac aids Apple attempt to create alternate standard

Marketing drive may desert other vendors

By Maura McEnaney

PALO ALTO, Calif. — Ashton-Tate last week announced its expected data base management package for the Apple Computer, Inc. Macintosh, adding its endorsement to Apple's plans to create an alternate standard to IBM.

The package, Dbase Mac, is a relational data base management system that uses the Macintosh interface to allow users to set up their own data relationships without programming. The product is priced at $495 and is scheduled for release in the fourth quarter. The initial release is a single-user product, but Ashton-Tate said a multiuser version for network use will follow.

Apple Chief Executive Officer John Sculley joined Ashton-Tate CEO Ed Esber in announcing the product, which was exhibited last week at the Macworld Expo in Boston.

"We made sure you could do on the Macintosh version anything you could do on the IBM versions," said Michael Stone, director of new product marketing. Stone stressed that Dbase Mac is not a part of the Microsoft Corp. MS-DOS Dbase III package. The Macintosh product "significantly reduces the amount of programming" required by users, he said.

"In Dbase for the Mac, you can see a lot of features that will be in future generations of our IBM products," particularly through the more advanced user interfaces and use of graphics, Stone said.

Sculley's presence at the introduction raised some questions as to whether Apple will throw its marketing weight behind Ashton-Tate and abandon support for early Macintosh DBMS products such as Blythe Software, Inc.'s Omnis III Plus and Double Helix from Odesta Corp.

Macworld Expo coverage on page 12

At last Monday's announcement in Apple's backyard of Palo Alto, Calif., Sculley said Apple will put major marketing resources into marketing Dbase Mac, although he would not elaborate on the agreement.

Ashton-Tate's entry into the Apple DBMS market may be too late to woo customers who already use other Macintosh DBMS products. For the past six months, Macintosh users at Seafirst Corp. in Seattle have been working with Blythe's Omnis III. Seafirst has not looked at the Dbase Mac product because of its success with Omnis, according to Assistant Vice-President Jim Kuhr.

Omnis, he said, "is a pretty easy-to-use product. It's fully relational and fully programmable in terms of the way you can set up relations between different files in a data set."

Although Seafirst uses some of Ashton-Tate's Dbase products, he added, "I don't feel there is a compelling reason to drive us into the Dmac environment."

While several Macintosh users contacted before the product announcement were not sold on the idea of Dbase for the Macintosh [CW, Aug. 11], analysts present at the product announcement handed in positive reviews.

Infocorp's Bob Lefkowits said he was impressed with the product because of the way users can actually see the relationships they are setting up between data structures. "You can't visualize it as easily in other products," he said. "I think this product will do all right."

Dbase Mac allows users to link up to 36 data files through common fields. The relationships are established by using the mouse to carry a key field from one file to another. An arrow appears on the screen to illustrate the data relationship.

The product also lets users customize reports by selecting type styles and fonts. The product supports Apple's Imagewriter printer, Laserwriter and Laserwriter Plus.

Dbase Mac has the capability to let users access IBM-compatible Dbase data files and can transfer files via the standard ASCII test. The product will run on a Macintosh with 512K bytes of random-access memory or on a Macintosh Plus with a System 3.1 operating system and a minimum of two disk drives, one of which must be the recent 800K-byte capacity drive. It can also be installed on hard disks.

Ashton-Tate's introduction has refocused the discussion as to whether the Macintosh can be a viable product in the business market. "We saw the Macintosh becoming a standard for its user interface," Esber said. "The fact is the Macintosh is a success as a business tool." Esber said he expects the product's procedural language to encourage new applications from third-party developers.

Stone conceded that few corporations have standardized on the Macintosh, but he noted the machines are increasingly penetrating that market. "The Macintosh is legitimizing the side door," Stone said. Consequently, more Macintosh products are to follow, and he added, "We're definitely up to our eyes in Mac development."

But according to Infocorp's Lefkowits, the real success of Ashton-Tate's product will depend on the future plans for the Macintosh. "The key is what the announcements for the Mac will be over the next six months. If the Mac were going to stay where it is now for the next six months, I don't think Ashton-Tate would have announced anything," Lefkowits said.

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□ REASON #2: ARRAY PROCESSING OPTIMIZES ACCESS TO LARGE SETS OF DATA.

Relational DBMSs have always dealt with **logical** sets of data. But they manipulated only one **physical** record at a time. V5 eliminates overhead by physically delivering arrays of hundreds, even thousands, of records at a time.

□ REASON #3: PARALLEL-PROCESSING OPTIMIZES COMPUTER RESOURCE USAGE.

V5 is 100% re-entrant shared code, and ORACLE's parallel-processing architecture fully exploits modern dyadic and quadratic processors from IBM, and other multi-processing computers such as those from DEC and Stratus. So ORACLE uses all the MIPS in parallel-processor configurations.

□ REASON #4: MULTI-TABLE CLUSTERING OPTIMIZES JOINS.

ORACLE stores data from different tables on the same physical disk page. This technique—called *multi-table clustering*—permits you to access data from multiple tables in one disk read operation. Clustering improves ORACLE performance on all multi-table operations, such as join queries, update transactions, etc.

□ REASON #5: HIGH-SPEED RELATIONAL SORT FACILITY OPTIMIZES DATA AGGREGATION

Ad hoc relational queries frequently request that data be grouped, ordered or otherwise sorted. V5's internal sort facility performs aggregation and elimination early, faster than previously thought possible.

□ REASON #6: EFFICIENT ROW-LEVEL LOCKING OPTIMIZES TRANSACTION THRUPUT.

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IBM recovery system delayed

From page 1

systems. Observers predicted it may be as much as a year before the package becomes generally available.

In the announcement, IBM stated that it has been forced to stretch its "early support program," an IBM euphemism for beta-site testing, of Extended Recovery Facility. Originally announced in February 1985 in conjunction with the Sierra 3090 mainframe, XRF was due for release to IMS users by the third quarter of 1986.

IBM is now saying "the high availability provided by XRF requires extraordinary levels of quality, thereby necessitating continued refinement of the product." The Aug. 5 announcement was a terse, four-paragraph statement that supplied no estimate of when XRF will be available, saying only that more information will be released in the first quarter of 1987.

'A tough bite to chew'

Developing XRF "is a tough bite to chew," conceded Paul Neuman, IBM spokesman in Rye Brook. "We are still getting the product to the point where we think the quality is what it should be," he said.

XRF was to be the product that would allow users of the IMS data base management systems to keep a mirror image of IMS transactions on a second processor, offering instantaneous backup if the main system were to go down. It was primarily sought by IBM's largest IMS users with extensive data bases involved in financial transactions, such as banks, brokerage houses and insurance companies.

"Some of these companies have hundreds of thousands of dollars moving through the IMS pipeline at any one time. If all of a sudden the pipeline breaks, they're losing money," said Francis Gens, an analyst with International Data Corp., a market research firm in Framingham, Mass.

XRF is actually not one product but a series of enhancements to five other IBM products: IMS/VS Version 2; MVXSP Version 2, Release 1.3; ACF/VTAM; ACF/NCP Version 4; and MVS/XA DFP Version 2.

The number of customers taking part in the early support program is believed to be small, no more than five, and they have been asked by IBM to remain silent on the product's problems, according to Thomas Henkel, senior analyst at the Yankee Group.

"It's the kind of product that you are better off delaying rather than delivering a bad product," he noted. Bugs were found in IBM's own XRF installation in Poughkeepsie, N.Y., and differences between that site and customer sites produced additional installation problems, he claimed.

Henkel estimated XRF may become available during the first half of 1987, but Gens predicted it will be another year before it is out.

Apple encourages third-party vendors at Macworld Expo

By Peggy Watt

BOSTON — Software products led the parade at the second Macworld Expo last week, which drew a liberal mixture of corporate, small-business and hobbyist fans.

Microsoft Corp. reaffirmed its interest in the Apple Computer, Inc. Macintosh with release of Macworks, an integrated package not unlike Apple's own popular Appleworks for the Apple II family.

Ashton-Tate also showed its Dbase for the Mac (see related story, page 10).

Among the handful of other products and upgrades announced were utilities, fonts and peripherals from both large and small vendors.

Technical support organization

Apple itself encouraged more of the same from third parties by announcing its Apple Programmers and Developers Association, a technical support organization for third-party and in-house corporate developers of Macintosh products.

The association is to be run by the Apple co-op in Renton, Wash.

For a $20 annual fee, an individual receives a quarterly catalog of development tools, technical notes and manuals and a newsletter to encourage communication among developers of all Apple products, according to Dan Cochran, manager of languages and tools, who is Apple's liaison to the new group.

"We're trying to serve not just the Lotuses and Microsofts but the hackers and the educators and the DP/MIS managers," Cochran said.

Microsoft's Macworks was enthusiastically endorsed by Apple Chairman John Sculley, who said he finds the package easier to use for most basic tasks than Jazz, a much-touted integrated applications package released last year by Lotus Development Corp.

'Important strategic product'

"I consider this an important strategic product in the continuing development of the Macintosh," Sculley said.

The $295 program, which is due out in September, includes word processing, data base management and spreadsheet with charting functions as well as communications. All of these functions are integrated for data exchange.

It runs on either a Macintosh Plus or a Macintosh with 512K bytes of memory and is available on 400K-byte disks on request.

Microsoft Chairman Bill Gates said Macworks is intended for the general business user, particularly first-time users.

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3317-8633

AI progresses slowly toward corporate user mainstream

Technology ready, buyers hesitant

By Eddy Goldberg

PHILADELPHIA — The wait for artificial-intelligence technology to enter the corporate user mainstream continues, with no immediate end in sight.

The latest evidence was last week's AAAI-86, the Fifth National Conference on Artificial Intelligence, where corporate users were few and far between. More than 100 vendors did exhibit, but their promises to link with mainstream computing fell primarily on the ears of developers and academics.

However, there are definite signs of progress. In the keynote address, Herbert Schorr, who heads up IBM's AI efforts, gave the technology a strong vote of support for commercial applications.

"The technology is essentially ready now," said Schorr, group director of products and technology for IBM's Information Systems and Storage Group.

However, he emphasized that it will be knowledge systems combined with existing data processing systems that produce what he termed the second wave for AI.

Money-saving application

Schorr said IBM's San Jose, Calif., manufacturing facility developed an expert system in eight months designed for storage system testing. That application is expected to save the company $5 million a year worldwide, he added.

However, Schorr cautioned users not to attempt too much with expert systems at first. "Find things that give you a good payoff that you can do rather quickly" and build from there, he suggested.

William Kania, manager of the AI marketing group at Digital Equipment Corp., said, "While we're excited about AI technology, we don't want to be carried away with it. AI is only the next step in data processing." He added that users do not want to abandon their traditional means of computing.

One corporate user remained unconvinced that AI can presently address mainstream data processing needs. "Vendors are in a scramble to say they can do something with the IBM world, large and small," said Ralph T. Shuey, senior research associate with Chevron Oil Field Research Co. in La Habra, Calif. But after searching the offerings on the show floor, he concluded, "Not many have yet."

Shuey, who has been working with symbolic processing machines for the past 2½ years, said the biggest barrier he has experienced in bringing AI into mainstream computing concerns the issue of computers as workstations vs. centralized computer systems. "Much of AI comes from people with workstations that they own or access on a network. The world I have to port AI to is very centralized," he said.

Michael L. Schneider, vice-president of technology research at Manufacturers Hanover Trust Co. in New York, said that although AI has moved from science to engineering in the past two to three years, he wants to run expert systems on the machines he does business with, IBM mainframes.

"I'd like to be able to develop on a symbolic processing machine with LISP for its development power and turn around and deliver it on a cost-effective environment," Schneider said. The key is cost-efficiency, he added, whether on a personal computer or a mainframe. "Am I going to get a return on my investment?" he asked.

Corporations unconvinced

Another hurdle AI is facing in entering the marketplace is that in many corporations it is still an educational, missionary sell; it will remain so until users are convinced it can offer real solutions to everyday commercial problems and can run on their existing hardware and software.

"There is a major learning curve you have to go through before you see how to use these tools. It's really not apparent to corporate people," said independent application developer Ron Ortscheid of Ortron Development Corp. in Buffalo Grove, Ill.

"I had some difficulty before I came to the show seeing how I could use this technology," he said. "But I suspect that once you cross that learning curve, you'll find it valuable."

Carnegie Group upgrades expert systems tools, adds interactive graphics package

PHILADELPHIA — The Carnegie Group last week announced Version 3.2 of Knowledge Craft, its software development environment for constructing expert systems.

Knowledge Craft enhancements include upgraded performance for OPS and Prolog as the result of improved compilation techniques, the addition of macro functions and improved debugging.

The company also announced two new products along with Version 3.2 — an interactive graphics package for creating two-dimensional screen images and a run-time LISP version of Knowledge Craft. Both are set for the second-quarter availability.

In addition, the Carnegie Group will introduce Knowledge Craft on conventional 32-bit workstations by the end of the year, specifically, on Digital Equipment Corp.'s Microvax-based AI workstation and the Hewlett-Packard Co. Series 9000 Model 320. Ports are also being built to Sun Microsystems, Inc.'s Sun-3 workstation, Apollo Computer, Inc. workstations and IBM's RT Personal Computer.

"Many 32-bit workstations have reached the point where they are, in many ways, competitive with specialized AI machines," said Carnegie Group President Larry Geisler.

Carnegie also will introduce two knowledge-based tools for embedding AI within conventional data processing applications.

The low-end product will run on a personal computer, be written in the C programming language and include a compiler and editor.

The second, upwardly compatible product, will include extended knowledge-representation and inference capabilities for solving larger problems. It will include a SQL-like interface to allow expert systems to directly access information stored in popular commercial relational data bases and allow conventional programs to access its knowledge bases.

These products will be released in multiple languages beginning with C and Common LISP and will run on IBM mainframes and DEC minicomputers as well as on the IBM RT PC and Sun-3. They will provide a migration path to Knowledge Craft.

In addition, Carnegie is developing software products for computer-integrated manufacturing that will combine conventional programming and AI techniques.

"What Lotus 1-2-3 did for accounting, these packages are designed to do for a production environment," Geisel said.

— Eddy Goldberg

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Burroughs strengthens commitment to IBM compatibility

Bridge, PC emulator BTOS windows to bow

By Alan Alper

NEW YORK — Burroughs Corp. last week unveiled a trio of products enabling its family of B25 workstations and its XE 520 shared resource processors to communicate better within IBM shops.

At a New York press conference, Burroughs unveiled a bridge enabling documents created on its B25s and XE 520s to be exchanged with IBM workstations running its Distributed Office Support System (Disoss).

The company also announced an IBM Personal Computer emulator that allows Burroughs B26 and B28 workstations to run application programs written for use under Microsoft Corp. MS-DOS and a windows product for B25 family workstations running its BTOS multiuser, multitasking proprietary operating system. All three products will be available beginning in September, according to Burroughs.

Burroughs said its new products reinforce the commitment it made one year ago to providing increased IBM compatibility for its users.

"These are checklist items you have to have in office automation," said Louis Giglio, a market research analyst with Bear, Stearns & Co. in New York. "Burroughs is incredibly late, though, with the bridge. Even Hewlett-Packard Co. and Wang Laboratories, Inc. already have one."

LeRoy W. Beers, Burroughs vice-president of the Distributed Systems Group, noted that the firm has been successful penetrating IBM accounts despite its products' lack of IBM compatibility. Approximately 30% of the 130,000 B25 family workstations shipped to date are operating within IBM-dominated shops, he said.

'Should make us stronger'

"We've been successful without a good bridge to IBM," Beers said, noting previous communications centered on IBM 3270 emulation. "These products should make us even stronger," he added.

The bridge, called OFISbridge, allows word processing documents or other files created on B25 workstations and XE 520 shared resource processors to be integrated within Disoss, IBM's mainframe-based OA system. OFISbridge, priced at $2,300, uses a BTOS Systems Network Architecture (SNA) gateway and Burroughs' implementation of LU6.2 to access the distribution and library services provided by Disoss.

OFISbridge converts documents to IBM's Document Content Architecture and Document Interchange Architecture. It uses menus based on the IBM Displaywriter's Electronic Document Distribution System. Burroughs workstations using OFISbridge do not require additional software or modifications to existing software to communicate with an IBM host, the firm noted.

The B25 cluster workstations can access the OFISbridge and SNA network gateway via a standard cluster line. All BTOS files residing on B25 workstations can be exchanged with other B25 systems or Disoss workstations through the Disoss host, Burroughs noted.

The IBM PC emulator module snaps onto the logic unit of B25 workstations and enables the processors to run IBM Personal Computer AT software packages. The Intel Corp. 80186-based unit, priced at $1,145, has 768K bytes of internal memory and Phoenix Software Associates, Ltd. read-only memory BIOS for compatibility under MS-DOS 3.1.

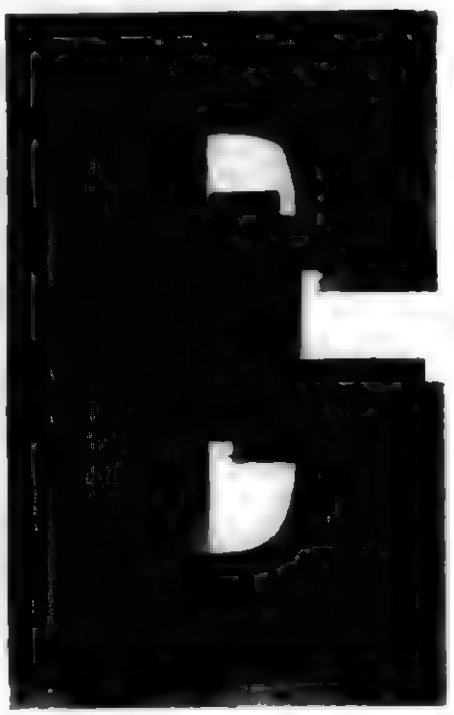
Asked why it took so long for Burroughs to offer MS-DOS compatibility for the workstations, considering the IBM PC has been the de facto standard for the last three years, Michael Brewer, Burroughs' general manager of workstations and office systems, said it was a matter of priorities.

"There were a number of things we wanted to do with BTOS so it would be a better solution for the small business environment, rather than application solutions that followed PC compatibility" he said.

Bear, Stearns' Giglio said the PC emulation module should hold Burroughs B25 customers in line. "It won't get them any incremental sales but most likely will preserve the base they already have."

BTOS Windows enables B25 family workstations to create up to 10 overlapping and variable size windows. It allows concurrent operation of a Disoss session from one window, an MS-DOS application in another and a BTOS application in a third, Burroughs said.

Prices for the package range from $250 for a stand-alone workstation to $375 for a version for clustered workstations.



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DG: Upgrade 'delay' strategic

By Donna Raimondi

Data General Corp.'s dual-processor version of the MV20000 superminicomputer, announced in November 1985 with a 120-day shipping date, has just begun reaching customers in the third quarter. The Westboro, Mass.-based company denied the delays are due to problems and said it is encouraging customers to fully utilize single-processor versions before converting them to the more powerful model.

Rumors persist that the Model 2 version of the top-of-the-line MV20000, which was originally scheduled for delivery 30 days after the Model 1 uniprocessor, which had a February shipment date, is only now shipping because of problems with processor chips as well as the operating system.

But Tom West, DG's systems division vice-president, said that the system is shipping according to plan, that it has no hardware or operating system problems and that DG had planned all along to ship the uniprocessor model first and then upgrade as customers needed the dual-processor Model 2.

Installation slows delivery, report says

In a July report, New York investment firm Salomon Brothers, Inc.'s Marc Shulman wrote that customers who had ordered the Model 2 were supplied by DG with a Model 1 instead. Complexities in installing the larger system are slowing down delivery dates, the report said. In the absence of a proven dual processor, DG's competitive position against Digital Equipment Corp.'s Vaxcluster is weakened, the report claimed.

A customer who received the dual-processor upgrade to his MV20000 in mid-July said that reports of faulty equipment or software are wrong. "We haven't had any problems with it," said Dennis Peck, senior vice-president of Professional Hospital Services, a division of American Medical International, which provides information processing products to 157 hospitals. "The Model 2 was a little late getting here," Peck said, but it is the "most robust hardware and software that we have ever received from DG, and we've been using their products since 1980."

Peck said he received his Model 1 in April and the Model 2 upgrade in mid-July.

"We have had very few problems running customer applications on the Model 2," said Jan Pieter Scheerder, DG's director of performance analysis for customer benchmarking. "Most of the problems really come from people getting used to a dual-processor architecture and what happens to an environment when you do that."

Taking advantage of a dual processor means special planning and scheduling, Peck said. "You have to think through which jobs you can run in parallel to get peak performance." DG is installing Model 1s in customer sites that order Model 2s until that customer's Model 2 configuration is optimized at DG's facilities, a DG spokesman said.

"That was really the expectation all along," West said. "We probably were not explicit about the fact that we thought a prudent way to lead our customers was to install a single I/O channel first and then to upgrade to multiple I/O channels. But that has been our customer and account strategy all along. . . . We don't tend to put those strategies in press releases."

A part of the perceived problem with the dual processors, according to DG's Scheerder, is customer expectations. The dual-processing architecture benefits performance only on jobs that require multiple processing or in shops running jobs concurrently. "If you have a single-threaded job that only runs on one processor by its very nature and design, a dual processor is not going to do anything for you," he said. "And a dual processor is not going to give you a boost if you haven't utilized the full capacity of the first processor. So again, we have to manage those expectations."

World Digest

Japan tech mart weakens

TOKYO — The recent bankruptcy of a major Japanese office equipment venture, Miroku Keiri Co., provides another signal that the lucrative Japanese market is deep in the throes of transition. Analysts forecast that the big industry names, including Fujitsu Ltd., NEC Corp. and IBM, will increasingly use their financial and technical muscle to take control of Japan's office marketplace.

Miroku's collapse, the largest to date for a Japanese venture firm, sent shock waves through the domestic industry because of the firm's fast-paced growth in the last decade, pushing it toward becoming a $149 million-a-year vendor of terminals and software. "We are at a loss how to respond to this completely unexpected failing," said a spokesman for the Taiyo Kobe Bank, one of Miroku's partners.

W. German DP jobs on rise

MUNICH — The demand for data processing professionals increased dramatically in West Germany during the first six months of 1986. Companies published about 7,000 job listings in West German trade journals during the first half of the year, up 40% from the same period last year, according to employment counselors SCS-Personalberatung.

According to an SCS report, software and system houses need qualified DP personnel. Recruitment companies, most of which are in the data processing area, report an intense demand for computer professionals.

During the previous 12 months, DP recruitment dropped off, but companies are now trying to beef up their staff. Computer-aided design and manufacturing specialists, who display the highest growth rate of any professional category, may find more than twice as many openings than during this time last year.

Asia latches onto HP RISC

HONG KONG — Hewlett-Packard Co. has sold its first HP 3000/930 reduced instruction set superminicomputer in Asia. Hong Kong is expected to be the first Asian 3000/930 site, with two machines destined for a pair of government technical institutes opening this fall.

In Malaysia, an unspecified user — believed to be another government training institute — will take a third 3000/930 supermini later in the year, and a Taiwan textile manufacturer will upgrade its existing HP 3000 by the beginning of 1987.

The total value of the four sales is estimated at $3.5 million. HP has also received an order for its HP 3000/840 technical Spectrum, from Tokai University in Japan.

Rated at the equivalent of 4.5 million instructions per second on a complex instruction set computer, the 3000/930 will rank as Hong Kong's most powerful processor in the education sector.

Japan's telecom decline

TOKYO — Japan's telecom gear output in May grew only 1.5% from a year ago to $883.2 million in value, owing to a 19.7% decline in export contracts during that month, a recent industry report said. Because of the bullish Japanese yen against the U.S. dollar, the shipment to the U.S. was hit hardest, decreasing 37.8% annually. Imports also dipped 15.8% to $18.5 million.

NTT goes on U.S. field trip

TOKYO — Nippon Telegraph and Telephone Corp. (NTT) sent a 14-member mission to the U.S. to study expert system applications at major local firms, including Digital Equipment Corp. and Boeing Co. During its 13-day stay, starting Aug. 10, the NTT delegation was also scheduled to attend a Dataquest, Inc. seminar on artificial intelligence and an AI show in Philadelphia.

Robotics healthy in Japan

TOKYO — Japan's robotics production in 1985 rose 18.5% to 48,490 units, up from a year ago. According to a recent Japan Industrial Robot Manufacturers' Association report, the dollar value of last year's output was also up 21.3% to $1.95 billion. The growth was attributed to a sharp hike in demand from the automobile and precision machinery industries. Deliveries to those industries rose to 7,600 and 2,600 units, respectively.

IBM in Australia doghouse

MELBOURNE — IBM has angered users in Australia and New Zealand by greatly increasing the price of an enhanced CICS performance analysis tool.

Users claim the price hike is too high, regardless of the enhancements, and, rather than pay the extra, they are evaluating equivalent third-party software packages. IBM's CICS performance analysis tool, CICS Pars/MVS is intended to accompany its most recent CICS/OS/VS 1.7 release. It reportedly costs 10 times as much as its predecessors, CICS/Pars and PA II.

Borland ranks No. 1 in UK

LONDON — Borland International, Inc. jumped to the top slot in UK business software sales for June 1986, according to Softsel Computer Products, Inc. UK ratings.

Borland's Turbo Prolog captured the No. 1 position, outselling Lotus Development Corp.'s 1-2-3 and Ashton-Tate's Multimate.

In addition, Borland's Turbo Pascal was listed third and its Sidekick held fifth place among the top 10 business software products for the month.

Turbo Prolog, Borland's first artificial intelligence product, shipped in April of this year. By May 31, less than two months later, more than 30,000 copies had been sold worldwide.

In spite of price cuts, decline of IBM PC seen on horizon

By David Bright

Although IBM has reduced the direct sales price of its basic Personal Computer by as much as 22%, the corporate market seems unimpressed. The cuts, which come on the heels of dealer price reductions in July and retail price reductions in April, further indicate that the end is near for the 5-year-old PC, observers say.

The price reductions were made ostensibly to combat the large number of lower priced clones that have been stealing market share from IBM. But the PC has a "limited life span" and may be phased out by year's end, comments Raymond Falls, an associate editor at Datapro Research Corp. in Delran, N.J. He claims IBM is simply trying to clear its inventory of the older machines. Compared with the PC, "the XT is much better designed, has more slots and uses fewer chips, so it's a little cheaper to make," Falls says. "Since you can buy the XT now without a hard disk drive, there is really no need for the PC."

However, an IBM spokesman indicates otherwise. "We are still manufacturing these models and obviously still marketing them," he says.

The spokesman says the price reductions were made to bring parity to direct sales prices and those offered by dealers.

"It's very encouraging that the price is coming down, but I don't want one," states Cheryl Currid, manager of sales, systems, planning and information at Coca-Cola Foods, a division of Coca-Cola Co. in Houston. With outdated features like a 4.77-MHz Intel Corp. 8088 microprocessor, five expansion slots and a 65W power supply, the PC is "not an acceptable business computer," Currid says. "The problem with the PC is that IBM has the slowest IBM compatible on the market," Currid quips.

Echoing Currid's views, the information services manager at a Michigan manufacturing corporation says his company has never purchased PCs and now requires Personal Computer AT-level power in many cases. For typical office applications, such as Lotus Development Corp.'s 1-2-3, the PC simply is not fast enough, he says.

The price cuts took effect on Aug. 1 and became public last week. The price of a PC with 256K bytes of memory and two floppy disk drives, formerly $1,995, was reduced 20% to $1,595; the price of the same model with one floppy disk drive dropped 22% from $1,845 to $1,445, and the price of a 64K-byte PC with no disk drives fell 16% from $1,390 to $1,165.

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VIEWPOINT

EDITORIAL

MIS and the Macintosh

The occasion of last week's Macworld Expo in Boston and the announcement of products by Ashton-Tate and Microsoft Corp. for the Macintosh present a handy opportunity to assess the system's status 30 months after its spectacular debut. Our conclusions are twofold.

1. The Macintosh has not been the runaway success that would knock IBM out of the personal computer ring, as some top Apple Computer, Inc. officials actually predicted in January 1984. (For the record, it was the most vocal of those officials, Steve Jobs, who was knocked out of said ring.)

2. Failure to achieve No. 1 has not meant that the Macintosh has dropped out of sight. On the contrary, the machine has a legion of adherents, and their corporate ranks appear to be growing.

Apple's problem with marketing the Macintosh to business users has always been its failure to give enough of these users a sound reason for buying the machine. Corporate users are looking for tools and solutions; the Macintosh offered neither and instead struck many as an overly indulgent technical plaything. The Macintosh was too slow, offered little available software, did not connect with other machines and had a closed architecture.

Much of this has changed, is changing or will soon change. The original 128K-byte machine has been upgraded, first, to 512K bytes and then to the 1M-byte Macintosh Plus, which is faster than standard 640K-byte personal computers. The software shortage has been resolved, in some cases (vide Microsoft's Excel) impressively so. Connectivity tools exist, notably 3Com Corp.'s Ethermac, though not yet in profusion. And closed architecture solutions — namely IBM PC-DOS and Unix capabilities — have been promised by Apple for a year and are now said to be scheduled for release at next January's Apple stockholders' meeting.

Meanwhile, corporate computer uses have become more diversified and corporate computer managers more sophisticated. These developments are not without their irony, as they pertain to the Macintosh and MIS. It now appears that the very DP/MIS executives whom Apple depicted as the enemy incarnate when the Macintosh was unleashed in 1984 may turn out to be the system's most effective champions within the corporate computing world.

At the time the Macintosh debuted, DP/MIS was scrambling to get control of the rapid proliferation of PCs within their organizations. With this objective largely achieved, and the majority of PCs installed as word processing and spreadsheet tools, information systems managers have been able to turn their attention to other areas of computing need.

While not abandoning their push for Macintosh connectivity and compatibility, they are better able now — having established an organizationwide information management strategy — to appreciate the Macintosh's technical virtues, to define a specific role for it within the corporation and to promote it as a desktop publishing solution or a low-end engineering workstation.

Apple's corporate battle on behalf of the Macintosh is far from over. But the prospects for a significant victory are far rosier now than at any time in the past 30 months.



LETTERS TO THE EDITOR

No representation in true democracy

A recent letter to the editor, "Computers give power to the people" [CW June 30], discussed the use of computers to enhance democratic participation by citizens.

Technically, the form of government in the U.S. is a republic, not a democracy. This means that the citizens elect persons to represent them in enacting federal law: people who understand the complexity of the issues, political maneuvering and the funding bills to which the writer refers. The framers of the Constitution realized that citizens were not sufficiently informed to make choices on each and every piece of legislation.

Even in today's society, with dramatic advances in communication, citizens have little hope for understanding the complexity of more than a few of the major issues. Also, one of the functions of any government is to protect its citizens, including minorities. A republic is best equipped to perform this function because the representatives act on behalf of a larger population, including minorities.

The writer is advocating a true democracy in which each person has a direct voting impact on the legislative process; the notion of representation in a republic is gone.

Also, the opportunity to amend legislation before passage is gone. True democracies are characterized by a sense of every man for himself, mob rule and tyranny of the majority. The protection of citizens becomes very difficult.

It is true that computers have great potential for disseminating information regarding legislation. Some possibilities are informing citizens of current legislation, informing citizens of the voting track records of representatives and electronic mail for citizens to express opinions to representatives.

But for the reasons stated above, a true democracy (computerized or not) is alarming, and a "democratically computerized world government" is highly dangerous.

Bob Farnham, Director
Computing Services and Systems
Graceland College
Lamoni, Iowa

Multiuser system 'close, but no cigar'

In regard to Mr. Kapsales's Reader's Platform, "Limited technology must take blame for current PC slump" [CW July 28], I can only echo the old carny cry of "close, but no cigar." A lack of technology is probably to blame for the slumping personal computer sales. And, Kapsales does indeed identify (if not clearly and explicity) the lack of clean and simple methods to share information. His response, the multiuser machine, is incorrect.

The one-CPU-per-user principle has some very definite advantages:

- Reliability — a fault affects only one user, not a group, and the PCs I have used have all been more dependable than the mainframes and minis.
- User knowledge — there are now many users who can use PCs, bringing end-user needs, knowledge and experience to the solution of business problems. The various programs for the PC have proven track records in the areas Kapsales lists as being of most interest. This is not true of the multiuser systems.
- Flexibility — in two important respects. The user can configure a system to answer specific needs, not accept a generic solution. And for the first time since the late Middle Ages, a user can work with the tools and in the manner best suited for him, while still producing output that is acceptable to and usable by all.

The lack of technology is what defines flexibility. We still do not have the products that will allow users to pass information easily and cleanly. And until we do, the PC market will probably remain flat. If the best solution that arrives is the IBM 17-layers of separately purchased and paid-for products, the market may never recover.

Kapsales's solution is to scrap the PCs and reinvest in multiuser hardware. That may appeal to a Big Eight consultant or to someone who wants to push end users out of controlling computing resources, but it is not the best way for a company, or an industry, to prepare for the changes ahead.

Steven Newton
Shorewood, Wis.

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VIEWPOINT

Chips for brains: Computers built with neural networks

When was the last time you got hold of a brain? I'm not talking about somebody overly smart, or even sweetbreads. I'm talking about a brain, as in cerebellum and gray matter.

Most of us never think about brains, unless we deal with people who have none. But if the research community has its way, the next generation of computers will be modeled on the actual physical structure of the human brain.

In the last year, a number of research laboratories around the country have been rallying behind the concept of semiconductor brain duplication, or neural networks. The activity has been triggered in particular by success stories from researchers at Johns Hopkins University and AT&T Bell Laboratories.

Neural networks vs. linear architecture

And now, with recent announcements from both Texas Instruments, Inc. and TRW, Inc. that they are getting ready to commercialize neural network technology, people are saying the next big thing is to get rid of our standard, linear, von Neumann architectures.

Simply stated, neural networks are attempts to physically reconstruct the brain with semiconductor technology. Connections between chips are patterned after nerve cell interconnections via dendrites and synapses. Instead of linear connections, the individual processors have multiple, three-dimensional connections and are able to access the appropriate neighbor chip (located above, below, next to or diagonally), according to need. In effect, each chip strives to exist as both a single autonomous unit and as an integral component of the complete machine.



By HARVEY P. NEWQUIST

This means that each chip can take separate but mutually beneficial paths to solve different pieces of a problem simultaneously, thus avoiding the bottleneck that occurs when processing is done linearly, or one step at a time. An added benefit is that if certain processors break down, other functioning processors can work around them and even pick up their work load.

In theory, this sounds wonderful for the future of all types of computing. Read on.

Let us start by examining what TRW is doing with neural networks. The company has introduced a commercial version of a machine it developed under contract to the Department of Defense called the Mark III Artificial Neural System Processor.

The Mark III costs $53,000 and uses a Digital Equipment Corp. VAX as its host system. The machine can have as many as 8,000 "neurons" and utilize roughly 500,000 interconnections.

Compare this with the almost 10 billion neurons in the brain, which have an estimated 10 trillion interconnections. With the current Mark III packaged in a box that is 24- by 18- by 12-in., a portable TRW version of a fully configured brain would probably be the size of Cleveland.

However, the focus of using the neural network is not really the same as that of mainstream computing. The systems we currently utilize on a daily basis are merely efficient calculators. They do one thing that humans are not good at — number crunching.

This takes on forms that are primarily adult in nature: accounting cost-modeling, storing facts, controlling inventories and so on. However, computers have never been capable of the kinds of things that children are good at (and which become second nature in adults), such as learning, utilizing senses, making cognitive associations and combining unrelated experiential data to produce new data.

The senses, in particular, are where computers fail to compete. Why? That is easy enough to answer by picking one of the senses — sight — and comparing its components with those used by machines, based on data such as the following from the University of Toronto's Playfair Neuroscience Unit: While the retina requires .0001W, a product with integrated circuits needs at least 200W. A retina weighs less than one gram, its machine counterpart more than 20,000 grams. Retinal gates total 25 billion vs. the chip-based product's one million. Finally, lead traces in the retina are fewer than three microns, those in a chip-based product, 250 microns.

As you can see, we are not quite there yet.

Hope to mimic sensory communication

Neural network machines hope to change the current state of affairs by utilizing the multiple-access, multiple-processor approach in mimicry of brain cell and sensory communication. At least that is what researchers hope will happen. You see, nobody knows how sensory communication works; nobody even knows how the brain works. And relative to neural networks and their brain-like architectures, it has been surmised that this undertaking is akin to building a model of a bird and expecting it to be able to fly and make little birds.

This is not deterring some researchers from looking into the possible production of the machines for use throughout the commercial market. New designs are under way at such institutions as Brown University, California Institute of Technology, Carnegie-Mellon University, University of California at San Diego, TI, AT&T and even IBM. The TRW machine is just the first to come, and bets are that there will be more.

And as these organizations start to move their man-made brains out into the world, you cannot help but think that Victor Frankenstein would be proud.

Newquist writes and consults on artificial intelligence and other advanced high-technology topics from his office in Scottsdale, Ariz.

Balancing technical perfection and political realities

The report of the Rogers commission on the shuttle disaster contains important lessons for everyone in data processing — indeed, for anyone involved in an enterprise revolving around technology.

The very high stakes of the National Aeronautics and Space Administration's mission made for the extreme situation that so often reveals interorganizational conflict in sharp relief.

Looking past the specifics of the Rogers report — the details of O-rings' seals on the booster rocket and who said or did not say what when — one sees that the report documents an all-too-human phenomenon: the tendency to buy harmony at too high a price, to dismiss unpleasant nay-sayers as Chicken Littles.

Additionally, the report reinforces research that has repeatedly found technologists to be a fairly conservative lot who are quite unenthusiastic about dissenting noisily — in public. Technical folk, it would seem, only blow the whistle when every other warning device has gone unheard.

One of the problems the report describes is a variation on the timeless sales vs. engineering conflict. The folks in sales are usually impatient for new products they know are coming, fearing that the windows of opportunity they see open may shut on them prematurely. In this case, the sales staff was NASA's own top-level executives, its congressional and other political supporters and its vendors and suppliers.



By HOWARD A. KARTEN

At the same time, engineering almost always wants more time to perfect the product, to tweak it a bit more, to add more value or more reliability. Programmers and engineers can become too attached to their creations, losing sight of the forest for the trees.

Everyone in DP, whether on the management or technical side, learns about this conflict early on in their careers. DP professionals believe disaster will ensue if they are not given more time to debug, tweak and enhance their systems, whereas the opposing group wants the product made available yesterday. This is true whether the opposing group is a user department in the same large organization or the sales department of a company selling hardware or software.

In the process of dissenting, some DP staff members make themselves offensive to management. The real issue is resolving DP judgment with sales judgment and organizational needs. Studies of DP professionals and engineers seem to indicate that technologists are not alarmists and certainly not eager to stir up problems for no good reason. Unfortunately, few organizations have managed to institute adroit methods of dealing with this kind of dissent.

And many DP professionals have often not been especially adroit at using the system to redress their concerns. (Incidentally, one of the dissents in the otherwise wimpy report, written by commission member and Nobel Laureate Richard Feynman, was a stinging criticism of NASA and its contractors. Feynman's recent book, *Surely You're Joking, Mr. Feynman*, is entertaining, enlightening and must-reading for anyone seeking a greater understanding of technically oriented people.)

Ignored problems do not go away

One of the points that the Rogers commission report makes, indirectly, is that ignoring problems does not make them go away. A problem ignored is a problem that is festering. Another point is that organizations need more formal processes for resolving disputes. Perhaps one answer might be organizational ombundsmen.

The technological change that is second nature to anyone working in the computer business obviously produces change in the social and organizational environments. With all that change going on around us, it is easy to fall into the trap of thinking that fundamental aspects of human behavior may have changed as well.

It is easy, too, for those who are intimately involved with technology, as DP professionals are, to become seduced by the idea of the technological fix — that technology can solve all kinds of problems.

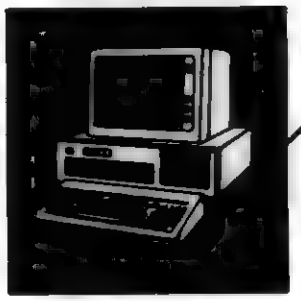
So it is good to be reminded periodically that some problems are eternal, despite changes in the technological arena.

Karten has been involved with computers for two decades as a programmer, systems analyst and DP manager and is author of How to Profit from Dow Jones News/Retrieval.

Make the Connection

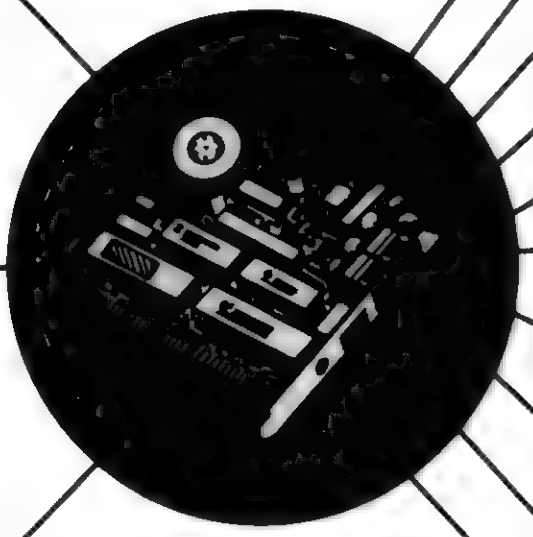






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COMMUNICATIONS

Telcos sell cable scheme as standard

By Elizabeth Horwitt

Challenging AT&T's and IBM's inroads into the building cabling arena, divested Bell operating companies Diamond State Telephone and Bell of Pennsylvania recently announced the Universal Information Transport Plan, a wiring scheme they claim supports any brand of computer at data rates of up to 16M bit/sec.

The two Bell Atlantic Corp. operating companies hope to make the Transport Plan a de facto wiring standard, said John Balerini, marketing network architecture staff manager at Bell of Pennsylvania. "In the absence of industry standards, each system has its own wiring specifications, and when you change the system, you have to rip out the wiring. IBM, Wang Laboratories, Inc. and Digital Equipment Corp. make cabling to lock out other vendors, so people will buy their products. Customers ask us, 'Why can't we have one type of wiring?' "

Under the Transport Plan, computers and other devices are linked to existing wiring closets via shielded twisted-pair cable plugged into telephone wall jacks. A system can be unplugged from one jack and moved to another "by an ordinary user — no need to send out a technician," Balerini claimed.

Two twisted pairs are designated for high-speed data transmission. The cabling has been tested to support up to 16M bit/sec. data rates over a maximum distance of approximately 100 feet between the workstation and wiring closet. Bell of Pennsylvania now has customer sites that support 8M bit/sec. rates. "We have no 16M bit/sec. installations right now because there currently are no network products that support that speed," Balerini said.

An additional four twisted-pair wires support central office-based data and voice services such as Centrex and Central Office-LAN, a 19.2K bit/sec. data network. The wiring specifications also conform to the Integrated Services Digital Network,

See TELCOS page 20

Network managers debut, analyze traffic for basic, high-level needs

By Stanley Gibson

Two centralized network management systems announced recently target user installations at opposite ends of the spectrum. Engarde, from Doelz Networks, Inc., manages major user installations costing $1 million or more; the 5110, from Case Communications, Inc., is an entry-level version of the Case 5000 series of management tools.

Both products collect, store and process diagnostic and traffic information from wide-area network interface devices. The network manager can thus monitor and troubleshoot the network from a central location. Both products can also generate reports on traffic patterns and usage trends for capacity planning and billing purposes.

Engarde, from Irvine, Calif.-based Doelz, is based on a Masscomp Corp. MC5500 graphics workstation with windowing capabilities. The workstation correlates information gathered with Doelz Esprit One and Elite One switches and concentrators. Network conditions are stored in the computer at 30-sec. intervals.

The workstation can graphically display major nodes and, using a zoom feature, smaller nodes within the major nodes. The color graphics workstation runs under RTU, Masscomp's real-time Unix operating system. It features a 71M-byte, 5¼-in. fixed disk.

The information is stored and accessed through Unify Corp.'s Unify relational data base management package. Visual Intelligence Corp.'s Dataviews is used for graphics operations.

According to President Frank Connors, Doelz plans to build future network management systems around high- and low-end Masscomp workstations that have not yet been introduced.

Engarde saved Seattle First National Bank from having to hire additional network management staff when it replaced an outdated network system with a $2 million to $3 million Doelz network, said Gary Scroggs, assistant vice-president and manager of network utilities.

See NET page 21

Micom ups networking capabilities

Expansion cards add protocols, capacity

By Elizabeth Horwitt

SIMI VALLEY, Calif. — Packet-switching and hub-networking capabilities, as well as greater power, are among the features Micom Systems, Inc. has just announced for its Micom Box multiplexer line. The company also unveiled a variable-speed dial-up modem.

Micom Box 3 is a more powerful version of its predecessor, Micom Box 2. Both products function like generic data communications devices that support a variety of networking capabilities. Additional functions can be added by inserting software Featurepaks into the expansion slots. "The user can start with a concentrator network and go to an X.25 packet assembler/disassembler (PAD) and then an X.25 switch by simply swapping Featurepaks," said Chris Kenber, vice-president of marketing operations.

All products in the Micom Box line can support modem boards that provide AT&T Dataphone Digital Service connections. The basic Box 3, supporting four 19.2K bit/sec. channels, is priced at $1,790 and is available now. Expansion cards supporting six channels cost $1,250.

Micom also announced six Featurepaks, three of which support X.25 packet-switched networking functions. "The Micom Box is a cornerstone of our low-end line of X.25 networking products," said Gregory Toussant, director of X.25 products.

The asynchronous packet assembler/

See MICOM page 20

INSIDE

Interpath Corp. releases voice recognition system for the IBM PC family/21

NEW THIS WEEK

- GTE Supply enhances Trailblazer modem
- Brooktrout Technology offers a voice messaging system

For more on these and other new products, see pp. 75-85.

INSTANT ANALYSIS

"So far, Open Systems Interconnect protocols allow you to build a network of computers but not a computer network, because crucial resource management capabilities are still lacking."

— John Haefner, chief of systems and network architecture division, National Bureau of Standards

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Telcos sell cable scheme as norm

From page 19

Balerini said.

The Transport Plan's high data rates "enable the customer to support IBM's 4M bit/sec. network, or Wang's 4M bit/sec. network, or a 10M bit/sec. Ethernet on the same cable," Balerini claimed.

Bell of Pennsylvania technical support people work with customers in order to tailor a building's wiring scheme to specific communications and systems needs, he added. "We will take responsibility for connecting various systems and for diagnosing problems in wiring and baluns — everything up to the communications controller," Balerini said.

Other operating regional companies within Bell Atlantic should start offering the Transport Plan before the end of the year, Balerini said.

"AT&T does not see Bell of Pennsylvania as a competitor, because our Premise Distribution System [PDS] wiring scheme already addresses the needs of our business customers," an AT&T spokesman said.

PDS, an unshielded twisted-pair wiring scheme that supports 1M bit/sec. transmissions, "was designed to keep network prices down by allowing customers to use existing cabling," he added.

Installation costs for Universal Information Transport Plan wiring range from $300 to $600, according to Bell of Pennsylvania.

"Cost could become an important issue" in the battle for cabling supremacy, according to Lee Doyle, senior analyst at Framingham, Mass. research firm International Data Corp. (IDC) "IBM's cabling is quite expensive."

Doyle disagreed, however, with Bell of Pennsylvania's claim of offering the only "universal" cabling system around. "There is no question that a lot of different systems will run on IBM's Token-Ring and Cabling System," he commented. "And AT&T and DEC both call their cabling systems multivendor."

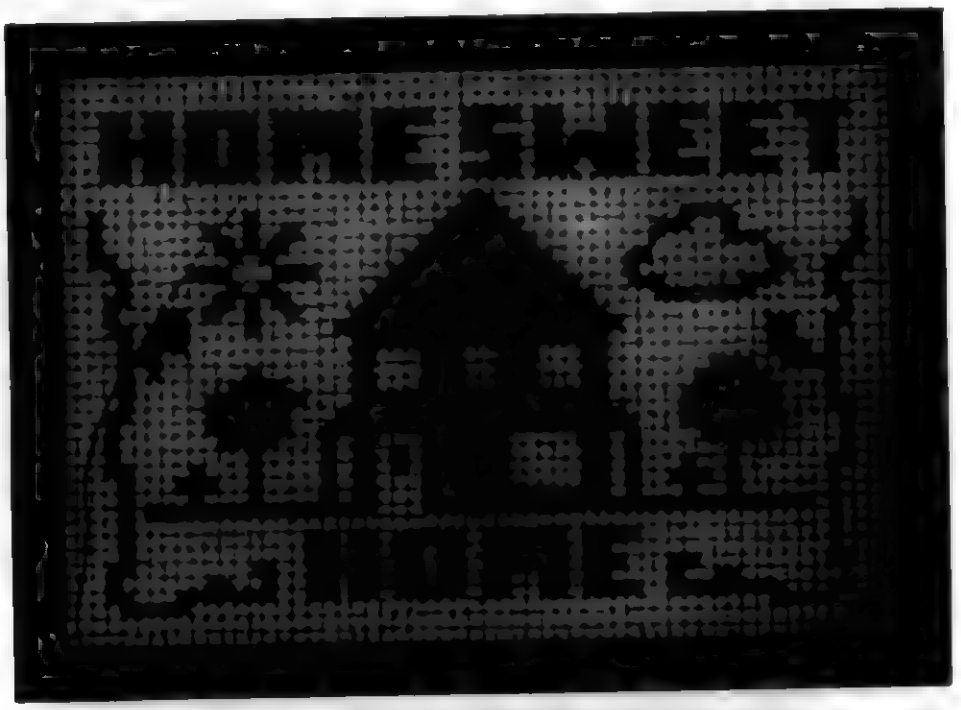
"What could be less vendor-specific than unshielded twisted pair?" said the AT&T spokesman, noting that PDS supports AT&T's Information Systems Network and Digital Multiplexed Interface, both of which can link third-party vendors' hosts and terminals.

"Both the IBM Cabling System and the Token-Ring are open systems," an IBM spokeswoman said. "We have made documentation for both products available to third parties, and a number of vendors say that they are attaching their products to the Cabling System."

Earlier this year, DEC announced Decsite Services to help customers plan, design and build custom — and multivendor — installations of the Decconnect wiring system and Thinwire Ethernet.

While admitting that "technologically and costwise, they have something," Doyle expressed doubts about the size of the Universal Information Transport Plan's potential market. "How many companies will rewire existing buildings unless they are Big Blue shops with deep pockets or have very specific data needs?"

According to an IDC survey, many firms have stand-alone hosts and a local-area network but "are skeptical of one cabling scheme that will satisfy all of their networking needs," Doyle said. "Why install a 'universal' wiring system until you're sure what it will be supporting?"



SIS HAS FOUND A NEW HOME AT DUQUESNE SYSTEMS

Duquesne Systems, a long time leader in providing software for managing shared devices for MVS and MVS/XA users, is now home for the **Single Image Software** product line. SIS products let you effectively manage the sharing of tape drives, DASD, and consoles, while maintaining data integrity.

MSM works to effectively manage the allocation of tape devices across all systems in your multiple CPU complex. MSM allows normal operations with all devices on line to all systems. MSM provides for truly natural and transparent shared device management.

MSI works in a multiple CPU environment to share DASD, maintain dataset integrity, and eliminate reserve lockouts. MSI provides the same thorough dataset protection for jobs executing in multiple CPUs that exists when jobs execute on a single CPU.

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Micom ups networking

From page 19

disassembler, which conforms to the 1984 CCITT standard, is priced at $500 and is available now. A 3270 bisynchronous PAD is priced at $1,950 and will be available in September. This version of Micom's synchronous PAD has the ability to collect performance statistics as well as network accounting and billing information. The X.25 packet switch is priced at $1,950 and is available now.

In the network concentrator arena, Micom unveiled the Enhanced Wideband Multiplexer, which supports 48K, 56K, 64K or 72K bit/sec. transmissions. It will be available in September for $600. The Enhanced Synchronous Multiplexer, available in October for $500, provides up to eight synchronous lines in addition to asynchronous channel support.

The Concentrator Switch, available in September for $600, performs as a network hub for up to 10 Micom Box or Micro800/2 data concentrators serving up to 255 user and computer ports. The switch interconnects multiple asynchronous channels originating at different Micom data concentrators, "so that users on any Box can talk to each other," explained Byron Henderson, director of marketing for the concentrator group.

"The switch enables multiple users on multiple Boxes to communicate, without needing direct links between each pair of data concentrators," Henderson added.

Micom also announced the Modem Dial Series 3124, which handles data rates of 300, 1,200 and 2,400 bit/sec. and conforms to AT&T Bell Laboratories 103A and 212A and CCITT V.22 standards. The product also supports communications software developed for the Hayes Microcomputer Products, Inc. AT Smartmodem command set. The Microcom Networking Protocol, another standard feature, provides error checking and correction over dial-up lines. Available in September, the modem will list for $549.

Interpath system allows PCs to recognize voice commands

By Eddy Goldberg

SANTA CLARA, Calif. — Interpath Corp. recently introduced Voicecommand C25, a $199 voice recognition system that allows a reported 99.9% accurate verbal operation of most programs written for the IBM Personal Computer and compatible machines.

Voicecommand allows the PC to recognize and accept the user's voice as an alternative to keyboard entry of commands and data, according to Interpath President John McAfee.

Users can define common commands like Load File, Print and Create Graph, which remain in the system for future use with any software package. Common verbs, nouns, numbers and names also can be defined as voice commands.

'Powerful tool'

"Voice recognition is a very useful and powerful tool, but it has been out of the reach of individual PC users," McAfee said. "Putting the price below $200 opens up the capability to almost everyone."

McAfee said the reported 99.9% accuracy is the result of Voicecommand's front-end signal processor, which has a very high noise filtering capability and gives a much cleaner signal than most available systems.

Interpath has developed a new architecture in which the recognition process is done in software using standard IBM PC hardware, McAfee noted.

Translates spoken word

The software intercepts the keyboard interrupts and translates the spoken word into a series of up to 1,000 user-defined keystrokes per word or command, according to McAfee.

Voicecommand's menu option enables users to define voice menus that can be used as substitutes for the usual on-screen menus.

Voice menus can be linked so that one voice command, such as Graph, will automatically load the next set of choices, such as Pie, Bar or Line.

The Voicecommand system includes a half-size add-on board, software, a microphone and an instruction manual.

It is available now to run on the IBM PC, Personal Computer XT and AT and requires 64K bytes of main memory.

Net managers introduced

From page 19

Engarde's ability to uncover network problems quickly is important since "every minute of downtime costs the bank money," Scroggs said. He added that the windowing feature is particularly helpful in network monitoring.

Engarde's starting price is $70,000 to $85,000, depending on the customer configuration. The product is available 90 days after order, according to Doelz.

Although an entry-level system, the Case Communications 5110 network management system provides many of the same functions as the larger Case 5000 series and can be expanded as a data communications network grows, according to Reyan Carpenter, marketing manager for the Columbia, Md., company.

Based on a Convergent Technologies, Inc. 32-bit minicomputer, each 5110 can manage a network consisting of up to 30 leased telephone lines equipped with Case 4000 series modems or up to three Case DCX 840/850 communications processors, according to the company.

The 5110 processor runs the Unix operating system, the Unify relational data base manager and system management software written in the C language.

The system costs $15,995 and will be available for delivery Sept. 1.

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF OHIO
WESTERN DIVISION

UNITED STATES OF AMERICA,)
Plaintiff,)
v.)
)
THE NATIONAL CASH REGISTER)
COMPANY, et al.,)
Defendants.)

In Equity No. 6802
NOTICE OF MOTION TO TERMINATE FINAL DECREE

Judge Walter H. Rice

TAKE NOTICE that NCR Corporation ("NCR"), formerly known as The National Cash Register Company, a defendant in this action, has filed a motion for an order terminating as to all defendants the "Final Decree" in this action, which was entered on February 1, 1916. The plaintiff, the United States of America, has consented to the entry of such an order, but has reserved the right to withdraw its consent for at least seventy (70) days after the publication of this notice.

The complaint in this action, which was filed in 1911, alleged that NCR and 28 individual defendants were engaged in a conspiracy to restrain trade, an attempt to monopolize and a successful monopolization of the cash register industry through a variety of anticompetitive practices, including corporate espionage and below-cost pricing. The Final Decree enjoins NCR and 17 individuals from, among other things:

(1) persuading a purchaser of a competitor's cash register to break his contract;

(2) espionage upon a competitor for the purpose of obtaining the names or addresses of purchasers or prospective purchasers or other information and using such information to dissuade any persons from purchasing a cash register from the competitor;

(3) inducing any employee of any competitor to disclose the business secrets of the competitor;

(4) inducing any employee of a competitor to leave the service of such competitor or inducing a dealer in competitive cash registers to cease to deal in such competitor's cash registers and to employ such employee or dealer;

(5) selling any cash register manufactured by a competitor or any cash register made to resemble a competing cash register when sold not for the purpose of earning profits therefrom but for the dominant purpose of preventing sales of such competing cash registers; or selling any cash register at a price fixed with reference not to the cost of manufacture but solely with reference to the price of said competing cash register, for the purpose of driving from business the manufacturer of the competing cash register;

(6) selling any secondhand cash register of NCR for the purpose not of realizing therefrom as much as practicable but for the dominant purpose of driving a competitor from business;

(7) having employees whose principal duty is to prevent competitors from selling cash registers or following the salesmen or dealers of a competitor for the purpose of interfering with the competitor's sales efforts or identifying its prospective customers;

(8) making any statement reflecting upon the solvency or responsibility of any competitor or upon the efficiency of any competing cash register when such statement is either a misrepresentation or is made for the mere purpose, not of directly promoting the sale of NCR cash registers, but of preventing the sale of competing cash registers;

(9) intimidating competitors or prospective investors in competitors with certain types of product comparisons or statements of purported losses suffered by the competitors in their efforts to compete with NCR;

(10) intimidating prospective purchasers of competing cash registers with suit for patent infringement;

(11) maintaining an ostensible competitor corporation that is secretly controlled by the defendants;

(12) acquiring ownership of any part of the business of any competitor in cash registers; NCR may, however, petition the Court to permit such acquisition.

Interested persons may submit comments concerning this matter by sending them to John A. Weedon, Chief, Cleveland Field Office, Antitrust Division, United States Department of Justice, 995 Celebrezze Federal Building, Cleveland, Ohio 44199 (telephone: 216-522-4070). Such comments must be received by the Division within sixty (60) days.

Copies of the complaint, Final Decree, motion papers, all comments submitted and all further papers filed with the Court will be available for inspection at the Legal Procedure Unit of the Antitrust Division, Room 7233, United States Department of Justice, Tenth Street and Pennsylvania Avenue, N.W., Washington, D.C. 20530 (telephone: 202-633-2481), and at the Office of the Clerk of the United States District Court for the Southern District of Ohio, Western Division, 200 West Second Street, Dayton, Ohio 45402. Copies of any of these materials may be obtained from the Legal Procedure Unit upon request and payment of the copying fee set by Department of Justice regulations.

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	San Diego	Oct 8
	San Francisco	Aug 12
		Oct 15
		Dec 3
	Sunnyvale	Oct 1
		Nov 19
CO	Denver	Nov 11
CT	Stamford	Oct 23
DC	Washington	Aug 28
		Nov 19
FL	Jacksonville	Nov 19
	Miami	Oct 16
	Orlando	Dec 16
GA	Atlanta	Aug 26
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IN	Indianapolis	Dec 2
KY	Louisville	Sep 30
LA	New Orleans	Dec 16
	Shreveport	Dec 10
MA	Boston	Sep 24
	Burlington	Oct 2
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PA	Philadelphia	Sep 16
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TX	Austin	Oct 21
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WA	Seattle	Oct 9
CANADIAN SEMINARS:		
	Calgary	Sep 17
	Montreal	Sep 25
	Ottawa	Oct 30
	Quebec	Sep 10
	Toronto	Nov 13
	Winnipeg	Oct 14

MICROCOMPUTERS

SMALL TALK
Maura McEnaney

CD-ROM all sizzle, no steak

Last March, I started a file of clippings on compact disk/read-only memory (CD-ROM) technology. Little did I know that I had created a monster.

In four months, the CD-ROM file has grown to be the largest in my filing cabinet. Right now, it weighs in at seven pounds and takes up three inches of drawer space. I'm now thinking of building the file a home of its own.

Every time I run across that monstrous file, I can't help but ask two questions: Is CD-ROM technology really that hot? If so, why isn't there more of it out there?

Maybe we should blame the CD-ROM information overload on the computer slump. "Editors are looking for new technology, and right now, it's CD-ROM," a colleague told me recently.

It's true that the shiny compact disks have a storage capacity of 0.5G bytes and are virtually indestructable, making the write-once technology ideal for storing large, unerasable data bases.

But like a rookie who receives too much press before he's hit his first home run, CD-ROM applications are still in their infancy.

Granted, the young industry took some major strides this summer when the High Sierra Group, an ad hoc group of 13 vendors, proposed a set of standards [CW, June 23] that would permit CD-ROM disks to run across multiple operating systems. And companies designed to help both users and software developers come up with CD-ROM applications are springing up here and there.

At a recent Information Industry Association conference on CD-ROM technology, Lotus Development Corp. Vice-President Don McLagan told attendees that the success of CD-ROM will depend

See CD-ROM page 25

McEnaney is a Computerworld West Coast correspondent.

Group tackles productivity

Pacesetter product gauges 'intangible' contributions

By Douglas Barney

PRINCETON, N.J. — A consortium consisting of 12 corporations and a variety of U.S. government agencies teamed up with Pacesetter Software, Inc. to develop Productivity Map, a software product that measures white-collar productivity.

"I was looking for a way to break through the barrier in measuring white-collar productivity. White-collar people say their jobs are not measurable, that they are intangible. I thought anything worth doing was worth measuring," said Greg Whitney, manager of organization analysis for 3M Corp. in St. Paul, Minn.

3M, a member of the consortium, will use the $695 Productivity Map to assist department-level managers in identifying what productivity is, identifying critical areas affecting productivity that need to be addressed by the manager and tracking actual performance, Whitney said.

According to Whitney, Productivity Map forms a new category of software. "It is the first and only one that I know of. We haven't seen anything else on the marketplace," he said.

The major difference between Productivity Map and project management software is that Productivity Map focuses on satisfying the customer's requirements, Whitney said. Project management software, however, is aimed largely at managing project schedules and expenses.

The program is interactive and asks the user a variety of questions to clarify the organization's objectives, examine internal activities, identify key customers and understand their objectives and select an appropriate performance measurement for their department.

With graphics and data management facilities, managers can track their department's progress.

The product runs on IBM Personal Computers and compatibles with a minimum of 256K bytes of random-access memory.

T/Maker will market Next's Apple software

By Douglas Barney

PALO ALTO, Calif. — Next, Inc. has licensed T/Maker Co. to market its $175 Writenow word processing package for Apple Computer, Inc.'s Macintosh. T/Maker Co. will ship the product in October.

Next, which acquired the package through the purchase of Solaster, Inc. earlier this year, was founded by former Apple Chairman Steven Jobs to develop high-end products for the academic market. "We bought a small company from Seattle called Solaster. We acquired them specifically because we wanted to acquire the programmers," said Dan'l Lewin, manager of sales and marketing for Next. "We are not in the business of selling Mac software."

T/Maker, on the other hand, is in the business of selling Macintosh software. "There is a need for an easy-to-use word processor, but with very powerful capabil-

See T/MAKER page 26

IBM expands maintenance list

By David Bright

IBM announced recently that it will provide maintenance service for 33 additional non-IBM products and introduced a memory expansion board and two modems. In addition, IBM introduced a 70M-byte fixed disk drive for the RT Personal Computer.

The additional non-IBM products brings the total number of non-IBM, PC-related products supported to 83. In June, Big Blue took a similiar step and added support for 17 non-IBM products.

IBM increased its support offerings "as a convenience to our customers to broaden the range of IBM support available to them," said spokeswoman Dale Bennett. The support offerings were part of a series of announcements earlier this month.

The newly supported products include peripherals and add-on boards from four vendors: Amdek Corp., Hayes Microcomputer Products, Inc., Hewlett-Packard Co. and AST Research, Inc. The majority of the items are various AST add-on boards. Depending on the type of service chosen, annual minimum maintenance charges range

See IBM page 26

INSIDE

Lotus contracts with encryption developer to design security system/28

Grid Systems announces E-mail for local or remote access/28

Maple Systems International offers aid in evaluating software packages/28

NEW THIS WEEK

- Toshiba America upgrades its IBM-compatible portable PC

For more on this and other new products, see pp. 75-85.

INSTANT ANALYSIS

"The issue in the future is not integrating micros into the world of minicomputers and mainframes, but how do minis and mainframes justify their existence."

— William Zachman, International Data Corp. corporate vice-president of research at Software Publishing Corp.'s introduction of its improved PFS: line

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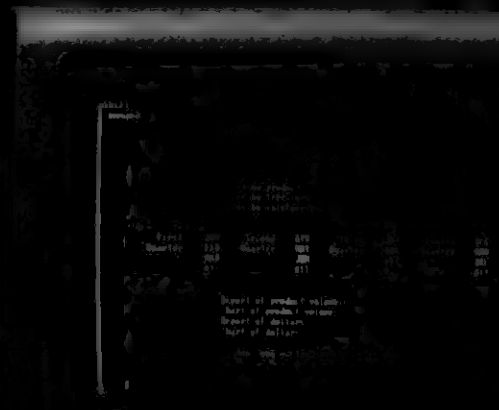
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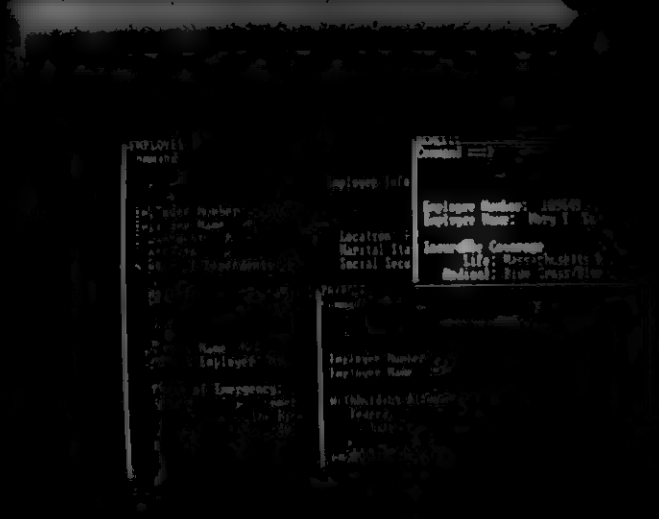
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Lotus contract with RSA Data Security in works

By Peggy watt

CAMBRIDGE, Mass. — Lotus Development Corp. is expected this week to announce that it has licensed RSA Data Security, Inc. of San Carlos, Calif., to develop an encryption system for a new Lotus product.

Lotus and RSA would not disclose details of the system, but RSA specializes in data security for network transmission. The company has done similar development work with other companies involving the protection of data communications files. RSA has a license for encryption system development with the U.S. Navy.

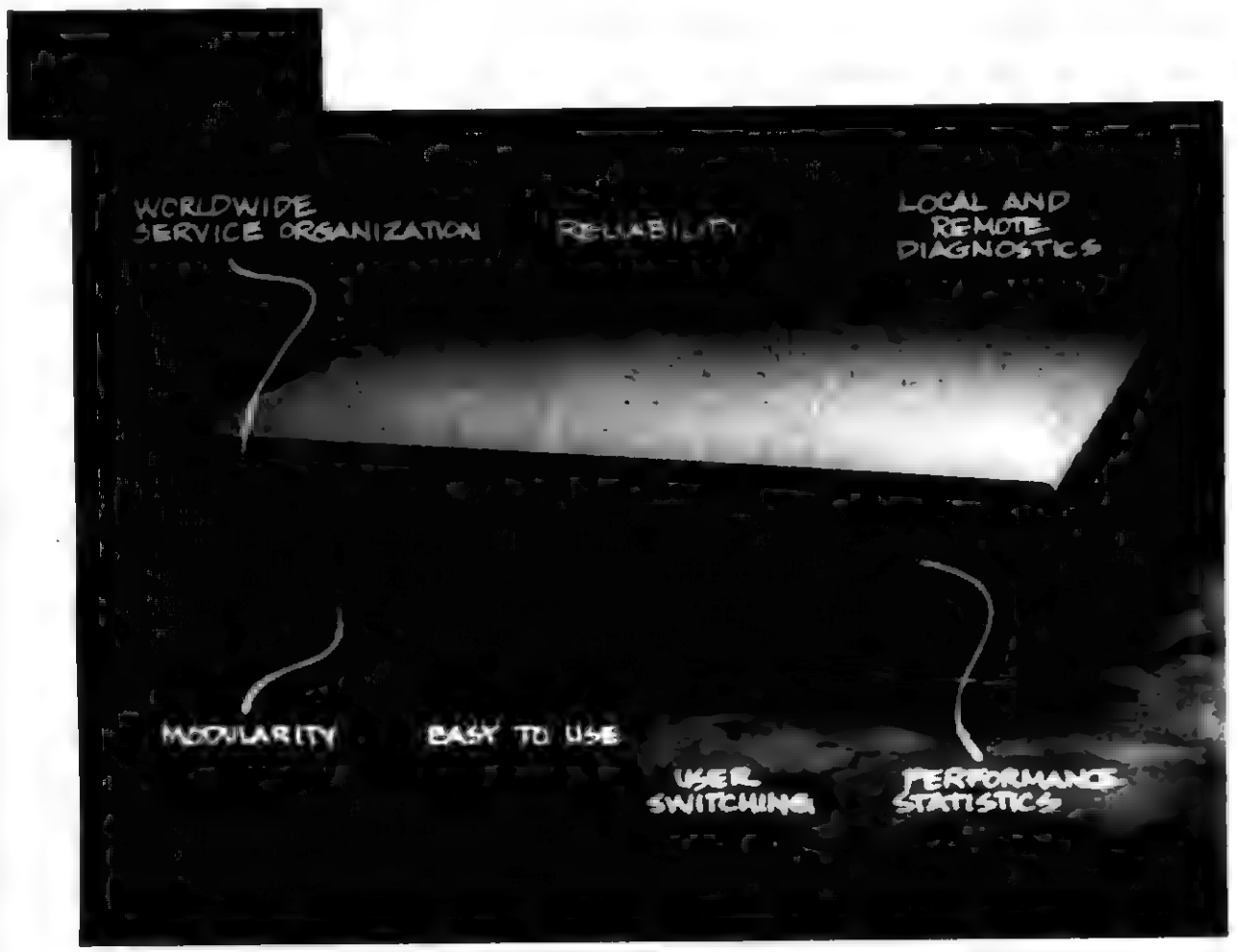
Lotus was unavailable for comment at press time.

The system RSA will develop for Lotus will be based on the RSA standard algorithm, which allows the user to check for file authenticity and verify the author of an encrypted program through a binary number generation program, according to an RSA spokeswoman.

The Data Encryption Standard is part of the RSA standard but includes additional verification features, she said.

The spokeswoman said the contract is a multiyear agreement and may eventually involve more than one Lotus product.

RSA's encryption method creates a digital seal, or signature code, that can be decrypted by a public key, or binary numerical password.



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IBM adds products

From page 23

from $30 to $275.

If a PC system carries an IBM warranty option or maintenance agreement, all of its add-on boards not under original warranty must be included in an IBM maintenance agreement, IBM said.

For customer carry-in repair, the maintenance charge for the Amdek 310-A monochrome display is $30. Annual maintenance fees for the Hayes Transet 1000 multifunction buffer begin at $65. The on-site exchange fee for HP's 7550A color graphics plotter is $275.

AST cards supported include I/O Plus II, Preview, Rampage, Rampage-AT, Ramvantage and Fourport. Annual fees for these boards are between $35 and $110.

Memory on the multifunction Memory Expansion Adapter ranges from 512K bytes to 3M bytes. Prices start at $595; each additional 512K-byte module costs $165.

The board includes a parallel printer port and an asynchronous serial communications port.

Both modems operate at 2,400 bit/sec. and support full-duplex mode. The standalone 5842 modem is priced at $719. The 4829 half-length, 2,400 bit/sec. modem card is priced at $569.

The 70M-byte ESDI Fixed-Disk Drive and Magnetic Media Adapter for the IBM RT PC support the proposed Enhanced Small Device Interface standard. The new drive replaces the previously announced 70M-byte Fixed-Disk Drive and carries a price of $3,995; the adapter is priced at $650.

The expansion board and modems should be available this month. Scheduled availability for the RT PC disk drive and controller is Sept. 26.

T/Maker to market tools

From page 23

ities, like Microsoft Corp.'s Word. We have automatic footnotes, a variety of headers and footers, a 50,000-word spell checker and unlimited windows. We have word processing that is as easy to use as Macwrite but is much faster than Microsoft's Word," said Royal P. Farros, T/Maker's vice-president of sales and marketing.

Next has not yet brought any product to market. Its scholarly workstation will not be offered until at least next year, Lewin said.

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Source: Tony Liberoni, Manager of Operations and Systems, PPG Industries Chemical Group

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"100% of our new on-line development is in MANTIS."
Source: Luther Perry, D.P. Director, Santa Cruz County, CA

MANTIS 1985

"MANTIS is the international on-line application development standard for General Foods."
Source: Fred Lambrou, International Director of Information Services, General Foods International

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The Choice does legwork in software decision

By David Bright

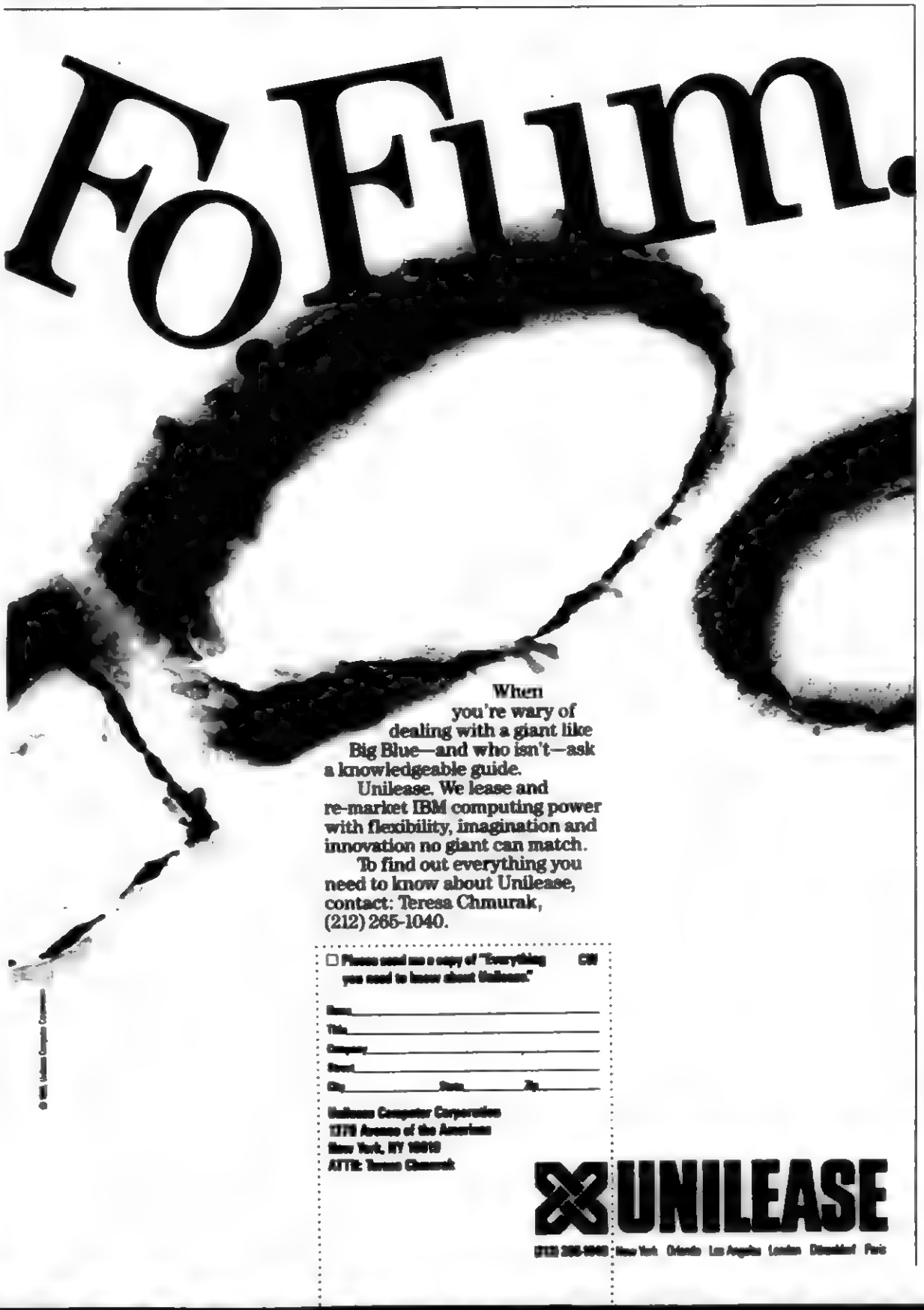
BETHESDA, Md. — Maple Systems International now has a program that aids in the evaluation of software packages. Called The Choice, the $100 package is targeted at managers and consultants involved in choosing applications for systems ranging from personal computers to mainframes.

Twelve templates are separately available for evaluating the following types of applications: accounts payable, accounts receivable, data base management systems, capital projects, general ledger, word processing, payroll, personnel, purchase order, fixed assets, financial modeling and fourth-generation languages. The templates cost from $25 to $50. Users can also create their own evaluation templates.

The templates will save managers time and effort. "We are doing the laborious and tedious homework of poring over user manuals, company brochures and industry reports to determine what is the state of the art in each of these applications," said Jim Cooper, president of the start-up company. "Users of The Choice can eliminate this research and use the template as a base on which to develop their own evaluations."

Although the software does not contain information about specific vendors' packages, it allows the user to compare a package's features with a list of as many as 500 features crucial to a particular type of application. The average mainframe application has between 50 and 250 requirements to be checked, and the typical microcomputer application has fewer than 50 requirements, Cooper said. Each feature is accompanied by a 100-word description.

For each type of application, the user weights and scores up to seven vendor packages; The Choice then summarizes and ranks each package. It can calculate and rank 450 requirements for seven vendor packages in less than 1 sec. The Choice requires an IBM Personal Computer or compatible with 256K bytes of memory and two floppy disk drives.



Grid releases LAN E-mail

By Peggy Watt

MOUNTAIN VIEW, Calif. — Grid Systems Corp. last week announced Field Mail, an electronic mail system for use on a local-area network or for remote access by users with laptop computers in the field.

The Field Mail package runs on the Grid Server, providing a maximum of 164 mailboxes for sending or receiving messages, according to a Grid spokesman. The Field Mail software package costs $3,125.

The corresponding software for each participating remote or local terminal is $75, and it runs on a Gridcase laptop system and IBM Personal Computer or compatible desktop computers. It is available immediately.

With the system, a user can assign a priority to each message sent, similar to postal service designations. First class calls for immediate delivery; second class, for delivery when a second message is sent to the same person. Third class ensures delivery upon availability of the server. Third-class mail may also be sent at off-peak times when one is using a time-sharing system or standard telephone lines linking servers.

The user can also send the same message to multiple recipients and set standing distribution lists. The Field Mail application is available immediately.

As many as 30 servers can be linked and electronic mail can be sent among them. The number of messages stored is limited only by server storage, which ranges from 10M bytes to 40M bytes.

The server is priced at $12,950 for a system with 10M bytes of storage and $15,300 for 40M bytes of storage.

CD-ROM all sizzle, no steak

From page 23

on its ability to clear several major hurdles, the first of which is the price of the hardware.

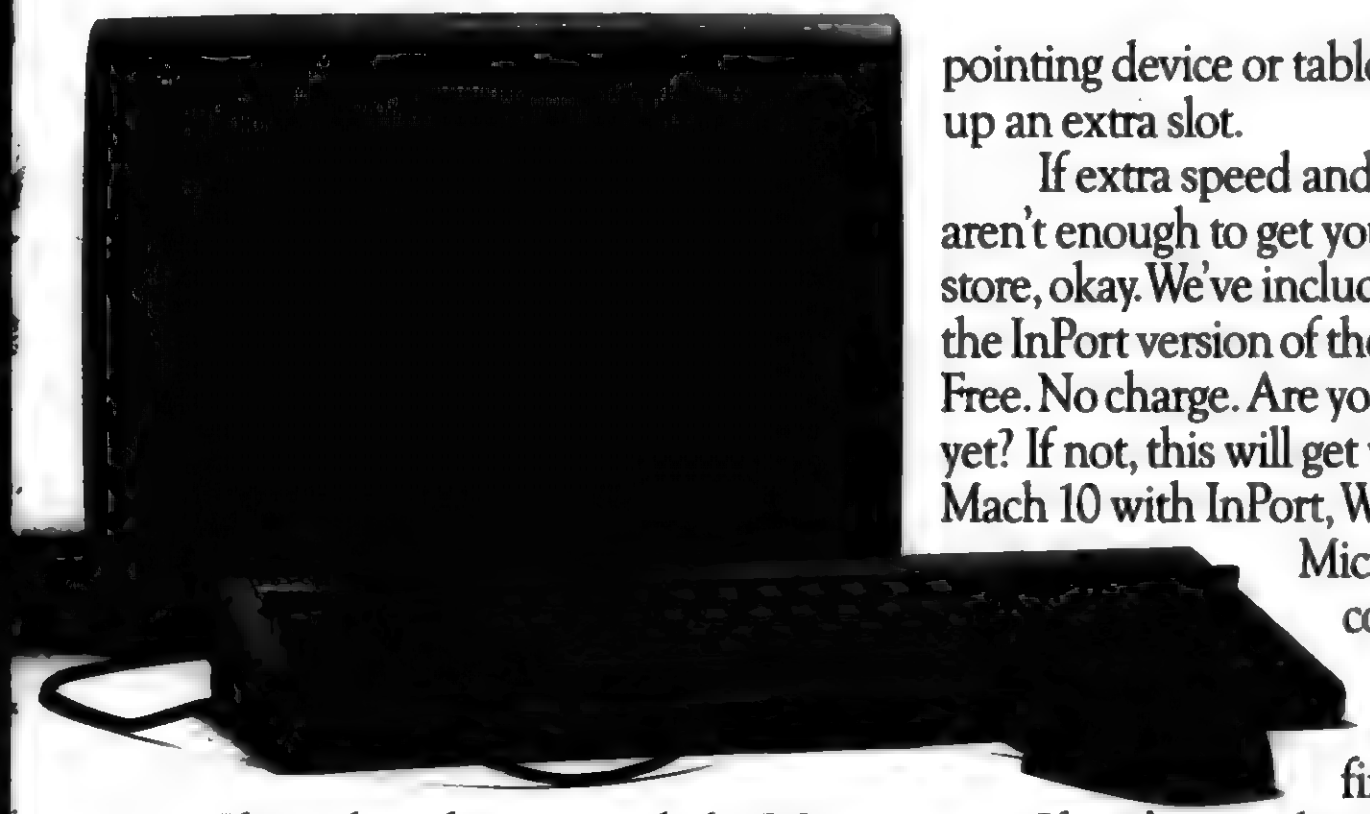
In its current form, CD-ROM is too expensive, McLagan pointed out. The compact disk readers that are needed to access a CD-ROM data base now cost about $2,250. As a result, many vendors are bundling the cost of the CD-ROM readers with their individual data bases.

Vendors are taking a hard-sell approach to CD-ROM, McLagan said. "We must make it immediately apparent to the end user what the capabilities of CD-ROM are," he added.

But exactly who that end-user will be remains to be seen. Will the responsibility for CD-ROM players fall under the jurisdiction of MIS managers, whose purchasing responsibilities have in some cases widened to include even telephones? Or will CD-ROM fall under the jurisdiction of the Information Center?

Unless some of those questions are answered, the seven-pound file I've started will grow heavier with more stories that only ponder the practicality of CD-ROM.

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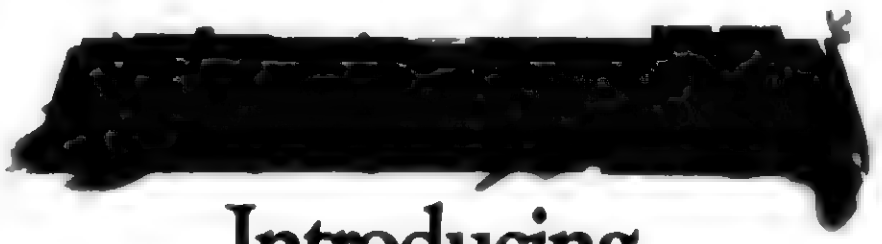
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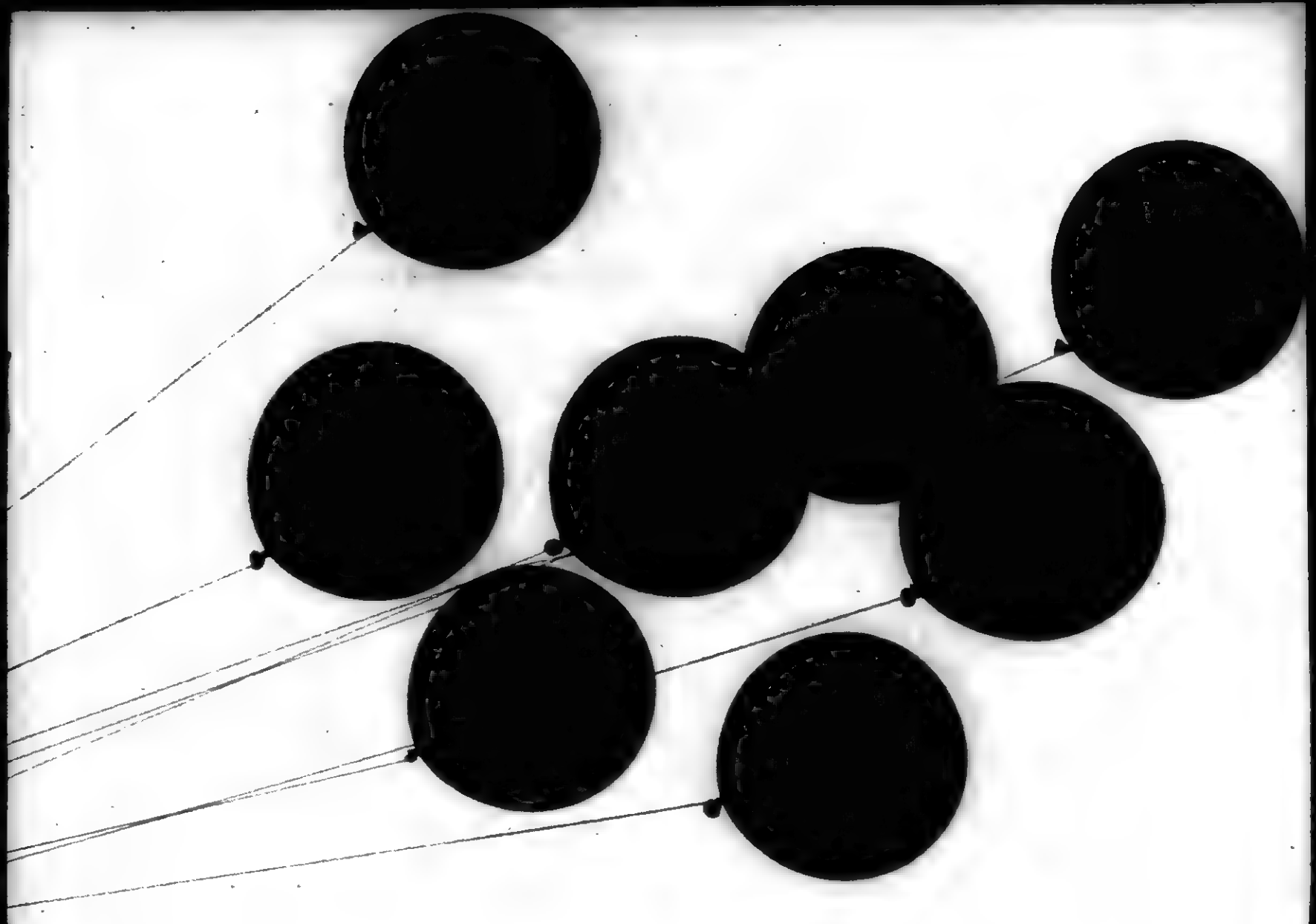
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SOFTWARE & SERVICES

SOFTLINE
Jim Highsmith

Soft harmony depends on trio

At a recent software engineering technology conference, Tom DeMarco (of structured-analysis fame) was asked what we have learned in the past 10 years about developing software. His response was that, even after a decade, what we have learned has not helped much because most people are asleep anyway. New technology is more or less irrelevant, DeMarco concluded. What we require is a new sociology.

From Jerry Weinberg at the same conference: "We already know far more than enough to double productivity — except how to look at ourselves, and we'll do anything to avoid that."

It is instructive that DeMarco, credited with popularizing a new analysis method and tool (data flow diagrams) and Weinberg, a respected author and consultant in systems development, are more concerned with the people problems of increasing productivity than with the technology.

In the last five years, powerful new software development technologies have reached the market. The potential improvements are far too great for any competitive organization to ignore. But how do we reach that potential?

This article addresses three factors critical to improving software development productivity — people, methods and tools — and makes the following recommendations:

• Concentrate on people issues and the installation of adequate organiza-

See SOFT page 34

Highsmith is a principal of Information Architects, an Atlanta-based consulting company.

From genesis, expert system shells subject to evolution

By Charles Babcock

PHILADELPHIA — When a group of Stanford University researchers in the early 1970s removed the medical knowledge from the expert diagnostic system Mycin, they renamed it Emycin, or empty Mycin, as a joke.

What remained, however, was the inference engine with a skeleton knowledge base, and what they had created was one of the first expert system shells. Since then, Emycin, with the addition of new rules and information, has propagated three more machines: Puff, an expert system for diagnosing respiratory diseases; Dart, an expert system for locating failures in telecommunications systems; and Guidon, an expert system for teaching medical students, according to Frederick Hayes-Roth, chief scientist and vice-president of research and advanced development at Teknowledge, Inc., an expert system shell builder in Palo Alto, Calif.

With an expert system shell, software developers have the equivalent of a fourth-generation language or application generator for use in the field of artificial intelligence, Hayes-Roth says. But, he warns, developing expert systems remains more an art than a science.

Hayes-Roth helped to develop the M.1 microcomputer and S.1 minicomputer expert system shells at Teknowledge. He served as an opening day speaker at a tutorial session on expert systems at the American Association for Artificial Intelligence conference last week.

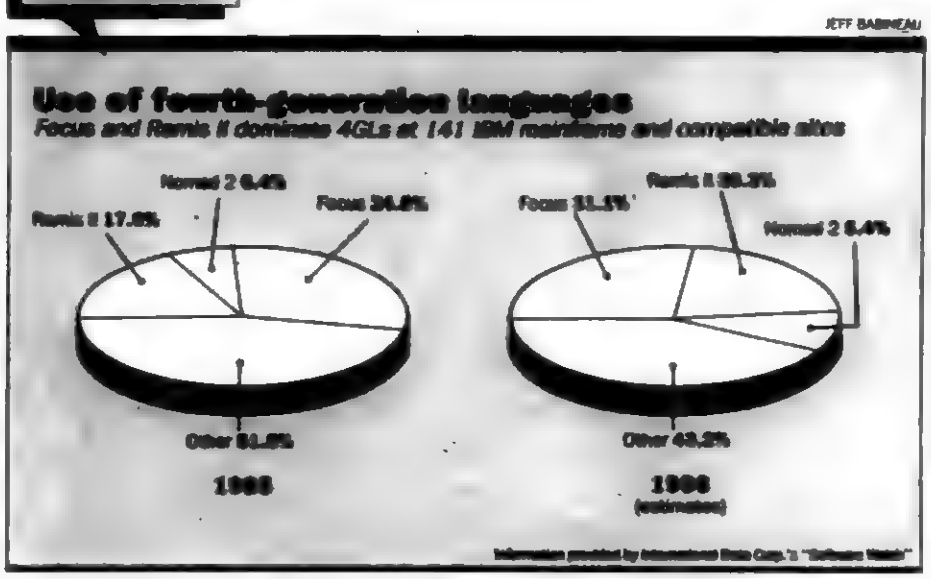
System shells are created by generalizing the basic skeleton of an existing expert system into something that can be used for a variety of applications, he explained.

Shells are good for one problem-solving process. Emycin, for example, was a forward-chaining process in which if-then rules acting on additional information helped move the system closer to identifying the disease. Other shells are backward-chaining devices. These types of shells break a problem down into its constituent

See EXPERT page 35

DATA VIEW

JEFF BARNEAU



INSIDE

Pick standards group drafts magnetic media standard/35

NEW THIS WEEK

- Autodesk upgrades Autocad
- Cosmic offers computer-aided design program

For more on these and other new products, see pp. 75-85.

INSTANT ANALYSIS

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— Prudential-Bache Securities July 24 research report on Management Science America, Inc.

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Soft harmony relies on trio

From page 33

tional change mechanisms.

• Focus on design methodologies.

• Leverage productivity by concentrating on analysis and design support tools.

First, the fact that programming productivity is not a technological problem must be accepted. In some companies, every methodology, project management system, software tool and gadget ever produced has been purchased at some point in the last 10 years — with little positive result.

But in one of the most productive development groups at a $4 billion company, there are long lists of all the "tools" they do not have — including a data base management system. Their average time to deliver major systems is six to eight months. Programmers produce three to five fully tested CICS programs per day.

What makes the difference? There are many answers to the question: long-term, foward-thinking management; commitment to full hardware and software support for all phases of development; and a 10-year investment in good, design-oriented development methodologies.

Introduction mechanism

The key element missing in many other companies seems to be a successful mechanism for introducing new products into the development environment.

Part of the problem has been the failure to differentiate between design and project management. While project management deals with tasks, scheduling, reporting and quality assurance, design deals with the how-to issues of analysis, data base design and structured programming.

Systems development organizations must begin to recognize the need for better techniques for tasks such as requirements definition, data base design, systems architecture design and programming. If the names Codd, Jackson, Orr, DeMarco, Yourdan, Gane, Constantine and Warnier, to name a few, are not being discussed in your organization, maybe it is time to refocus on design methodologies that help the staff learn to do the task more effectively.

Tools are the third leg of the productivity triangle. There are two types: logical tools, such as data flow diagrams or entity diagrams, help the communications process (graphics, structure diagrams and decision tables), and physical tools, such as Designaid from Nastec Corp. (hardware/software), enable easy construction and modification of those communications mediums.

Newer software tools can even assist algorithmic processes, that is, automate the methods in addition to the documentation.

With a growing number of tools available, where should the emphasis be placed? T. Capers Jones, a respected author and lecturer on programming productivity, has gathered statistics showing program coding is only about 10% of the cost of large projects, whereas defect removal, at over 40%, is the largest expense.

Other authors have stated the cost difference between discovering a defect in programming and analysis is $100 to $1. Yet most efforts over the last 10 years have been directed toward programming tools. Given this data, it appears the emphasis should increasingly be on tools to support the front end of the development life cycle (requirements and design).

New tools to support analysis and design are beginning to emerge. The potential for computer-aided software engineering (CASE) workstations is enormous. These tools are just beginning to make an impact in leading-edge companies.

Reaching higher levels of software development productivity is not easy. Just as we cannot expect a nonengineer to design an automobile — even with a sophisticated computer-aided design and manufacturing system — we cannot expect analysts and programmers to use CASE technology without adequate software engineering knowledge.

Only by bringing an integrated, well-disciplined approach to people, methods and tools will the full software development productivity potential be reached.

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With Structured Query Language (SQL)—a powerful and easy-to-use language—programmers can become more productive because they can concentrate on what they want to process, rather than on how to get the data. For example, one line of SQL can do the work of many lines of COBOL.

And programmers can also be more efficient because of all the supporting software IBM has developed: high level programming languages, program generators and extensive programming tools and aids.

A User's Dream

What's more, SQL is based on English, which means that users can easily access information in DB2 files, either directly or by means of products like Query Management

Expert system shells evolve

From page 34

parts and solve them separately.

In addition, Hayes-Roth said, shells use "hill climbing," a technique in which the distance to a goal is estimated to order the choices in a search of the most promising possibilities.

These are considered "weak methods" in constructing expert systems, meaning they are not specific to the task in the way that separately engineered hardware and software might be.

Knowledge engineers, or people who try to capture the insight of a human expert in a computer system, have recognized a number of problems with an expert system like Emycin.

The systems are not integrated into the environment for which they were designed. They have a static view of time, which makes it difficult for them to deal with problems that unfold during a long period, and they have a lot of built-in assumptions that do not apply when used on a new class of problems, Hayes-Roth said.

However, researchers at Stanford, in working with Emycin, have come up with Oncocin, a cancer-therapy prescribing system.

According to Hayes-Roth, it is closely integrated with the record-keeping in which doctors typically engage, it offers output in the form of graphs, it can back up and explore previous treatments that may be affecting the patient and it can suggest a current therapy for treatment.

Another shell that is not confined to the research laboratories is Salt, a hill-climbing shell from Carnegie-Mellon University that has been used to produce an expert system to configure elevators, schedule their construction and tell a repairman how to fix them after they are installed in a building, Hayes-Roth said.

"Salt is able to presuppose constraints. It knows problems are interrelated and cannot be checked in isolation," he noted.

The rapid development of expert systems, according to Hayes-Roth, will result in "more effective shells evolving over time, tailored to more specific applications."

Pick group sets norm

SAN DIEGO — The Spectrum Manufacturers Association (SMA), a collection of 17 vendors that use the Pick operating system from Pick Systems, has recently released drafts of standards for magnetic media interchange and the Basic language.

Last fall, the association designated an SMA standard for data base management systems running on member hardware. SMA's goal is to provide technical standards that will maintain base-level compatibility among products as they are developed.

The association is composed of domestic and foreign companies, two of which are Prime Computer, Inc. and Pick Systems.

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SYSTEMS & PERIPHERALS

HARD TALK
Donna Raimondi

Drumming up summer news

These are the dog days of summer — that sunny, steamy time of year when even busy MIS managers want to slip on their designer shades and put their moccasin-clad feet up on a porch railing — preferably located on an island somewhere.

While that urge to escape is hitting the work force, vendors seem immune to it. For the past few weeks, strange messages and phone calls from vendors have streamed into *Computerworld*'s editorial offices. All of a sudden, vendors have decided to get chatty about their companies' progress since last we met. No new products right now, these messages say, but here is what we've been up to for the last year.

It is sort of a hot-weather public relations version of Aunt Millie's Christmas card missive, in which she relates that cousin Herman broke his toe in February and Aunt Philippina finally divorced nasty Uncle Henry last spring.

Amdahl Corp., for instance, called a press conference, in part to say it has discovered that its 5890 Model 300 dual processor, announced last October, actually outperforms the company's previous measurements. Instead of being 1.7 to 1.9 times more powerful than Amdahl's 5870 dual processor, the Model 300 reportedly is actually 1.8 to 2.1 times more powerful than the 5870.

Also, a note from Alliant Computer Systems Corp. President Ron Gruner says that the minisupercomputer vendor has had three successive quarters of profitability in what has been a tepid

See DRUMMING page 38

Raimondi is a Computerworld senior writer.

Southland tests Amdahl

Early user reports 5890 matches vendor's claims

By Jaffry Beeler

SUNNYVALE, Calif. — The world's largest convenience store chain recently became the first corporation to identify itself publicly as an early user of Amdahl Corp.'s newly available IBM 3090 class of mainframes.

Word that Dallas-based Southland Corp., with an annual revenue of $12.8 billion, ranks among the first six buyers of Amdahl's 5890 Model 300 coincided with the hardware vendor's claim that the processor exceeds its initial performance estimates by about 10%.

In doing its own testing during the past two months, Southland found that, at least in a batch environment, the 5890 Model 300 performed as well as Amdahl claims. Southland plans to move on-line applications to the Model 300 next month.

Disclosure of the early user installations and of the greater-than-expected Model 300 throughput came at Amdahl headquarters in Sunnyvale during a recent press conference that featured prepared remarks by Southland's MIS Vice-President David Karney.

Southland, which owns the 7,800-store 7-Eleven and 450-outlet Chief Auto Parts chains, installed its 5890 Model 300 on June 28 to create an upgrade path for its existing Amdahl 5860, which was fast reaching capacity level. The acquisition also promises to enable the firm to maximize the speed of the 1.2 million on-line IBM CICS transactions it processes each day, Karney said.

Prior to installing its latest mainframe, Southland ran its real-time CICS applications on an IBM 3090 Model 200 and divided its batch jobs between the 3090 and the 5860, which competes with IBM's older

See SOUTHLAND page 38

CDC says Map V array processor boosts Cyber/180 performance

By James Connolly

MINNEAPOLIS — Mainframe manufacturer Control Data Corp. has introduced an attached 32-bit array processor designed to increase the performance of its Cyber/180 line of superminicomputers and mainframes in computation-intensive applications such as simulation and seismic image and signal processing.

According to the vendor, the Map V performs up to 100 million floating-point operations per second with I/O transfer rates of up to 100M byte/sec. The processor, which attaches to the Cyber/180 midrange Models 840A, 850A, 860A and 870A and the high-end 990E and 995E, was designed to let customers achieve near-supercomputer performance at a fraction of the cost of a supercomputer, according to Martin Ferrante, CDC marketing manager for array and parallel processing systems.

Ferrante said the Map V can be used to accelerate a variety of simulation and signal and image processing applications for seismic processing in petroleum exploration, medical imaging, speech analysis, radar and sonar analysis, aircraft simulations, filtering, molecular modeling, matrix manipulations and fast-Fourier transforms.

The I/O interface can reportedly transport data and applications at up to 100M byte/sec., compared with the 1M to 3M byte/sec. rates for competitive systems, according to CDC officials. The vendor claims the increased speed will eliminate the I/O bottleneck that in the past has limited the effectiveness of array processors.

The Map V combines parallel, pipelined multiple processors in an architecture supporting multiple application processing and supports multiple host connections in a mixed-vendor environment, according to a CDC spokesman.

The company said it is offering a 32-bit

See MAP page 40

INSIDE

Wang Laboratories introduces a color graphics terminal for use with its VS series of superminicomputers/**38**

Telex releases its first internally developed terminal system for the airline industry/**40**

NEW THIS WEEK

- Genicom unveils 3410 Quiet printer
- Displex offers uninterruptible power supply
- For more on these and other new products, see pg. 75-85.

INSTANT ANALYSIS

"IBM says you can't have one architecture up and down the product line. DEC is doing its best to prove that assumption is wrong."

— John McCarthy, research manager at Forrester Research, Inc. in Cambridge, Mass.

Floating Point strives to bring supercomputing into office

Announces minisupers, entry-level processor

By James Connolly

BEAVERTON, Ore. — Floating Point Systems, Inc. last week announced two minisupercomputers that it says will move supercomputing capabilities from the computer room into an office environment.

In addition to introducing what it termed independent or stand-alone minisupercomputers named Superserver and Superstation, Floating Point also announced an entry-level version of its attached scientific processor and renamed its other attached processors.

Although intended for use at the departmental level, the Superstation, Superserver and entry-level M64/10 remain targeted at the engineering and scientific markets.

Floating Point's existing scientific computers, previously known as the FPS-364, FPS-264 and FPS-264/20, were renamed the M64/40, M64/50 and M64/60, respectively.

Company officials said the MAX series application accelerators have been renamed the M64/140 and M64/145. In addition, the company said the Superserver and Superstation will be available as attached processors under the names M64-20 and M64-30, respectively.

The Superstation is available in two configurations, each of which includes a Digital Equipment Corp. Vaxstation II/GPX and from 8M to 32M bytes of memory.

The basic configuration is the M64/320 Superstation, which Floating Point officials said can perform 6 million floating-point operations per second (MFLOPS). It costs $187,000.

Uses surface-mount boards

The high-end Superstation, the M64/330, reportedly performs 12 MFLOPS and costs $275,000. The Superstation uses surface-mount boards and, like the other products announced last week, runs Floating Point's SJE operating system. The M64/320 can be field upgraded to the M64/330.

"Our M64 series users have access to one of the most comprehensive libraries of supercomputing math routines and third-party applications software in the industry.... With the Superstation and Superserver, we are extending supercomputing capability from the computer room environment into the office," said John M. Harte, Floating Point's vice-president for marketing.

He added, "These new independent engines and the new entry-level M64/10 will provide the competitive edge necessary to increase our market share and create the awareness that supercomputing is now reality at the departmental level.

The M64/220 Superserver and the M64/230 Superserver are network computer servers that include Sun Microsystems, Inc. Sun 3/50 workstations. They feature an Ethernet interface with the Transmission Con-

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Drumming up summer news

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period at best for many other computer companies. The note also relates that marketing and sales efforts have been aggressively expanded both at home and internationally (more than 15 new sales offices); that more than 20 application packages are now available on the FX/1 and FX/8 computers; and that it has now installed 32 customer systems.

Wang Laboratories, Inc. decided to send along a package of all the press releases it has cut from newspapers and magazines over a three-month period. News from Stouffville, Ontario's *Stouffville Sun* of a triathalon winner in a Wang-sponsored race competes with *The Vancouver Province*'s report of a Wang-sponsored $21 million computer research and development start-up in Victoria, B.C.

Digital Equipment Corp. founder and President Ken Olsen decided to wait for the summer doldrums to announce that businesses have to completely rethink the way they operate. He expounded on a concept in which all company departments will do business in a standardized way. His vision of this new business method sounds very much like the way he claims compatible DEC VAX computer systems work.

From DEC's press relations folks recently came a message that *Computerworld*'s DEC history chart, showing the evolution of DEC machines, was wrong. The chart was printed in an October 1985 issue.

IBM called in to say it liked the article on its RP3 parallel processing project [CW, July 28] except for one line about the fact that Big Blue does not always use the latest technology in some of its research projects. The irony is that the line in question is a quote from one of IBM's own personnel.

And Mitchell Associates, Inc. President Mitch Modeleski, who, despite Prime Computer, Inc.'s objections, ran a third-party vendor exhibition at the MGM Grand Hotel in Reno, Nev., concurrently with the 1986 National Prime User Group (NPUG), also wrote. He sent copies of several letters that went back and forth among him, NPUG President Patricia Craig and the MGM Grand questioning just who is entitled to show up at the site of NPUG meetings.

In a statement that looked like a bald attempt to control Craig, Modeleski wrote to her, "Let us view Prime's latest threat [to pull out of NPUG if the third-party vendors are allowed to exhibit concurrently] for what it is — a bald attempt to control Patricia Craig. . . ."

These bits and pieces are just some of the many keep-in-touch messages received here this summer. Perhaps *Computerworld* should repay in kind, with tales of exciting summer newsroom activities. We could start with the time rain dampened the company picnic.

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Wang graphics terminal bows

Advent ups support for VS superminis

By James Connolly

LOWELL, Mass. — Wang Laboratories, Inc. last week announced a color graphics terminal for use with its VS series of superminicomputers.

The Advent terminal reportedly provides improved support for high-resolution graphics in conjunction with traditional Wang information management software, graphics applications, integrated data base and spreadsheet packages, including Wang Office, Wang's VS Graphics Facility and Wang 20/20 TM.

Wang officials also said the terminal supports specialized third-party applications for VS systems, such as mapping, project management and decision support packages.

The terminal includes a 19-in. color monitor, an electronics control unit with a 16-bit Intel Corp. 8086 microprocessor and a three-button mouse device for graphics cursor management. The monitor was designed to provide 1,280 by 1,024 pixel bit-mapped display with 100 pixel/in. resolution. It can display up to 32 colors simultaneously from a palette of 4,096 colors. The terminal also supports multiple-screen windows that display information in several formats.

The company said graphics output can be printed on Wang's LIS-12 and LIS-24 laser printers and the Wang 5577 matrix printer.

The terminal will be available in October and costs $13,900.

Southland tests Amdahl 5890

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3081 Model K mainframe. But by early this year, "We had reached a point in our natural growth where we had begun to exhaust our 5860's capacity," Karney said.

"Our requirements for systems resources are growing 40% to 50% per year, partly because of our high-level language development activities," Karney said, citing the inefficiency of those high-level languages.

To ease its resource constraints, Southland recently decided to replace its 5860 with a faster alternative. At first, the user organization considered procuring a second 3090 Model 200 but eventually rejected the option for price/performance reasons. Amdahl claims that the 5890 Model 300 provides about 30% more internal throughput than comparably priced IBM systems, such as the 3090 Model 200.

Nor did Southland cast its lot with IBM's still-unshipped 3090 Model 400, which the retailer would have been unable to install quickly enough for the retail chain to avoid overloading its 5860, Karney said.

For a while, Southland considered replacing its 5860 with an Amdahl 5880 but ultimately nixed that idea, too. Although the multiprocessor 5880 outperforms the uniprocessor 5860 by a wide margin, the larger machine would have provided only enough additional computing power to tide over the company until next year, Karney said. By then, the firm would have been due for another systems upgrade.

In the end, Southland narrowed its field of mainframe prospects to the Model 300, which is expected to satisfy the user organization's resource needs through the middle of 1988. Acquisition of the new CPU also will postpone by several months the expected degradation of the firm's response times, which currently range from three and five seconds, as the business grows, Karney said.

Although Southland was once an early user of Amdahl's 4705 communications processor, the installation of the Model 300 marks the first time that the company has consented to become a guinea pig for an untried general-purpose mainframe.

"Participation in Amdahl's early-release program definitely raised concerns for us," Karney said. "I knew the criticism I'd hear if the machine fell short of expectations would be much greater than the praise I'd get for putting us on the leading edge of technology."

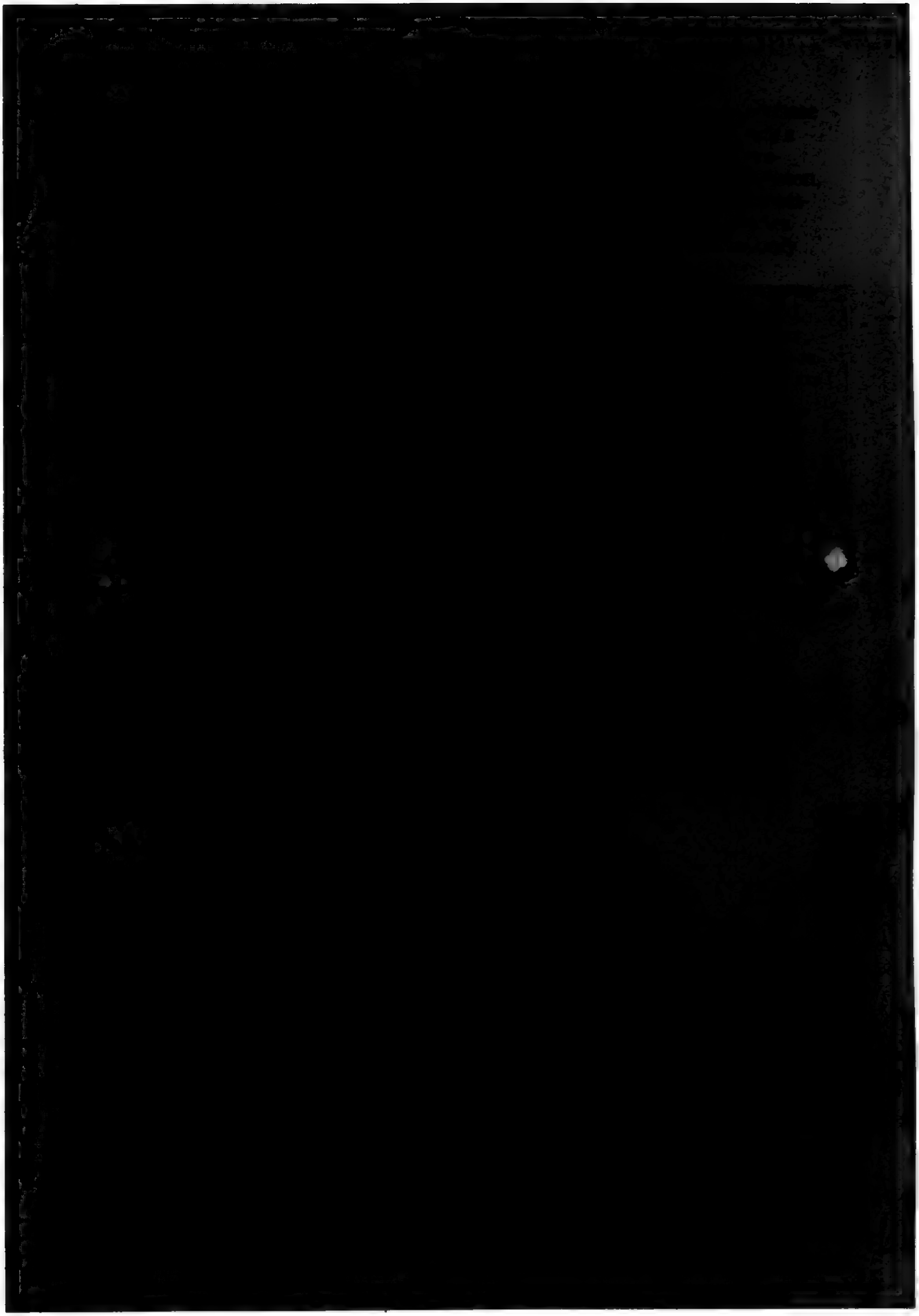
But despite the potential risks, Southland proceeded with the 5890 Model 300 installation, partly because it was heartened by the results of Amdahl's own internal use of the machine. Since late May, a 256M-byte Model 300 in the vendor's Corporate Computer Services (CCS) department has performed IBM MVS/XA production jobs without a system failure and has supplanted three existing 5860s, according to CCS director Cindy Johnson.

A second 5890 has also executed simulated production applications in Amdahl's Performance Evaluation Center (Ampec), where the machine was 80% to 90% faster in MVS/XA batch tasks than the company's dual-processor 5870. The observed throughput edge is even greater than the 70% to 80% advantage that the vendor quoted when it announced the product last October, according to Amdahl Chief Operating Officer Joseph Zemke.

In IBM Information Management Systems environments, the 5890 Model 300 outperforms the 5870 by 100% to 110%, compared with a predicted superiority of only 80% to 90%, Zemke added. The performance figures that emerged recently from Ampec jibe well with the numbers that Southland has collected independently, Karney said.

During the past seven weeks or so, the retailer has moved all the batch applications that previously resided on its 5860 over to the 5890 Model 300, which provides three times more power than the older CPU. At the same time, Southland has also equipped the Model 300 with Amdahl's Multiple Domain Feature (MDF), which permits two or more operating systems, either similar or dissimilar, to coexist in the same box.

In September, Southland intends to activate its MDF, which will create inside the MVS/XA-based 5890 a logically discrete region for the maintenance of the company's systems software, he added.



Telex launches terminal system for the airline industry

By James Connolly

TULSA, Okla. — Expanding upon the capabilities of its earlier terminal line, Telex Computer Products, Inc. has announced a series of products developed specifically for the airline industry.

The Airline Systems Automation products reportedly are compatible with the existing Telex 1000 and Telex 4000 terminal systems and are the company's first internally developed terminal offerings for airlines. The products include two IBM 3270-compatible display stations, a control unit and a selection of intelligent workstation configurations.

The display stations are the 078-A and the 080-A terminals, which the company said are designed to fit in the limited space of an airline ticket counter or reservations office. They include the choice of either green or amber monochrome monitors. The 078A has a 12-in. display with split-screen capability and costs $1,700. The 080-A features a 15-in. display with quad-screen partitioning and costs $2,750. Both are available with either Airline Link Control or 3270 keyboards.

The 070-A control unit reportedly is compatible with Telex's 1070/1076 controller and was designed to support cluster configurations of up to 32 terminals on a single coaxial cable of up to 5,000 ft under various protocols. It costs $3,400.

The Intelligent System Series is based on Telex's 1280 Intelligent Workstation, which is compatible with the IBM Personal Computer AT and was designed to connect through an Airline Device Feature (ADF) or Airline Controller Feature (ACF) to airline host systems. The ACF costs $1,500, and the ADF costs $1,200.



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Floating Point minisupers

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trol Protocol and Internet Protocol and Sun's Network File System.

The M64/220 provides 6 MFLOPS of peak performance and the M64/230 is rated at 12 MFLOPS, according to the company.

Like the Superstation models, the Superservers are available with 8M bytes to 32M bytes of memory and can be field upgraded from the basic model to the high-end model.

The M64/10 was designed to be a front-end-compatible minisupercomputer delivering 6 MFLOPS of power for less than $100,000.

The M64/10 is available with 8M bytes of memory, a 170M-byte disk drive and a software package that includes Fortran and SJE as well as Floating Point's Program Development Software without attendant math libraries.

According to a company spokesman, it can be upgraded to other M64 series models as user needs increase.

Floating Point announced its first 64-bit attached minisupercomputers in 1981. Company officials claimed that peak performance ranges in the M64 series now reach 341 MFLOPS at prices ranging to more than $1 million.

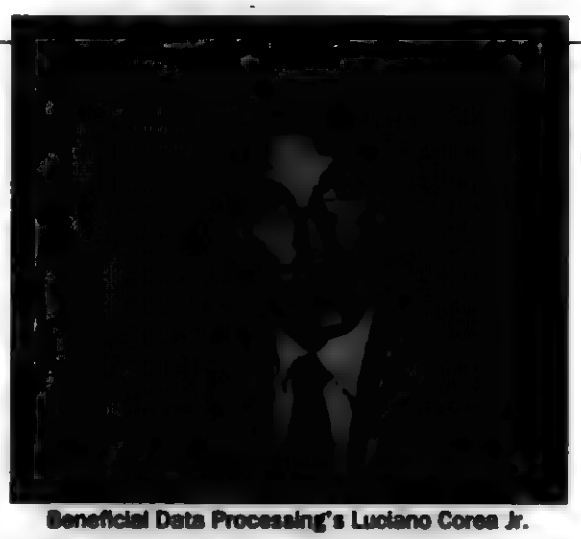
Map V boosts Cyber/180

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array processor rather than a 64-bit processor because the simulations and processing problems at which the Map V is targeted do not typically require 64-bit processing.

However, CDC said it expects the typical Map V customer to be a large, sophisticated organization that needs a turnkey solution or products that allow for rapid development and processing of proprietary codes.

Executive Roundtable



Beneficial Data Processing's Luciano Cores Jr.



Transamerica Financial Services' Arnold Danberg



Quaker Oats' Ronald Brzezinski



Georgia Power's Grady Baker

End-user computing

MIS answers the call

The news will come as a shock to few MIS managers: Computing power is increasingly being taken in hand by end users. From all indications, they like what they've got and are eager for more.

Recently, **Computerworld** ***invited four MIS executives to discuss end-user computing — its form in and impact on their companies.***

In the discussion, moderated by Senior Editor Glenn Rifkin, it became clear that MIS is willingly taking great steps to provide computer power across the desktops of American workers. But technological and managerial challenges still abound.

How do you define end-user computing in your organization?

Danberg: I would define end-user computing as an environment in which the user has free control and latitude over the process. He may use data which is interchanged through the mainframe or the MIS division, or he may create his own data. But he's in control, he's responsible for the product and the effectiveness of the use of the equipment.

Baker: We define end-user computing as information systems as opposed to foundation systems: The user is totally in control of what's done and what's used. And the MIS function is a support function to the client, and we call them clients.

Cores: We consider end-user computing to be computing that occurs outside the MIS arena. In essence, we provide them support. They are in control of their data, and we've come 180 degrees from the days when DP was driving computer use. They are now giving us the direction — what they need, what they want. And they are, in essence, responsible for their own destiny.

Brzezinski: Our definition has been one where the client — we kind of struck the word "user" from our vocabulary — is responsible for all aspects of computing, except manipulating or changing mainframe data. We can and do provide support to them, but in a sense, they achieve their end results through the access, support and manipulation of data as given to them by the mainframe caretakers.

A couple of years ago, we went through an assessment of all the money being spent at Quaker's information systems activity. We found that MIS was paying a lot of the bills but managing only 40% of that total dollar figure. It was an eye-opener. So end-user computing had been there for a long time but sort of under the covers. Now it's brought out.

Why is the word "user" suddenly taboo?

Brzezinski: It was deemed insulting, and some people made a conscientious effort throughout the entire company to stop using the word, and it's almost gotten to become second nature that you refer to all the people who are outside the MIS area but receiving services as "clients." And that, in a sense, is maybe even a little subordinating, but it's better than the connotation that "user" put on.

End-user concerns in 1986

What are the major concerns of your clients or end users now?

Brzezinski: Data access and integration is overwhelmingly the biggest issue. It started back in the time-sharing days, eight to 10 years ago in our company. Now that the clients have the capability to download data, how do you provide them that easily?

Cores: Our users are concerned about us being responsive to their needs. We can give them the equipment, but they need more than just equipment put on a desk and software installed for them. They're looking for a total support group dedicated to them that they can go to.

Danberg: The roles and responsibilities have been perplexing to us. Where does the client or user's responsibility start and end with relation to the process? We find that the more that end-user computing gets embedded into the process, you've got the same problems you have that stem from the mainframe — the problems of security, fallback and

End users beckon, MIS answers the call

[Continued from previous page]

recovery, reports and the like.

And yet all of the traditional safeguards that the MIS people have struggled with for 30 years now may or may not be in place. We find that people do some very good and creative work, and then they, for whatever reason, either leave or get transferred, and the process that they've developed leaves with them and isn't easily transportable or maintainable. I'd say that both the user community as well as the MIS division are wrestling with that problem.

Brzezinski: Does the MIS division take on the responsibility to assure that the procedure and business aspect of what they develop is secure?

Danberg: You're addressing the mainframe now?

Brzezinski: No, I'm talking about personal computers.

Danberg: We're beginning to. One of our sister organizations, Transamerica Insurance Group, has done a splendid job. In essence, they have developed a continuum of classes of end-user computing, going from jobs that are management-oriented, either internally or externally, to jobs that are just analytical in nature. Along that continuum there are degrees of control, degrees of auditability in terms of standards.

Data security: Who is responsible?

Brzezinski: I know in our company, the auditors are attempting to have us be policemen for that type of caretaker role. In my opinion, that is really a management issue at the management level outside the information systems department — once the education and awareness of what the dangers are have been expressed. I find it too much of a responsibility to entrust to inside the MIS department.

Danberg: I don't agree. The information officer of the organization, which we happen to be, has a responsibility to insure the valuable asset of that organization, which is information, and that it's used correctly. Just like the chief financial officer has the responsibility to see that whoever may be performing financial applications within the organization is doing it in a correct and consistent format. That's our responsibility; that's what we've been trained to do; that's what we've got sizable budgets to do. And how we implement it determines our success. But I don't believe we can shun that responsibility.

Brzezinski: No, I'm not saying shun the responsibility. You do it through issuing a procedure and training policy like the financial divisions do. But to take on that policeman role and caretaker role for all of distributed applications is asking way too much of any centralized group.

Who should do it?

Brzezinski: The management of that organization. The same way that you as a manager have to manage your own petty cash and expense account type of responsibilities, you have to extend that to know how you use information. It's a dispute in the industry right now.

Danberg: I wouldn't disagree with what you say, Ron [Brzezinski], except that in the same fashion that auditors, either DP auditors or financial auditors, set up standards and guidelines and rules, it's the MIS responsibility to do the same.

Brzezinski: Agreed.

Danberg: Now, who polices it is a question of how the industry matures over time. Certainly, as people become more computer literate — and incoming management in today's industry is by and large computer literate — that policing role will diminish. At the moment, at least as I see it within our organization, if we don't do it, nobody else will. Hence, it's our responsibility to do it.

Baker: Information resources is a service organization just like the other staff organizations in the company. I have a great deal of trouble giving them that much authority and responsibility over the resources that I need to get my job done.

The security thing is overplayed; we're all public corporations, and we publish Form 10Qs and annual reports, and an enormous amount goes out to the public, so why protect the information from our employees?

We spend a lot of money on security that we don't need to. In my own case, I have a PC in my office that is connected to about four other computers, and each one of them has an elaborate logon process. And all of the code words that I need to get into the employee data base and the customer data base and all the others are written on a 3- by 5-in. card that lays right by my keyboard. Executives do not remember logon sequences very well. And you're just wasting your time to make it difficult to get in there.

> **"** *'Enormously expensive decisions were being made at very low levels in the corporation. The very low-level managers were thinking of very expensive needs that could only be met through expensive data processing projects.'* — Georgia Power's Grady Baker

I agree with Arnie [Danberg] that some guidelines and rules should come from the people who are familiar with how to secure it, but as far as the security is concerned in the user department, it's their resource and they need to take care of it just like with petty cash.

Brzezinski: Grady [Baker], are you MIS or are you in the general management? I'm having a hard time positioning you.

Baker: About 18 months ago, we had a reorganization, and I got responsibility for the information resources. And then a few months ago we had another reorganization, and I got rid of that thing.

Encountering the end user and meeting expectations

What are some of the end-user-related frustrations you encounter?

Baker: One of the biggest frustrations to general management is the cost of information resources as regards the results. We are continually being oversold on what can be accomplished and quite frequently disappointed about what is actually accomplished.

> **"** *'The traditional information systems organization is going to move from a manufacturing mode into more of a maintenance and support mode.'* — Transamerica's Arnold Danberg

Another thing which frustrates us is the time dimension that particularly mainframe people work with. And general management is used to telling people to do something and have it done by Tuesday. But when you talk to your mainframe processors, they talk to you in quarters, and they say, "We'll do it third-quarter next year," and you know that if they just miss it by one quarter, they've got a nine-month leeway. That's really not what you're used to.

That's the reason, I believe, a lot of managers are migrating toward the smaller processors, because it is possible to do something quickly. Whereas on mainframes, even simple things can be quite complex if they have an impact on executive routines or other programming. And the fact that your mainframe processors are, on the average, two years behind in their programming makes it difficult for you to respond to needs of others quickly.

We've been hearing that for a long time now, and we have to wonder if there ever is going to be some solution to that problem.

Baker: We divided systems into two types: information systems and foundation systems. Anybody who would ever think about running a foundation system on the minis and micros, that's just impossible. You're going to send out four million bills a month or four million reports a month; the mainframe process is the only way to do it. If you're going to keep up with the payroll on 15,000 people, the mainframe process is the only way to do it.

But the information systems — the tools that an executive or clerk or manager needs to do his business — can be very quickly and easily handled on the smaller machines. It has been my experience, and I have access from my office to the large processors, that there's very little data there that I'm interested in, because it's all data, there's very little information.

Coras: It's important that information systems give that direction to the end user also. We have a three-tier approach: We've got a mainframe application, we've got minis and then we've got the personal computer.

A lot of times the end user does not know where logically this should fit. So they're trying to put a mainframe application on a PC. If you are running 10 to 12 hours on a PC, then you've misplaced that application. A lot of times, as Grady [Baker] mentioned, they can't wait two years to get it. So what we try to do is say, "We've got three resources here; let us go in and sit down and help you. What do you want to do? How do you want to do it?"

First off, make your determination — is it really an end-user application or maybe a foundation system? Or maybe we go in and we prototype it at a smaller scale; so that when it goes into the DP side of the house, there has been a lot of groundwork laid. Reports have been defined; you know what you want to do; and results are what you're looking for.

Maybe you put an interim system up without all the bells and whistles, but it gives the end user something to do and you can afford to take the time to get a full-blown DP foundation system going. That's what we think is valuable, because the end user really is trying but doesn't understand all the tools that are out there.

End-user relations: An evolution

How has your relationship changed with the end users in the last five years? Has it gotten better, worse?

Coras: It's gotten better in our case, because before there was no such thing as end-user computing. We've evolved over three years. What we find is that you can't be all things to all people, and you're always going to have some users who think the sun rises and sets on you. You're going to have others who could care less if you even existed. And that's something you have to accept. You just can't do all things at all times. You have to prioritize your resources and go for the high-payback items when it comes to assistance.

How do you decide which client gets the priority attention?

Coras: What we attempt to do is when they fill out a request for service, we ask them to give us a cost/payback analysis. What are the benefits of us going in and doing this?

If you tell me you can potentially bring a million dollars to the bottom line vs. someone who has a nice thing that will bring $5,000 or $10,000, that makes it easy. What's

The roundtable participants



Grady Baker
Georgia Power Co.

Grady Baker is executive vice-president and general manager of Georgia Power Co. in Atlanta. Before being named to his current position in March 1985, Baker was responsible for marketing and administrative services and in that capacity oversaw the MIS function. He is a technology buff who closely watches the trends and transitions within the MIS world.

An electrical engineering graduate of Georgia Institute of Technology, Baker joined Georgia Power in 1953 and has moved steadily up through the corporate ranks ever since.

According to Baker, Georgia Power spends in excess of $100 million per year on computer-related activities.

The $9 billion investor-owned utility serves 57,000 of the state's 59,000 square miles.



Ronald Brzezinski
Quaker Oats Co.

Ronald Brzezinski is corporate vice-president of information systems for Quaker Oats Co. in Chicago. In this role, Brzezinski is responsible for all computing and communications technology in the company.

Brzezinski notes that the end-user population at Quaker is represented by 2,500 knowledge workers at all levels of the corporation.

With 25 years in the information services industry, Brzezinski has worked in such varied positions as manager of consulting services for Nolan Norton & Co. as well as a professor of computer technology at Purdue University. He has an MBA from the University of Michigan.

Quaker Oats is an international manufacturer and marketer of foods, pet foods, toys, tools, clothing and crafts.



Luciano Corea Jr.
Beneficial Data Processing Corp.

Luciano Corea Jr. is vice-president of office information systems for Beneficial Data Processing Corp. in Peapack, N.J. Corea's department consists of office systems, information center, electronic publishing and small systems and is dedicated to serving the end-user community with office automation, personal computing and fourth-generation language support.

Corea notes that Beneficial has installed more than 1,200 workstations in its Peapack headquarters alone, with the potential of end-user computing on all of them.

Corea has been a member of the DP staff for 16 years and has been in the DP field for 21 years. He is a graduate of Montclair State College in Upper Montclair, N.J.

Beneficial Data Processing is a subsidiary of Beneficial Corp., a large financial service company.



Arnold Danberg
Transamerica Financial Services

Arnold Danberg, MIS vice-president for Transamerica Financial Services in Los Angeles, has spent nearly 30 years in the data processing industry. In addition to his role as MIS vice-president, Danberg serves as director of electronic data processing for Transamerica Financial Corp., which includes Transamerica Title Insurance and Transamerica Tax Services.

Danberg is responsible for providing support to more than 500 financial professionals at Transamerica. He participated in the development of on-line systems with Teleregister and Bunker Ramo Corp. as well as time-sharing services with Computer Sciences Corp.

Transamerica Financial Services, a subsidiary of Transamerica Corp., has more than 400 consumer loan offices in 26 states.

not always easy is the benefit analysis that the user has to give. So it's a learning curve on their side. We attempt to juggle as much as we can, but when push comes to shove, we take the highest payback item.

That sounds good on paper, but I wonder if there's not a lot of gray area there.

Corea: Definitely.

Baker: Very much so. To control cost and prioritize projects, we have something that we call a management council — made up of senior vice-presidents and executive vice-presidents — which meets once a month. Starting about a year ago, we got the MIS manager to come in and make a 30-minute presentation every month on the cost and on what he's doing. And he outlines for every officer in that room the total that he has been billed for information services over the last month.

It was really an awakening for some of them who knew their DP budgets were big, but they never knew how big they were. So we got a very significant senior management interest in what's going on in the information resources world.

One of the things we found was that enormously expensive decisions were being made at very low levels in the corporation. The very low-level managers were thinking of very expensive needs that could only be met through the expensive data processing projects. We found we were doing a lot of things that somebody way down in the organization just wanted. Senior management was not able to test the need adequately.

We have a generation of senior managers — and it is a generation problem, it seems to me — who can't type; and they don't want to type, and they'll never learn to type. They're not familiar with data processing. They don't know anything about computers and are not interested in it as a technology. They're just not equipped to manage it.

Coming along behind this generation of senior managers is another generation of senior managers who will be much more computer literate because they've been taught this in high school, and certainly, you can't hire an engineer now without getting a very good computer expert. They're good analysts, they're good programmers and they understand the whole world. But that senior management generation is coming in, and right now, you're dealing with people who, in general, are not that great.

Brzezinski: Getting back to your question, though. Client computing has probably been one of the driving forces that woke up general management to the idea that there's a lot more complexity out there than they thought.

But, by itself, it did nothing but maybe frustrate a lot of people. And if you couple that, as Quaker has, with a refocusing of all information systems resources and programs and education, this played a very important role in helping educate the general population. That seems to be kind of naturally evolving throughout Quaker right now. We have 1,000+ people using personal computing with daily access.

So the role of the PC or client computing has, in the last two years in particular, significantly increased the awareness of what was going on in MIS; and it just made all the other planning, the committees, the funding — in particular the funding and the funding awareness — easier to sell and communicate.

So I really give a lot of credit to the use of personal or client computing out there in the industry. It's just made our jobs easier, contrary to the way a lot of us looked at it four years ago — as a threat. Hindsight says it's really been a blessing.

Baker: Provided you let your definition of your job move with the times.

Danberg: Grady's [Baker] point about letting your definition of the job move with the times is an astute one, because that's something we need to do as MIS people. There's no doubt in my mind that we're going to find PCs embedding themselves into the process.

Right now, by and large, they're used primarily as analytical tools. But real distributive processing is about to come, if it's not upon us right now. And as PCs get more embedded into the process, the exposure is going to get higher and higher.

And cost-effectiveness comes into play, the question of security becomes an issue, as does the question of accountability — the end user now assumes responsibility for it. And they're going to need support. So the traditional information systems organization we've seen in the past is going to move from a manufacturing mode into more of a maintenance and support mode. That's going to need to be recognized.

What are your opinions of the *Forbes* magazine cover story of a few months ago that said that productivity hasn't really been affected at all by the influx of information systems?

Brzezinski: I disagree. Productivity has increased significantly in many of the areas. Now there are certain areas where it's a status symbol, but we can point to case after case where a lot of our business people are doing things, having much more intelligent access in the use of information.

It has a major impact on productivity in our company, from the vice-presidential level right down to the first level of supervision or clerical.

Can you track that in any formal way?

Brzezinski: We are putting up some benefits-measuring systems to do that. I'm ex-Nolan Norton, and we were big on that. What it amounts to is that if you look at certain sales per employee, we aren't that good yet.

But our mechanisms are coming into place to start tracking it.

Reaping the rewards and measuring the benefits

Have these satisfied users become your best, most enthusiastic backers of computing?

Brzezinski: Let's put it this way, maybe they're not standing up and shouting "Go, go," but what they're doing is encouraging us and not standing in the way, like we'd have seen three years ago. I don't know if anybody wants to be a crusader for

Continued on next page

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another department, but on the other hand, by joint presentations and joint discussions of what's going on, we've formed an awful lot of partnerships which we never had before.

That's probably the key, that we have a lot more working partnerships throughout the entire organization.

Cerea: We participated in that *Fortune* study. They interviewed our chairman, Finn Caspersen, who's a driving force behind the implementation of office systems at Beneficial. He was one of the few who said that productivity has absolutely increased as a result of installing the systems.

Part of the problem with that article was the industry hasn't come far enough. They're still looking at soft-dollar savings; they're still looking at percentage of gain vs. how much time did I save because I'm a manager or secretary or clerical? That's the wrong target to shoot at.

> ***'I give a lot of credit to personal computing in the industry. It's made our jobs easier, contrary to the way a lot of us looked at it four years ago — as a threat. Hindsight says it's really been a blessing.'***
>
> — Quaker Oats' Ronald Brzezinski

There's a methodology that's being developed that shows you how to go out and get hard dollars. We were able to go in, in one instance, and create through our network the ability to refine documents on an almost day-by-day, hour-by-hour basis. We estimated a reduce-to-risk and also reduce-to-revenue of a million dollars in one activity that took place over a two-week time period. The dollars are there.

You [Brzezinski] mentioned the Lotus implication. You take a spreadsheet, and in some instances, people are saving tens of thousands of dollars on a simple spreadsheet. The evidence is so obvious that it's being overlooked. It's now commonplace, and the real benefit behind it is ignored.

Danberg: It's particularly difficult to measure the benefit. Some of the early claims of office automation were ludicrous. They equated giving a tractor to a farmer and how many acres he could plow vs. how many more letters a secretary could do if she had a word processor. Those are ludicrous comparisons.

Baker: If the farmer doesn't own any more acres, the tractor doesn't mean too much to him.

Danberg: That's right. And if you save a secretary four hours a day, and she has nothing else to do, that's not very much of a savings either. So, we have found in some of our operations that the use of support systems, especially those that do some data base manipulation and word processing, have shown us productivity factors in the area of 40%. We don't know the soft aspect of it — how many errors are not made any longer and things of that sort. The industry has suffered — at least the office automation aspect — from those early claims that were just outside the realm of reasonableness.

Cerea: The sad part about it, though, is they're still pushing those same claims for justification. And now, senior management's coming back and saying, "Fine, now prove it." How do you prove a soft saving? And like you said, I'm getting my job done two hours sooner, so I can go play golf. The company hasn't gotten anything out of that.

Baker: There are two ways to improve productivity. One is to automate things that you are doing and the other is to do new things. And the most difficult thing to measure about the impact of information resources of an organization is the value of what you're doing that you couldn't do before, because you have no base to measure it against.

In 1976 we used some of the first 8-bit processors to get a data extract off electric system operating computers, and we made that available in a 300 bit/sec. dial-up to the managers of the electric system. It made us millions of dollars, because the president of the company would get up every morning at five o'clock and he would dial up. And while his printer was going, he put on the coffee. And by the time his coffee was ready, he had two or three pages, and he would sit there and read it.

By the time he got to the office, he was ready to straighten things out. Because *he* did that, everybody else got interested in it. And the fact that information was available on-line made us millions of dollars and a better operated electric system.

Now, that one incident has fired me up, and I've been trying to find similar incidences ever since.

Brzezinski: Only if you start measuring money spent on technology per class of person, such as sales or clerical, but then how do you assign credit to that?

In our company, it's getting to be looked upon more and more as a tool, and I like that. There is still the necessity to have to plan to install a technology, so it doesn't get out of hand. But it is becoming more imbedded in the day-to-day process.

Baker: A lot of applications have

Continued on page 48

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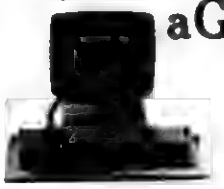
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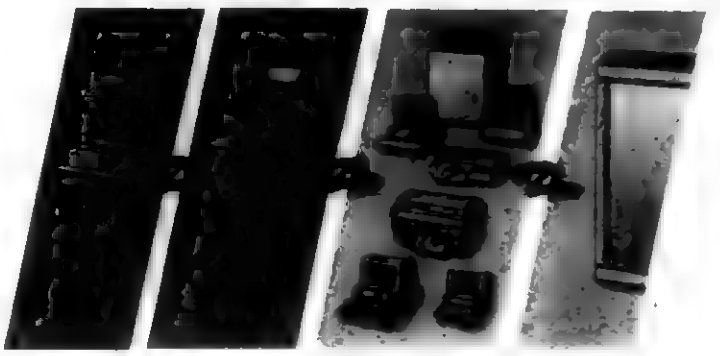
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Business Computing Systems

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to be supported intuitively.

Damberg: As far as the tools are concerned, I would suggest that 10 years from now, you're not going to be able to hire the kind of professional you want without supplying the workstation. Just like you can't hire the kind of secretary you want today and say, "Here's a Selectric typewriter."

How many of your people now use a workstation?

Damberg: Of the professional people that are involved in strategic planning or financial planning or analytical activity, the number is probably in the high 85% to 90% range today. But they're a small cadre of people. That's going to increase as we tend to distribute the computer responsibility — human resources systems to the human resources function, accounting systems to the accounting folks, manufacturing systems out to the manufacturing shop floor.

Are you upgrading the systems constantly, going from an IBM Personal Computer XT, for instance, to a PC AT?

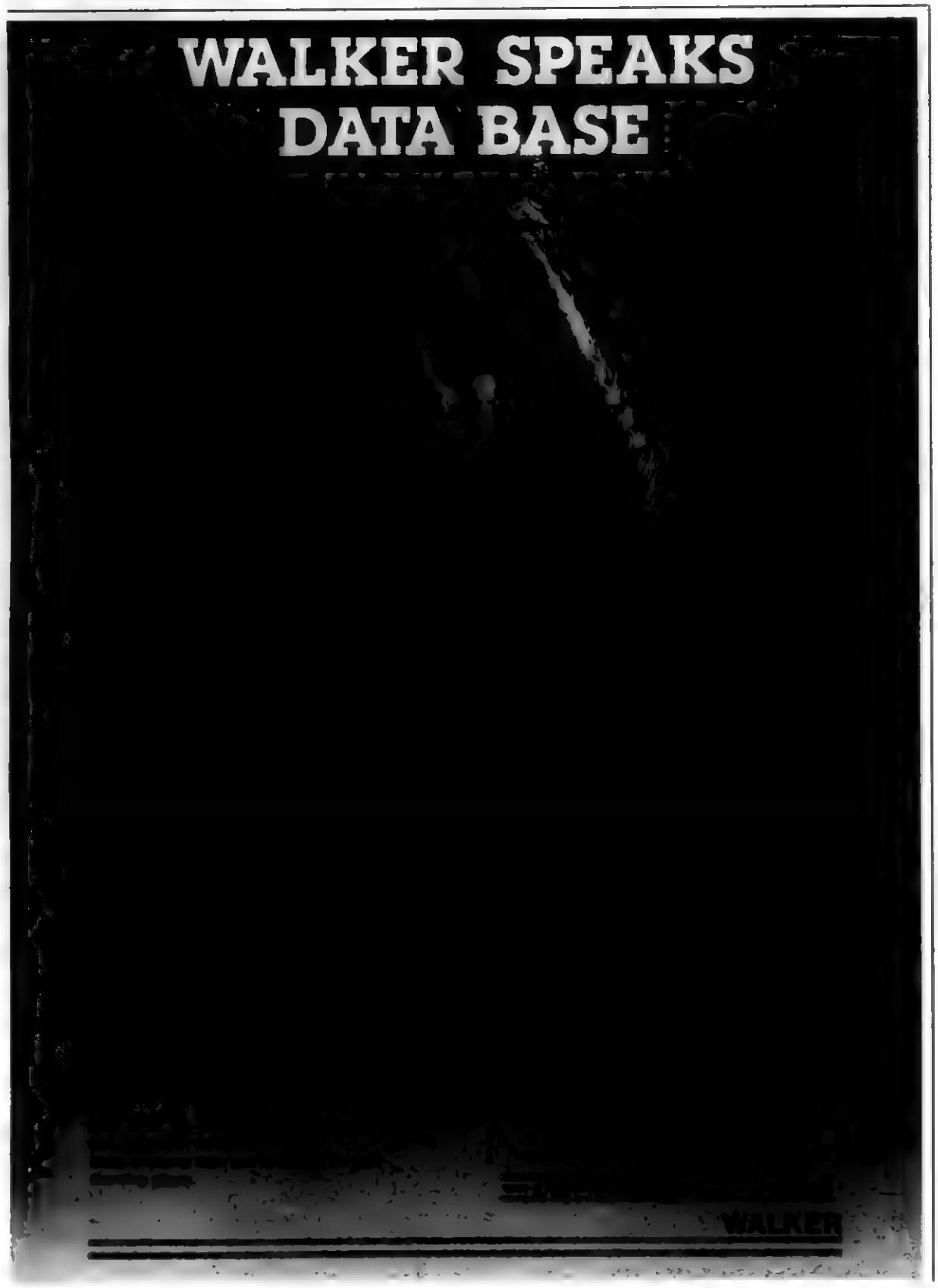
Damberg: Yes and no. We look at each one individually. That's the dilemma — the cost-effectiveness. There comes a point where you download so much data that you've exceeded what was originally a small microprocessor support system; it's now become a functioning system. We try to measure it in terms of exposure: How much exposure does it have? What would happen if it didn't function? We try to exercise control at that level. But there's no answer to that one.

Is there a demand for more processing power on the part of the managers — everybody wants an AT power machine?

Brzezinski: Quaker's gone through a conscientious replacement of more power in certain areas of the company, because the functionality has definitely increased. We put the older machines out to first-time users.

So the low-cost AT clones must be very appealing to you.

Brzezinski: Yes, they are. The vice-president of investment relations just got hers and sat in her office last week and kept saying, "Wow, is it fast."



The PC revolution: Caught by surprise

As you look back on it, did you handle the influx of PCs as you would have liked? Were you caught by surprise, and would you manage it differently today?

Brzezinski: We all went through some learning, no doubt. It depends how fast you adjusted your learning to the reality of the situation. At Quaker, we were very fortunate in that we set up an information center which was probably one of the best ones I have ever seen in the industry. I was not at Quaker at the time it was set up. It was very service-oriented with the objective to educate people.

That was the turning point at Quaker. It has been nothing but positive since then, and that has been two years. We've got six full-time people staffing it. My biggest concern right now is how to refocus that activity.

Corea: We really didn't have a significant PC problem. We were fortunate, likewise, in that in 1983 — when we started looking at end-user computing and we formed the office information system department and end-user support group — we had probably 15 to 20 PCs in the entire corporation.

We had elected to take a departmental computer approach, where we got superminis and then distributed workstations off of that. So what we did was to come up with the three-tier approach. Now what we're finding is that when users come to us and say, "Here's our application," we either direct them to the mainframe, mini or to the PC where the PC makes sense.

Another advantage that we had is that with the system that we selected, we could use existing PCs and they could become satellite terminals on the departmental computer. So, in essence, they had their own computer power on their desks, plus the ability to get into the network and have all the capabilities of office automation. We were fortunate in that we didn't have an uncontrolled growth that we had to react to; we were able to plan more for it.

So you feel like you've got the handle on it now?

Corea: I think we do. It was a little bit of a stepchild for a while, and it wasn't given the attention that it should have gotten, because there weren't that many of them. I said to myself, I've got 1,200 other workstations and 25, 30 or maybe 40 PCs now, so they were kind of pushed off to the side. Now we can form another group which is exclusively dedicated to PC support for training, implementation, review of hardware and application development.

Brzezinski: How many do you have there?

Corea: We have probably 50 to 60 now. The majority of them are on the [Data General Corp.] network.

Brzezinski: We've got about 800. Until the technology stabilized, [Xerox Corp.] was very big; [Burroughs Corp.] was very big when they first came out. Unfortunately, when the IBM system came out, it became a natural standard that everybody wanted just because it was IBM. In retrospect, that was probably the best thing that happened to us. But

trying to standardize at first was a little bit of a mistake. You recover from it very fast. But something had to be done, and we were all learning.

Do you still have these isolated boxes?

Brzezinski: Sure. In some cases we're letting some of our programmers use them at home. Or, where we find a specific need, we can still get mileage out of them. But a lot of them have been around three, four or five years at this stage.

Baker: For about 10 or 15 years, we had a very rigid, centralized processing arrangement. Everything had to be done centrally and the approval process or purchasing of data processing equipment was all centralized. Three or four years ago we began to liberalize, and finally we realized that the manager who can buy a car might as well be able to buy a PC. If he's smart enough to buy an automobile, he probably ought to be smart enough to buy a PC.

The main thing that happened was that a lot of the equipment that had been bought under the guise of turbine bearings or word processors was reclassified as to what it really was. We had generating plants with maintenance information systems being run on word processors. It took six or eight word processors to do it all, but those engineers will find a way to do it.

Cores: That's the key. The end user is going to find a way to do it, either with you or without you. Ideally, it's going to be with you, and the sooner we realize that, the better off we're going to be.

> ***"We've told vendors, "If you, in fact, come in and talk to our users and we find out about it, then we're no longer going to do business with you."***
>
> — Beneficial's Luciano Cores

Baker: It was about seven or eight years ago that I heard a story about a consultant who went to see a banker, and the banker assured him that all his data processing was centralized. The consultant said, "Are you sure you don't have any small minis or micros sitting around?" He said, "I'm sure." The consultant looked through the bank and found 56 different systems hidden out there.

Is that still going on in some organizations?

Cores: We have central ordering. There's no way you can guarantee that somebody can't get a PC, but we have an agreement with our accounts payable and our purchasing people that any type of PC equipment should come through our area. It's not so much that we want to control what you do, we just want to understand your application a little bit to make sure you're getting what you need to accomplish your task.

Baker: MIS publishes a list of supported devices and software, which means they've got somebody who knows something about it and can help. But if it's not on the list, it doesn't preclude somebody from buying it.

Brzezinski: The biggest reason for the client's trying to use a centralized service right now is that the acquisition, as we all know, is only the small part of the overall cost. With your maintenance cost and your discounts on software and all, it's to their advantage to go through the centralized approach. I don't find any cases right now where people are trying to go around us at Quaker.

Baker: I don't know of any. It's just not necessary.

Brzezinski: Exactly. Attitudes changed on both sides, and it's healthy.

That's for the purchase. What about for writing applications?

Brzezinski: Writing applications is their responsibility. If they need help and support, we will train. But we will not take on the responsibility of writing the applications.

Baker: Ron [Brzezinski] made the point that they refer to the users as clients at Quaker, and we do that at Georgia Power, too. In fact, when I got involved in it about a year and a half ago, one of the criteria for the managers in the MIS organization to be judged on was how many of their clients they took to lunch. It's necessary that they market their services just like any of the other consultant organizations do. It's for the benefit of the company that they use all of the marketing tools that any other sales organization ought to use. MIS no longer has a captive market in any big organization.

Brzezinski: That's nice — a lunch. I've got a full-time client service manager, and he has no people reporting to him. He reports to me. And his whole responsibility is our relationship with the clients.

Baker: We have a client support department that used to be the systems development department. The foundation systems in our company are run by the mother company, Southern Co., and we used to have a systems development department, with about 70 people in it, whose purpose was to interface between the users and the mother company.

I, we did away with that department, and we changed it to the client support department. Our ambition is to have a tag on every PC or every terminal with a name and phone number of somebody from client support. If you have a problem, you can dial that number. That's the optimum situation.

Do any of you have a micro manager, PC coordinator or some equivalent as part of MIS?

Continued on next page

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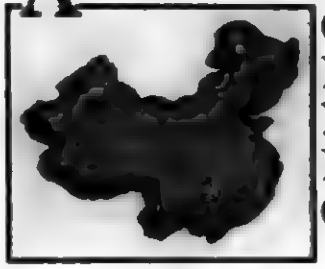
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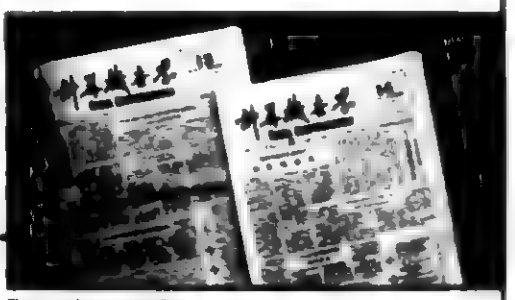
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Brzezinski: Our information center manager is that. And it's a direct report to me. All the purchasing per se, the administrative aspects, goes through the purchasing department.

Is there a computer specialist within the purchasing department now?

Brzezinski: No, we provide everything right up until the point of negotiation, and they just take on the contracts because they're pretty good at that.

Cores: We do all of our own within the office information systems side of it. As a matter of fact, we just hired a person from Entre Computer Centers, Inc. It's amazing how much money he saved us in a week just because he has been in the business, he knows the profit margin and he has negotiated with people. Where we were getting 22%, he says it's either 30% or it's nothing. And we've gotten 30%.

What is his title?

Cores: He is an information center PC analyst. We've broken it down into basically three groups. We have an information center, and that consists of decision support, fourth-generation language and personal computing. Those three groups report to an information systems manager. We have one number to call into the information center for any problem. Someone within that group will get back to you within 10 to 15 minutes.

Vendors: Friends or foes of the end user?

Do you allow the vendors to interact with end users at all?

Cores: No. As a matter of fact, we've told them, "If you, in fact, come in and talk to our users and we find out about it, then we're no longer going to do business with you."

Brzezinski: Wow! I encourage it. Definitely. We could not have done a lot of the things we have accomplished had not our clients worked with vendors. We cannot be all things to all people, and I do encourage it.

I hear the word 'education' over and over. Have you become more teachers than technicians?

Brzezinski: Since November of last year, we have trained over 800 people in one- and two-day courses. We have an ongoing education program. There's a tremendous amount of education. We've got two classrooms set up with PCs. We have eight to 10 people at all times in those classrooms. We go out to our plant areas and do that. But once you get that, what do you do?

Baker: The name of the product sort of implies a difficulty with a central MIS — that is, "personal computer." It is personal, and the use is going to be driven by the attitude and the ability of the individual sitting down in front of it. That's one of the major things we've really been focused on.

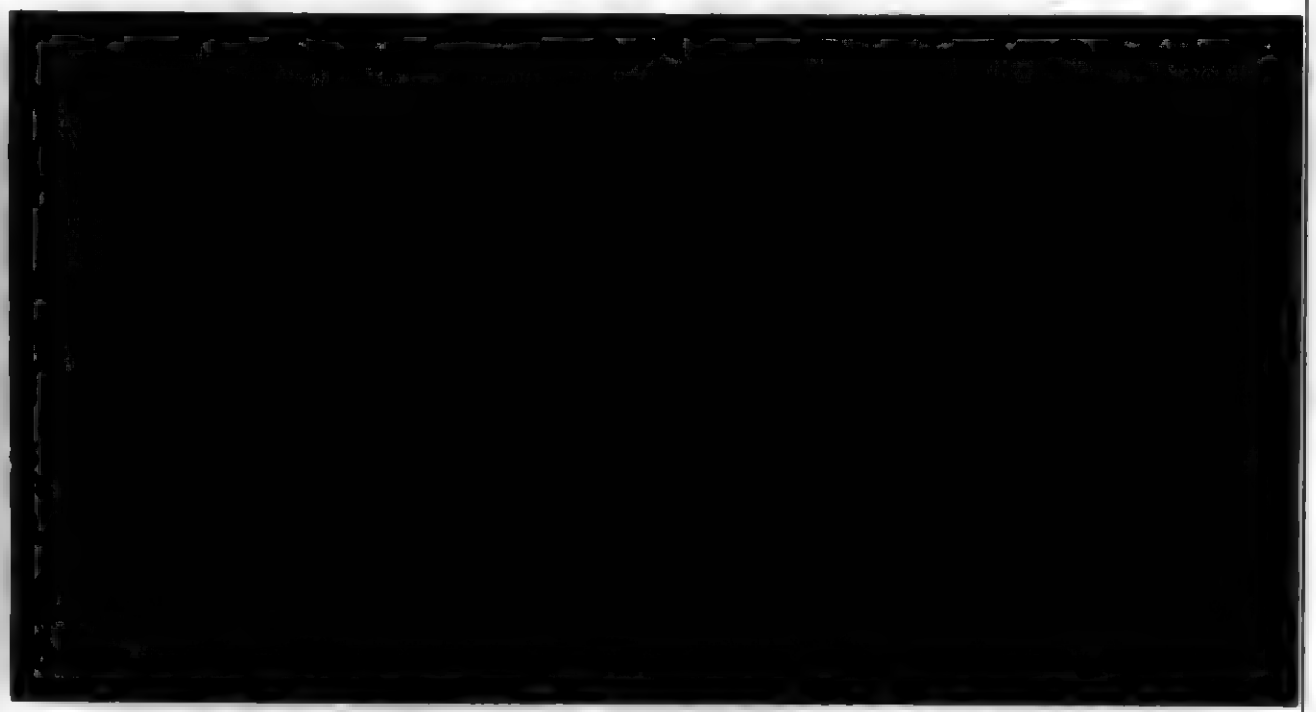
Tracking end-user satisfaction

How do you track end-user satisfaction?

Brzezinski: I don't relate to that at all. The only thing we can track is our service to them. But the majority of the activity that goes on is under their direct control. So how do I track whether you're happy today or not? Nor do I care whether you're happy. I mean, yes I do, but there's a lot of other things we have to attend to. By defining the service you're providing and tracking how well you do on that service level, we have our measures and reports. But the service is certainly not on developing and supporting the application.

Cores: We have regular meetings we call information center coordinators. We have a large electronic mail interface, so we go out and attempt to solicit information. And one thing users aren't is shy. They are willing to tell you. And it gets back to . . . Are you willing or can you react to the problem being presented to you? Again, you have to evaluate one user's needs vs. the greater preponderance of them. You may have one or two users who are not totally happy, but then you have 95 others that are.

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form that users fill out at the end of a project?

Danberg: Where client computing is of a class where it's application- or process-driven or performing a function, you indeed have the obligation to assist and support and evaluate the effectiveness as a support to them. We find that our users welcome that, they want it. They don't know how to do it. They see that success breeds success. And if they are able show successful PC applications, they are able to pyramid on that.

Brzezinski: We don't really have that many pioneers out there. People want to find prepackaged solutions. You do encourage some pioneering, very definitely. That's where you get a lot of your ideas. But most of the clients out there do want to leverage off of what's already going on.

Baker: Being an engineering-oriented company, most of our professionals are pioneers. The younger engineers in particular have a very broad computer background that they got in engineering education, especially electrical engineers.

> ***"It is middle management that I'm concerned about — trying to get more enthused — because there is where you are really going to get your payoff."***
>
> — Quaker Oats' Ronald Brzezinski

We have nine different computer centers, and those came out of the engineers' own efforts to do their own thing. Engineers will be more apt to run out from under you than others, like financial or accounting.

Danberg: It's a cultural thing. The culture dictates the environment. We, being a financial institution, are by nature very control-oriented. And our operating management is reluctant to try a lot of new innovative things unless they get the support of the traditional organizational elements.

Baker: Again, that's a generation thing. Harvard University, just a couple of years ago, starting making all the MBA candidates buy their own computers.

When this generation of MBAs begins to integrate into the business environment you'll start to see the change.

Brzezinski: Grady [Baker], you can probably not hire engineers and put them into a computerless environment.

Baker: No way. They would feel lost. In fact, I was talking to the head of the electrical engineering department at Georgia Tech, and he was complaining bitterly about the fact that he just got a budget cut.

And the cut he was complaining about was not money, but they had cut his mainframe access time: "How can I train electrical engineers if they can't have their terminal time?" Those are the people coming out, and they will have to have available to them the tools that they've been trained to do the job with.

Senior management support: Is it crucial?

Do you feel you are getting support from top management that you need to service end users?

Corea: In our organization, it started at the top. We put our system in and our chairman of the board and all of our senior management were in the first group to go on that system. In essence, they are saying to the corporation, "We believe in it. We're going to be a technology-driven corporation, and the fact that we are going to be the first people on here should give direction and insight to the rest of the executives that get on board or get left behind." That's one of the keys to success. End-user training, top management support — without both of those, it's not impossible, but it's a heck of a lot more difficult.

Do you consider MIS now to be part of top management?

Corea: As a matter of fact, my boss, who is president of Beneficial Data Processing, is on the operating executive committee, and the vice-

Continued on next page

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Continued from previous page

chairman of Beneficial Corp. was the past president of Beneficial Data Processing.

Is that a recent development?

Corea: No, it happened in 1978. We admitted that without technology, without our computer-based systems, we're not going to survive into the '90s. It has become the heart of the financial organization. I suspect in your areas too, without those systems and without the ability to get the competitive pricing . . .

Damberg: We're evolving into it.

Baker: That brings up one of my favorite subjects. Time after time we're willing to spend megabucks building systems to support our clerks and our professionals. But I haven't seen a lot of effort being put forth to make the job of executive management any easier. My advice to MIS managers is if you want your Hay points to be higher or your titles to be better, then I would pay a lot of attention to what my executive vice-presidents and presidents are concerned with and see if I couldn't develop some solutions for some of their problems. These people make decisions. That is what they do for a living. And I haven't really seen a lot of applications to make that decision making easier.

Brzezinski: I would suspect that in the financial-related industries you don't find that argument as much as you may in a technical industry like yours. By the sheer nature of your business, you have a lot of techies, and they are more concerned with their own environment. In financial companies, you'd find a lot more of the executive solutions already being computerized. We happen to be somewhat of a marketing organization and again, like Lou [Corea], it started at the top. Top management support or involvement is not an issue when it comes to end-user computing.

Baker: What do you do for your president to make his life easier?

Brzezinski: We put on a complete financial analysis and a data-browsing capability that our chairman is the first one to use. He has it at home. And our president uses it at home. They like to browse. They don't like to program. We aren't trying to force them into the programming mode. We keep adding more and more data. They can virtually access the type of data they want within the pace and acceleration with which they want to receive it. As they grow into using more, they'll get it. The point is, you don't go ahead and prepackage big solutions for them and say, "Now learn this." This has been going on for three years now with our executives, from the chief executive officer on down.

Baker: I have a philosophy that any application for a senior executive that requires more than one finger to implement on a computer is doomed to failure.

Brzezinski: I disagree, because it's a personal thing. It depends on the personal aspirations of the CEO. Our CEO likes data, he's a data enthusiast and he likes to browse. But he is not into the idea of programming. So we give him all the data he needs. We make access to it and package it nicely for him. And whether it's one finger or two fingers: . . . What if someone came into you and said, "You're an executive and all you can have is one-finger applications." Would you be offended?

Baker: My hobby is assembler language programs.

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> ***'The awe with which the upper echelon is held prevents people who have the tools from saying, "You need something and here's where I can help you."'***
> — Georgia Power's Grady Baker

Brzezinski: You'd be offended.

Baker: I wouldn't pay any attention to it.

Brzezinski: The president of our Fisher-Price Toys Division writes his own programs. He's actually doing benchmarks from one PC vs. another. He happens to be a technology enthusiast. It really is personal, and I disagree with your statement that MIS executives aren't attending to the executive needs.

Corea: Also, the generation change that you are anticipating in the future has already occurred at Beneficial. Our chairman, president and many of our senior vice-president are in their 30s and 40s. They know technology, they've experienced and know what they can do with it. And they utilize it. Some people might use it five hours a day, others five minutes a day.

Making life easier for top executives

Baker: Let me ask you another question. I buy software as a hobby. I see an ad in a magazine, and I'm on the phone with a Visa card and stuff is coming in and most of it is very trashy.

Do you do things to make the mundane things in the office easier for the executive? You've got word processing for the secretaries, which enables them to spend more time with their nails. What do you do for the executive?

Brzezinski: I went to our executive management and put on a workshop

Continued on page 54

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for the chairman on down a couple years ago. And that's after a couple of them already had PCs. The issue was: They need blocks of time to sit down, and most of the really senior executives don't have that block of time because they are busy dealing with people, and so what they want is stuff at home they can use, possibly. And what's happened is they have transferred their PCs out of their office or given them to their secretaries to do routine work.

There's too much hype saying, "Do more for the executive," because you have to find your level of interaction. And I think Quaker is finding its own. It is middle management that I'm more concerned about — trying to get that middle management level more enthused at this stage, because there is where you are really going to get your payoff, not at the upper one. Now how do you get the payoff at the middle level?

> ***'I don't think it's the technology. We've got enormous technology. It's the recognition of the needs that's the problem, both by the guy who needs the help and by the person who can furnish it.'***
>
> — Georgia Power's Grady Baker

Danberg: Your organizations are larger than the one I represent. I find that my problem is that I don't have people on my staff who can relate to the senior management problem. That inability to relate makes it very difficult to say what kind of support system they need. My people tend to be techies. They know how to define requirements and, once having defined requirements, build systems. But trying to define business needs and then trying to develop the necessary technological solution to support that business need requires people with unique talents and skills.

What are you doing about it?

Danberg: At the present, pondering it, quite frankly. I don't know the answer. Certainly we don't see the people coming out of the educational institutions today providing it. They've got the basic knowledge, but they don't have the practical operational experience. My own personal feeling is that it's going to evolve. For years, we've faced the dilemma of, How do people migrate from MIS into the business world, into the user departments? I think we're going to see a shift of people from the user departments migrating into the MIS world. And that may be the conduit by which this is going to happen.

Brzezinski: That's exactly it. Because at Quaker, we did not write the executive systems. Our corporate planning department wrote the systems. But they had a lot of training and cooperation from our staff. So we had a team effort going writing executive systems. We don't profess to understand all the executive needs, and they were better positioned to do it.

What kinds of things are your executives looking for from MIS that they're not getting now?

Baker: There is still a lot of work to be done in that area. Providing them with risk-free experience and intuitive data bases upon which to make decisions is an area where a lot of work could be done. Getting the information from people who run the models into the executive's hands is an area that needs work.

I really am not satisfied with the mundane, day-to-day tools that are provided. Most executives spend a lot of time on the phone, and anything you can do to make that better will be appreciated by them. A lot of research needs to be done there. There's a feeling in the organization that these guys have to be great and superefficient, or they wouldn't be where they are. That's not necessarily true. Most of them were lucky — right place, right time. Then they need a lot of help doing their jobs efficiently and effectively. The awe with which the upper echelon is held prevents people who have the tools from going in and saying, "You need something and here's where I can help you."

Is the technology not there yet?

Baker: I don't think it's the technology. We've got enormous technology. It's the recognition of the needs that's the problem, both by the guy who needs the help and by the person who can furnish it.

Cores: I don't think it's sometimes as difficult as we make it out to be. We've got the DG Comprehensive Electronic Office system, so we've got electronic mail. Our chairman has said that that system has made him 50% more productive, just in the short messaging capability. Not to have to make phone calls. Not to have to sit and dictate. Not to worry about spelling.

Baker: So your chairman can type?

Cores: He can type, but he's not a speed typist. But when you get a message from him, you find out that he is more interested in getting answers as opposed to content and form. If I'm sending a message to you, do you care if I spell "saw," "sew" or "aww"? You don't. And what you find is that a lot of the formality goes out of what we have

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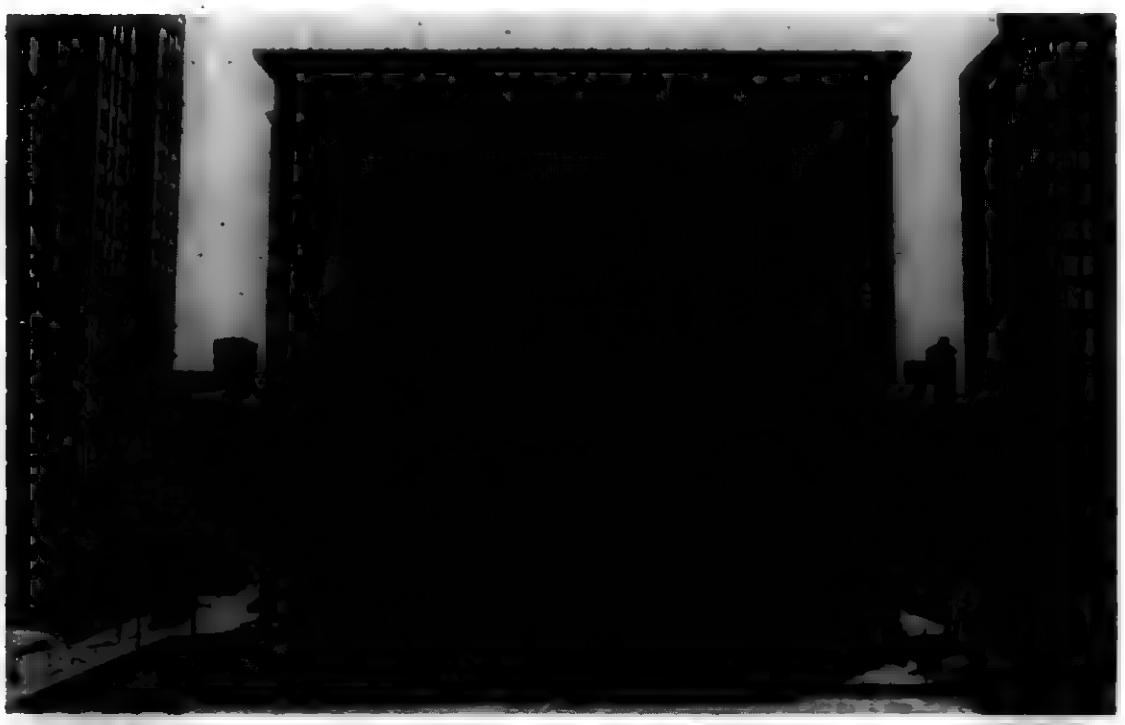


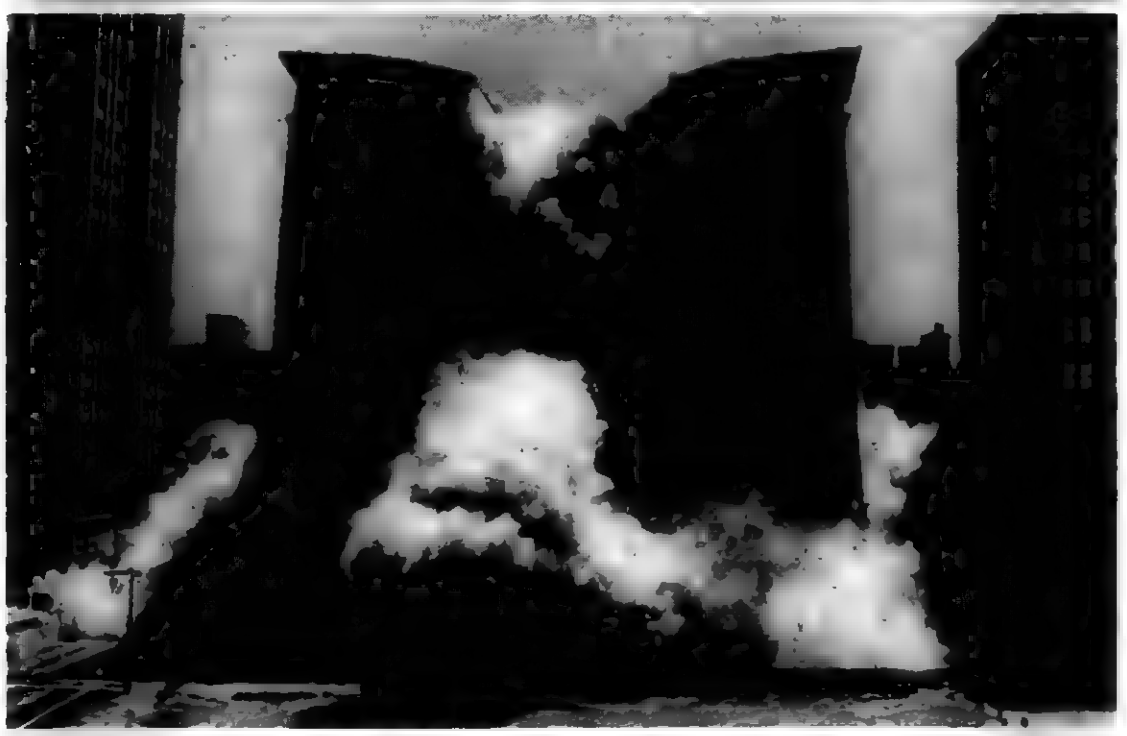
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Continued from page 54

to do now, because it's expected and it's written and everybody sees it. You also learn that they cut through management layers. If you put workstations on multiple people's desks, you don't need multiple tiers of management to pass things through. The line goes directly from the chairman of the board to whomever he or she wants to send that information request to. And once it comes from the top down the first time, you've broken that barrier and information is free to flow back up to the top. Our chairman has a terminal at home, a portable he travels with. In essence, he's never away from the office.

Baker: People are beginning to write articles today on organizational design or philosophy that say to improve the efficiency of the organization, you need to flatten the organization and widen the expanse of control. That is such a true statement. That is the sort of thing that end-user support can make possible in an organization. Quick and effective communication is vital to achieving that. You get better and quicker decisions.

> ***'Once communication comes from the top down the first time, you've broken that barrier and information is free to flow back up to the top.'***
>
> — Beneficial's Luciano Cores

Danberg: The technology is here. It's integratable. We're crossing boundaries. If you look at the history of MIS, all our systems were based on cost-effectiveness or the cost of doing business. Nobody would deny doing payroll. Nobody would look for the cost-effectiveness of doing a payroll; that's the cost of doing business.

Now we hear the phrases "competitive advantage" and "productivity," both of which are not terribly measurable today. So it requires a belief by senior management that the payback is there. I have to say that's cultural and it's industry-driven. In the engineering-oriented industries, they recognize that. It's highly management-driven. If senior executives believe there are advantages to be gained, even if they are not measurable today, they'll move forward.

The outlook for the future

What is your outlook for the future of end-user computing?

Danberg: I'd have to say it's a field that's evolving. The problems we will be faced with in end-user computing are the problems we've faced as a maturing industry within DP. We're only a 30-year-old industry, and we've made remarkable strides. The old adage was "large systems, large problems, small systems, small problems." I don't think that holds true. The problems are the same. As we embed data processing into the business process through the use of PCs, we're going to have to be very creative in our outlook, in our approach. It's going to be evolving with changing roles on both sides, all for the better, in my judgment.

Baker: There will be a continuing fuzziness between foundation systems and information systems as time goes on. As communications becomes better and better and high-speed communications becomes available, the large processors will be data reservoirs and the data manipulation will be done at user stations, even the very large number crunching that goes on in mainframe processors now. It all will be tied together virtually at bus speed, and small systems will extract the data, manipulate it, produce whatever is necessary and put it back.

Cores: You will see a blurring between the mainframe, mini and micro environment. It will become transparent to the user. It's not all that far off. You're not going to know where what you're doing is being processed, be it on your desk, on a mainframe or wherever. That will offload a lot of CPU cycles. So you might not see a large growth in host-based processing.

Departmental computers, the 32-bit Digital Equipment Corp. Microvaxes, the DG MV/2000s, are going to play an important role. You're getting a MIPS' worth of power now for $15,000. I'd rather have one of those that supports 15 users in an area at a $3,000-per-workstation cost than PCs on everybody's desk, where I have to figure how to network them together, how to get data back and forth.

Brzezinski: I look at what's happened as a lot of excitement. Within the last two years in particular, a lot of tools have been put in place to take advantage of the many things we've been trying to do for the last 10 years. We're just starting to leverage a lot of the client community talent, resources and ideas, and we are in a position because of the technology to link all this together.

We're buying tools to drop down everything into PCs and further blur the boundaries. My biggest challenge is to refocus the traditional information center. How do you now position what has been a very successful group of people to take advantage of this next era? Of trying to capitalize on the talent out there in the client communities? ■

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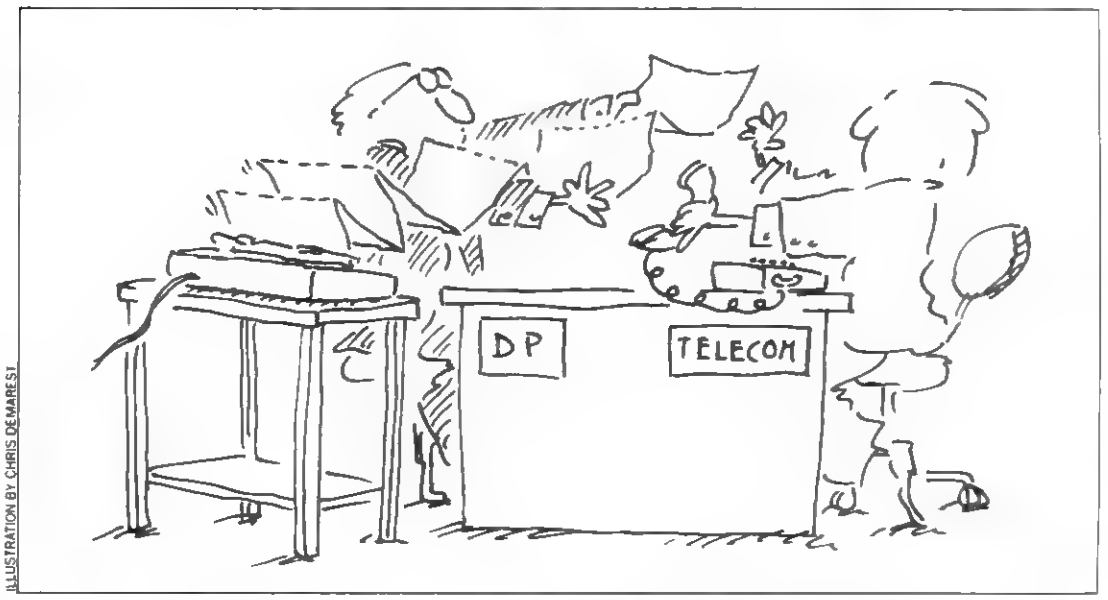


ILLUSTRATION BY CHRIS DEMAREST

The roles needed to manage the integrated technologies are changing, and so, too, should the organization that has responsibility for them.

By PETER G. W. KEEN

For the foreseeable future, the bottleneck in exploiting integrated information technology in general and telecommunications in particular will be the supply of good people, not the supply of the technology itself. This partly reflects the gap between the need and the supply, which has always been a problem in the information systems field. Typical large firms carry backlogs of development projects measured in man-centuries rather than man-years.

Personal computers and end-user software packages have helped cut into the backlogs but have created new ones of their own, as supply creates demand. A rough rule of thumb is that 50% to 70% of information systems staff is working on maintaining or updating existing systems, 20% to 40% on enhancing them and only 10% on developing new systems.

When the tax laws change, a business unit adds a new customer service or IBM introduces an improved operating system, existing programs must be modified. The effort can be huge. When the U.S. Postal Service proposed changing the ZIP code to nine digits, calculations of the cost to the Fortune 100 firms of changes to their basic processing systems were in the billions of dollars.

The problems of maintenance and backlogs will remain with us for a long time. Software tools for developing large systems are improving, but productivity is increasing at a far slower rate than are the demands for new applications.

This constraint, though, is relatively small compared with the fairly sudden shift in the entire skill base required for the integrated technologies. If one knows a person's job title in information systems, one may have no idea what he actually does or what is the career trajectory for the job. The chart on page 60 summarizes the changes from the era of separate applications in the 1970s to the portfolio of technologies and applications for the mid-1980s and 1990s.

In discussing these changes, the acronyms IIT and IS are used. IIT stands for integrated information technology. IS stands for information systems, the corporate development function for the main computing applications. (The old term was "data processing"; "information management" is a more recent one.)

No standard labels

One of the problems in describing what is happening in the field is the lack of standard labels for and descriptions of the broadening range of jobs, skills and roles involved. The chart gives a flavor of the range. When we are short of people in the professional jobs, the problem of building a new human resources base will be horrendous. It will be worst in the area of telecommunications, especially in terms of finding individuals who combine the following, virtually contradictory requirements:

Strong technical qualifications in digital communications and in the integration

About the author

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of communications and computing: The ink is scarcely dry on the diploma.

Strong operational experience — older and with obsolescent knowledge but solid understanding of large-scale commercial operations.

Proven management skills — something few technical specialists have the desire or even the talent to acquire, wanting instead to build systems.

Knowledge of the business — Where does technical staff get the lateral development and exposure to build the knowledge? Where do they find the time to keep up in the technical field as well?

Few people combine this mix of skills; they are at a premium in the marketplace. As firms recognize the importance of telecommunications to their business strategies, they are willing to pay whatever is needed to get these people.

It is not just managers who are scarce: Technical specialists in advanced telecommunications are always hard to find — and to keep — because the field is changing so quickly. Younger staff members with Ph.D.s in computer science often lack a real understanding of the operational side of telecommunications. On the other hand, the older ones need a sabbatical to update their knowledge base, but they cannot be spared from their existing work.

The problem is not simply one of a limited supply of bright, educated, motivated people, nor is it one of salary. Over time, the market will alleviate, if not eliminate, that shortage. A far greater problem is that while a firm can go out into the market and bid up the price for first-rate technical talent, organizational experience has to be built, not bought. Telecommunications for business strategy involves building the human equivalent of a wine collection. The intellectual crop of 1986 may be the best since 1888, but the wine has to mature for years.

Of course, not every technical professional needs to acquire those skills. But more and more aspects of exploiting the information technologies depend on the hybrids — people who combine strong technical and adequate business and organizational skills or strong business and adequate technical ones. They are the human resources base for the new IIT organization. They do not have career paths, because their jobs never existed. They have only career trajectories — and immense career ambiguity (see chart page 61).

Career ambiguity

IIT increasingly relies on taking people who are on a technical trajectory and moving them toward a business/organizational one. For example, the information center is an IS innovation designed to help business units build their own development capabilities. They can use end-user software to build their own planning models and spreadsheet reports or design a small-scale management information system. ("End user" is a vague term that basically means that anyone with analytic skills can learn to use the tools; professional training and experience in information systems is not required.)

The skills required to staff and run an information center are very different from the skills of traditional IS development. Technical experience is far less important than personality.

In many ways, the information center is a marketing and consulting arm for IS. It is a service role helping business units, not a technical role building applications.

The best programmers may be ineffectual in the information center, where they reside as professionals with strong standards and focused skills who have to support amateurs muddling through ad hoc projects and perform "quick-and-dirties."

Managing the information center is as much an organizational as a technical role. What is the career path? The job has never existed before. The center's manager has been pulled away from the technical career trajectory and runs the risk of becoming a mediocre technician and of no longer being part of the mainstream of IS.

At the same time, the manager is not a real finance or marketing professional, however many systems his information center helps the finance and marketing departments build. In this way, too, the junior personnel in finance, those who have learned Lotus Development Corp. 1-2-3, Information Builders, Inc. Focus, McDonnell Douglas Computer Systems Co. Multiplan or any of the other myriad new tools for end-user development and who now work almost full-time on building applications that use them, are not real systems professionals. In fact, they possess only a smattering of technical skills — not enough to get jobs in IS. They are also no longer moving along the traditional career path in finance.

The situation is extremely ambiguous on both sides. Integrating the information technologies and bridging the culture and knowledge gaps between technical and business people at senior, middle and junior levels largely depends on maximizing career ambiguity for some of the best talent in the organization.

Just a few examples of areas without clear career directions include office technology, telecommunications planning for business innovation, supporting personal computing, defining information needs for customer service, product development for electronic delivery, financial planning for IIT, training users of personal computers, developing strategic plans for computer-integrated manufacturing and selling technology-based products such as electronic cash management and dealer order entry systems.

In some large firms, senior management's response to the problem of ambiguity is to tell the people concerned about the issue, "Don't worry — you are the ones who will be running the firm 10 years from now." Those concerned do worry, and they need an environment in which what is promised is a privilege, not a punishment. Systematic lateral development and movement of people from IS to business units and from business groups into IS for periods of six months to two years should become an institutionalized part of the way the firm grows its human resources.

This is happening in very few companies, except ad hoc. A frequent pattern is that the junior analyst who builds planning models for the marketing department is initially seen as Superman and quickly becomes indispensable — and unpromotable — and eventually moves on to another firm to do the same job. The junior analysts who stayed within the traditional career framework move up the traditional ladder.

Growing hybrids

The hybrids are the new blood of the organization of the 1990s. For them to grow, they must have management attention, if only because in a time of ambiguity people will watch what management does, not what it says. There are many formal and informal ways senior and middle-level executives can help:

- Selecting the best junior staff for the lateral development that builds hybrid skills.
- Redefining the management fast track to require experience in taking full and direct responsibility for some aspect of IIT.
- Helping break down the physical and psychological isolation of the IS organization by insisting that staff be temporarily assigned to work in business units.
- Providing first-rate instead of expendable supervisors to provide user involvement on development projects.

All these are relatively

The changing nature of DP and telecom jobs

New technology reorganizes job categories and departments: DP became information systems and will merge with telecom in the next decade.

1970s

Data Processing
- Project leaders
- Systems programmers
- Application programmers
- Systems analysts
- Operators

Telecommunications
- Operations managers
- Telephone supervisors
- Cable room operators

1980s

Information Systems
- Office technology analysts
- Business analysts
- Data modelers
- Data base specialists
- End-user support staff
- Managers of project leaders
- Architecture planners
- Decision support staff

Telecommunications

Technical specialists in
- Local-area networks
- Voice/data transmission
- Standards
- PBX
- Data switches
- Satellites
- International Postal Telephone and Telegraph authorities

1990s

Integrated Information Technology
- Specialists in document management
- Specialists in videodisk
- Product development planners
- Expert systems development staff
- Integrated Services Digital Network specialists
- Videoconferencing planners
- Videoconferencing operations staff



simple contributions upper management can make.

Organizing the IIT function

The roles needed for managing the integrated technologies are changing and so, too, should the organization that has responsibility for them. In most firms, that organization consists of a central information systems function plus divisional IS units, a corporate telecommunications group and any number of fragmented units that handle some aspect of voice and data operations. The function of the telecommunications group largely depends on the stage the company is in in the shift from a technical utility to a coordinated business resource.

The specific mandate, structure and relationship of IS to senior management and to the wider corporate organization largely reflect the historical development of DP and the communications utility. Very rarely are these a conscious response to the realities of the electronic marketplace. A new approach to organizing IS is needed.

Organizing is not the same as organization. It is easy to draw new organization charts and shuffle jobs around. Organizing implies a much more dynamic emphasis on communicating and on roles — literally, the parts workers play — rather than on tasks.

On the whole, telecommunications and information systems organizations have been defined more in terms of tasks — projects, specialist skills, technical niches and responsibility for specific applications — than roles. The key themes in organizing IS relate to building systems and running corporations.

> ***Organizing is not the same as organization. It is easy to draw charts and shuffle jobs around. Organizing implies a more dynamic emphasis on communicating and on roles than on tasks.***

Coordination, not control

The new roles relate far more to marketing, communicating, supporting and planning. But the old skills remain essential. If anything, solid, reliable operations are more, not less, important when failures affect service and are seen by customers instead of being hidden behind the walls of the data center. But the new information function is a full service function. This means that the following become the tasks for organizing:

- Coordinate the planning, implementation and use of the information resource, balancing central direction with decentralized application.
- Shift the organization for IIT toward being a staff function comparable to corporate finance, instead of existing mainly as a unit that builds systems.
- Amalgamate telecommunications and information systems within the IIT organization as interrelated departments within the information company, not independent functions.
- Use human resource planning to drive, not follow, technical planning and implementation.

The chart on page 62 shows the likely formal organization structure that will result.

No organization chart can communicate the main role of the IIT function — to find a suitable level of centralization to coordinate the integrated business resource. The main principle for managers of IIT has to be, "Respect the reality of decentralization and establish the criticality of coordination."

Very roughly, this means that the key infrastructures, especially telecommunications, require moving toward centralized direction and that building the applications that carry the traffic and making decisions on what traffic to add should be increasingly decentralized. If the architecture is clear and technical standards are backed up by rules, guidelines and procedures, distributed IS units in the business groups can handle most development needs. This is a very big if.

Guidelines with teeth

B. L. Williams of the consulting firm Arthur D. Little, Inc. provides a useful framework for assessing the degree of centralization of any particular telecommunications organization. He defines a spectrum of decision-making authority ranging from fully autonomous to integrated/centralized.

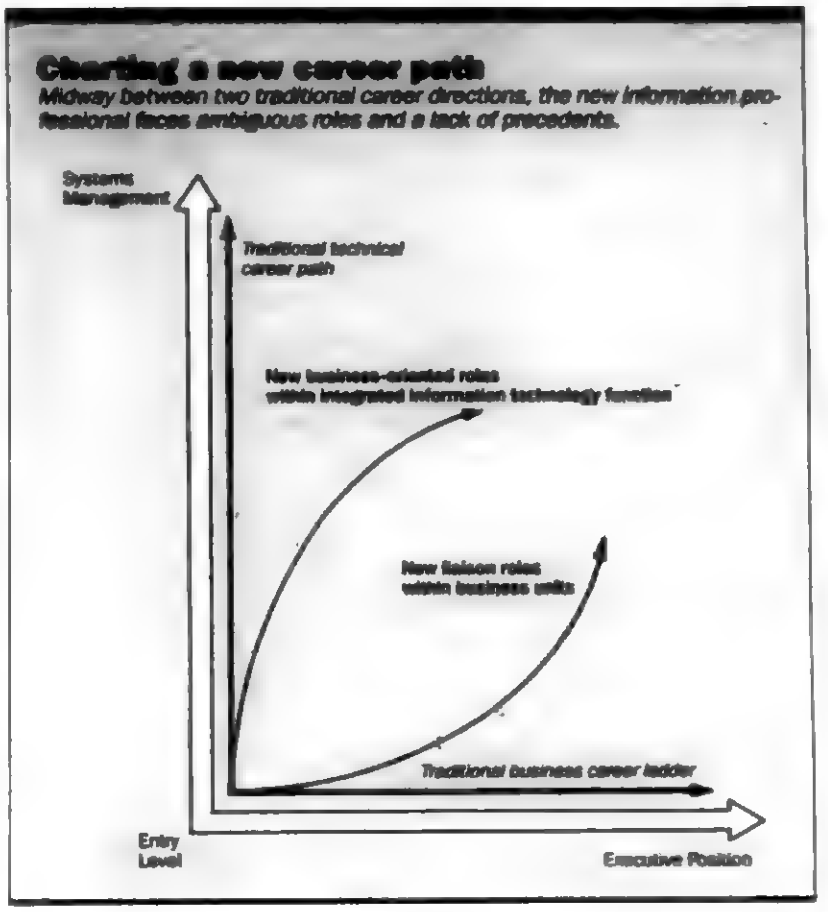
Each extreme seems undesirable. Autonomy — with every unit making its own decisions — means that a corporate resource, as opposed to a set of incompatible technical facilities, will never be created. Full centralization contradicts the principle of decentralized decision making, which is one of the most basic realities of modern business.

The two intermediate positions, guided and coordinated, are unstable — they combine a little of each extreme. They both have many merits, but they can be made to work only if senior management defines a vision to justify them, establishes the policies to make them possible and clarifies the authority and roles of the centralized architect and planning unit and of the decentralized business operations (see chart page 63).

The phrase "guidelines with teeth" addresses the issue of authority. "Standards" is an ambiguous term. It can mean anything from a set of recommendations that can be ignored by business units to a corporate architecture in which no local discretion is allowed. The technical standards may be the same in both instances; the key question is, Who either enforces them or decides on exceptions?

As one telecommunications manager in a major international consumer goods firm discovered, publishing a set of standards does not answer that question. His company, Quintex, Inc. (this is a pseudonym), planned to install a common worldwide financial reporting system. To support this, the manager defined a set of computer and communications standards to be followed by each division in each country in which Quintex operated.

The head of Quintex's Taiwan subsidiary decided not to wait for the new system. The volume of



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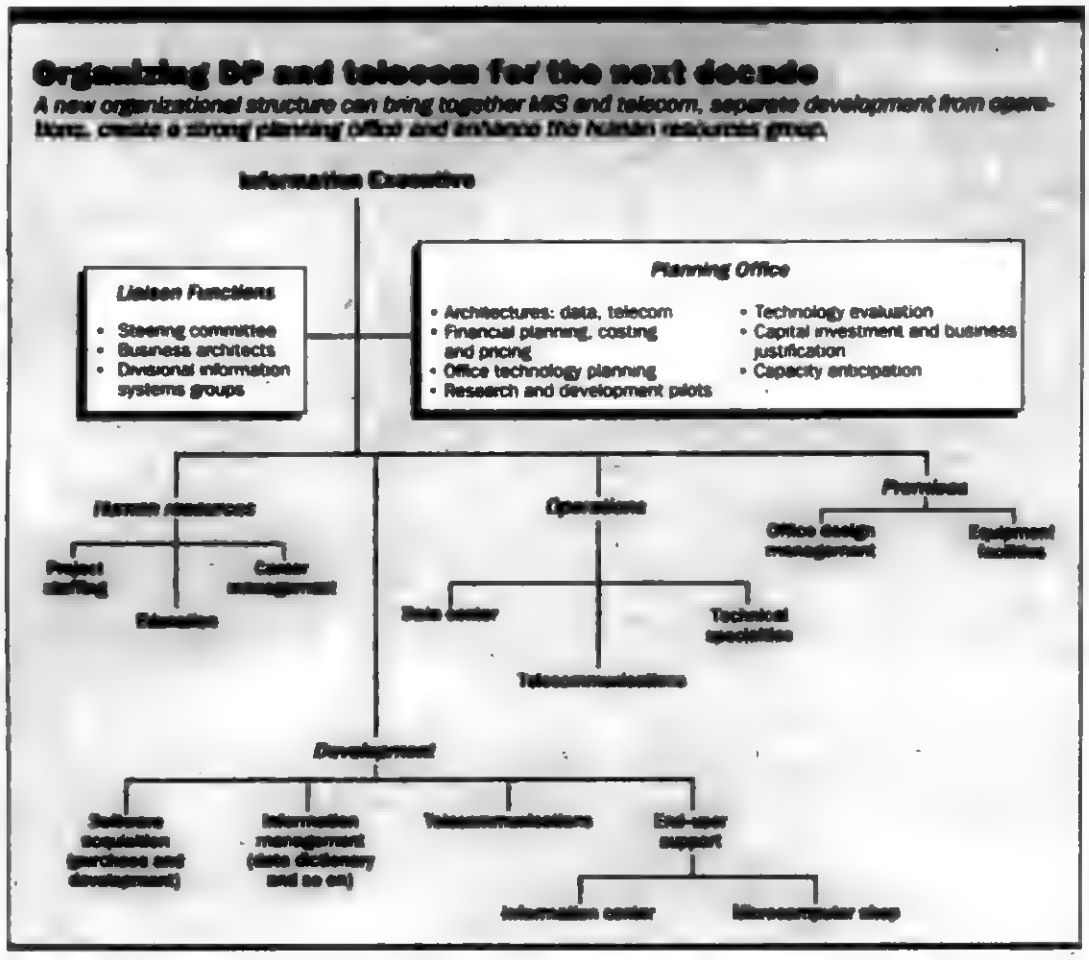
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business was expanding rapidly, and existing computer systems were inadequate to handle the unit's needs.

He approved the purchase of a software package that ran on a nonstandard computer and used the equipment manufacturer's nonstandard communications protocols.

The corporate telecommunications manager tried to get the decision overridden. He pointed out that he had been given the responsibility to define a company-wide policy and that Taiwan's action threatened the whole concept of shared computer systems, common reporting and integrated communications.

The head of the subsidiary responded in a memorable telex that he had been given the responsibility to make profits for the firm, that he had immediate needs and did not intend to sit around and wait.

The communications manager responded that the local decision threatened long-term integration. He argued that it would add costs in the end and slow down the implementation of the worldwide system. He lost the argument, and Taiwan has its independent communications facility.

It is not easy in such instances to decide who is right.

Here it did not matter: The senior business manager had the authority, the communications manager had nothing more than a piece of paper, and might was right. For standards to be effective, they have to have teeth.

Quintex's communications manager recognized this after the fact. He asked the information systems steering committee, which set policy for computing and communications, to clarify this mandate.

The manager listed the benefits from the integrated approach and the costs of local autonomy. He accepted that sometimes exceptions would have to be made but argued that he must have, if not the final say, then at least some real influence.

He wanted a preliminary veto: All local systems must follow the standards, and his unit's approval should be required for any deviation from the standard. He would have vetoed the Taiwan proposal and suggested they find an alternative package.

If Taiwan wanted the veto overturned, they would have to make their case to the IS steering committee. He said, "The onus should be on the divisions to justify exceptions, not on me to justify the standards."

The corporate architect

Most large firms have an architecture or are trying to define one; that is a basic requirement for any coordinated communications plan.

These firms need to make sure they clarify the role of the corporate architect.

At the one extreme — fully autonomous management — the corporate architect is a staff adviser and at the other — fully integrated and centralized management — a controller.

Guided or coordinated management requires a custodian — someone who can guarantee the integrity of the overall architecture while adapting it to special needs and exceptional situations. This means having at least a preliminary veto. Quintex's manager defined an architecture, but his role as an architect was not made clear.

In almost every firm in which telecommunications is seen as more than an internal technical utility, the trend is toward centralization.

This assertion is based on analysis of almost 50 large companies, half of which are U.S. and half European. They come from every major industry.

The analysis is based on published and private documents and was carried out in mid-1984.

The firms include Exxon Corp., GTE Corp., Citibank N.A., Federal Express Corp., Connecticut General Corp., Merrill Lynch, Pierce, Fenner and Smith, Inc., Chase Manhattan Corp., Sears Roebuck & Co., American Express Co., IBM and Lockheed Corp. in the U.S. European firms include Sainsbury and Tesco Stores PLC, Scandinavian Airlines System, British Leyland, Ford Motor Co. in the UK and Germany, Grand Metropolitan PLC and Barclays Bank PLC in the UK.

Regardless of their specific strategies, almost every firm is trying to resolve the issue of how to get centralized coordination. None of them want to push toward more decentralized planning, although most of them favor decentralized network operations. The firms with central units that are most successful politically and technically share the following characteristics:

- The central group plays a strong consultancy role for the other units. The central unit relies on having a pool of first-rate technical staff to encourage the other units to draw on it; rather than try to control by fiat, the central group controls by incentives and expertise.
- They have a clear mandate to design and maintain the optimal topology for the corporate network, supervising almost every aspect of planning and operating facilities that are identified as "corporate."
- They use accounting mechanisms and provide service and support functions to

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A range of telecom management styles

On the spectrum of management styles, the extremes — "local autonomy" and "centralized" — are undesirable. The intermediate positions offer many benefits but require vision and clear lines of authority to achieve balance.

	Strategy	Role of Corporate Telecommunications Group	Telecom Standards	Corporate Priority		Organizational Pros and Cons
Local Autonomy	Business units take full responsibility for planning operations	Advisory only; may coordinate investment plans	Minimal, if any	Cost-efficient local operations	+	Matches planning, operations to decentralized units' very different needs and environments
					–	Guarantees incompatibility; no basis for gaining economies of sharing
Guided	Local autonomy plus central unit to provide technical and planning assistance	Provides guidelines and consultancy services, especially in areas involving new technology	Standards are recommendations based mainly on technical and cost issues	Cost-efficient local operations plus providing economies of expertise	+	Builds small, highly skilled advisory group that local units can draw on
					–	Standards often ignored, since authority lies with local units
Coordinated	Central group plays strong staff role and sets criteria for long-term planning and investment	Coordinates planning and may supervise operations of some corporate facilities	Guidelines with teeth; corporate group has some authority to ensure standards are followed and to approve exceptions	Balance between centralized coordination and decentralized development and operations; creation of flexible architecture to provide integration path	+	Provides base for corporate highways with local freedom about traffic
					–	Frequent ambiguities or conflicts of authority
Centralized	Creation of a corporationwide set of shared utilities and common delivery base	Directs planning and operations; ensures standards are followed; may leave day-to-day operations to local units	Standards are rules to be followed	Corporate rather than local cost-efficiency; creation of shared corporate resource	+	Provides clear links between corporate business planning and telecommunications planning
					–	Frequent opposition by local units to central "czar"

ensure credibility, equity and incentives for their client units.

The accounting mechanisms include charging by use, not budget, with a predictable standard cost per unit — such as a transaction or monthly subscription fee per terminal. Another mechanism is providing both consolidated and detailed billing reports so that user managers can predict and control their level of computer usage. Many of the firms try to set their prices below the outside market rate.

In many of the firms, especially outside the U.S., operations relocation motivates coordination; many of the firms are moving information systems and administrative units away from central cities. Another coordination trigger is office technology and a general concern with reducing overhead and staff costs.

A third force toward coordination is simply underestimating growth in demand for telecommunications. One oil company anticipated and planned for a 20% increase per year in the number of terminals in use between 1980 and 1985; the actual figure was 70%. Bank of America anticipated in 1982 that it would process 80 transactions per second on its main on-line systems by 1986; in 1984 it revised the estimate to between 500 and 1,000. A British insurance firm based its five-year plan, beginning in 1986, on the assumption that it would have one workstation for every 10 workers by then. By late 1985, the ratio was already 1:3.

The information executive

Information executives possess the authority to guide and coordinate. However, they are not czars. Much of the executive's role involves liaison and negotiation with corporate and business unit managers and with divisional IS units.

Some of the mechanisms for two-way coordination include steering committees, liaison units for applications and formal and informal planning groups that include representatives from the business units, divisional IS groups and all other groups affected. The job of these committees is to establish priorities and plans and to resolve issues of resource allocation, phasing, staffing and project management.

One key liaison mechanism requires much senior management direction or attention, especially when the firm is trying to accelerate its use of technology to make major business moves. That is the top policy committee of managers who can make things happen and who share, review and update the corporate vision for telecommunications and make it credible.

This is not just another committee. If it includes two or three of the most senior managers in charge of key parts of the business, a few who may be more junior but are recognized in the firm as innovators and opinion leaders, plus the head of any corporate function who is a very powerful force in the firm, then the title of the committee is irrelevant.

Citibank's Institutional Banking Group called its planning committee for international electronic banking "the gang of seven." Tom Theobald, the committee's head, assigned some strong personalities from marketing to direct its efforts. One of these was famous for his aggressive moneymaking for the bank.

The technical organization in the international bank was very weak, and no bland committee could have given it the political muscle that the gang provided. The selection of these people sent a clear signal to the rest of the firm of the importance the bank placed on telecommunications.

Cross-fertilizing in planning

No firm that is trying to move quickly to exploit IIT possesses the in-house skills needed to direct its planning. IS and telecommunications leaders need accountants to find ways of funding, costing and pricing what is now a complex economic good. They need marketing experts to shift to a service role.

The information center, support for end-user computing, assignment of client or account managers to handle particular business units' needs and the development of business systems analysts are only a few areas in which information systems and telecommunications groups are adopting a market-oriented rather than product- and application-based service role.

But these groups possess very little knowledge of marketing principles and techniques.

In the same way, IIT needs economists to help in forecasting, pricing and modeling the relationship between the business plans, the external environment, vendor strategies and trends (especially IBM products and prices and telecommunications costs) and the technology strategy.

It increasingly has to be able to draw on people who understand ergonomics, psychology, education and human resource planning, because every aspect of IIT is now intrinsically linked to behavioral and organizational issues.

Sincerity is no substitute for technique. The best IIT organizations are sincerely doing their best to broaden their planning bases. But sincerity just isn't enough. Technique comes from the following practices:

- Systematic cross-fertilization between the IIT unit and the wider organization, by recruitment and temporary assignments from within the organization and by distributing development and support staff to the business units.
- Using consultants and academics to bring in new knowledge and avoid personal obsolescence, to provide an integrating perspective and to help educate and advise senior managers.
- Hiring, growing and retaining good talent.

A few of the planning areas for IIT have to be addressed by some combination of these three sources of talent (see chart page 62). Obviously, it is up to the IIT organization to handle most of these aspects in the short term the best way it can; for the long term, they should rely on human resource planning.

To encourage staff to seek and accept the temporary assignments to or from IIT necessary for cross-fertilization, present such jobs as a privilege accorded to the new "fast track."

Reassure the assignees either by guaranteeing a position to which they can return or by creating permanent liaison roles.

Insist that there be no poaching. Many IIT units report that their users, quite sensibly, try to retain any good people who have been loaned to them.

Remember that the goal is

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to build a cadre of hybrids. Time the lateral development carefully: It is silly to take someone who has 20 years' technical experience and very limited exposure to the business and expect him to be credible or effective outside that sphere; the vice-president of systems development should not become an overpaid apprentice in marketing.

Conversely, if trainee programmers are shipped out to the finance department, they are of little value, since they have not yet mastered their own trade.

The best time to make the move seems to be between two and five years after a person's hiring. The time spent in the other department should last no more than two years so that the person's old knowledge does not become obsolete.

If 10% of incoming recruits are targeted for such a process in both directions, the long-term human resource problems for IIT will be solved in about five years. The sooner a firm starts, the quicker the chief bottleneck that hinders the exploitation of technology's opportunities will be unjammed. Good IIT managers and good personnel managers know this. They generally cannot do much to solve it, because it requires both senior management initiatives and clear signals from the top that this is the path for the future.

As for consultants, in all fields there are bad and good consultants, greedy and responsible ones, merchants of hype and solid professionals. It can be hard to tell which is which, especially in new technical areas.

The best advisers often apply their business experience to a new area involving technology, although they will not have built the systems they are recommending. The top technical specialists apply their insights to a new aspect of business but will not be able to show success in it.

Getting a sense of options

Often senior executives bring in academics or well-known experts to help them get a sense of the main options and issues. When they do, however, DP managers should beware of joining the fad-of-the-month club.

For example, when *Business Week* published a cover story on the coming wonders of expert systems, many IIT managers groaned. The article, like so many on a hot new topic in the field, gave senior executives false expectations about the progress in expert systems and artificial intelligence. It led to them pushing for action and bringing in experts to talk about what the firm should be doing.

These experts often come from a scientific or academic environment where their experience is with small-scale applications or pilot projects — that is where work in the state of the art is being done. However, they have no understanding of large-scale commercial processing and operations, of organizational aspects of information management.

It is not that their knowledge is invalid — only their extension of their knowledge to the world of business and business uses of technology.

Differences exist between the worlds of scientific/academic and large-scale business computing. In scientific/academic computing, analysis is complex in terms of methods, models and computation. Data structures are complex, but volumes are low; software is advanced. The technical base is a stand-alone or simple time-sharing computer, and "architecture" refers to the hardware. The organizational context is of limited relevance to a technical decision, and implementation is equivalent to installation. The application is the strategy.

> ***It is silly to take someone who has 20 years' technical experience and limited exposure to the business and expect him to be credible or effective outside that sphere.***

In commercial computing, operation is complex in terms of project management, coordination and procedures. Volumes limit the complexity of data and the practicality of software with high overhead and inefficiency. The operating system and architecture dominate decisions; architecture relates to the integration of the organizational resource. Organizational interactions are driving factors for decisions, and implementation means making the system work organizationally as well as technically. Business operations define the strategy.

Learning by example

Bright people who operate only from experience and assumptions often make IIT managers look like anti-intellectual Neanderthals; these managers are put on the defensive.

Until very recently, the field of information technology in large organizations held substantial barriers to entry: Managers had no experience in the trenches of systems development or telecommunications operations. That barrier has been removed.

The areas in which firms most often need top-level advice are the ones in which such experience is not necessarily relevant. Business planning for telecommunications is one such area. The best advisers will be people who are thoroughly up-to-date on developments in the International Standards Organization's Open

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Financial Modeling Packages for Micros (Product Spotlight, September 15) Examines how standalone spreadsheets are fast disappearing and being replaced by integrated programs or financial modeling packages. The main article looks at what users can do after outgrowing their spreadsheets, and presents the use of a financial modeling package as one solution. Closing date August 29

Communication Standards (Executive Report, September 22) Focuses on electronic data exchange protocol (EDI), which allows for the direct computer to computer exchange of standard business forms. This report studies the value of EDI in the transmission of purchase orders, invoices and other important documents in various industries. Also, a look at how EDI is strengthening the trade relationships between customers and suppliers. Closing date September 5.

On-line Computing (Executive Report, September 29) Explores the fact that although on-line transaction processing (OLTP) has been around since the 1960s, the market is now heating up with IBM and some BUNCH companies battling a group of young companies for the bulk of the market. This report examines on-line computing with a look at the major players, the current state of the art, and what users want. Closing date September 12.

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October 13	Hardware Roundup/Small-scale Systems (Product Spotlight)	September 26
October 20	Hardware Roundup/Microcomputers (Product Spotlight)	October 3
October 27	Decision Support Systems (Executive Report)	October 10
November 3	"1000th Issue/40th Anniversary of the Computer"	October 10
November 10	PC Graphics Hardware (Product Spotlight)	October 24
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PRODUCT SPOTLIGHTS

Systems Interconnect and advances in local-area networks, value-added networks or digital private branch exchanges (PBX).

Examples of instances in which the inexperienced adviser says "It's easy" because a concept is proven or a framework is available include large-scale data base management, international standards for telecommunications, implementing local-area networks and voice/data integration. It is not easy to implement these advances, and it is misleading to persuade managers that it is.

The IIT field is grasping for ways of making sense out of the bewildering changes and dilemmas firms face. But the firms need simple, not simplistic, models. How do they tell the difference? The deep and the shallow thinkers all use the same transparencies in their presentations. Conceptual models and mere motions look and sound the same. The deep thinkers have a base of proven results, either their own experience or the successful implementation of their recommendations.

Sometimes a leading adviser, especially on the busy conference circuit, comes up with a useful framework or striking message. That speaker will be in constant demand. The temptation is then to stop learning and to stick with the one idea, well and often wittily presented. Again and again in IIT, good academics and consultants have used up their intellectual capital by turning it into temporary income.

This is a problem of intellectual adolescence. IBM represents the orthodoxy of information technology. Many of the Young Turks in the consulting field are explicitly anti-IBM.

There is a lot of truth in the criticism of IBM. The new IBM is not the old one. It has been the aggressor, not the follower, in the market. With all its faults, it has moved to head off all its competitors — even AT&T — except the Japanese. This now is the battleground.

Most important, it has established its architectures, rather than its products, as the reference for the field. IBM's Systems Network Architecture is the de facto standard. That is why every major manufacturer of computer and telecommunications equipment has adopted it. Its personal computer has never been the best in the field, nor have its office technology products generally matched the best of other vendors.

Experienced IIT managers and planners know all the pluses and minuses of IBM, from the value of the plastic wrapping to the cost of cumbersome operating systems.

For them, the issue is, "If not IBM, then who?" For the new generation of consultants, the response tends to be, "Not IBM." As a knee-jerk reaction, that is as absurd as the stereotypical old-line DP manager's reaction, "Only IBM, of course."

> ***"Experienced IIT managers and planners know all the pluses and minuses of IBM. For them, the issue is, "If not IBM, then who?" For the new generation of consultants, the response tends to be, "Not IBM." That is as absurd as the stereotypical DP manager's reaction, "Only IBM, of course."***

Choosing an adviser

Does this person understand the craft of large-scale information systems and telecommunications development and operations? Has he worked on a really big project (involving at least a dozen people for a two-year period, say) from inception to operational use?

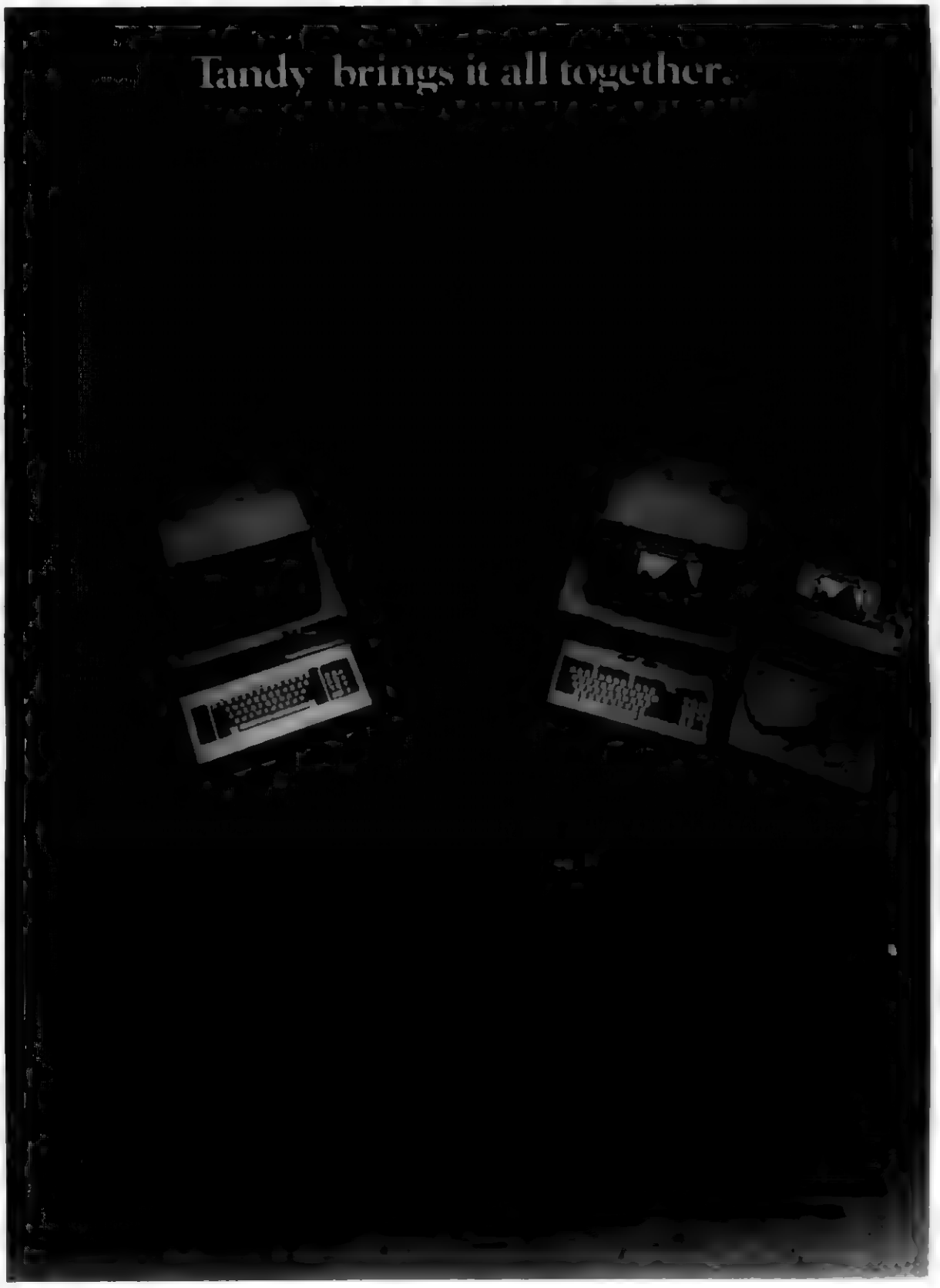
If not, there is a fairly strong risk that he overlooks the complexity of the management process and interaction between technical and organizational issues in large-scale business applications.

One cannot simply extrapolate from scientific projects that involve small, simple or well-structured data bases, or from personal computers and local-area networks, to an environment marked by a myriad of interdependencies.

What is the candidate's pedigree, in terms of intellectual base and the quality of the firm(s) he has worked in? The exemplary firms described provide their people with a training ground that in itself adds a value to the employees' own qualifications, job titles and project experience. The same is true for the very best of the computer and communications vendors.

Does the adviser know the field, in terms of the research literature, what is going on in the leading vendor and user companies and what the practical state of the art is? Ironically, at a time when the field of IIT needs a combination of first-rate analytic ability and some mix of breadth and depth in business and technical areas, anyone can become an expert. It is very easy for people to grab at the latest fad term or hot topic and sound convincing. This happened in the early 1980s with office automation and more recently with expert systems. It is increasingly commonplace with business telecommunications, which is among the hottest of all topics.

The reason senior managers have to address the issue of how to validate outside advisers for IIT is simply that they have no choice but to



use them. The same is true within the IIT organization. Bad advisers do damage, however. They raise expectations about what is practical, mislead the organization about the risks and returns and add to fog and fantasy, not vision.

Development and operations

The most immediate change large firms have to make in how they organize the IIT unit is to move from having information systems and telecommunications as separate functions — each with a development and operations unit — to splitting the IIT organization into a development arm and an operations arm, each of which includes both telecommunications and information systems groups.

In many large firms, telecommunications and information systems have evolved on largely separate paths. In addition, the pace of change in communications from voice and analog to digital technology and in information systems from automation of clerical processes and batch systems to a broad range of on-line and data- and communications-oriented applications has increased the fragmentation of responsibilities and authority.

> ***Bad advisers do damage. They raise expectations about what is practical, mislead the organization about the risks and returns and add to fog and fantasy, not vision.***

The company then has voice specialists who do not understand data communications, data communications staff members who disdain data processing as a technically unsophisticated function and DP specialists who view telecommunications in terms of the software requirements for on-line applications. The development staff possesses up-to-date technical knowledge and relatively little experience, while the operations personnel have the solid experience and an obsolete knowledge base.

The cultures have to be brought together and the organization based on each one's strengths.

In the development arm, the information systems functions include the following:

Software acquisition to build and buy applications. The trend is toward buying packages, end-user software and fourth-generation languages. Standards for system compatibility are important.

Information management. Data is among the most valuable traffic on the network highways, and the delivery of and access to data via telecommunications is a competitive resource. Data base management software and procedures and technology to create the data architecture shift the focus in IS from programming to information resource management.

End-user support. An information center should be a do-it-yourself store for nontechnical people to develop ad hoc small-scale systems and should offer assistance in acquiring and using microcomputers.

First-rate operations remain critical. Reliability, security, response time, smooth installation, maintenance and troubleshooting translate to quality of customer service in the business resource era. When the network is down, the business is down.

The old-timers are not obsolete — they provide a critical skill. Rather than turn them into mediocre development supervisors (and the digital communications whiz kids into ineffectual managers), surely it makes most sense to recognize that strategy needs cables as well as vice versa.

Last but not least: facilities

The final major innovation in organizing for IIT is one whose importance is easy to overlook; the fact that the office of the future is very physical in nature and telecommunications has tremendous implications for office design and administration and vice versa.

Many telecommunications-related functions are controlled by administrative service units, especially at the local level. Now, when an employee moves to a new office, there can be several hours of work needed for drilling and cabling to install a workstation.

Furniture, lighting and desks have to be picked on the basis of ergonomic and health and safety factors for users of terminals. No office can be designed now without careful attention to cabling for local-area networks, PBX and an employee-workstation ratio that is virtually certain to move close to 1:1 during the lifetime of the building.

The information executive needs new authority over many aspects of office design and must supervise any relocation of business operations and control the planning of office equipment and facilities. This aspect of IIT is very different from development and technical operations.

Facilities management has traditionally been a subset of administrative services. The move is now in the other direction. One manager of IS in a large insurance firm is quite candid about his objective here: "I want to get full control over administrative services, because by 1990 the main evaluation criteria for my group's performance will depend on trivial details that they now handle." ■



MANAGEMENT

TAKING CHARGE
Mitch Betts
and David A. Ludlum

Pregnancy and VDTs

If you thought the study of the effects of VDTs on pregnant women by the National Institute for Occupational Safety and Health (NIOSH) would be the end-all of VDT studies, take a closer look.

The study will focus on whether VDTs cause miscarriages and birth defects among women who use them. But in approving money for the study, the White House Office of Management and Budget (OMB) ordered the deletion of questions about whether VDTs might cause stress, a key issue considering the pace of much data entry work.

NIOSH plans to study the pregnancies of 2,000 telephone directory assistance operators who use VDTs at Bell South Corp. and compare them with those of 2,000 AT&T operators who do not use VDTs [CW, Jan. 14, 1985].

In an interview earlier this month, Teresa Schnorr, an epidemiologist who is directing the study, described the deleted portions as "critical." These portions would have investigated concerns that VDTs might affect a woman's ability to conceive or may cause miscarriages that occur so early in a pregnancy that they are not noticed. Bell South opposed those portions of the study in a critique submitted to NIOSH and the OMB, Schnorr said.

Many observers had hoped the NIOSH study would end the debate over clusters of miscarriages and birth defects reported by women using VDTs. Last year, a report by the U.S. House of

See **PREGNANCY** page 70

Betts is Computerworld's Washington, D.C., correspondent, and Ludlum is senior editor, management.

U.S. West boosts OA links

Holding company seeks postdivestiture solution

By David A. Ludlum

DENVER — U.S. West, the regional telephone holding company for 14 western states, has embarked on a program of integrating a slew of disparate computer systems in an effort to improve internal communications and reduce costly use of paper.

The job entails linking office automation hardware and software from IBM and Wang Laboratories, Inc., as well as machines from Digital Equipment Corp. and Unix systems running on boxes from several other vendors.


Paul Malkoski

The effort stems from a corporate drive to improve communications by allowing users of the incompatible equipment that has been installed over the years to talk to each other and receive memos via electronic mail.

The unification of the systems by U.S. West, which operates Mountain Bell, Pacific Northwest Bell and Northwestern Bell, is in part a response to organizational realities generated by the breakup of the Bell system.

"Since divestiture, we've been taking a more universal approach to problem solving, particularly in office automation," said Paul Malkoski, an assistant staff manager with Mountain Bell's Business Information Services department.

As a by-product of improving communications, the company aims to stem the tide of paper streaming through its offices by 25% this year. It estimates usage of 35.8 million pieces of paper a year at a cost of $45.8 million, a volume it attributes in part to the dictates of regulation and divestiture.

Half of the paper reduction is to come from the expansion of electronic mail, which emphasizes broadcasting memos as well as transmitting messages among individuals. Memos are being distributed through electronic bulletin boards and document data bases, Malkoski said.

The other half of the reduction is to come through new record management systems, including a computer-assisted retrieval system from Eastman Kodak Co., and through changing workers' attitudes toward the use of paper.

Separately, U.S. West's Human Re-

See **U.S.** page 69

Expos bring technology in-house

By David A. Ludlum

Pressed for time and faced with a steady barrage of computer product announcements, some information systems managers have taken vendors by the horns by inviting them to in-house miniature exhibitions.

Such an event, called a technology day by some, is one of a variety of methods that information systems managers use to keep up with rapid-fire technological change while attending to their other myriad duties.

"The problem is keeping abreast of technology," says Ronald Price, information systems operations manager at Polaroid Corp. of Cambridge, Mass. "Technology day came about as a result of vendors coming in with different products and new releases. I said, 'Gee, this is crazy.' "

At the Gillette Co. of Boston, where similar events are held, manager of office systems Joseph J. Calabresi says he started holding technology days for a selfish reason: "I just haven't the time anymore."

The idea is "to get problems and solutions together," Calabresi says.

By inviting the office systems vendors around which Polaroid has standardized — Wang Laboratories, Inc., Digital Equipment Corp. and IBM — the camera compa-

See **EXPOS** page 69

INSIDE

Calendar: Shows, conferences, seminars/**72**

INSTANT ANALYSIS

"You see the information center positioning itself as an information broker, and that's a very powerful position."

— **Eric Greenberg, director of surveys for the American Management Association**

MANAGEMENT MEMO

Strategies: Hyatt tests terminals; firms employ ergonomics

Hyatt Corp. is experimenting with using information technology to enhance accommodations at its Hyatt Regency Hotel in Cambridge, Mass. The hotel installed terminals for an in-house videotex system in deluxe rooms on a floor for business travelers and outside elevators on other floors.

The system, developed by Cambridge Technology Center, Inc. (CTC), uses AT&T 3B computers and 510 terminals and a telephone with touch-screen dialing. It offers information on hotel facilities and local dining and entertainment.

After a two-month trial, CTC removed the system to improve the software. The terminal was not designed for public use, which caused some users to lose their way, said CTC President Howard Kolodny.

CTC is developing a new read-only memory and expects the system to be back in service in "a month or so," Kolodny said. In the future, it might access external information such as stock quotes, news and flight information, he added.

Feedback from Hyatt guests has been wonderful, said Susan Conway, the hotel's director of sales. Other hotels have expressed interest in the system, and CTC is negotiating an agreement regarding it with AT&T, Kolodny said. He added that the system may be appropriate for other settings such as corporate visitor centers and office building lobbies.

■

U.S. West, the regional telephone holding company for 14 states (see story this page), may try to capitalize on its experience with information technology to go into a new line of business — **trading securities**.

The Denver-based company has filed waivers with the U.S. Department of Justice seeking permission to enter the securities business as well as the consumer electronics business, with a focus on computers.

U.S. West's knowledge of communications is a factor in its interest in securities, said Don Johnson, the company's director of public information. "We certainly know the business of information distribution. Our experience would serve us well if we chose to get into that area," he said.

But filing the waiver "doesn't necessarily mean we will," Johnson said. The company wants to be prepared if it decides to go ahead. He confirmed that it is "certainly not afraid" to acquire another company to go into the securities business.

■

Ergonomic features for VDTs are provided by about three-fourths of the companies that responded to a member survey by the Data Processing Management Association.

Among the most common features

See **MEMO** page 70

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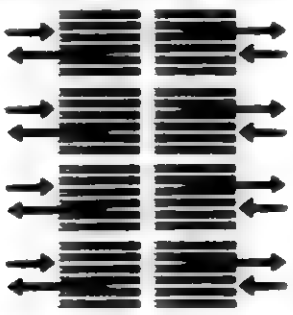
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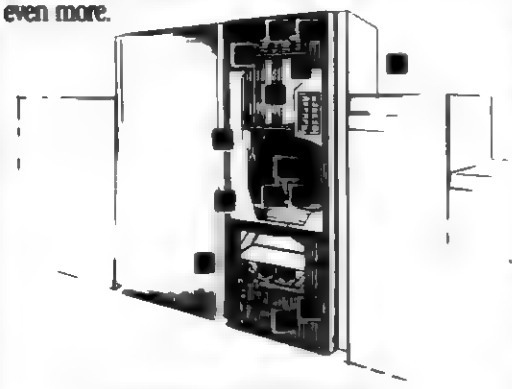


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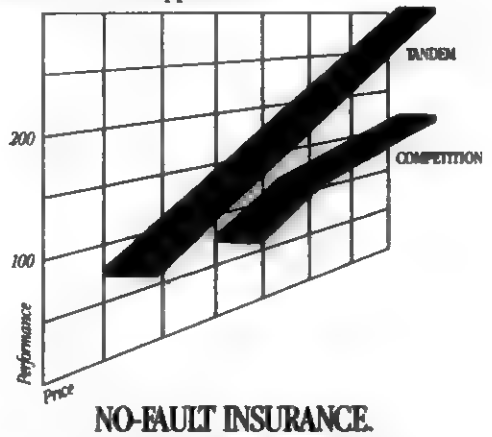


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TANDEMCOMPUTERS

U.S. West boosts OA links

From page 67

sources department is experimenting with telecommuting, observing about 100 employees in the Denver and Phoenix areas who are doing most of their work from home. An official of the department declined to elaborate on the experiment.

U.S. West's office automation systems include about 15 multinode local networks that serve roughly 20,000 terminals operating from about 150 host computers. There are 14,000 electronic mail users.

The company recently consolidated its Denver-area operations through construction of a new headquarters building, a move it used to kick off its integration effort by installing a broadband, coaxial cable network.

"It pointed the way to what we wanted to get," which was a vast wide-area net linking U.S. West computers in an area from the state of Washington to Arizona, Colorado and Minnesota and in offices in Washington, D.C., Malkoski noted.

The Denver-area network, which U.S. West built in-house, links 7,500 terminals and computers from seven vendors, both in the new building and others within a seven-mile radius. It includes switches that allow reconfigurations without moving lines and voice cables that run alongside data lines.

The network ties together the three predominant office automation and operating system environments at U.S. West — IBM Professional Office Systems (Profs) operating on VM, Wang Office running on VS and AT&T Unix System V operating on several brands of hardware.

U.S. West is "going to put less emphasis" on another environment — DEC's All-In-1 operating on VAX/VMS. It has relatively few of the systems and wants to avoid the aggravation of building specific gateways for them, Malkoski said. It will continue to use the DEC computers, porting Unix office automation systems to them.

"It's not that we don't think DEC is a good and valued vendor," Malkoski said. "We are removing All-In-1 from the picture, not DEC. It's more a tactical decision than anything else."

In building its wide-area network, the company is integrating the systems within each environment before attempting to tie them together. Integration of individual environments should be finished during the last quarter of this year, Malkoski claimed. The bridges between environments are expected to be done by the first quarter of next year.

U.S. West required each network to have a standard directory of electronic addresses, a file transfer format, directory updating and consistent software revision. The single biggest technical challenge has been integrating the user directory systems, Malkoski noted.

One hurdle has been resistance from vendors that are not eager to help U.S. West use other vendors' products, he said. "In some ways we're at the mercy of some vendors. They're protecting their own turf. IBM doesn't want to tell you how to integrate Profs into Wang Office because they want to sell you more Profs," Malkoski said.

In the future, U.S. West will standardize purchases of office automation equipment around the three environments, selecting the one that offers the best solution for the problem at hand, Malkoski said.

Expos bring tools in-house

From page 67

ny allows more of its technical staff to get a look at the products, Price says.

Polaroid surveyed its users on the types of products they wanted to see. It also asked vendors to demonstrate how their equipment relates to Polaroid's applications and to discuss future directions, Price says.

Holding a technology day can help avoid the need for Polaroid employees to travel to exhibits, he adds.

The event is useful to the vendors because they get to talk to a number of Polaroid users in one place, Price says. Polaroid's only costs have been for wiring, overnight security for the products and refreshments.

At Gillette, various vendors interested in displaying products are invited to do so as a group. An advantage of that is monitoring which vendors users are exposed to, Calabresi says. Information systems managers decide which vendors show their wares on the basis of the corporation's standards.

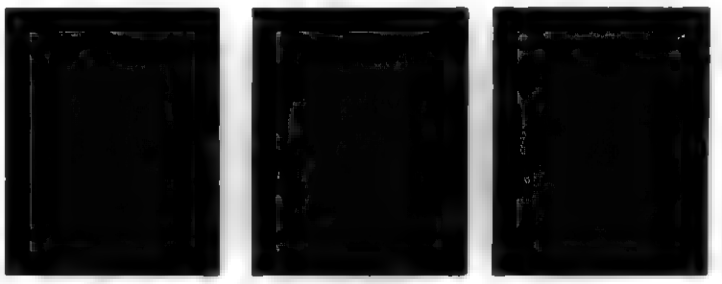
Gillette also tries to keep its nontechnical personnel abreast of technology by holding another type of event, also called a technology day, that is an annual full-day conference at a Boston hotel featuring outside speakers. The company also puts out a newsletter, "Information Technology News."

Not all information systems managers say they are enamored of technology days.

"I'm not sure that would prove anything. There's always a fudge factor involved when the vendors are trying to sell their wares," says Peter Lowber, assistant director of the Bureau of Systems Policy and Planning for the Commonwealth of Massachusetts.

The Commonwealth must avoid such contacts with vendors after a request for proposals has been issued in order to not run afoul of ethical guidelines, he notes.

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EIA/associates, developer and marketer of IBM PC peripherals and a company with 500% growth during its last fiscal year, first started using Computerworld to reach a selected audience (MIS/DP) with a narrow segment of their product line (LANs and micro-to-mainframe and micro-to-midi communications links). But as the responses started coming in, Nora Feldman Gildea, Director of Marketing, found that Computerworld attracted much more than just MIS/DP professionals.

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Pregnancy and VDTs

From page 67

Representatives' Subcommittee on Health and Safety (CW, Sept. 16) called the NIOSH study vital and said its results could have far-reaching effects in reducing the fears of pregnant women using VDTs.

At recent House hearings, the Communications Workers of America (CWA) denounced the OMB action, charging it damages the credibility of the study.

The OMB, which controls government studies involving questionnaires under the Paperwork Reduction Act of 1980, initially rejected the NIOSH study proposal on grounds that it contained technical design flaws (CW, Feb. 24).

NIOSH resubmitted the proposal, and the OMB gave it conditional approval.

A June 6 letter by James B. MacRae Jr., chief of the OMB's reports management branch, said the questions on stress and other topics should be deleted because there was insufficient evidence linking them to reproductive problems. "They [the questions] therefore have no practical utility. In addition, they impose unnecessary burdens on respondents, and would add to the costs of conducting the study and data analysis," the letter said. MacRae also objected to questions about fertility, stating that measuring the effect of VDT exposure on fertility is not the purpose of the study.

Critics say the OMB made the changes at the behest of Bell South, which is concerned that it may be singled out for adverse publicity, but the OMB has denied the charge.

The CWA protested that the OMB's criticisms were strikingly similar to those of Bell South. David E. LeGrande, the union's director of safety and health, said he believes the OMB "basically was told what direction to take by Bell South and then used its letterhead to sign onto it."

> ***The OMB initially rejected the NIOSH study proposal on grounds that it contained technical design flaws.***

At a hearing held by Rep. Ted Weiss (D-N.Y.), the representative expressed concern that the OMB was meddling in a scientific study. Philip Landrigan, director of occupational medicine at Mount Sinai Medical Center in New York and former director of the NIOSH VDT study, testified that the OMB's action as an "unwarranted intrusion into the scientific authority of the agency."

NIOSH Director J. Donald Millar, when asked by Weiss what he thought of Bell South's end run around his agency, responded that he was "not real fond of it."

Millar said he understands that industries affected by sensitive NIOSH studies may try to revise, delay or kill the studies.

An OMB spokesman acknowledges that the office was aware of the Bell South concerns, but says the OMB also independently concluded that the study design was flawed.

When the study was first proposed more than two years ago, NIOSH planned to have both a retrospective study, looking at past pregnancies of VDT users, and a prospective study, following future pregnancies.

However, the prospective study has been dropped because, NIOSH officials said, it is increasingly difficult to find a control group of women who do not use VDTs.

Dr. William Halperin, chief of the NIOSH industrywide studies branch, said the telephone companies appear to be switching more employees to VDT use. He said it seems unlikely the prospective study will be done.

MANAGEMENT MEMO

MEMO from page 67

are detachable keyboards, used by 81% of the respondents; adjustable backrests on chairs, used by 71%; adjustable-height chairs, used by 78%; and swiveling monitors, 65%.

Managers who were surveyed also said they pay attention to vision problems, with 61% claiming to use glare-reducing filters for screens.

Slightly more than half put blinds or shades on windows near VDTs, and 88% buy terminals with brightness controls. But only 18% provide lighting for documents.

The survey shows that fewer than half the companies consult workers on implementing new technology or on revising work routines because of new technology — 40% and 48%, respectively.

■

Participative management is on the decline in data entry, while job rotation has become more popular, according to a recent survey by the Data Entry Management Association of Stamford, Conn.

The number of member organizations with participative management declined to 24% from 37.5% last year, according to the survey. In 1984 the portion was 35%, and in 1983 it was 43%.

Meanwhile, the portion of respondents with job rotation programs grew to 70% from 63% last year.

The driving forces behind most data processing professionals' careers are challenge or self-esteem, according to another survey by the Data Processing Management Association.

The survey reported 36% of respondents are motivated by challenge and 33% by self-esteem. Salary and career enhancement were each cited by 15%.

The survey found that U.S. information executives earn an average of $42,760 per year and that 59% feel they are "sufficiently paid" compared with managers who have similar responsibilities in other fields.

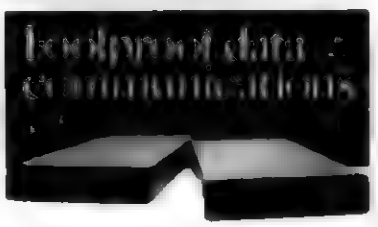
■

Executives waste 7.4% of their time looking for things that have been misplaced, according to an independent survey of vice-presidents and personnel directors sponsored by Accountemps of New York.

Based on a 40-hour week, that figure adds up to three hours a week and four workweeks a year of lost time, the firm said. Respondents were from the 1,000 largest U.S. corporations.

Perhaps that helps account for the heavy work load top executives take home. A similar study for Accountemps' parent firm, Robert Half International, Inc. of Jericho, N.Y., put the load at 10.5 hours a week.

— David Lindhurst



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Phone (_____) _____
Anderson Jacobson, Inc., 521 Charcot Avenue, San Jose, California 95131, (408) 435-8520.



A network is not a network if it's not working.

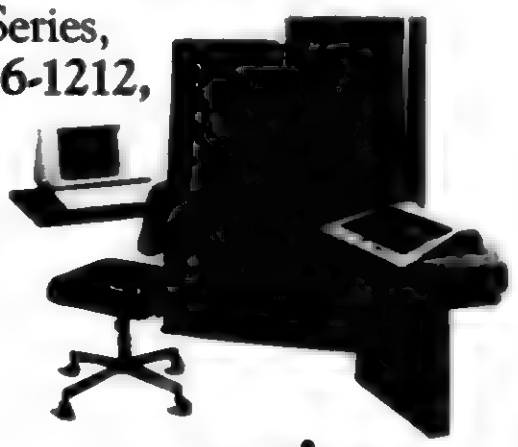
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Visit the Codex booth at TCA (September 23-25); CMA (October 8-10); and Info (October 6-9).

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CALENDAR

AUGUST 24-30

The Third International Congress on Advances in Non-Impact Printing Technologies. San Francisco, Aug. 24-28 — Contact: Society of Photographic Scientists and Engineers, 7003 Kilworth Lane, Springfield, Va. 22151.

Fault Tolerant Computing. Santa Cruz, Calif., Aug. 25-29 — Contact: Karin Poklen, Institute in Computer Science, University of California Extension, Santa Cruz, Calif. 95064.

Interconnect '86. San Mateo, Calif., Aug. 26-28 — Contact: Agnes M. Pavel, Program Director, U.S. Telecommunications Suppliers Association, Suite 1618, 333 N. Michigan Ave., Chicago, Ill. 60601.

Information Systems Assessment. Noordwijkerhout, the Netherlands, Aug. 27-29 — Contact: Stichting Informatica Congressen, Paulus Potterstraat 40, 1071 DB Amsterdam, the Netherlands.

AUG. 31-SEPT. 6

International Federation for Information Processing Congress '86. Dublin, Sept. 1-5 — Contact: International Federation for Information Processing Congress '86, 44 Northumberland Road, Dublin 4, Ireland.

Fourth Annual Office Automation Society International Conference. Chicago, Sept. 2-6 — Contact: Sue Pickard, OASI, Suite B, 15269 Mimosa Trail, Dumfries, Va. 22026.

The Desktop Publishing Conference. San Francisco, Sept. 3-6 — Contact: Seybold Seminars, 6922 Wildfire Road, Malibu, Calif. 90265.

Project Management Systems. Minneapolis, Sept. 3-5 — Contact: The American Institute, Carnegie Building, 55 Main St., Madison, N.J. 07940. Also being held Sept. 22-24 in Boston, Sept. 29 to Oct. 1 in Philadelphia and Oct. 22-24 in Cincinnati.

Federal Computer Conference. Washington, D.C., Sept. 3-5 — Contact: Ben Hughes, Federal Computer Conference, Box N, Wayland, Mass. 01778.

Telemarketing/West. Los Angeles, Sept. 3-5 — Contact: Doug Shreve, The Telemarketing Foundation, Inc., P.O. Box 829, Arnold, Md. 21012.

National Canadian Systems 3X Users Show. Toronto, Sept. 4-5 — Contact: Elodia Thomas, c/o The Producers, 360 Merrimack St., Lawrence, Mass. 01843.

SEPTEMBER 7-13

1986 Electronic Printer Conference. Boston, Sept. 7-10 — Contact: Jean O'Toole, CAP International, Inc., One Snow Road, Marshfield, Mass. 02050.

System 1022/1032 Users Conference. Burlington, Mass., Sept. 7-10 — Contact: System 1022/1032 Users Group, c/o Software House, 1000 Massachusetts Ave., Cambridge, Mass. 02138.

Planning for Network Integration. Nashville, Sept. 7-10 — Contact: Southeastern Telecommunication Association, P.O. Box 901, Richmond, Va. 23207.

How to Design and Implement Bar Code Systems. Detroit, Sept. 8-9 — Contact: Nancy Loerch, Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

Tutorial Week Boston '86. Cambridge, Mass., Sept. 8-12 — Contact: Martez A. Camilleri, Director of Tutorials, IEEE Computer Society, 1730 Massachusetts Ave., Washington, D.C. 20036.

Entity Modeling: Techniques and Application. Washington, D.C., Sept. 8-10 — Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

Technical Update Conference — 86. Anaheim, Calif., Sept. 8-10 — Contact: Security Pacific Audit Services, Suite 208, 11565 Laurel Canyon Blvd., San Fernando, Calif. 91340.

NCC-Telecommunications Conference. Philadelphia, Sept. 8-10 — Contact: NCC-Telecommunications, American Federation of Information Processing Societies, 1899 Preston White Drive, Reston, Va. 22091.

Quality Assurance Institute's Seminars on Quality Data Processing. Toronto, Sept. 8-12 — Contact: QAI, 9222 Bay Point Drive, Orlando, Fla. 32819.

Writing Procedures, Policies and Documentation. Austin, Texas, Sept. 8-12 — Contact: Laurel Lewis, Information Mapping, Inc., 275 Wyman St., Waltham, Mass. 02154.

43rd FID Conference and Congress. Montreal, Sept. 8-18 — Contact: FID 43rd Conference and Congress, C.P. 1144, Succursale Place Desjardins, Montreal, Que., Canada H5B 1B3.

National Capital Datapoint User Group Meeting. Arlington, Va., Sept. 9 — Contact: Margaret Valavanis, OSP/WHS/DCOAR, Room 1C730, The Pentagon, Washington, D.C. 20301.

Computing in the 21st Century. Bloomington, Minn., Sept. 9-10 — Contact: Charles Babbage Institute, University of Minnesota, 103 Walter Library, 117 Pleasant St. S.E., Minneapolis, Minn. 55455.

Satellite Communications Users Conference 86. Las Vegas, Sept. 9-11 — Contact: Satellite Communications, 6530 S. Yosemite St., Englewood, Colo. 80111.

Midcon/86. Dallas, Sept. 9-11 — Contact: Midcon, 8110 Airport Blvd., Los Angeles, Calif. 90045.

1986 Intelligent Buildings Conference and Exposition. Atlanta, Sept. 9-11 — Contact: Bryson Asso-

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ciates, 162 Tower Place, 3340 Peachtree Road N.E., Atlanta, Ga. 30026.

Corporate Electronic Publishing Systems IV: A Conference and Show. Boston, Sept. 9-11 — Contact: Cahners Exposition Group, 999 Summer St., Stamford, Conn. 06905.

Real-Time Operating Systems: A Hands-On Workshop. San Diego, Sept. 9-12 — Contact: Yolande Amundson, Integrated Computer Systems, P.O. Box 3614, 5800 Hannum Ave., Culver City, Calif. 90231. Also being held Oct. 28-31 in Boston and Nov. 11-14 in Palo Alto, Calif.

Second European Simulation Congress. Antwerp, Belgium, Sept. 9-12 — Contact: The Society for Computer Simulation, c/o Ghislain C. Vansteenkiste, University of Ghent, Coupure Links 653, B-9000 Ghent, Belgium.

Southwest Idaho Chapter of the Data Processing Management Association's Annual Computer Show. Boise, Idaho, Sept. 10-11 — Contact: Jerry Morelan, Publicity Chairman, Southwest Idaho Chapter of the Data Processing Management Association, Boise State University, College of Business, 1910 University Drive, Boise, Idaho 83725.

Devlin Associates, Inc. Tenth Annual Disaster Recovery Planning Conference. Atlantic City, Sept. 10-12 — Contact: Devlin Associates, 430 Exton Commons, Exton, Pa. 19341.

Token-Ring Network & Application Program Interfaces. Palo Alto, Calif., Sept. 11-12 — Contact: Token-Ring Network & Application Program Interfaces Seminars, Communications Solutions, Inc., 992 S. Saratoga-Sunnyvale Road, San Jose, Calif. 95129. Also being held Sept. 25-26 in New York.

Dataquest, Inc. Conference. San Diego, Sept. 11-12 — Contact: Computer Storage Industry Service, Dataquest, 1290 Ridder Park Drive, San Jose, Calif. 95131.

Optical Storage and Retrieval. Hyannis, Mass., Sept. 11-12 — Contact: International Optical Telecommunications, 720 Main St., Hyannis, Mass. 02601.

SEPTEMBER 14-20

CADRE — An Applied Data Research Users Conference. Nashville, Sept. 14-18 — Contact: Allen Haggar, Director of Client Relations, Applied Data Research, Rt. 206 and Orchard Road, CN-8, Princeton, N.J. 08540.

Bypass: The Second Wave. New York, Sept. 16 — Contact: Jon Boroshok, Conference Registrar, The Eastern Management Group, Four Century Drive, Parsippany, N.J. 07054.

Canadian Office Machine Dealers Association/Candex. Montreal, Sept. 18-19 — Contact: Roy Whitsed, Candex Conference, Inc., 47 Lakeshore Road E., Mississauga, Ont., Canada L5G 4L7.

SEPTEMBER 21-27

National Retail Merchants Association's 28th Annual Retail Information Systems Conference. Anaheim, Calif., Sept. 21-24 — Contact: J. Joseph Miller, Director of Retail Standards and Technology, National Retail Merchants Association, 100 W. 31 St., New York, N.Y. 10001.

PSMJ CADD Managers Roundtable. Hyannis, Mass., Sept. 21-26 — Contact: Anita Stasiowski, PSMJ Roundtables, 10 Midland Ave., Newton, Mass. 02158.

Eighth Annual Lasers in Graphics/Electronic Publishing in the 80's Conference. Anaheim, Calif., Sept. 21-29 — Contact: Lasers in Graphics, Suite 1, 1855 E. Vista Way, Vista, Calif. 92084.

"C" Programming with Style and Discipline. Milwaukee, Sept. 22-24 — Contact: John T. Snedeker, Center for Continuing Engineering Education, College of Engineering & Applied Science, University of Wisconsin — Milwaukee, 929 N. Sixth St., Milwaukee, Wis. 53203.

Space Tech '86. Orlando, Fla., Sept. 22-25 — Contact: Society of Manufacturing Engineers Public Relations, Box 930, One SME Drive, Dearborn, Mich. 48121.

Lasers in Automotive Manufacturing. Detroit, Sept. 23-24 — Contact: Mary Dombrowski, Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

International Videotex Industry Exposition and Conference. New York, Sept. 23-25 — Contact: Susan LeDonne, Cahners Exposition Group, P.O. Box 3833, Cahners Plaza, 999 Summer St., Stamford, Conn. 06905.

Computer Aided Publishing '86 Exposition and Conference. Washington, D.C., Sept. 23-25 — Contact: Computer Aided Publishing Association, Suite 200, 90 W. Montgomery Ave., Rockville, Md. 20850.

Artificial Intelligence and Advanced Computer Technology Conference/Exhibition. Wiesbaden, West Germany, Sept. 23-25 — Contact: Tower Conference Management Co., 331 W. Wesley St., Wheaton, Ill. 60187.

EDI Training Session. Arlington, Va., Sept. 25-26 — Contact: TDCC, 1101 17th St. N.W., Washington, D.C. 20036.

The Fourth Annual NCR Users Eastern America Conference. Atlantic City, Sept. 25-26 — Contact: Jack Hibberd, ECUO Treasurer/Convention Publicity Chairman, c/o AOR, Inc., P.O. Box 429, Willow Grove, Pa. 19090.

Robot Applications for Automotive Manufacturing. Detroit, Sept. 25-26 — Contact: Mary Dombrowski, Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

The Association for Women in Computing's Fifth Annual Conference. St. Louis, Sept. 26-28 — Contact: Association for Women in Computing Conference '86, 407 Hillmoor Drive, Silver Spring, Md. 20901.

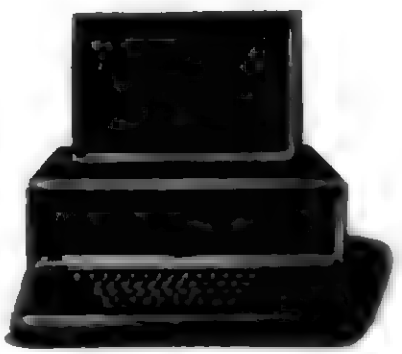
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COMPAQ



NEW PRODUCTS

DEC Q-bus, Unibus get color images

Peritek Corp. of Oakland, Calif., has introduced its VCX-Q/U color graphics board for Digital Equipment Corp. computers.

The single board, which costs $5,895, is reportedly able to create images 24 planes deep, with an independent alphanumeric overlay. The VCX-Q/U board can display any of 16 million different colors at any moment, giving the user immediate access to virtually all hues discernible to the human eye, according to Peritek.

VCX-Q/U is quad-height size, configurable for either DEC Q-bus or Unibus computers. Principal applications for the graphics board, according to a Peritek spokesman, include sophisticated imaging, process control, simulation and presentation graphics.

The graphics display is said to consist of 512 by 512 pixels, with the color of each pixel being determined by 8 bits each for red, green and blue. Each 8-bit set is generated by an independent frame buffer and look-up table, permitting maximum flexibility in color selection.

The independent memory-mapped alphanumeric overlay reportedly consists of 50 lines by 80 characters. With this, the user has a choice of 64 character colors and 64 background colors, all independent of the graphics colors. The character set is stored in random-access memory and is user-programmable. VCX-Q/U has two video controllers, one for graphics and one for alphanumerics, which permit each display to be operated independently.

The board comes with a composite sync input, which is said to accept an internal signal to synchronize the board's operation with peripheral equipment. A direct port, independent of the computer's bus, enables an external device to operate directly on the board's registers and memories, according to a Peritek spokesman.

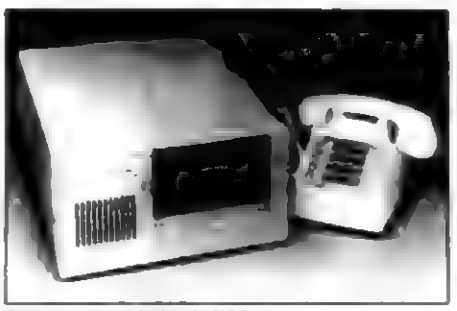
Software available for the VCX-Q/U includes test routines, initialization routines and a micro-level subroutine library for C language and Fortran, the vendor stated.

V-Mail supervises messages

Brooktrout Technology, Inc. of Wellesley Hills, Mass., has unveiled its V-Mail 220 voice messaging system, which is priced at $9,900 per unit and is said to be capable of handling up to 100 users.

The V-Mail 220, a computer-based unit connected to the user's telephone system, digitally records, stores and plays back voice messages. According to the vendor, the V-Mail 220 is accessible 24 hours a day from any telephone in the country to allow users to direct the unit to record, route and retrieve messages. This service is said to help eliminate "telephone tag," to ensure that messages are delivered accurately and to protect the privacy of messages.

V-Mail 220 reportedly allows the user to send the same message to a number of people simultaneously. The system also reminds the user of any messages, forwards messages to another telephone number at a user-determined time or to a third party and lets the user review, revise and edit phone messages before sending them. With V-Mail 220, users can also identify caller and time of message, review previously saved messages, send messages normally or flag messages for urgent delivery and check to see if previously sent messages have been received.



Brooktrout's V-Mail 220

The system can be configured as an open system in which anyone can call in and leave private messages, or it can be used as a closed system in which use is restricted to assigned users.

The messaging system has four major components: a microcomputer, two speech I/O channels, a 20M-byte, 5¼-in. Winchester disk drive and multitasking control software.

Each of the V-Mail 220's I/O channels handles one telephone line. The cards connect directly to an existing telephone system and can digitize and play speech, decode Touch-Tones and eliminate pauses. The system can store up to 1½ hours of messages and can be expanded to 3½ hours by adding another disk.

Genicom unveils Quiet printer

Genicom Corp. of Waynesboro, Va., has added the 3410 Quiet dot matrix printer to the company's 3000 family of printers.

The Genicom 3410 Quiet is said to feature multiple mode printing, high-duty cycle and a noise level of lower than 55db. The 3410 Quiet is priced at $2,645.

According to a Genicom spokesman, the 3410 Quiet prints 400 char./sec. in draft mode and 120 char./sec. in near-letter-quality mode. At 18 and 10 char./in., the 3410 Quiet prints 244 and 136 columns, respectively.

The printer reportedly works with all popular personal computers and comes with a Centronics Data Computer Corp. parallel and RS-232C serial ports. With standard IBM graphics protocol, the 3410 Quiet is said to print high-resolution, dot-addressable graphics up to 144 by 144 dot/in. According to Genicom, 16 national character sets and IBM character sets 1 and 2 are also standard.

Up to six copies of paper can be accommodated with a choice of either rear or bottom feeding. An adjustable six-pin push tractor plus upper friction pinch rollers are used when paper is fed through the back of the printer. Optional automatic sheet feeders and single or dual bins are available.

Genicom also offers the 3410 printer, an identical version of the 3410 Quiet, although it does not include the sound reduction package. The 3410 printer is priced at $2,450.

INSIDE

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Robin Schwartz
Employment and
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Robin Schwartz is Employment and Employee Relations Manager for McCormack & Dodge, a software company based in Natick, Massachusetts. She is responsible for recruiting people for the company's home office as well as its seven regional offices across the country. And earlier this year when Robin was looking for software applications sales and support people, she chose to run an ad in Computerworld.

"I had numerous openings for positions across the country. From a cost-efficiency standpoint, Computerworld seemed like the logical choice," says Robin. *"But before finalizing my decision, I did a little investigating. I talked to our sales managers here at McCormack & Dodge — and they all agreed. The #1 place to recruit qualified computer professionals nationally is Computerworld. To keep in touch with what's going on in the industry, people have to read Computerworld,"* she explains.

McCormack & Dodge is enjoying national visibility as a result of the ad, but, more importantly, Robin is quite pleased with the responses. *"My people were right. We placed the ad in the beginning of the year and received tremendous response via our two-day hot line (800 number). And since we are still getting resumes, Computerworld obviously has a long life cycle through its pass-along circulation,"* she adds.

"The quality of the responses has made our ad placement more than worthwhile," concludes Robin. *"The professionals responding to our ad are experienced, not just job changers. We are getting in touch with just the people we need to reach."* In fact, according to Robin, *"Quite a few of the positions are already filled. Thanks to Computerworld!"*

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SOFTWARE & SERVICES

Applications packages

Autodesk, Inc. has released **Autocad Version 2.5** for the IBM RT Personal Computer.

Version 2.5 of Autocad runs under AIX, IBM's enhanced Unix operating system. It will take advantage of the PC RT's unrestricted access to up to 4M bytes of random-access memory to offer fast regeneration for large drawings. Additionally, it will handle programs written in Autolisp, the interactive programming language written into Autocad.

Autocad 2.5 on the IBM RT PC is priced at $2,750.

Autodesk, 2320 Marinship Way, Sausalito, Calif. 94965.

MCBA, Inc. has ported its **accounting and distribution software packages** to the AT&T 3B family of computers.

The software packages available include accounts payable, bill of material processor, customer order processing, payroll purchase order and receiving, master scheduling and material requirements planning, according to the vendor.

Features found in each package include an optional security system that provides access privileges for each user, the ability to use a variety of terminals and provisions that alert the user to and allow recovery from data file I/O errors.

Prices range from $1,500 to $3,000 for object code only and $2,000 to $6,000 for source code licenses.

MCBA, 425 W. Broadway, Glendale, Calif. 91204.

Cosmic has announced the availability of the **Plaid** computer-aided design (CAD) program.

Plaid is a three-dimensional CAD system for interactively constructing and displaying sets of complex geometric models. Polygons are constructed explicitly by coordinates or graphically with either terminal cross hairs or a digitizer. Solid models are constructed by combining or rotating the polygons. Users may view the assemblies from arbitrary viewpoints in both wire frame and hidden-line renderings, with or without perspective.

Plaid is written in Fortran 77 for use on Digital Equipment Corp.'s VAX VMS computer. A 10-year license costs $6,000.

Cosmic, University of Georgia, Computer Services Annex, Athens, Ga. 30602.

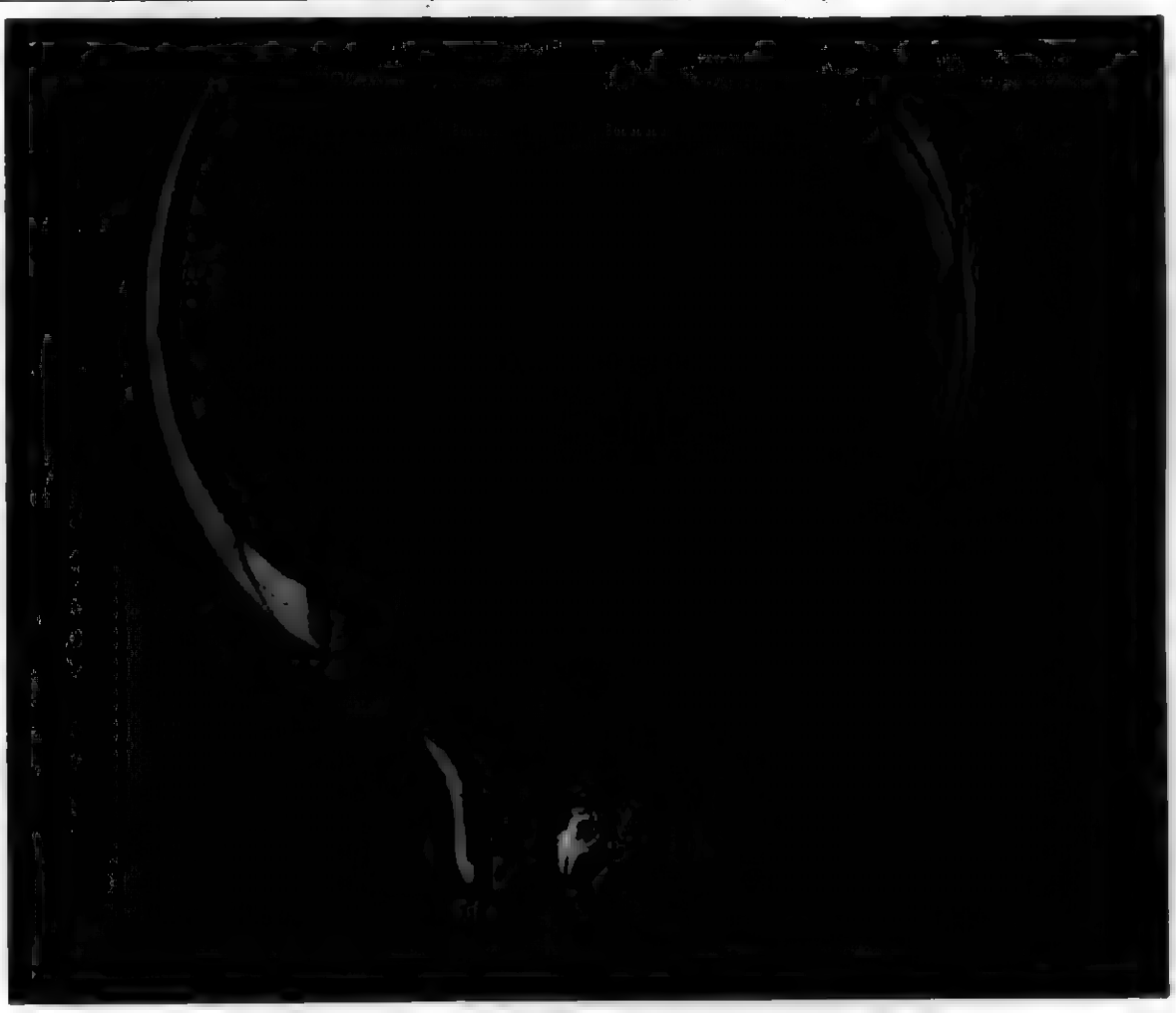
Precision Visuals, Inc. has announced the **Picsure Plus** data display system.

Picsure Plus offers fast start-up for new and infrequent users, with on-line tutorials and instant Help. Users can produce line, pie and bar charts, data tables, scattergrams and illustrations with single-button responses to menu prompts.

Picsure Plus combines multiple images into a single chart and automatically sizes and positions text and sets margins. Additional features reportedly allow users to merge images created with other Precision products and keep track of saved charts and data.

Picsure Plus costs $20,500 on a Digital Equipment Corp. VAX 8200 or VAX-11/780.

Precision Visuals, 6260 Lookout Road, Boulder, Colo. 80301.



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Languages

Sun Microsystems, Inc. has added **Modula-2** to the programming languages for its Sun-2 and Sun-3 workstations.

Said to be an alternative to C, Modula-2 is suited for large application projects in areas such as computer-aided manufacturing. Modula-2's type checking and system-level access capabilities make it suitable for producing systems software and embedded systems.

Modula-2 on Sun's workstations is priced at $2,000.

Sun Microsystems, 2550 Garcia Ave., Mountain View, Calif. 94043.

Utilities

Tektronix, Inc. has announced its **Plot 10 Tekniviews** software.

Tekniviews reportedly provides window management functions such as pop-up menus, multiplane windows and vertical and horizontal scroll bars to Tektronix's 4111 computer display terminal and 4120 series color graphics workstation.

Tekniviews also runs under Digital Equipment Corp.'s MicroVMS and on Microvax II workstations and VAX/VMS computers.

Tekniviews costs $995 for the workstation version and $1,995 for the VAX version.

Tektronix, P.O. Box 1000, Wilsonville, Ore. 97070.

■

Structured Software Systems, Inc. has introduced **SDF200**, a language enhancement that adds a disk directory format to the Basic and Pascal operating systems for Hewlett-Packard Co.'s Series 200 and 300 desktop computers.

By adding SDF200 to existing operating systems, single-workstation users are said to gain the advantages of the Structured Directory Format without the expense of acquiring a shared resource manager controller.

SDF200 costs $600.

Structured Software Systems, 1072 Irick Road, Mount Holly, N.J. 08060.

Data base management systems

Groton Database Systems, Inc. has introduced **GDS/Galaxy**, a relational DBMS for distributed data bases and transaction processing.

The GDS/Galaxy system is said to provide fast, reliable data base access in complex multiuser environments. It runs on the Digital Equipment Corp. VAX and Microvax and on microcomputers from Sun Microsystems, Inc. and Apollo Computer, Inc.

The GDS/Galaxy ranges in price from $7,000 to $50,000.

Groton Database Systems, 150 Westford Road, Tyngsboro, Mass. 01879.

MICROS

Systems

Toshiba America, Inc. has introduced the **T1100 Plus**, an enhanced version of its IBM-compatible portable personal computer.

The laptop comes with two 3½-in., 720K-byte disk drives, 256K bytes or 640K bytes of memory, parallel and serial ports, an optional 300 to 1,200 bit/sec. modem and a new keyboard layout. Also included are a clock/calendar and interfaces for a red-green-blue and monochrome composite monitor.

The T1100 Plus with 256K bytes of memory costs $1,999. With 640K bytes of memory, it costs $2,399.

Toshiba America, 2441 Michelle Drive, Tustin, Calif. 92680.

Software application packages

Westminster Software, Inc. has announced the **Pertmaster Project Management System.**

The system is composed of three integrated software programs. The programs are Version 6.0 of Pertmaster, Pertplotter and KeepingTabs, a summary interface. The system runs under Microsoft Corp. MS-DOS.

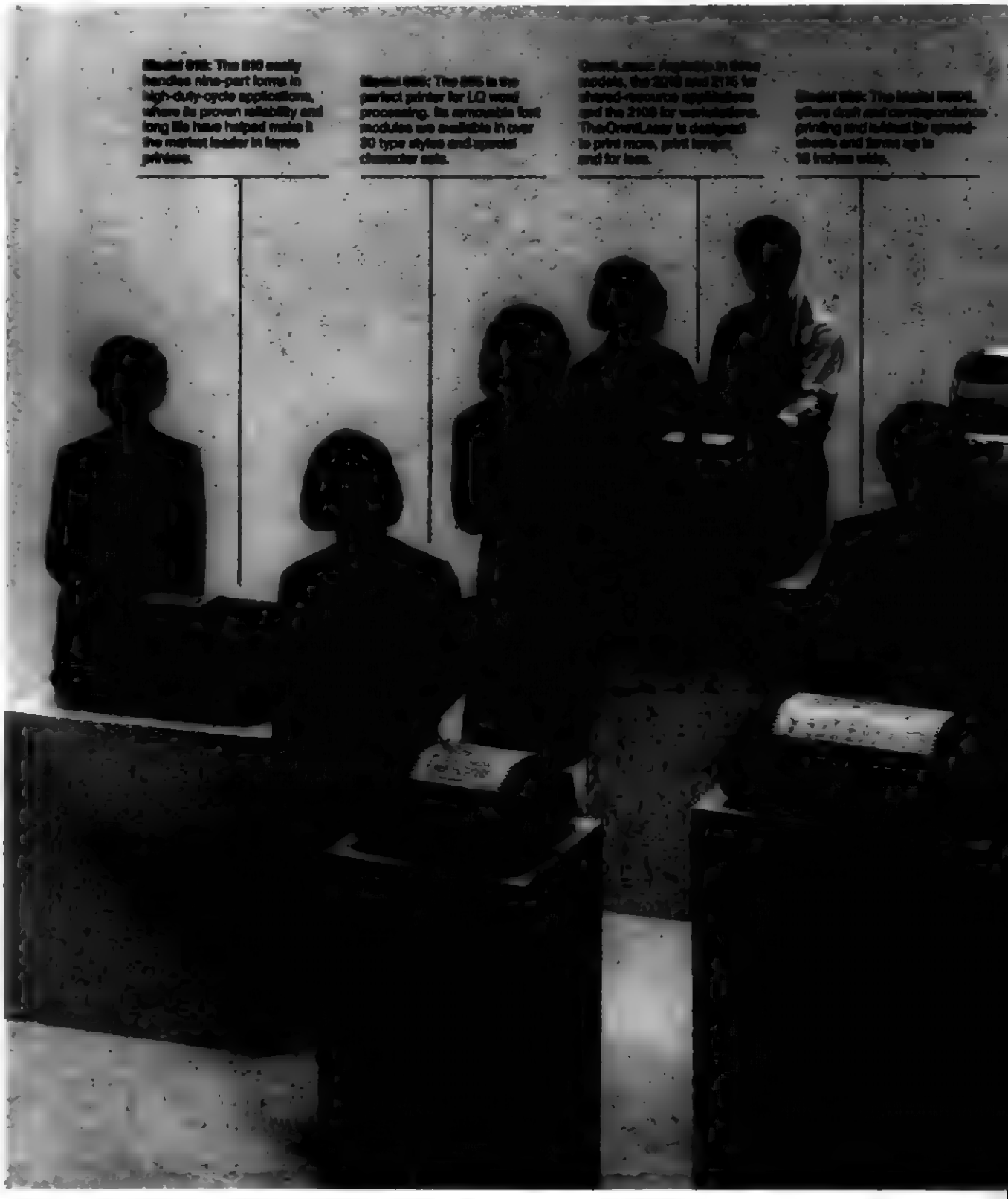
With a capacity for 2,500 activities, the Pertmaster Project Management System costs $1,695; the 1,500-activity version costs $1,495.

Westminster Software, 2570 El Camino Real, Mountain View, Calif. 94040.

Software utilities

Imagimedia Technologies, Inc. has released **Portacad**, a utility said to facilitate transporting data between computer-aided design (CAD) systems.

The printers of Texas
The printers you need when



NEW PRODUCTS/MICROCOMPUTERS

According to the vendor, Portacad allows users of two-dimensional CAD systems, such as Autodesk, Inc.'s Autocad, to port their files to the vendor's Microcad for processing in 2-D space and vice versa. Portacad enables users working on a micro, mini or mainframe system to take material quantities directly from computer data.

Portacad costs $250.

Imagimedia Technologies, P.O. Box 210308, San Francisco, Calif. 94121.

Software enhancements

KEA Systems Ltd. has introduced **Version 2.6** of its **ZstemPC-VT100** software, designed to provide IBM Personal Computers with Digital Equipment Corp. VT100 terminal emulation.

Version 2.6 includes optional BIOS keyboard handling, a random-access memory-resident keyboard handler and IBM PC-DOS printer handling. Also included is support for VT640 remote-controlled invocation of the ZstemPC-4014 companion package and for PC-DOS Version 3.2.

ZstemPC-VT100 costs $150.

KEA Systems, #412-2150 W. Broadway, Vancouver, B.C., Canada V6K4L9.

■

Ken Orr & Associates, Inc. and **Nastec Corp.** have released **Documentorr Version 2.1**, linking Documentorr's computer-aided software engineering capabilities to Ken Orr & Associates' Structure(s) automated diagramming and Cobol-generation functions.

Version 2.1 uses pop-up menus customized to users' needs. Users can select diagrams and execute graphic editing commands such as expand, shrink and copy.

It costs $6,900.

Ken Orr & Associates, 1725 Gage Blvd., Topeka, Kan. 66604.

Communications

IBM has introduced **IBM Series/1-PC Connect**, a Series/1 licensed program that runs on an IBM Personal Computer, Personal Computer XT or AT.

The program is said to support the Series/1-to-PC Channel Attachment feature, a high-speed connection between a Series/1 and a PC. It provides PCs on the IBM PC Network or the Token-Ring network access to Series/1 disks and printers via the IBM Netbios interface.

IBM Series/1-PC Connect requires Realtime Programming System Version 7.1 or IBM Series/1 Event-Driven Executive Communications Facility Version 2.1.

It costs $400.

IBM, Old Orchard Road, Armonk, N.Y. 10504.

Printers/ Plotters/Peripherals

Random Corp. has announced the **Colleague portable terminal**.

The Colleague is an 8-lb portable terminal with a 25-line by 80-char. enhanced LCD display, a full travel keyboard and an internal 300 to 1,200 bit/sec. modem.

The Colleague can be interfaced to equipment through a standard RS-232C, 75 bit/sec. to 9.6K bit/sec. serial port. It features 20 programmable channels with 16 programmable function keys per channel.

The Colleague terminal costs $995.

Random, 581 Northland Blvd., Cincinnati, Ohio 45240.

Board-level devices

Information Systems Division of Toshiba America, Inc. has introduced its **Dual emulation** (DE) and **Down-line loadable** (DLL) type font expansion board kits.

The DE kit gives users the ability to utilize the full IBM extended character set. The DLL kit allows users to download disk-based type fonts to the printer from any IBM Personal Computer or compatible.

The P351 DE kit costs $99, the P341 DE and DLL kit, $199 and the P321 DLL kit, $22.

Information Systems Division, Toshiba America, 2441 Michelle Drive, Tustin, Calif. 92680.

Instruments. your needs are demanding.



Premium performance and industrial quality. That's what TI printers are known for. Their reliability has always been standard-setting. Their throughput, consistently high. And their quality surpasses the needs of their applications. Which means few, if any, failures and a minimum of downtime. In fact, about all the service a TI printer needs is a paper or ribbon change.

The reason is simple — every TI printer is made to do its job very well, for a very long time.

The Model 810. The workhorse.

For almost a decade, the Model 810 heavy-duty 150 cps system printer has been printing forms and data reports in virtually unattended operation. Its performance has been so reliable that it's the choice of most of the world's major airlines for ticket counter service for one reason. If they aren't printing tickets, they aren't making money. We even took the 810's field-proven architecture and put it to work in our Model 880 system printers. You can't argue with success.

The Model 880 Series. The 300 cps heavy-duty system printers.

Our 880s are the perfect upward migration and high-speed complement to the Model 810. They're twice as fast, fully compatible with the 810, offer correspondence-quality printing, raster graphics, and come in three models — the standard 880, the 880DP and the 880AT. The DP model offers the higher throughput necessary for high-speed data processing forms and report printing applications. And the AT model is ideal for multi-user environments because it is both hardware- and software-compatible with AT- and XT-class personal computers.

TI's micro-printers. They make more out of any PC.

Dual-mode, letter-quality, color printing and graphics, too. However you use your PC, there's a TI micro-printer to match. Our micro-printers feature front plug-in fonts, easy-to-use control panels and a long service life. They're also compatible with virtually all PC hardware and third-party software. Available in both 80- and 132-column carriage models.

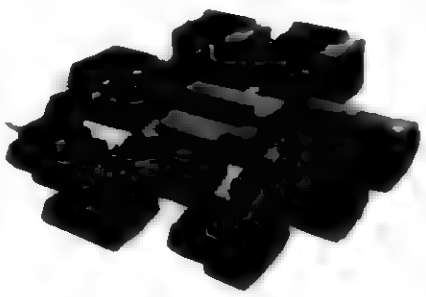
Now, our OmniLaser™ Printers. TI's answer to the shared-resource laser environment.

The TI OmniLaser family of printers is the very first of the second generation of laser printers. Why did we wait? Laser printers of the first generation couldn't live up to our standards for function, quality and reliability. In fact, our OmniLaser printers are documented to last up to 15 times as long as their first-generation counterparts, with the lowest cost per page in the industry.*

To be TI printers, the OmniLaser had to print unerringly at incredible speed with unrivaled quality. And they had to be simple to use. The OmniLaser Model 2015 will last in shared-resource work environments where lesser printers fail. They had to be the "810" of laser printers.

So if you're equipping a computer system with printers, or replacing those you already have, demand the printers that fit your demanding needs. Call 1-800-527-3500. For the printers of Texas Instruments.

TEXAS INSTRUMENTS



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*As reported in the March 1986 edition of DataQuest.

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NEW PRODUCTS/COMMUNICATIONS

COMMUNICATIONS

Controllers

Distributed Logic Corp. has introduced its **Model CQ1610** async controller.

The Model CQ1610 can reportedly be used to multiplex up to 16 RS-232C data channels to Digital Equipment Corp. LSI-11, MicroPDP-11 or Microvax computers. The controller reportedly provides full DEC DHV11 modem control on all channels.

The CQ1610 is software compatible with DEC DHV11 drivers and offers software-selectable transmission rates and character formats. CQ1610 offers data rates from 50 bit/sec. to 38.4K bit/sec. on all 16 channels.

The Model CQ1610 controller costs $1,600.

Distributed Logic, P.O. Box 6270, 1555 S. Sinclair St., Anaheim, Calif. 92806.

Voice/data communications

Dialogic Corp. has announced its multiline voice product **Dialog/40.**

Dialog/40 reportedly provides telephone management features as well as record and playback, Touch-Tone decoding and Touch-Tone dialing. A single Dialog/40 is said to be able to support the interface and servicing of four telephone lines concurrently. Software support for Dialog/40 includes subroutines for line management, Touch-Tone response and dialing options.

Dialog/40 requires one expansion slot in an IBM Personal Computer, Personal Computer XT, AT or compatible.

The Dialog/40 costs $1,195.

Dialogic, 60 Baldwin Road, Parsippany, N.J. 07054.

Protocol converters

May-Craft Information Systems, Inc. has announced its **May-Craft 52 Local** protocol converter.

The May-Craft 52 Local protocol converter is said to allow up to seven ASCII devices to be connected to a standard twin-axial IBM System/34, 36 or 38 port. ASCII devices can be attached directly or remotely through an asynchronous modem.

The base unit is available in two models: Model 1 is a one-port nonexpandable unit, and Model 2 is expandable to up to seven ports and comes equipped with a single RS-232 port.

The Model 1 base price is $1,450.

May-Craft Information Systems, 4312 Beltwood Pkwy. S., Dallas, Texas 75244.

Software

Tektronix, Inc. has announced the **Protocol Microlink** software package.

Protocol Microlink is said to provide an interconnection among Tektronix 4132 and 6130 workstations and Digital Equipment Corp.'s Microvax II workstations running MicroVMS Version 4. The software is compatible with the Transmission Control Protocol/Internet Protocol standard.

Protocol Microlink reportedly implements networking protocols, which makes it possible for users of Microvax II, 4132 and 6130 workstations to exchange text and data files.

Protocol Microlink costs $2,995.

Tektronix, P.O. Box 1700, Beaverton, Ore. 97075.

Multiplexers/Modems

GTE Supply has enhanced its **GTE Trailblazer** modem.

The latest release of GTE Trailblazer reportedly has increased speeds from 10K bit/sec. up to 18K bit/sec. The Trailblazer is said to adapt to any line condition by automatically adjusting its speed by no more than 100 bit/sec. at a time. The modem features internal error correction, real-time line analysis and remote access. It operates with any asynchronous device with a serial RS-232 interface and plugs into a standard AC wall outlet.

The GTE Trailblazer costs $1,995 for the IBM Personal Computer card and $2,395 for the stand-alone modem. Upgrades are available for $99.

GTE Supply, 5225 Wiley Post Way, Lakeside Plaza 2, Salt Lake City, Utah 84116.

Racal-Vadic, Inc. has introduced its **4850PA** modem.

The 4850PA 4.8K bit/sec. modem is said to provide AT&T Bell Laboratories 208 and CCITT V.27 compatibility, four integral automatic dialers and full front-panel control. With the addition of application drivers to the communications software, the modem is said to perform the control and automatic-dialer functions.

An alphanumeric display and keyboard integrated into the front panel allow local reconfiguration, diagnostics and option configuration.

The 4850PA costs $1,295.

Racal-Vadic, 1525 McCarthy Blvd., Milpitas, Calif. 95035.

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AT&T IS IN

$600,000

If ever a case can be made to substantiate the claim "time is money," this is it.

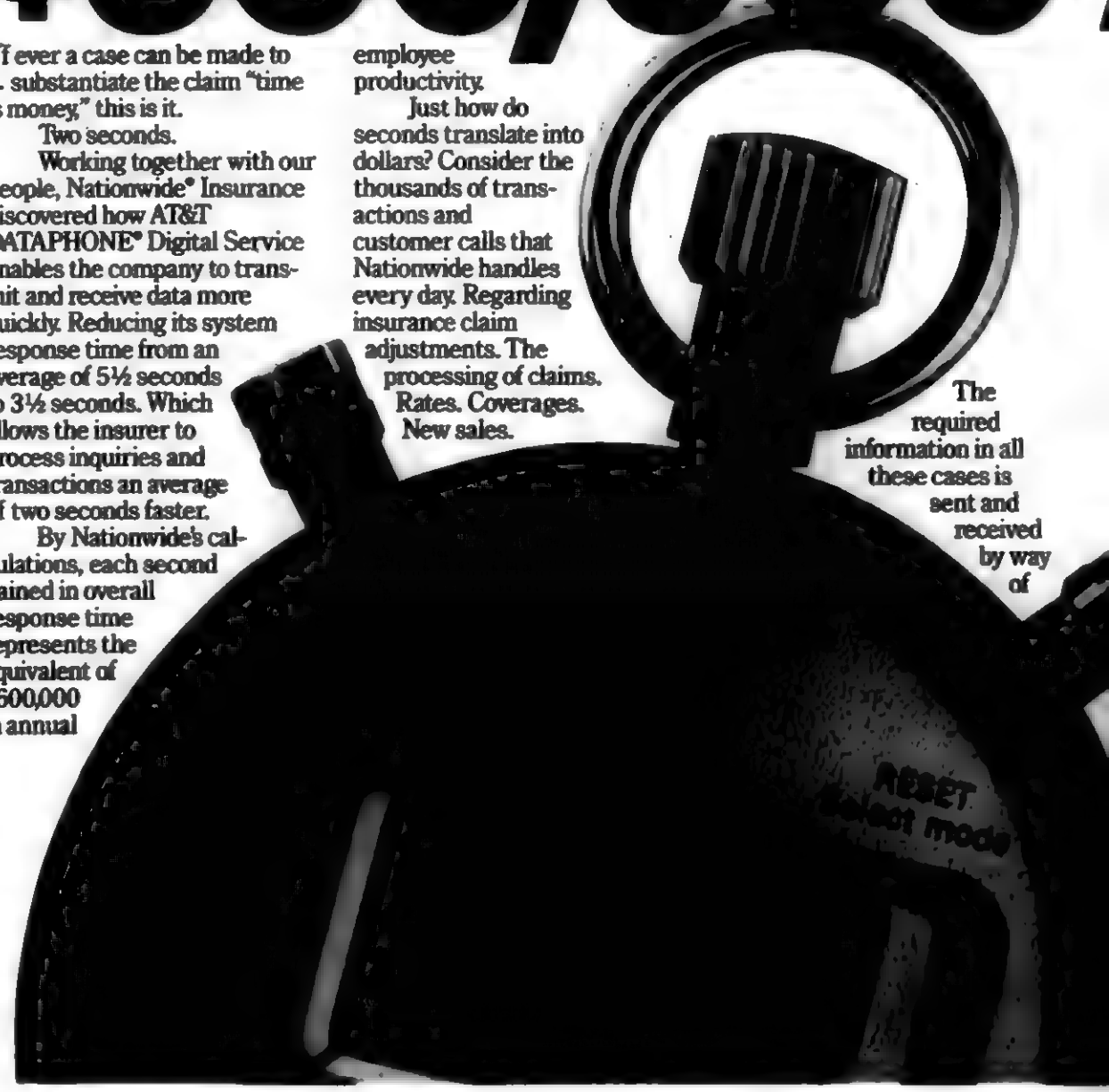
Two seconds.

Working together with our people, Nationwide® Insurance discovered how AT&T DATAPHONE® Digital Service enables the company to transmit and receive data more quickly. Reducing its system response time from an average of 5½ seconds to 3½ seconds. Which allows the insurer to process inquiries and transactions an average of two seconds faster.

By Nationwide's calculations, each second gained in overall response time represents the equivalent of $600,000 in annual employee productivity.

Just how do seconds translate into dollars? Consider the thousands of transactions and customer calls that Nationwide handles every day. Regarding insurance claim adjustments. The processing of claims. Rates. Coverages. New sales.

The required information in all these cases is sent and received by way of



NEW PRODUCTS/COMMUNICATIONS

Local-area networks

Avanti Communications Corp. has released **B8ZS encoding**, an enhancement to the company's Series 2300 Local Area Data Distributor said to improve data transmission throughput and reliability.

The B8ZS encoding feature reportedly provides clear channel transmission at rates of 56K bit/sec. to 3.152M bit/sec. The B8ZS feature identifies consecutive data zeros and substitutes a pattern that is a bipolar violation. The Series 2300 identifies this pattern and passes along data zeros to the communication device.

The B8ZS option for the Series 2300 costs $250.

Avanti Communications, Aquidneck Industrial Park, Newport, R.I. 02840.

Test equipment

Systems Strategies, Inc. has announced **EX3278**, software for testing the communications functions of IBM's 3270 series computer products and systems.

EX3278 is a package of Cobol CICS transaction programs that tests and exercises the facilities of 3278 display terminals, Models 2 and 5, 3279-2A and -2B color terminals and 3287 printers.

The EX3278 license fee is $12,000.

Systems Strategies, 225 W. 34th St., New York, N.Y. 10001.

Auxiliary equipment

Dataprobe, Inc. has announced its **HD-RJ45S-24-8** modular jack distribution system.

The HD-RJ45S-24-8 is said to interconnect four 50-pin telephone connectors with 24 eight-wire modular jacks. According to the vendor, each connector distributes six four-pair circuits to RJ45-type modular jacks.

The HD-RJ45S-24-8 modular jack distribution system is priced at $215 each.

Dataprobe, 110 W. Palisade Blvd., Palisades Park, N.J. 07650.

SYSTEMS & PERIPHERALS

Turnkey systems

NCR Corp. has introduced their **NCR 6760 Tower-Check** system.

The Tower-Check system is said to provide processing for items from an intelligent reader and sorter base. A typical configuration includes a 12-pocket reader and sorter; 2M-byte Bell Laboratories Unix-based processor with integrated disk; an NCR 6430 band printer and capture media.

The cost of a typical configuration is $137,355.

NCR, 1700 S. Patterson Blvd., Dayton, Ohio 45479.

Data storage

DY-4 Systems, Inc. has introduced its **DVME-718** small computer systems interface (SCSI) controller.

The DVME-718 is said to be based on an 8-MHz Motorola, Inc. 68010 CPU. The module includes a direct memory access controller, two byte-wide memory sockets, direct random-access memory and full-feature SCSI interface.

DVME-718 costs $1,989.

DY-4 Systems, Suite 202, 1475 S. Bascom Ave. Campbell, Calif. 95008.

■

Telebyte Technology, Inc. has released **Telebyte TDX 45** and **TDX 75** small computer system interface (SCSI) versions of two 9-track ½-in. tape drive subsystems.

The Telebyte TDX 45 and TDX 75 SCSI versions are said to be able to communicate with a wide range of high- and low-performance single- and multiple-host systems.

Buffered data transfer rates are up to 1.25M bit/sec. Both tape drives feature ANSI-compatible dual-density support of 800 and 1,600 bit/in.

The TDX 75 SCSI version costs $7,400, and the TDX 45 costs $6,400.

Telebyte Technology, 270 E. Pulaski Road, Greenlawn, N.Y. 11740.

SAVING A SECOND.

DATAPHONE Digital Service, part of the AT&T ACCUNET® Family of Digital Services. A range of high-performance services utilizing state-of-the-art digital technology.

So Nationwide has the information in its customers' hands. Fast.

And due to DATAPHONE Digital Service's 99% established reliability level and error-free transmission rate, an uninterrupted flow of data is assured. Knowing that what was sent is what was received, regardless of distance. While downtime or the need for retransmission is virtually eliminated. This is significant in a business where downtime can mean a productivity loss of $16.00 per minute, per person.

Together, all these factors have helped Nationwide maximize its productivity. So its people can not only respond to customer inquiries faster, they can respond to more inquiries.

At the same time, we've been able to help Nationwide meet another key corporate objective: expanding its customer base.

Since DATAPHONE Digital Service enables AT&T customers to transmit information virtually everywhere throughout the U.S., Nationwide has been able to expand its own geographic reach.

In addition to helping Nationwide design its network, we continue to help monitor and modify it, to best fit Nationwide's communications needs. A service we'll keep on performing as Nationwide's needs continue to evolve.

To quote Virgil L. Pittman, Nationwide's Vice President of Systems and Data Processing: "AT&T's DATAPHONE Digital Service has been a big plus for us. It's helped us enhance our customer service in many ways."

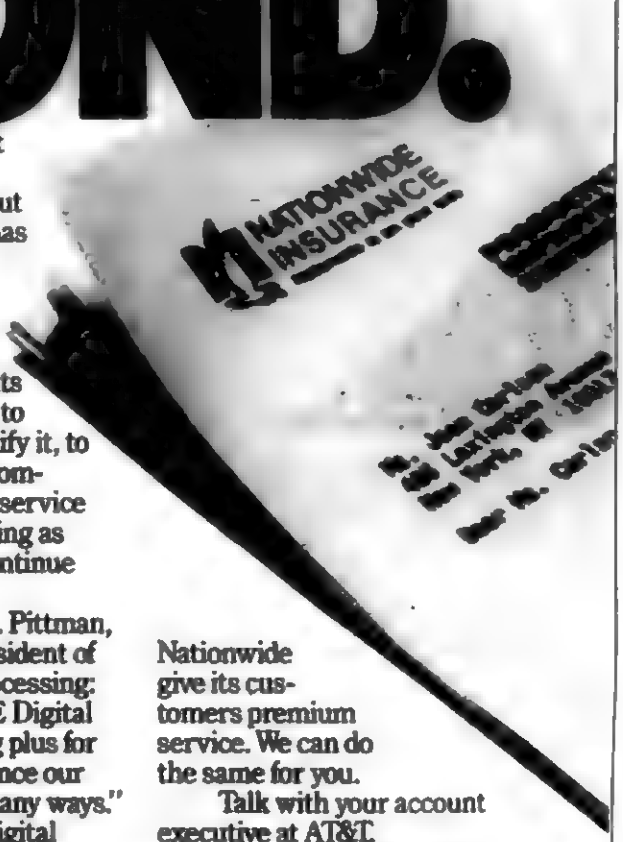
DATAPHONE Digital Service. Available throughout the United States, as well as to Canada and the United Kingdom. Just one of a full range of AT&T ACCUNET Digital Services that can be tailored to meet your business needs. No matter what size business you're in. Or where your business is located.

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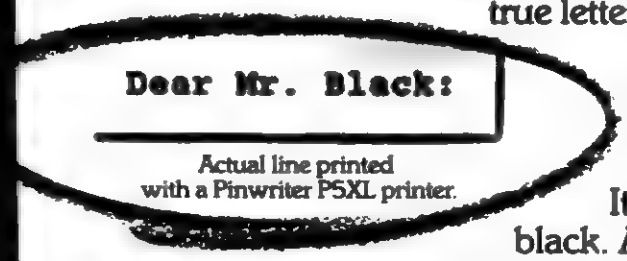
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NEC'S PINWRITER P5XL HAS

Our Pinwriter® P5XL printer has changed forever the way people look at dot matrix printing.

It's the first and only dot matrix that can use a letter-quality multistrike film ribbon—the same ribbon used in typewriters and letter-quality printers, such as our Spinwriter.® Which means for the first time in computer history you can produce important letters and documents with crisp, black, true letter-quality printing without sacrificing speed or graphics capability.



Actual line printed with a Pinwriter P5XL printer.

Fast, black letter-quality printing will be the primary reason many people will buy a P5XL printer. But there are plenty of other good reasons. In fact, it's the most versatile printer ever created for personal computers.

It can use an optional ribbon to print seven other colors plus black. And it has the best graphics resolution of any impact printer you can buy, due in part to our advanced 24-pin printhead. Plus it can print more typefaces automatically than any other dot matrix printer. And it's quiet and fast.

You can also expect a P5XL printer to turn out millions of characters before it will need service because it has the highest reliability rating in the industry. And there's a nationwide network

C&C Computers and Communications

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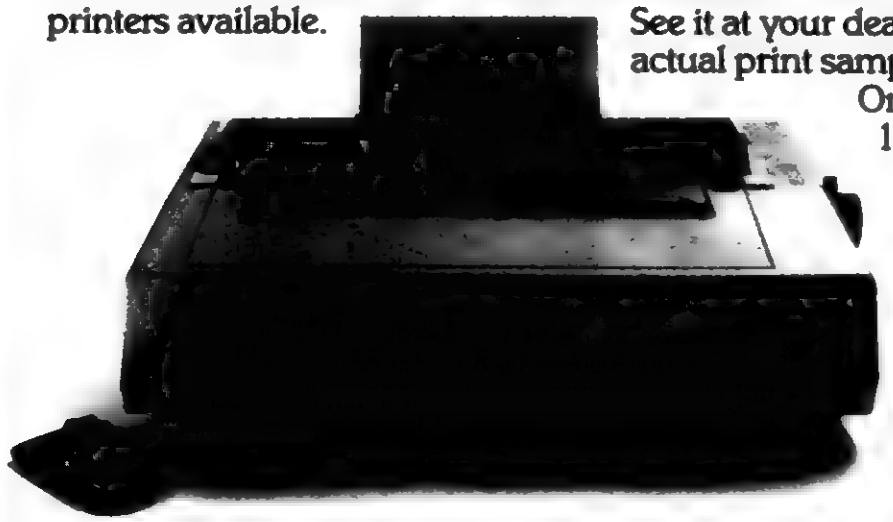
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of NEC Customer Engineering Service Centers to take care of maintenance.

Now, while the Pinwriter P5XL performs a little black magic, you won't have to go in the red to buy it.

The Pinwriter P5XL is the latest addition to the most advanced and extensive family of 24-pin printers available.



See it at your dealer or for an information package that includes actual print samples, call 1-800-343-4418 (in MA 617-264-8635).

Or write: NEC Information Systems, Dept. 1610, 1414 Massachusetts Ave., Boxborough, MA 01719.

NEC PRINTERS. THEY ONLY STOP WHEN YOU WANT THEM TO.

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NEC Information Systems, Inc.

EXPECTATIONS

The new ADDS 2020 will raise your expectations about all display terminals. You've always expected readable data. Now you can have high resolution, larger characters, 80/132 columns, 14" green, amber or white display, line graphics for highlighting, and variable-speed smooth scroll. There is, however, one thing you should not expect from the 2020—screen flicker. A unique 70Hz refresh produces a flicker-free display that you can read all day.

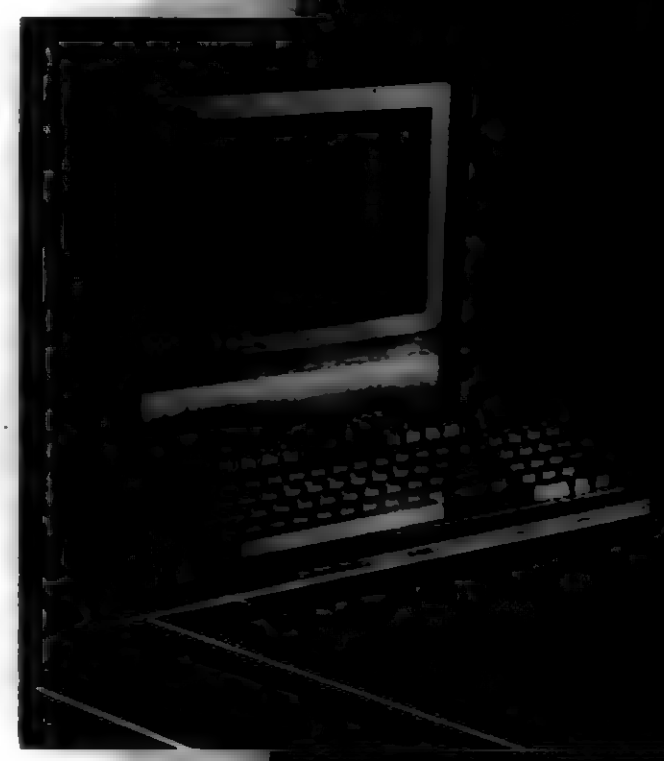
You've never expected 44 programmable keys with 88 modes and over 2500 characters of non-volatile memory to support them. Never expected it because the ADDS 2020 is the first terminal to give it to you.

The ADDS 2020 keyboard gives you a legend strip and the satisfying feel of solid quality. And if you like your PC keyboard, keep it. With the ADDS 2020 you can use IBM PC* compatible keyboards, even IBM's.

Greater expectations: The 2020 provides Lotus*-like menu bar assistance for function keys and applications; available desk accessories include a clock, calendar, calculator and tele-communications; a printer port for either serial or lower-cost parallel printers; and bell volume programmable from the keyboard or host. And, as superior as this new terminal is, it is still fully compatible with ADDS, Hazeltine, Lear Siegler, TeleVideo, Wyse and many other terminals.

Beyond the 2020

There's a new ADDS behind the ADDS 2020. With still more inventive products to come like the new "picture perfect" 3220. So call 1-800-231-5445 today.



ADDS

...ised. I didn't expect so much from a ...inal. I'd like to see more information on the ...DS 2020.

Name

Company

Zip

*IBM is a registered trademark of International Business Machines Corporation.

*Lotus is a registered trademark of Lotus Development Corporation.

NEW PRODUCTS/SYSTEMS & PERIPHERALS

Printers/Plotters

Facit, Inc. has introduced its **C5500** printer.

The C5500 is said to interface with both micro and minicomputers and to handle graphics and correspondence printing. It prints draft-quality correspondence at 250 char./sec. and near-letter-quality at 60 char./sec.

Other features include fanfold or cut-sheet feeding, print parameter switching and color flexibility. It allows users to set their own print parameters, such as font style, form length and interface protocol, by responding to questions posed by the printer. The C5500 can use a four-color ribbon or a black ribbon.

The C5500 costs $1,595.

Facit, 9 Executive Drive, Merrimack, N.H. 03054.

Power supplies

Emergency Power Engineering, Inc. has introduced the **Mainframe Power Center** (MPC).

The MPC reportedly isolates, distributes and monitors AC power to systems such as the IBM 3090 mainframe family. According to the vendor, with the MPC, electric installation of a typical mainframe can be completed in less than half a day.

One MPC has connections for as many as four high-current loads. In addition, between 42 and 126 power poles are available to distribute power to any combination of smaller single-phase and three-phase loads, such as disk drives, printers or other peripherals.

The MPC costs from $9,000 to $20,000, depending on features and kVA rating.

Emergency Power Engineering, 3580 Cadillac Ave., Costa Mesa, Calif. 92626.

■

Displex, Inc. has introduced an **uninterruptible power supply** (UPS), said to protect against power blackouts, brownouts, spikes and surges.

The UPS is said to eliminate the need for dedicated lines by guarding against interference and hazards related to poor grounding. It eliminates both common-mode and normal-mode noise and spikes that can garble computer data and pose safety and reliability problems.

The unit features sine-wave output, zero transfer, short circuit protection, high noise immunity, quiet operation and up to 20 min. of back-up time at full load provided by maintenance-free batteries.

The unit is available in power ratings of 1.25 kVA, 2.50 kVA and 6.20 kVA.

The system is priced from $3,140.

Displex, One Alexander Place, Glen Cove, N.Y. 11542.

Auxiliary equipment

Proximity 2000, a security access control system, has been introduced by **Cardkey Systems**.

Said to provide hands-free operation by reading concealed tags or cards with special coding and design over a 12-in. to 16-in. distance, Proximity 2000 controls access to a secure area for as many as 65,000 individuals. The system can operate as an on-line, off-line or stand-alone device and can also monitor up to eight supervised alarm contacts.

The Proximity 2000 system, which includes a D-400P Terminal/Controller, costs $2,850.

Cardkey Systems, 20660 Bahama St., Chatsworth, Calif. 91311.

PRICE REDUCTIONS

American Computer & Peripheral, Inc. has announced price reductions on their **American 88** (XT) **Basic system**, **American 88 Perfect system**, the **American 286-A** (AT) **Basic system** and the **American 286-A Perfect system** computer systems.

The American 88 Basic system with 128K bytes of random-access memory (RAM) and Microsoft Corp.'s MS-DOS costs $750; the American 88 Perfect system with 640K bytes of RAM costs $3,150; the American 286-A Basic system with 512K bytes of RAM costs $2,450; and the American 286-A Perfect system with 512K bytes of RAM costs $4,850.

American Computer & Peripheral, 2720 Croddy Way, Santa Ana, Calif. 92704.

■

Tamp Computer Systems, Inc. has reduced the price of its **Disaster Recovery System** for IBM Personal Computers and compatibles.

The Disaster Recovery System is said to consist of a six-phase approach for making a disaster recovery planning project and contains tools necessary for the six phases. Included are sample questionnaires, interoffice memos and external letters.

The Disaster Recovery System now costs $7,500.

Tamp Computer Systems, 1732 Remson Ave., Merrick, N.Y. 11566.

Rexon Business Machines has reduced the prices of its **RX55**, **RX105**, **RX205** and **RX405** multiuser microcomputers.

The entry-level RX55 with 512K bytes of memory, four serial ports and two parallel ports, a 25M-byte hard disk drive and a 60M-byte ¼-in. cartridge streaming tape drive is now priced at $9,990, according to the vendor.

The RX105, with the same features as the RX55 but with 51M bytes of disk storage, now is priced at $10,990.

The RX205 with an 85M-byte Winchester disk now costs $12,990, and the RX405, which features a 227M-byte disk drive and an eight-slot card cage, now costs $23,990.

Rexon Business Machines, 5800 Uplander Way, Culver City, Calif. 90230.

The United Kingdom is one of the world's largest computer markets. And you can profit from it.

The United Kingdom is one of the largest and most developed markets in the world for technological products. Total MIS/DP expenditures in the United Kingdom are forecast to exceed $28 billion by the end of 1989, according to International Data Corporation, the world's leading market analysis and consulting firm for the information processing industry.

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COMPUTER INDUSTRY

Section begins on page 110

M&D switches to independent units, aims to triple revenue

Divisions to handle own products, profits

By Charles Babcock

NATICK, Mass. — While large companies such as IBM have used independent business units to achieve specific corporate goals or to function in a niche area of corporate operations, McCormack & Dodge Corp. is one of the first large software companies to reorganize its entire business around that approach.

M&D is in the process of reorganizing into five independent business units in an attempt to triple its revenue by 1991 and minimize turnover, especially among its skilled programming staff.

The Natick-based applications software company, part of Dun & Bradstreet Corp., passed the $100 million mark in revenue last year after 17 years in business. With 1,300 employees, it has taken the reorganizational step in an attempt to maintain its entrepreneurial spirit, says Frank H. Dodge, president, chief executive officer and cofounder of the firm.

Each of the five independent units will be responsible for its own profit and loss and for its own product line, including development, marketing and support. A companywide sales force will continue to handle direct sales, but each business unit will be responsible for training the sales force in its product line, Dodge says.

The concentration of so much responsibility in each unit will force more decision-making power down to the level of "middle managers, who are crucial to the company's success," Dodge adds.

In addition to improving business performance, the new organization is designed to increase an employee's sense of participation in the company, says M&D Vice-President for Human Resources Loretta S. Henry.



CEO Frank H. Dodge

She claims the firm's 20% annual turnover rate is substantially below what she says is the industry average of 30% to 35%. M&D wants to keep it that way, if not push its rate lower.

"You agonize over your superstars," she says. "You want to keep talent, not lose it. You want to let them have an impact."

One noted "technical superstar" who left M&D a year ago is Executive Vice-President John B. Landry, developer of the flagship Millennium accounting software series. Henry says the reorganization had "nothing whatsoever" to do with Landry's departure and that Landry was in the unusual position of being able to acquire his own company, Distribution Management Systems, Inc. of Lexington, Mass.

Annual turnover can be anywhere from 10% to 30% at a software products company, with an average tenure of 2½ years for software engineers, according to a spokesman for Robert Kleven & Co., a Lexington, Mass.-based placement office.

M&D's reorganization was designed in consultation with a cross section of 40 middle managers, according to Dodge. The group was asked to plan the transition as if "an alien spaceship had landed and captured the executive committee," he says.

The new business units at M&D will be as follows:

- Distributed systems, headed by John P. Birch, formerly vice-president of research and development. It will be responsible for developing products that distribute applications from mainframes to minicomputers and microcomputers.
- Applications tools, headed by Dean F. Redfern, formerly vice-president of information services. Its product line includes M&D's Millennium series, including fourth-generation development tool Millennium:SDT and Millennium:FYI, an on-line memo and electronic mail package.
- Financial systems, headed by David G. Todd, formerly vice-president of marketing and support. Its product line will include general ledger, accounts receivable, accounts payable and other financial applications.
- Human resource systems, directed by Henry P. Holland. Its product line will be human resource applications such as payroll and personnel management.
- Manufacturing systems, also under the direction of Holland, with responsibility for the PIOS manufacturing series. M&D will hire an executive who will report to Holland to manage the manufacturing systems operation, formerly Rath & Strong Systems Products, Inc., in Dallas.

Within each business unit is an account manager. The holders of this newly created position will be located geographically close to customers and serve as their contacts for product implementation and support.



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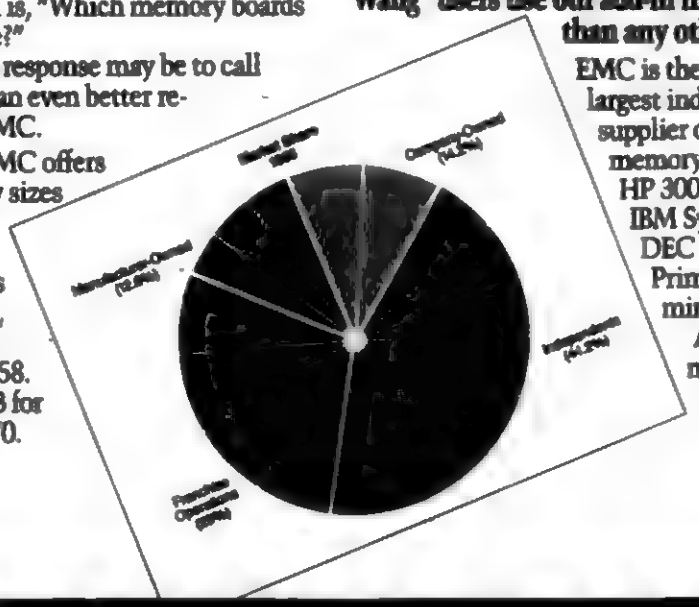
As a result, unlike HP, we have *no maintenance charges* of any kind.

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CW-8-18

Fujitsu to offer U.S. vendors domestically produced disks

Japanese firm opens U.S. plant

By Jeffry Beeler

HILLSBORO, Ore. — Fujitsu Ltd.'s U.S. subsidiary recently opened a $30 million disk systems factory that soon will give Amdahl Corp. and other North American vendors their first domestic source of Japanese-designed storage products.

Although Fujitsu America, Inc. delayed the plant's formal dedication ceremony until Aug. 1, the facility has reportedly been producing 10½-in. disk subsystems since April.



Fujitsu President Yamamoto

To date, the products have gone mainly to the firm's OEM customers, the first of which was Portland, Ore.-based Sequent Computer Systems, Inc., according to Fujitsu America President Masaka Ogi.

But in approximately 15 months, the plant will also begin shipping 10½-in. storage modules to Amdahl, the U.S. reseller of Fujitsu's IBM-compatible mainframes, according to Wally Cox, the factory's director of manufacturing.

Relocating manufacturing sites

In the past, Fujitsu has always manufactured the modules in Japan and exported them to the U.S. But now, with the recent opening of its fifth U.S. manufacturing site, the Japan-based company for the first time is beginning to locate its disk systems assembly lines in the same countries where the products will be sold.

"Currently, only 25% of Fujitsu's total sales come from overseas," Fujitsu President Takuma Yamamoto told *Computerworld*. "In the future, we hope to expand our growth rate overseas so that the U.S. and other countries contribute a greater percentage to our overall revenue."

Currently, the Hillsboro site employs nearly 100 workers, all but a handful of them American.

It produces several hundred units per month exclusively for domestic consumption, according to Mike Gluck, senior vice-president for Fujitsu America's Storage Products Division.

Strengthen service, support

The decentralization of the parent company's disk systems manufacturing efforts is an attempt to strengthen Fujitsu America's service and support of its peripherals customers.

"When our disks are being shipped from Japan, we sometimes have trouble responding promptly to sudden increases in customer demand," Gluck said. "But by producing the equipment here in the U.S., we gain additional flexibility and can adjust our capacity to meet short-term production requirements."

Production, R&D site

The factory forms part of a 130-acre site that will ultimately hold six extra buildings. These buildings will house both manufacturing and research and development activities.

As additional production floor space gradually becomes available, the complex will likely broaden the scope of its manufacturing endeavors to include other kinds of storage modules aside from the 10½-in. disk units.

Some possibilities for future product emphasis include 8-in. disk and ¼-in. cartridge tape systems, Gluck said.



An IBM Color Display.

It can really boost an operator's efficiency. That's what REJIS found out. REJIS is the Regional Justice Information Service in St. Louis.

This information service is a trendsetting, government criminal justice network linking 120 different agencies to a central computer.

REJIS quietly initiated a pilot program using IBM 3179 Color Displays. The units were tested under everyday conditions. Default colors were used, so no software changes had to be made. The quiet test turned into a smashing success.

End users were amazed to see how data popped and how mistakes

Uneasy truce in chip war

From page 110

an interesting test of the supposedly integral part the Japanese government plays in the private sector.

With all the political posturing that has followed the agreement, what has been glossed over is the overall semiconductor industry context. The commodity chip price war is essentially over, and the winners are the companies whose names end in a vowel.

In that context, the recent trade agreement is more like a postwar treaty than a landmark of cooperation. Whether the fate of the U.S. chip industry will look more like the ravaged Germany of the 1920s or the revitalized Germany of the late 20th century remains to be seen.

The touchiest part of the agreement is Japan's promise of increased U.S. access to its markets — reportedly a mandated market share increase from 8% to 20% in the next five years. That requires overcoming two intrinsic facts about the Japanese market.

First, the majority of semiconductors sold in Japan go not into the latest parallel processor, but into videocassette recorders, microwave ovens, calculators and the other consumer goods that made Japan, Inc. what it is today. American suppliers aren't making many chips for those products, since the Japanese cornered the market long ago.

The related second point is Japan's ingrained cultural predilection toward purchasing things Japanese. They have no need for "Park Your Dodge in Detroit" bumper stickers. Like business card exchanges and sake dinners, buying native goods is part of Japanese business ethos.

If Reagan, Nakasone and their trade emissaries can change that, so much the better; the prediction here is that they will not. U.S. semiconductor exports to Japan may improve to a degree. But one gets a strong feeling that there will be new trade skirmishes breaking out when 1991 rolls around and the U.S. market share looks well short of the targeted 20%.

And then the politicians will be out in force again.

were easier to catch.

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IBM

FAA to halt purchases

From page 110

equipment is in place at our facilities and we need it. We can't get along without it."

Paradyne provides the FAA with modems, multiplexers, a network management system and related services, in order to implement the Data Multiplexing Network Project for improving air traffic control operations.

In December 1985, Paradyne was suspended from obtaining new or renewed government contracts after the company and some of its top officials were indicted by a federal grand jury for allegedly defrauding the Social Security Administration [CW, Dec. 23]. The defendants have vigorously denied the charges.

GAO auditors said they are not convinced the FAA should purchase more Paradyne equipment and urged the FAA to study alternatives to continuing its business dealings with Paradyne.

A new evaluation

Changing circumstances, such as the Paradyne suspension and pending litigation, warrant a new evaluation of the need to purchase Paradyne equipment, the GAO concluded.

Paradyne's suspension was triggered by criminal charges alleging that the firm won a $118 million contract for data communications equipment and terminals by misleading Social Security Administration officials as to the status and availability of the products.

At a key demonstration test, Paradyne used a Digital Equipment Corp. PDP-11 processor instead of the Paradyne P-8400 processor promised in the bid and covered the label with a Paradyne label without informing agency officials.

The Department of Justice earlier this month filed a civil suit against Paradyne to recover profits the firm obtained under that contract.

The Justice department plans to delay the civil proceeding until after the criminal trial.

Nixdorf ignites overseas vendors' hopes to enter U.S. market

W. German company scores retail contract

By Dennis Phillips
Computerworld International News Service

BONN — The recent signing of a $100 million contract between West Germany's Nixdorf Computer AG and a 400-store U.S. retail chain, reportedly Montgomery Ward & Co., may help open the door to the North American market for European software companies, industry analysts predict.

The very competitive price war for both hardware and standard software programs in the U.S. had many analysts fearing just the opposite trend. They expected U.S. companies would invade the European market. But now Nixdorf's success in winning a big contract "in the lion's den" gives European firms cause for optimism.

Top quality software, an installed service network and a cutthroat price combined to help Nixdorf grab the more than $100 million contract with the U.S. retail chain, according to insiders.

"From the hardware side, there's no reason to buy from Nixdorf," says a banking analyst, who asked to remain anonymous. "So if it's true they won the contract for their software, that puts a new light on things. Maybe European companies, and especially German ones, will have a greater impact in the U.S. now."

Nixdorf's software department now offers about 130 software programs, mostly developed in-house, for different applications.

'A complete solution'

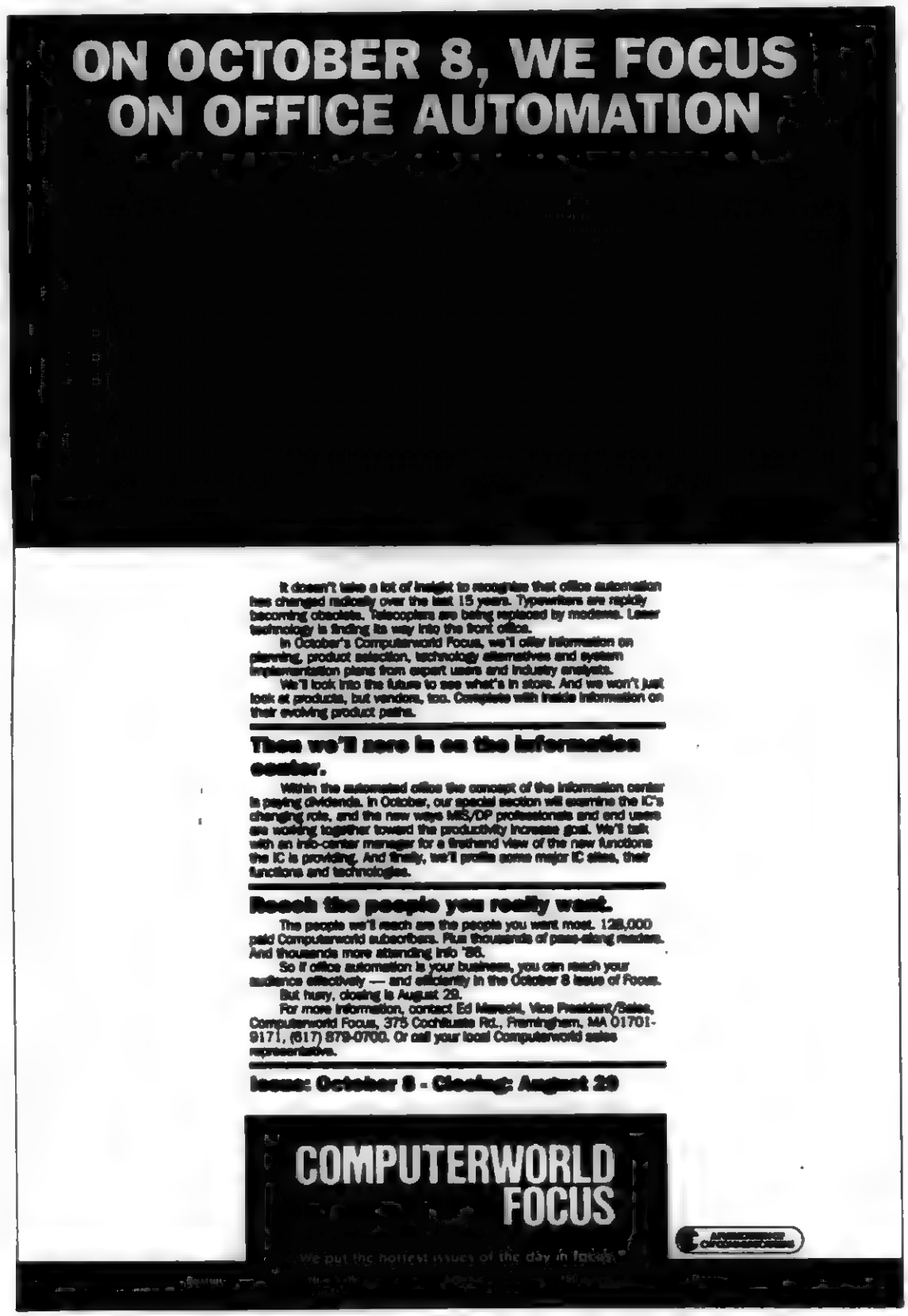
"I think the European companies may have a competitive advantage as they offer a complete solution — hardware, software and service," says Hans-Joachim Grobe, consultant with management consultants Dieboldt Deutschland GmbH in Frankfurt.

While traditionally strong in the European and Asian banking sector, Nixdorf also installed a new retail point-of-sale (POS) program in Australia recently. The 45-store Myer retail chain in Australia ordered 2,250 POS terminals from Nixdorf at the end of 1985, according to Nixdorf spokesman Rolf Prey.

Developing the software for that system undoubtedly helped the West German firm in its bid for the U.S. contract. If the U.S. chain, like the Australian retailer, wants 50 terminals per store, it will require 20,000 POS terminals. Installation in the U.S. is to start in 1987.

Considering the downstream advantages for Nixdorf, the sales price was probably set with no profit margin at all, analysts suggest. Nixdorf confirms that the contract is split 50% for hardware and 50% for software and services.

Until now, Nixdorf has lost money in the U.S., investing heavily to set up its own sales and service offices in 100 U.S. cities [CW, July 7]. "We needed to get a customer to use this system, but without such a technical support system you can't win a major contract," Prey says. "First we had to invest. Now it will start to earn money in America."



Harris broadens CAD packages via acquisition

By Alan Alper

NEW YORK — Harris Corp. last week announced the acquisition of Scientific Calculations, Inc., a Fishers, N.Y.-based developer of electrical computer-aided design (CAD) software.

Harris said it acquired the privately held Scientific Calculations, which has sales of about $30 million, to broaden its portfolio of mechanical CAD products to include electrical CAD packages for the design of printed circuit boards and integrated circuits. Scientific Calculations' SCICADs printed circuit board design package is said to be used by approximately 70% of leading electronics firms, according to Harris.

James Oyler, senior vice-president of Harris's Information Systems sector, said the acquisition would enable the Melbourne, Fla., firm to become the only vendor offering its own range of mechanical and electrical CAD software packages.

"Users are beginning to need packages from various disciplines," Oyler said. "And, over time, demand will increase."

Scientific Calculations is essentially a software developer, but also markets turnkey, electrical CAD systems based on Digital Equipment Corp. hardware.

Oyler said Scientific Calculations will retain its name and operate under current management, led by President Paul Watkins.

The company will be part of Harris's Information Systems unit. Eventually, however, Scientific Calculations' sales, marketing and product development will be merged into the sector, he added.

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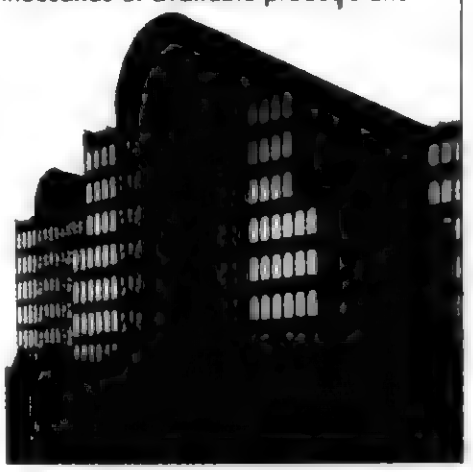


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2 ☐ Computer dealer/dist.
3 ☐ Computer OEM
4 ☐ Office products dealer
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6 ☐ Software developer
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8 ☐ Turnkey vendor
9 ☐ Value adder
10 ☐ Other (specify) _____

II Corporate Volume Buyers
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M ☐ Insurance
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III Your Job Function
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BB ☐ Administrator
CC ☐ Consultant
DD ☐ Corporate officer
EE ☐ Creative arts (all)
FF ☐ Designer (all)
GG ☐ DP/WP manager/operator
HH ☐ Engineer (all)
II ☐ MIS Dir./Mgr.
JJ ☐ Programmer
KK ☐ Purchasing
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IV Product Lines Offered
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A2 ☐ Super microcomputers
A3 ☐ Minicomputers
A4 ☐ Microcomputer software
A5 ☐ Minicomputer software
A6 ☐ Peripherals
A7 ☐ Communications
A8 ☐ Cabling
A9 ☐ Furniture
A10 ☐ Supplies/Accessories
A11 ☐ Other _____

If the space program had advanced as fast as the computer industry, this might be the view from your office.

And space stations, Martian colonies, and interstellar probes might already be commonplace. Does that sound outlandish? Then bear these facts in mind:

In 1946 ENIAC was the scientific marvel of the day. This computer weighed 30 tons, stood two stories high, covered 15,000 square feet, and cost $486,840.22 in 1946 dollars. Today a $2,000 portable can add and subtract more than 20 times faster. And, by 1990, the average digital watch will have as much computing power as ENIAC.

The collective brainpower of computers sold in the next two years will equal that of all computers sold from the beginning to now. Four years from now it will have doubled again.

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Request for Proposal No. 1133, due Tuesday September 23, 1986 at 3:30 p.m. for the acquisition of a Pharmacy System for the UNIVERSITY MEDICAL CENTER to be installed on an IBM 4381 running MVS/SP and CICS 1.6.1. Vendors must attend a mandatory bidders' conference Thursday, September 4, 1986 at 2:00 p.m. in the Computer Services Office of the University Medical Center, 2500 North State Street, Jackson, MS 39216.

Request for Proposal No. 1134, due Tuesday September 16, 1986 at 3:30 p.m. for the acquisition of a multiprogramming minicomputer based system to function as a distributed processor to the Sate Computer Center for the MISSISSIPPI STATE PERSONNEL BOARD.

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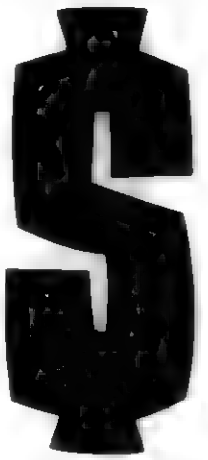
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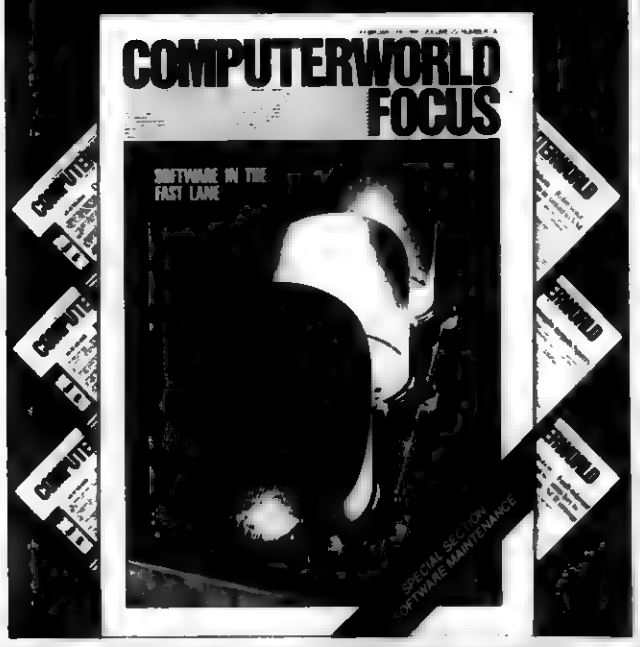
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Assists in the development of applications supporting financial and student administration. Requires a B.S. in accounting, business, or computer-related field and at least three years experience in systems analysis/programming. Prefer strong management skills and knowledge of COBOL, EASYTRIEVE, TSO, CICS, MANTIS/TIS.

Microcomputer Specialist

Assists administrators, faculty, staff, and students using the IBM Personal Computer and compatibles. Duties include general consulting, teaching short courses, writing documentation and newsletter articles, and assisting in the application of microcomputers into administrative departments. Requires a B.S., two years' experience, and a knowledge of DOS, word processing, spreadsheets, and database management.

Programmer

Develops applications in support of the University Administration. Requires a B.S. in accounting, business, or computer-related field with working knowledge of at least one programming language. Prefer one year experience and knowledge of COBOL, EASYTRIEVE, TSO, CICS, MANTIS/TIS.

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The closing date for all applications is August 29, 1986. Send a letter indicating the position(s) applied for, a current resume, and the names, addresses, and phone numbers of three references to:

Personnel Selection Committee
Division of University Computing
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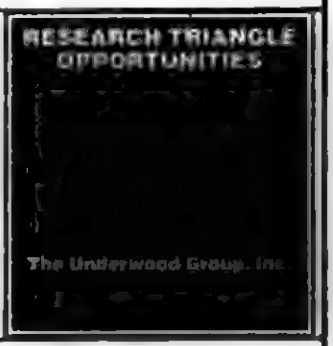
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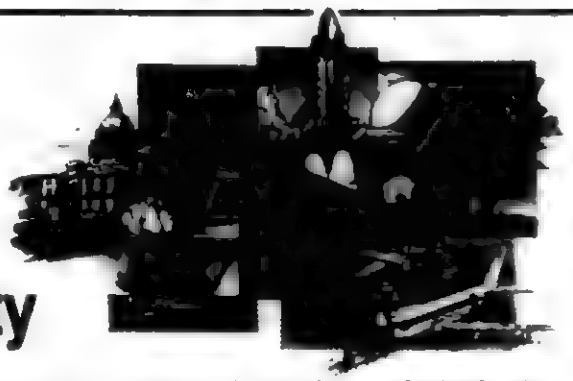
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TECHNICAL WRITER—To write and update Project Athena's user documentation set, work with faculty and staff to determine needs, participate in design of Athena's systems and services; test pre-release software. Bachelor's degree or equivalent experience and one year technical writing experience necessary. Strong "under the hood" technical background including knowledge of at least one programming language, computer editors and formatters. Experience in university setting, UNIX system, application area knowledge strongly desired. Writing samples required. (A86-744)

SYSTEMS PROGRAMMER/RELEASE MANAGER—Will assist in planning and executing systems builds and installation of software. Will be responsible for separating bug reports between installation, configuration, design, or development errors. Special qualifications: Bachelor's degree or equivalent combination of education and experience is required. Three to five years of professional experience in systems programming is required. Individuals should have extensive experience with UNIX operating systems and C, Fortran and Lisp also desirable. Professional experience should include work in some of the following areas: source code control for large projects, system engineering, tuning of operating systems, and management of local area networks. Good communications skills are vital. (A86-711)

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Please send two copies of resume, referencing appropriate job number and writing sample as necessary to: Sally Hansen, MIT Personnel Office, E19-239, 77 Massachusetts Avenue, Cambridge, MA 02139.

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MIT

New positions exist in a progressive healthcare system that operates five hospitals in Northern California. Mercy Health Care Organization has the following openings in Sacramento, California.

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To install software packages, develop new programs, and analyze user needs in a newly installed network of IBM 38 systems. Position requires five years of programming experience, two years using RPG III and CRT. Experience with Dynamic Control software and a degree are desirable. Salary range $27,000 - $33,000 per year.

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Japan: Mr. Shuji Mizuguchi, Computerworld Japan, 7-4 Shintomi 1-Chome, Chuo-ku, Tokyo 104. Phone: (03) 551-3882. Telex: 252-4217 (Computerworld Japan only).

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Mexico: Henry Morales, Computerworld Mexico S.A. de C.V., Oaxaca 21-2, Mexico City 7 D.F. Colonia Roma, 06700 Mexico. Phone: (05) 514-4218. Telex: 177 1300 (ACHAME).

The Netherlands: Wout Berends, CW Communications B.V., van Eeghenstraat 84, 1071 GK Amsterdam, The Netherlands. Phone: (020) 64 6651. Telex: 18242 (CWCOM NL).

Norway: Mr. Morton Hansen, CW Norge A/S, Hovmveien 43, P.O. Box 2862, Toyen, 0608 Oslo 6, Norway. Phone: (20) 64 77 25. Telex: 76476 9 (CW NOR N).

People's Republic of China: Chen Mingkun, China Computerworld, 74 Lu Gu Gun Road, P.O. Box 750, Beijing 10039, People's Republic of China. Phone: (47) 814 6174. Telex: 222214 (CCW CN).

Spain: Neil Kelley, Computerworld/Espana, Barquillo 21-3 izda, Madrid-4, Spain. Phone: 231 23 85; 231 23 86; 231 23 88. Telex: 47894 (CW E).

Sweden: CW Communications AB, Sodra Hamnvagen 22, S-115 41 Stockholm, Sweden. Phone: 46 8 67 91 80. Telex: 14904 9 (NOVACW).

Switzerland: Gebhard Osterwalder, CW Publikationen AG, Witikonerstrasse no. 15, CH 8032 Zurich, Switzerland. Phone: (01) 55 10 77. Telex: 816710.

Taiwan: Grace Tang, ACE Media Agency Ltd., Room 503, 1, Fu Hsin S. Road, Sec. I, Taipei, 10587, Taiwan, R.O.C. Phone: 751 3636. Telex: 14142 (ACE GROUP). (Representative for all CWCI publications).

United Kingdom: Martin Durham, CW Communications Ltd., 99 Grays Inn Rd., London, WC1 8UT, United Kingdom. Phone: (01) 831-9252. Telex: 262346.

Euan Rose, Bill Dunlop, Barbara Levy, Christine Taylor, Beere Hobson Assoc., 345 Goswell Rd., Islington, London EC1, United Kingdom. Phone: (01) 278 3415. Telex: 311951. (Representatives for CWCI publications).

Venezuela: Kalman von Vajna Nagy, CW Comunicaciones, C.R.L. Torre Maracaibo, Piso 10, Oficina H, Av. Libertador, Caracas, Venezuela. Phone: 72-76-30.

West Germany: Eckhard Utpadel, CW Publikationens GMBH, Friedrichstrasse 31, 8000 Munchen 40, West Germany. Phone: (089) 38172-0. Telex: 5215350.

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Businessland to buy Morris

By Alan Alper

Continuing its acquisition binge, computer retailing giant Businessland, Inc. last week agreed to purchase privately held Morris Decision Systems, Inc., a leading reseller to corporations in the New York metropolitan market.

Under terms of the deal, the purchase price, to be paid in Businessland common stock, will be based on Morris's closing financial statements. A Businessland spokeswoman said several hundred thousand shares of new Businessland stock would be issued to Morris shareholders. The deal is expected to close Sept. 3.

Businessland's proposed acquisition of Morris follows its recent takeover of Kansas City, Mo.-based Amerisource, a 28-outlet chain operating primarily in the Midwest. Earlier this year, the San Jose, Calif., firm attempted to acquire 36-store chain MBI, Inc., of Rockville, Md., but could not come to terms [CW, June 9].

Sought to be acquired

Morris sought to be acquired after recently deciding that it would have difficulty continuing to grow or attracting additional financing due to deteriorating market conditions, Morris President Jim Coane said.

"This was aggravated by price cuts made by all our major suppliers recently," he said. "IBM's moves in April on their workstations also made it difficult for us to add value by building up the hard disk drives."

Coane said Morris had been discussing a business combination with Businessland for a couple of years. "They embrace the same basic strategy — selling to corporations — that we have executed in the marketplace," he claimed.

Analysts last week said Morris appears to fit nicely with Businessland. "It looks like a fair match," said Seymour Merrin, an analyst with the Gartner Group, Inc. in Stamford, Conn. Merrin founded the Westport, Conn.-based chain Computerworks, Inc., which was acquired by Morris last November.

Reflects ongoing consolidation

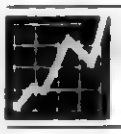
The proposed acquisition reflects the ongoing consolidation within the computer retailing business. "The big companies have to get bigger," Merrin said. "They want more clout with their suppliers, and their customers want vendors who have more clout as well."

Coane agreed. "You have to make money on the buy side since it's hard to make any money on the sale side," he explained. "That comes only with purchasing power, which results only from buying in large volume."

The 6-year-old Morris, which operates three computer centers, has annual revenue of approximately $32 million. Businessland, which operates 99 outlets in 43 metropolitan markets, posted sales of $404 million in its fiscal year ended June 30.

If the acquisition is finalized, Morris' founder and Chairman, Anthony Morris, will become a corporate vice-president of Businessland, Coane said.

Despite skepticism, disk drive stocks can prove rewarding



ACTIVE ISSUES
Kathy Porteus

Investors are giving Winchester drive companies a raw deal, according to analysts.

In recent weeks, disk drive stocks such as Seagate Technology Corp. (SGAT — 12), Micropolis Corp. (MLIS — 16¾), Maxtor Corp. (MXTR — 14¾), Priam Corp. (PRIA — 2⅝) and Miniscribe Corp. (MINY — 6½) were particularly hard hit owing to negative investor sentiment toward technology.

Jean W. Orr, vice-president with Drexel Burnham Lambert, Inc., says, "Investors feel that component suppliers will be affected by continued sluggish demand for computers regardless of how affected they now seem."

Analysts say some drive companies currently trade below their price/earnings ratios of a year ago, despite improved fundamentals. An oft-cited example is Seagate, which is also recommended by most analysts who follow disk storage firms.

Seagate recently disclosed fourth-quarter and fiscal 1986 results that surpassed expectations. The company reported 1986 earnings of 72 cents per share on revenue of $460 million vs. last year's per-share earnings of 2 cents on $215 million in revenue.

"Seagate's margins were fantastic, its business mix showed real improvement, and such good numbers come in the wake of one of the worst slumps ever," says Steven Ossad, an analyst with L. F. Rothschild, Unterberg Towbin.

Yet Seagate is selling "at absolutely no multiple," according to Ossad, who estimates Seagate will earn $1.25 per share in fiscal 1987. Likewise, Orr says Seagate has been and continues to be a very good value.

Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

She estimates the company will earn $1.15 to $1.20 per share in the current fiscal year.

Why hasn't a stock like Seagate responded better to positive company developments?

"Disk drive stocks are always volatile and have been characterized by radical shifts in investor sentiment," Ossad explains. "Right now, nobody wants to believe that some of these companies are doing very well."

James Stone, an analyst with Shearson Lehman Brothers, Inc., laments that "investors do not understand the dynamics of the Winchester drive market." According to Stone, brand loyalty does indeed exist among OEM customers, and the market is still oriented toward product performance, quality and service.

Nevertheless, Stone says, the perception persists that this is a commodity market in which "customers will sell their mothers for a $5 difference in the price of a drive."

Stone says he believes Micropolis's stock, like Seagate's, is being held down by fear. "Investors are concerned that the industry's deep trouble three years ago could resurface in spite of four or five consecutive quarters of up earnings," he says. Stone estimates Micropolis will earn $1.75 per share in fiscal 1986, ending Dec. 31.

Both Stone and Ossad describe Priam as a very risky bet based on the company's new 190M-byte drive, which is still in pilot production. The company suffers from a weak core business and the reputation of delivering new products late.

But Ossad recommends purchase of Priam because it is a prudent speculation. Under 3, Priam appears to be selling $1.00 below book value, according to Ossad, and the company has $25 million to $27 million in cash and no debt.

Despite current investor resistance to Winchester drive companies, analysts maintain that the potential for a valuation increase exists. "People will inevitably discover," Ossad says, "that here is a group of stocks that are out of favor and doing much better than anybody really thinks."

Chip slump eases in spite of layoffs

From page 110

steady increase in the book-to-bill ratio from a low of .65 in January 1985, observers say AMD's layoffs were just a delayed reaction to the hard times of a year ago.

Kidder Peabody & Co. analyst Adam Cuhney said AMD's layoffs were in part the result of problems stemming from a loss of key sales and marketing people, declining research and development efforts and the firm's unsuccessful attempts to bring products developed in Sunnyvale, Calif., into production in its Austin, Texas, manufacturing facility.

AMD's no-layoff policy was often held up as an example of extraordinary management. But the plan backfired when stock prices began to slip. "They went out with a bold idea of holding on to their employees and trying to manage the way the Japanese manage," White said. "But they were clearly running counter to the trend, and their stock price suffered."

The chip industry clearly has yet to achieve the dramatic turnaround predicted by the SIA at the end of last year. That rebound never materialized because a turnaround must be market driven, and "there has just not been enough demand to warrant an upturn," according to Michael Gross, analyst at Framingham, Mass.-based market research firm International Data Corp.

"There are no meaningful signs of an increase in demand for semiconductors from the computer sector," said W. J. Sanders III, AMD's president and chief executive officer.

Semiconductor manufacturers will continue to record losses during the third quarter of this year, but the fourth quarter could bring a return to profitability, Gross said. An upturn will begin to show through in the first quarter of 1987, as purchases of communications and computer equipment increase.

Probst to retire; exec office forms

From page 110

cal to users, whether Sperry or Burroughs, that their concerns are addressed. That's why it is important that the new company has a Sperry presence at the top."

In a separate statement, Burroughs said a meeting is scheduled to be held Sept. 16 for shareholders to conclude the merger between the two companies.

Each share of Sperry common stock is expected to be exchanged for $30.60 principal amount of Burroughs 9.75% subordinated debentures and 0.918 of a share of Burroughs Series A convertible preferred stock.

Convergent reorganizes, cuts staff

SAN JOSE, Calif. — Confirming recent industry speculation [CW, Aug. 11], Convergent Technologies, Inc. last week announced a major reorganization that included the layoff of 500 of the company's 1,900 employees.

Convergent also reduced top management salaries by 10% in a related cost-cutting move.

The reorganization creates a new unit, Convergent Small Business Services, that will manage Convergent's push into turnkey systems in vertical markets.In the past year, Convergent has acquired or announced its intent to acquire vendors of turnkey systems in the legal, accounting and dealer and distributor markets.

The existing Convergent Technologies unit will maintain responsibility for the firm's current OEM and value-added reseller business. But President and Chief Executive Officer Paul C. Ely Jr. said Convergent is attempting to diversify away from what he called the grand-slam OEM deals, such as the workstation contract AT&T canceled earlier this year.

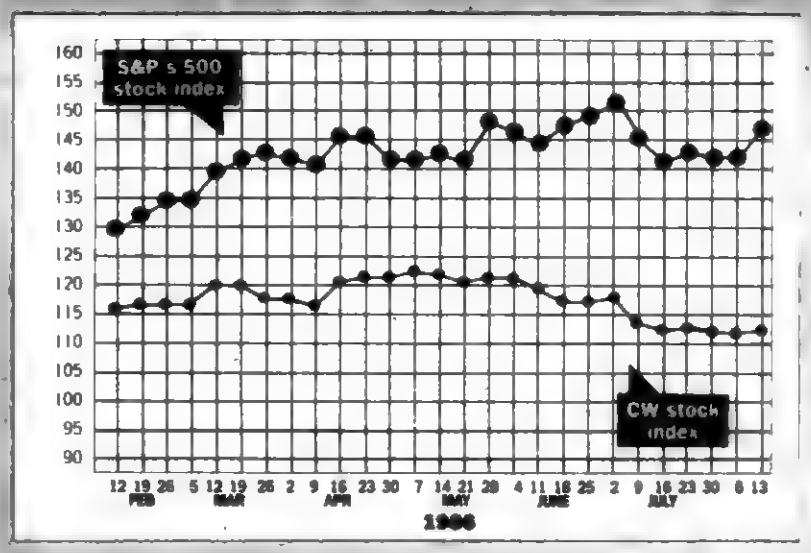
Ely called last week's layoffs "a direct result of the steep decline in our sales to AT&T."

— Clinton Wilder

COMPUTER INDUSTRY

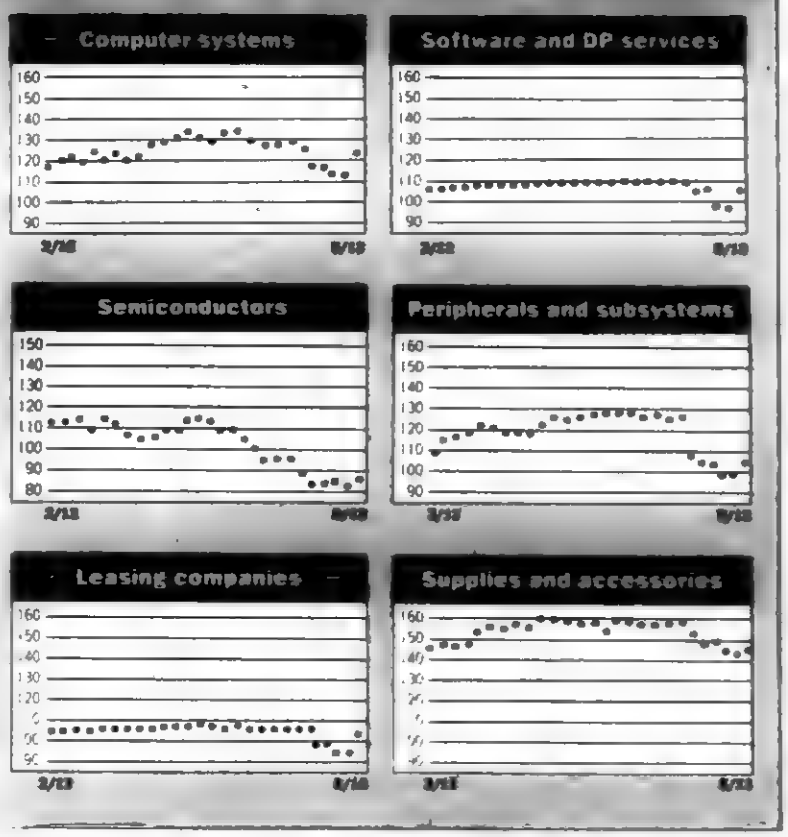
MITCHELL / HAYES

Computerworld stock trading index



All indexes reflect a market level of 100 on Dec. 31, 1984, and track stock market performance in relation to that base. The CW stock index represents the unweighted average performance of the six computer industry groups tracked below.

	8/6/86	8/13/86
Computer systems	111.6	**122.0**
Software and DP services	97.3	**108.1**
Peripherals and subsystems	99.3	**104.6**
Supplies and accessories	143.3	**146.8**
Semiconductors	81.6	**85.0**
Leasing companies	93.0	**102.0**
CW stock index	112.2	**113.4**
Standard and Poor's 500 stock index	141.6	**146.9**



Computerworld stock trading summary

CLOSING PRICES WEDNESDAY, AUGUST 13, 1986

EXCH		52 WEEK RANGE (1)		PRICE CLOSE AUGUST 13 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS					
O	ALPHA MICROSYSTEMS	8	4	4 25	-0 3	-5 6
O	ALTOS COMPUTER SYS	19	10	11 38	-0 6	+5 8
A	AMDAHL CORP	19	10	17 75	+0 4	+2 2
O	APOLLO COMPUTER INC	19	9	12 00	+2 0	+20 0
O	APPLE COMPUTER INC	39	14	36 00	+4 9	+15 7
N	AT&T	26	20	23 50	0 5	2 1
N	BURROUGHS CORP	72	52	71 25	+4 6	+6 9
O	C P T CORP	7	4	4 25	+0 0	-0 0
N	COMPAQ COMPUTER CORP	18	8	14 75	+1 1	+8 3
A	COMPUTER CONSOLES INC	12	6	8 63	+1 3	+15 0
O	CONCURRENT COMP CORP	25	1	13 25	+1 8	+15 2
N	CONTROL DATA CORP DEL	27	15	21 13	+0 3	+1 2
O	CONVERGENT TECH	14	6	6 13	-0 1	2 0
N	CRAY RESH INC	100	44	85 75	+5 0	+6 2
O	DAISY SYS CORP	32	8	9 75	+1 3	+14 7
N	DATA GEN CORP	50	30	34 88	+3 4	+10 7
N	DATAPOINT CORP	9	5	7 50	+0 3	+3 4
N	DIGITAL EQUIP CORP	98	50	97 38	+7 6	+8 5
N	ELECTRONIC ASSOC INC	7	4	4 50	+0 8	+20 0
N	FLOATING POINT SYS INC	46	14	15 63	+1 1	+7 8
N	GOULD INC	38	15	17 88	1 8	8 9
N	HARRIS CORP DEL	36	22	27 88	+0 1	+0 5
N	HEWLETT PACKARD CO	48	29	42 13	+2 3	+5 6
N	HONEYWELL INC	87	59	66 38	+2 5	+3 9
N	IBM	162	122	134 00	+2 9	+2 2
O	IPL SYS INC	4	1	3 00	+0 3	+9 1
N	ITT CORP	60	32	53 50	+3 1	+6 2
N	M A COM INC	21	13	14 75	1 4	8 5
N	MATSUSHITA ELEC INDL LTD	100	49	83 50	+0 9	+1 1
O	MENTOR GRAPHICS CORP	21	11	14 13	+2 8	+24 2
N	MODULAR COMPUTER SYS	9	6	8 88	+0 0	+0 0
N	MOHAWK DATA SCI CORP	4	1	2 50	+0 6	+33 3
N	NBI INC	16	9	10 00	+0 6	+6 7
N	NCR CORP	57	31	54 25	+4 3	+8 5
N	PRIME COMPUTER INC	28	15	19 88	+0 4	+1 9
N	SPERRY CORP	76	46	75 63	+0 4	+0 5
O	STRATUS COMPUTER	26	15	21 25	+1 8	+9 0
O	SYMBOLICS INC	16	7	7 13	+0 3	+3 6
O	TANDEM COMPUTERS INC	39	13	38 38	+4 9	+14 6
N	TANDY CORP	45	32	36 13	+1 5	+4 3
N	TEXAS INSTRS INC	148	88	115 63	+12 0	+11 6
A	ULTIMATE CORP	35	11	17 50	+3 0	+20 7
A	WANG LABS INC	23	12	13 75	+0 5	+3 8
A	WANG LABS INC	23	11	13 50	+0 4	+2 9
N	XEROX CORP	72	46	56 63	+4 5	+8 6
	SUPPLIES & ACCESSORIES					
N	AMER BUSINESS PRODS	37	25	30 00	-0 4	-1 2
N	BARRY WRIGHT CORP	25	17	19 50	+0 5	+2 6
A	DUPLEX PRODS INC	23	17	20 13	+0 0	+0 0
N	ENNIS BUSINESS FORMS INC	28	15	23 75	-0 3	-1 0
N	3M CO	115	74	112 00	+2 3	+2 1
N	MOORE LTD	28	18	24 63	-0 4	-1 5
O	STANDARD REGISTER CO	50	30	37 25	+0 0	+0 0
N	WALLACE COMPUTER SVCS	50	33	46 25	+0 3	+0 5

EXCH		52 WEEK RANGE (1)		PRICE CLOSE AUGUST 13 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & DP SERVICES					
O	ADVANCED COMP TECH	7	3	5 13	0 1	2 4
N	ADVANCED SYS INC	20	11	15 00	0 8	4 8
N	AGS COMPUTERS INC	25	14	18 13	-0 9	-4 1
O	AMERICAN MGMT SYS INC	20	8	17 25	0 3	1 4
O	AMERICAN SOFTWARE INC	15	9	12 38	+0 9	+7 6
N	ANACOMP INC	7	3	4 00	0 5	11 1
O	ANALYSTS INTL CORP	10	4	4 63	0 1	2 6
O	ASHTON TATE	34	10	26 50	+3 6	-15 8
O	ASK COMPUTER SYS INC	15	7	11 00	+0 9	-8 6
O	ASTRADYNE COMP IND	3	1	1 91	+0 5	+35 5
N	AUTOMATIC DATA PROC	39	18	33 25	+3 5	+11 8
O	COMPUTER ASSOC INTL INC	25	10	24 25	+1 8	+7 8
O	COMPUTER HORIZONS CORP	15	10	11 13	+1 0	-9 9
O	COMPUTER NETWORK TECH	10	2	6 81	-0 0	-0 0
N	COMPUTER SCIENCES CORP	40	20	36 00	+1 6	+4 7
O	COMPUTER TASK GROUP INC	19	12	11 75	+0 0	+0 0
O	COMPUTONE SYS INC	6	1	1 88	+0 0	+0 0
O	COMSHARE INC	13	9	12 13	0 1	1 0
N	CULLINET SOFTWARE INC	20	8	8 75	-0 9	-11 1
O	CYCARE SYS INC	17	10	12 00	0 1	1 0
O	DUQUESNE SYS INC	45	11	29 00	+0 5	+1 8
N	GENERAL ELEC CO	83	56	76 88	+3 4	+4 6
N	GENERAL MTRS CORP	50	33	[illegible]	+0 0	+0 0
N	GTE CORP	57	38	55 63	+1 0	+1 8
O	HOGAN SYS INC	12	4	10 38	+0 4	+3 8
O	INFORMATION SCIENCES INC	4	1	2 13	-0 4	15 0
O	INFOTRON SYS CORP	23	12	12 50	-0 3	-2 0
O	KEANE INC	18	7	7 50	+0 0	+0 0
N	LOGICON INC	43	27	27 75	-0 3	-0 9
O	LOTUS DEV CORP	39	15	35 00	-8 0	-20 7
O	MANAGEMENT SCI AMER	16	8	14 50	+1 4	+10 5
O	MCI COMM CORP	13	6	7 75	-0 3	3 1
O	MICOM SYS INC	23	10	11 00	0 3	2 2
O	MICRO PRO INTL CORP	4	2	2 44	+0 3	+11 4
O	MICROSOFT CORP	36	26	29 75	+2 0	+7 2
O	NATIONAL DATA CORP	26	11	19 50	+1 4	+7 6
O	ON LINE SOFTWARE INT	16	6	12 25	+0 5	+4 3
O	ORACLE SYS CORP	29	14	15 88	+1 0	+6 7
N	PANSOPHIC SYS INC	36	18	28 13	+1 5	+5 6
N	PLANNING RESH CORP	24	14	20 25	+0 0	+0 0
O	POLICY MGMT SYS CORP	24	15	17 50	+1 8	+11 1
O	PROGRAMMING & SYS INC	11	5	9 00	0 3	2 7
O	[illegible]	37	18	36 50	+3 8	-11 5
O	SCIENTIFIC COMPUTERS INC	6	4	4 25	-0 3	-6 3
O	SEI CORP	28	15	16 25	-0 5	-3 2
O	SHARED MED SYS CORP	43	29	34 13	0 3	0 7
O	SOFTWARE AG SYSTEMS INC	22	13	17 00	+0 0	+0 0
O	SOFTWARE PUBG CORP	10	5	5 50	0 4	6 4
A	STERLING SOFTWARE INC	21	7	17 88	+1 5	+9 2
N	[illegible]	23	13	20 00	-0 5	-2 6
O	URS CORP	18	10	15 50	+0 3	+1 6
O	VM SOFTWARE INC	32	17	27 25	+3 0	+12 4
	SEMICONDUCTORS					
N	ADVANCED MICRO DEV	34	14	16 38	+1 8	+12 0
N	ANALOG DEVICES INC	25	14	17 00	+0 3	+1 5
O	ANALOGIC CORP	16	10	11 50	+1 3	+12 2
N	APPLIED MAGNETICS CORP	20	12	15 50	+0 8	+5 1
O	AVANTEK INC	24	16	17 38	+1 6	+10 3
O	HADCO CORP	7	4	4 63	+0 4	+10 4
O	INTEL CORP	32	16	20 00	+3 0	+17 6
O	MICRO MASK INC	8	2	3 00	0 3	7 7
N	MOTOROLA INC	50	29	38 88	+1 9	+5 1
N	NATIONAL SEMICONDUCTOR	16	9	9 25	+0 5	+5 7
N	TERADYNE INC	30	17	19 13	+0 5	+2 7

EXCH		52 WEEK RANGE (1)		PRICE CLOSE AUGUST 13 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	PERIPHERALS & SUBSYSTEMS					
A	AM INTL INC	9	3	6 25	0 3	3 8
A	[illegible] INC	3	2	2 25	+0 1	+5 9
O	AST RESH INC	33	11	10 88	0 5	4 4
O	AUTOTROL CORP	10	6	7 00	0 5	6 7
O	AVANT GRADE COMPUTING	9	3	3 25	-0 4	10 3
O	BANCTEC INC	13	7	7 13	0 1	1 7
N	BOLT BERANEK & NEWMAN	48	28	41 88	-2 8	+7 0
O	CAMBEX CORP	2	1	1 00	+0 0	-0 0
N	CENTRONICS DATA COMP	8	4	7 88	+0 9	+12 5
A	CETEC CORP	9	6	6 25	+0 1	+2 0
A	COGNITRONICS CORP	6	3	3 38	0 3	8 6
N	COMPUGRAPHIC CORP	29	17	17 25	0 6	3 5
N	COMPUTERVISION CORP	19	9	12 75	+1 3	10 9
N	CONRAC CORP	18	11	15 25	+0 6	+4 2
A	DATAPRODUCTS CORP	18	11	13 63	0 3	2 4
A	DATARAM CORP	18	5	9 [illegible]	+1 6	+21 3
O	DATA SWITCH CORP	9	5	8 13	+0 8	+10 9
O	[illegible]	7	5	5 63	+0 3	+5 7
N	[illegible]	15	9	8 88	0 [illegible]	0 4
O	ENDATA INC	6	3	5 75	+0 4	+7 0
O	EVANS & SUTHERLAND	27	16	21 38	0 3	1 2
N	FLOATING POINT SYS INC	46	14	15 63	+1 1	+7 8
O	GANDALF TECHNOLOGIES	8	5	6 25	+0 1	+2 0
N	GENERAL DATACOMM IND	15	8	10 25	+0 9	+9 7
N	HAZELTINE CORP	29	16	17 88	+1 0	+5 9
O	ICOT CORP	13	6	9 00	0 1	1 4
O	INFORMATION INTL INC	18	10	15 50	+0 4	+2 5
O	INTECOM INC	7	3	4 94	+0 2	+4 0
O	INTERLEAF INC	15	8	8 13	+0 1	+1 6
O	MEGADATA CORP	5	3	2 88	0 4	11 5
A	MSI DATA CORP	14	8	10 38	+0 3	+2 5
N	NASHUA CORP	28	12	27 13	+1 4	+5 3
O	NETWORK SYS CORP	26	10	12 50	+0 8	+6 4
N	NORTH AMERN PHILIPS CORP	48	32	39 75	+3 6	+10 0
N	NORTHERN TELECOM LTD	38	25	29 50	+0 9	+3 1
O	NOVELL INC	21	10	18 88	+1 6	+9 4
O	OMEX	1	0	0 38	+0 0	+0 0
N	PARADYNE CORP	13	6	6 63	+0 0	+0 0
A	PENRIL CORP	9	5	4 88	0 3	4 9
N	PLESSEY PLC	38	19	29 00	0 5	1 7
O	[illegible]	15	11	12 13	+0 3	+2 1
O	QMS INC	16	6	14 50	+0 3	+1 8
O	RAMTEK CORP	7	2	6 00	+0 6	+11 6
N	RECOGNITION EQUIP INC	17	9	11 25	0 1	1 1
N	SANDERS ASSOC INC	63	29	59 88	+0 0	+0 0
O	SCAN TRON CORP	24	12	18 50	+2 3	+13 8
N	SCIENTIFIC ATLANTA INC	15	9	8 69	+0 0	+0 0
O	SEAGATE TECHNOLOGY	14	5	12 00	+0 8	+7 1
N	STORAGE TECHNOLOGY	7	1	2 63	0 1	4 5
O	SUN MICROSYSTEM INC	20	11	14 50	+2 3	+18 4
A	T BAR INC	7	5	6 13	0 1	2 0
A	TAB PRODS CO	15	10	14 50	+0 3	+2 8
O	TANDON CORP	8	3	3 50	+0 4	+12 0
A	TEC INC	9	4	5 50	+0 5	+10 0
N	TEKTRONIX INC	65	47	58 88	+3 1	+5 6
O	TELEVIDEO SYS INC	4	2	2 50	0 1	4 8
N	TELEX CORP	69	40	55 50	+1 3	+2 3
N	TIMEPLEX INC	24	14	15 63	+0 9	+5 9
N	TITAN CORP	12	5	9 63	+0 6	+6 9
O	VISUAL TECHNOLOGY INC	2	0	0 50	0 1	11 0
O	WYSE TECH	19	7	15 63	+2 1	+15 7
	LEASING COMPANIES					
N	CONDISCO INC	25	12	20 00	+2 3	+12 7
N	CONTINENTAL INFO SYS	12	5	10 13	+0 6	+6 6
O	FINALCO GROUP INC	5	3	3 13	+0 0	+0 0
O	PHOENIX AMERN INC	6	2	3 75	0 1	3 2
O	SELECTERM INC	12	5	5 75	+0 4	+7 0
N	U.S LEASING	46	32	41 50	+2 3	+5 7

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INSTANT ANALYSIS

"The onslaught of Asian competitors . . . has irrevocably changed the semiconductor industry. Our world has changed, and to survive, we too must change."

— W. J. Sanders III, president and CEO, Advanced Micro Devices, Inc., on his company's first layoffs since 1974

Chip slump said to be easing despite layoffs, slow orders

By Maura McEaaney

Declining orders and a leading manufacturer's break with a no-layoff policy were grim news for the U.S. semiconductor industry last week. But while news of layoffs would seem to indicate further deepening of the worst slump in the industry's history, analysts say they believe the chip business is inching its way to recovery.

Semiconductor billings for the three-month period ending in July slipped to their lowest point in eight months, according to statistics from the Semiconductor Industry Association (SIA). The SIA's monthly book-to-bill ratio fell to 0.97, marking the first time in six months the indicator dropped below 1.0. The latest book-to-bill ratio indicates that for every $100 worth of products shipped, manufacturers received $97 worth of new orders.

"The industry is better off today than it was a year ago," said analyst Edward White of E. F. Hutton & Co. "Orders are up, and prices are firming. I think we're closer at hand to a general economic improvement in the industry. The book-to-bill is basically a summer lull. There's no chance the book-to-bill will be above 1.0 in August."

Hand in hand with the recent book-to-bill figures came news of 200 layoffs at Advanced Micro Devices, Inc. (AMD), which had been adhering to a no-layoff policy since 1974. Effective last Friday, AMD, citing a "murderous competitive environment," dismissed 200 employees with less than one year's service. Further layoffs could occur after AMD's second-quarter results are reported in October.

In the previous week, Intel Corp. announced the closing of an offshore plant and the layoff of 1,320 workers.

Although the layoffs paint a gloomy picture for an industry that had shown some improvement of late, including a

See CHIP page 108

FAA to halt Paradyne purchases

By Mitch Betts

WASHINGTON, D.C. — The Federal Aviation Administration (FAA) last week disclosed that it will not buy additional data communications equipment from Paradyne Corp., the Largo, Fla.-based firm that was suspended from government contracts because of fraud charges.

The FAA, which had obtained an exemption from the governmentwide suspension of purchases from Paradyne, was under increasing pressure from the House Committee on Government Operations and the General Accounting Office (GAO) to stop doing business with Paradyne.

Fred Farrar, a spokesman for the FAA, told *Computerworld* the FAA will not buy any more new equipment from Paradyne, but will purchase equipment that is currently leased from Paradyne in order to end the relationship.

Miriam K. Frazer, a Paradyne spokeswoman, said the FAA has not officially informed Paradyne of any forthcoming changes in the contract. She added that the firm says it is in the best interests of the FAA and taxpayers for the agency to continue doing business with Paradyne.

A GAO investigation concluded that although it was prudent to continue leasing installed Paradyne equipment to avoid disrupting the air traffic control system, the FAA should not buy more Paradyne equipment in light of the firm's suspension.

Farrar said, "We will not buy any more new equipment from Paradyne, even as options under existing contracts. We will, however, purchase equipment that we now lease from Paradyne, because that

See FAA page 89

INDUSTRY INSIGHT
Clinton Wilder

Uneasy truce in chip war

What will benefit more from the recent U.S.-Japan semiconductor trade agreement — the profits of Intel Corp. or the U.S. Senate campaign of Silicon Valley Congressman Ed Zschau?

The question is purposefully cynical. But it stems from the stampede of politicians, from President Ronald Reagan on down, rushing to praise or take credit for the recent pact that purports to end Japanese vendors' alleged chip dumping in the U.S. It certainly makes for good politics, but the potential positive impact for beleaguered U.S. semiconductor vendors remains a huge question mark.

First, a look at the good side. A trade agreement, however superficial it may be, is certainly better than a trade war. If U.S. firms can have a little more confidence in the price stability of memory chips, they can plan future research and development and marketing strategies without the threat of the price slashing nightmare of the past two years.

Part of that confidence may come from the role that Japan's Ministry of International Trade and Industry (MITI) has pledged to play in enforcing the terms of the agreement. But that, too, is a question mark. If push comes to shove, and MITI is called on to research and document Japanese pact violations and enforce penalties, it will be

See UNEASY page 89

Wilder is Computerworld's *senior editor, computer industry.*

Probst to retire; exec office formed for Sperry/Burroughs

By Alan Alper

NEW YORK — Burroughs Corp. last week went a step closer to taking over Sperry Corp. by establishing an executive office to manage the proposed $10 billion merged company.

In disclosing its new executive lineup, Burroughs revealed that Gerald G. Probst, Sperry's chairman and chief executive officer, would retire at the end of this year.

Probst, 62, is expected to take an unspecified consultant's role and will become a member of the new corporation's International Advisory Board.

The executive office will consist of W. Michael Blumenthal, Burroughs chairman and chief executive officer; Sperry President Joseph J. Kroger; Burroughs President Paul G. Stern; and Burroughs Executive Vice-President James A. Unruh.

Kroger will assume the new title of vice-chairman, handling external operations of the firm's commercial business, including all sales and marketing activities. Stern and Unruh will retain their previous titles, with Stern overseeing day-to-day operations and the firm's government business and Unruh managing corporate staff and planning operations, including finance.

Analysts were not surprised by Probst's intended departure or the makeup of the new corporate suite.

"Blumenthal honored his plan to give one Sperry executive a shot at the top job with a key position," noted Michael Geran, an analyst with E. F. Hutton & Co.

Jay Stevens, an analyst with Dean Witter Reynolds, Inc., said, "It's criti-

See PROBST page 108

DATA VIEW

Second-quarter earnings
Profits are down for a broad range of vendors, and Boole & Babbage and Harris post gains

Company	Net Income April-June, 1986 (thousands of dollars)	Percent Change From 1985	Revenue April-June, 1986 (thousands of dollars)	Percent Change From 1985
Boole & Babbage, Inc.[1]	244		8,705	+20
Comshare, Inc.	130	-63	16,894	+1
Harris Corp.	16,919	+5	577,205	-5
Symbolics, Inc.	1,740	-2	31,717	+50
Trilogy Ltd.[2]	(10,865)		6,934	-14

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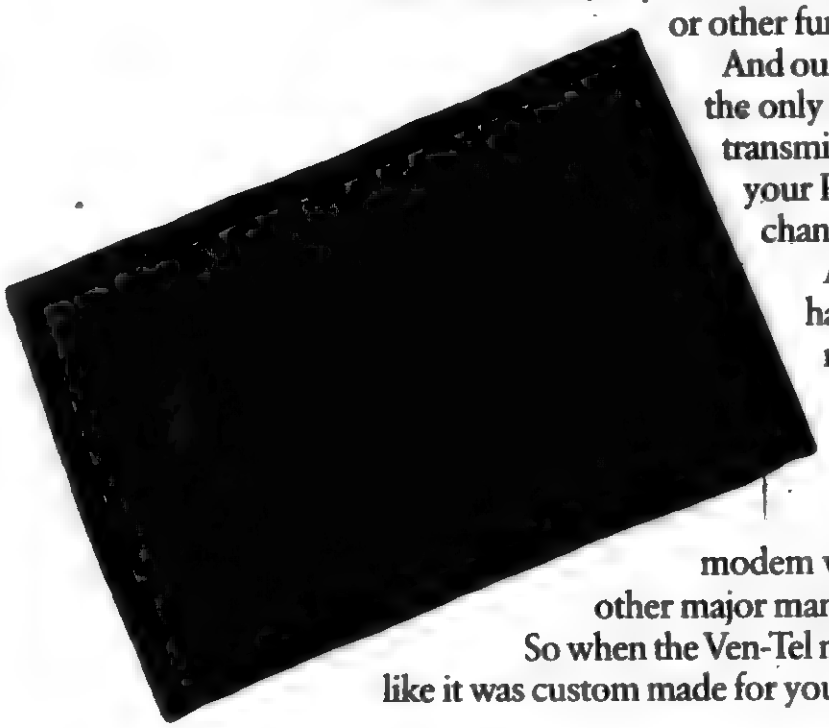
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FOCUS

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MS-DOS VS. UNIX?

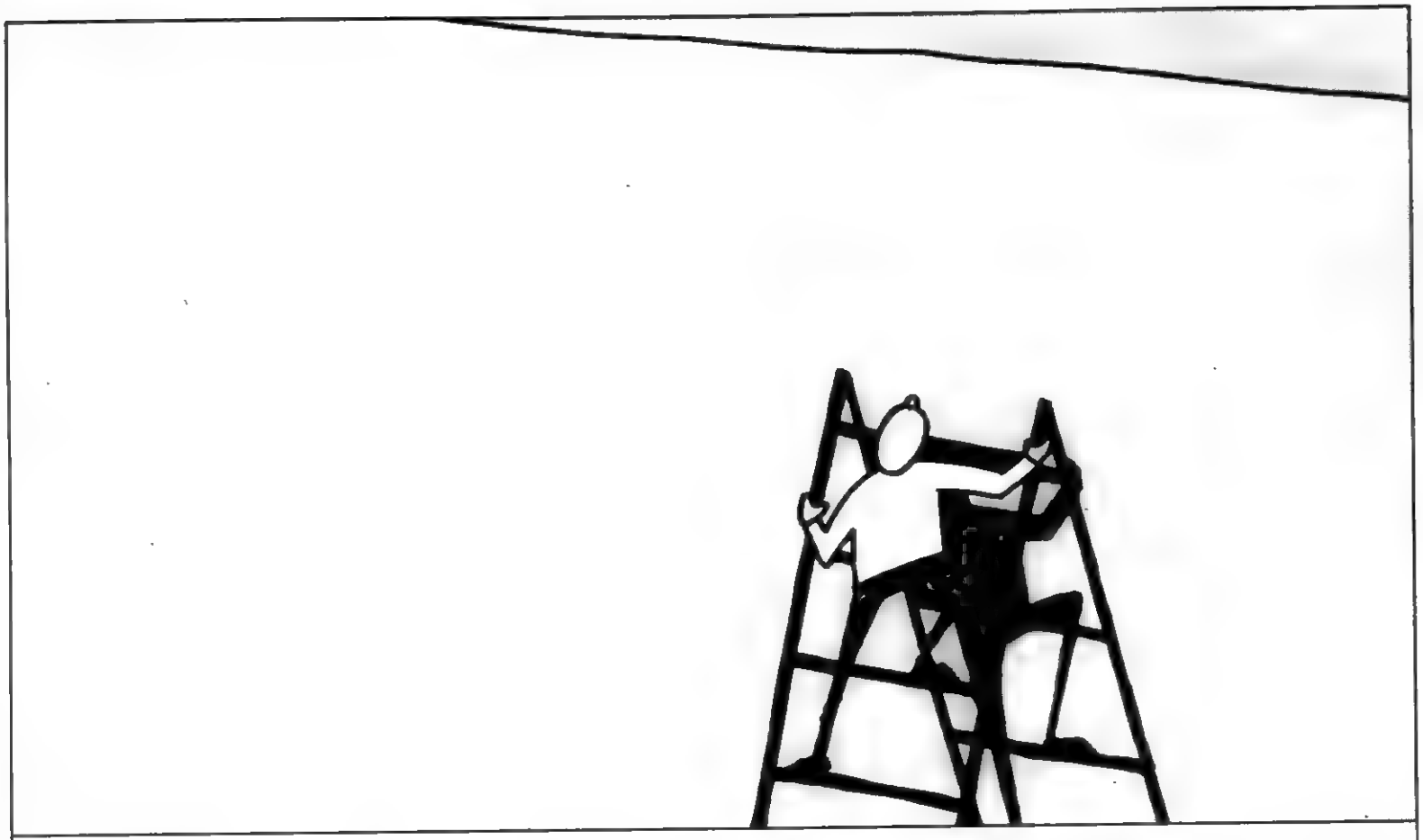
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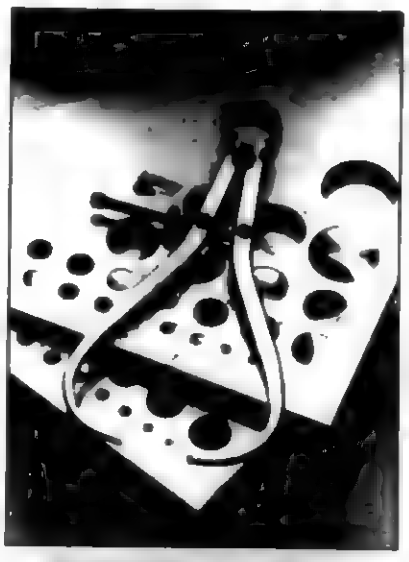
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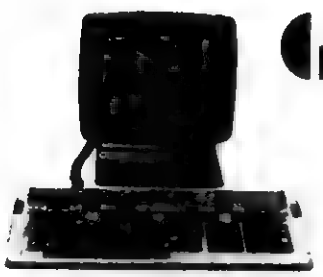
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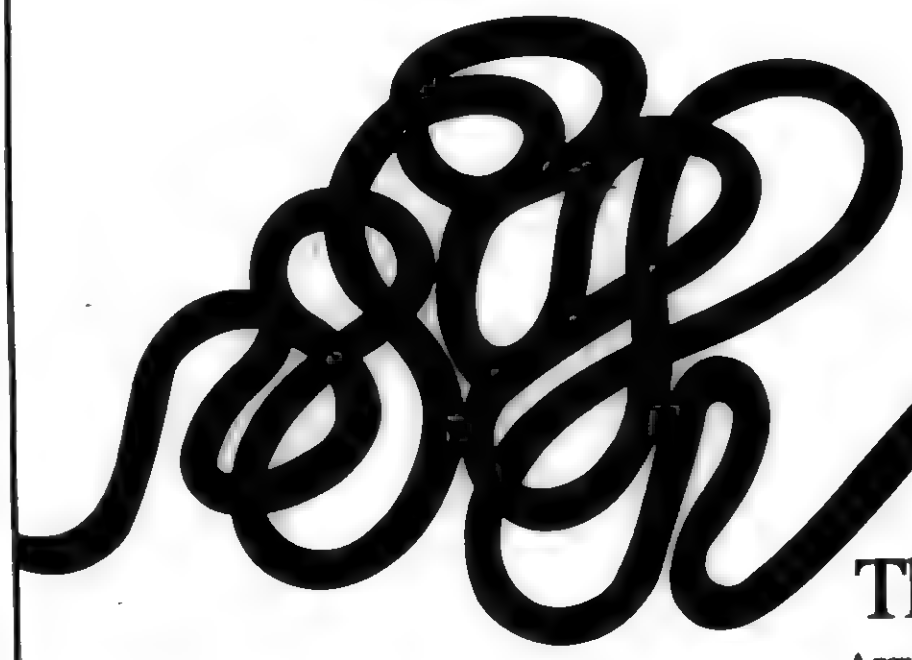


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UNIX VIEWPOINT

EDITORIAL

Nix Unix? Not Yet

Those of you who have been in the industry for any length of time have seen a number of different technologies and buzzwords arrive on the scene with much fanfare only to fall back into obscurity. Vendors tout the idea, the press leaps on a new buzzword and, more often than not, users never seem to get around to ordering it.

While this is not really the case with Unix, some similarities exist. When Unix became commercially available, vendors and some ardent fans proclaimed that Unix was the best thing since sliced bread. In the past few years, these people have been administered a strong dose of reality. Although it is clearly not the total solution, Unix will become an important, if unobtrusive part of an overall system architecture.

The one-time rivalry between Microsoft Corp. MS-DOS and Unix also seems to be cooling down. Unix advocates watched the rapid rise of the personal computer running MS-DOS. Buyers flocked to the microcomputer, shunning Unix with its lack of software and difficult user interfaces. However, users have now grown tired of their single-user systems and are looking to multiuser systems and networking capabilities. Since MS-DOS and Unix each have much to offer in this new world, vendors are realizing it may be to their advantage to make these environments coexist rather than fight.

Many major computer vendors are now offering Unix to their customers. This may be a result of market pressures for an MS-DOS connection and from a user need for multiuser systems rather than from a strategic commitment to Unix. But Unix is also becoming an important and oftentimes dominant operating system in certain key markets like supercomputers, electronic publishing and departmental computing.

Unix is not necessarily being accepted for itself but for what it can do. Its more technical characteristics have often obscured the system's commercial applications possibilities. These attributes were for programmers, not users, and therefore, software vendors tended to avoid Unix. Vendors have learned, however. Many have begun providing value to their Unix-based systems that will appeal to business users. Custom software and interfaces, IBM connections and connectivity within systems from the same vendor are starting to appear. The real benefit of Unix, of course, will be when it can provide file compatibility across different vendors' systems to be used as a distributed operating system.

Unix has had a varied history. Users justly shied away from it when they were being told it was *the* definitive operating system. Yet as users' needs change toward increased capabilities and networking, Unix can be of real value. And users are starting to realize it.

Sound But No Fury



INSIDER
Timothy J. Caffrey

Unix is like the Little Engine That Couldn't — it won't pull buyers off the sidelines or generate new market opportunities — at least not on its own. The idea that Unix is a marketing concept gone bust can be misleading, however. Unix will still play an important, if somewhat understated, role in emerging systems architectures.

The most significant long-term impact of Unix will be in defining small- and medium-scale processor operating environments. The steady convergence of Unix and Microsoft Corp. MS-DOS is already forcing a reassessment of the shape of personal and departmental computing. And, while Unix technology informs new generations of operating systems, analysis of Unix marketing claims yields a new set of tangible planning options.

The most compelling case for Unix today is based on its potential to substantially reduce the costs of hardware and software acquisition and of application development and maintenance. This argument has three broad points.

First, Unix affords an alternative to the quasi-monopoly pricing of large systems. The artificially high pricing structure for mainframe systems and software is being challenged by the price/performance of new, commodity microprocessor-based systems. Unix is perhaps the most tangible means of taking advantage of these new economies of small while avoiding the pricing strategies of market leaders.

Compounding the issue of technical sophistication is the argument that market leaders such as IBM and Digital Equipment Corp. will resist the emergence of Unix as a standard, portable operating system. While DEC, IBM and others offer Unix as an option on their processors, they do so in response to market pressures and not out of a strategic commitment to Unix. The influence of these market leaders will make a Unix buy more costly in the near term.

In addition to the subtle opposition of market leaders, Unix suffers from lack of a white knight. AT&T has repeatedly failed to follow through on its self-proclaimed role as Unix market mentor. The resulting loss of momentum has allowed IBM to advance de facto standards that will reduce the technical attractiveness of Unix.

Finally, when all other attacks have been exhausted, the naysayers point to a continued lack of good off-the-shelf Unix utilities and applications

The second point is that a uniform programming environment like Unix could allow more efficient use and deployment of application development and maintenance personnel and resources. Adopting Unix as a standard across processors would eliminate the need to support multiple operating environments and reduce the rate of increase for expenditures for application development and maintenance.

Finally, a standard operating environment would increase the portability of applications across processors. Closely related to the point above, the promise of portability would allow for greater flexibility in systems deployment and reduce costs of hardware and software migration.

The case for Unix outlined above obviously does not stand unchallenged. Opponents generally acknowledge the potential cost-savings. However, their argument counters this potential with a claim that the momentum required to produce these cost-savings will not quickly emerge.

The first splash of cold water comes in the claim that Unix is technically unsophisticated and unproven in large implementations. Arguments about Unix's technical capabilities (or lack thereof) abound. While Unix has been successfully implemented in complex and sophisticated environments, these implementations have required considerable technical enhancements. In addition, Unix, unlike proprietary operating systems, is not optimized for specific hardware architectures. Thus, it is likely to require a high level of customization to yield optimum performance.

As a neutral observer, it is difficult to make an argument for Unix based on its visible merits. In the near term, a commitment to Unix appears to be justified largely by faith, not fact. A near-term commitment to Unix will involve high start-up costs. In the long term we are more likely to benefit from its legacy than its tangible presence.

Caffrey is vice-president, Office Automation Services, at International Data Corp. in Framingham, Mass.



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UNIX VIEWPOINT

Seybold: Lack Of Software Slows Unix Acceptance

Patricia Seybold is the president of Patricia Seybold's Office Computing Group, a Boston market research firm. Seybold, who founded the company nine years ago, is seen by many as the Good Housekeeping seal of the office automation industry. And vendors turn to her for the "Seybold Seal of Approval."

Seybold has a line of office systems-related newsletters, which is headed by the company's flagship product, the "Office Systems Report." In February 1986, she began publishing "Unix in the Office," a newsletter that examines the quality of software and solutions provided by Unix. Seybold recently shared her perceptions on the state of Unix in the corporate environment with Computerworld Focus *senior writer Rebecca Hurst.*

How effectively are Unix vendors working to meet the needs of users?

Unix vendors are not working particularly well or hard to meet the needs of the office user. Their goals tend to be more centered on how to make software customizable for the value-added reseller [VAR] or OEM to whom they are selling.

What the user ends up with in terms of Unix office software really falls short in usability. The majority of Unix office applications do not have the integration and functionality of proprietary offerings such as those from Digital Equipment Corp., Wang Laboratories, Inc. or even IBM. Users may also stumble upon dead ends in the Unix software, and that's a user interface problem.

How will that affect these users' acceptance of Unix?

This will have a negative impact. In fact, it already has. Two of the earliest office software applications that came out in the Unix environment were the products from Interactive Systems, Inc. and Fortune Systems Corp. With Interactive's software, the problems had to do with functionality and the user interface. Fortune's interface was pretty good, but it had problems with bugginess and user support.

Part of the problem seems to be that Unix is a three-tiered market. You cannot fault a company like Quadratron [Software Co.] for not designing its software directly for the end user because that's not its market. The VAR is. You can fault the VAR for not adequately perceiving the size of the task it has in polishing the software. The VAR cannot just add value in terms of some vertical market application. It has to enhance the user interface, integration and support.

What can the vendors, VARs and OEMs do to provide better applications for the end user?

Vendors must be more responsible for designing packages that can be sold as is to end users. They should give more thought to the large end user as one of their major markets and, therefore, should design turnkey systems for that market.

VARs should also pick up more responsibility and understand that they are not selling against personal computer dealers but against Wang, DEC, Data General Corp. and Hewlett-Packard Co. They need to know that the quality of the software, support and interface and the user's expectations are all quite a bit higher in mini marketplace, particularly in the office automation arena.

Do any Unix vendors provide competitive office system software?

The overall impression is that Unix software in office automation is not at good as the proprietary office software that's already out there. That is beginning not to be true. Applix, Inc. and Emerald City have office system software that actually surpasses the proprietary software of the major mini vendors.

How is the growth of vertical market applications contributing to the growth of Unix?

I see very few people doing multiuser vertical market software today that's not Unix. What this says is that if you're a small business or a targeted department within a large company with specific needs, and you try to find software to meet those needs, chances are much greater today than they were two years ago that that application is going to run in a Unix environment.

Why do you see that happening, and to what extent will this trend continue?

I see this trend because of the hardware. The Unix processors are so much more cost-effective than processors from the major minicomputer suppliers. And there are so many of them out there that the competition is fierce. This in turn keeps the prices low. . . .

There are still lots of shops for DEC VAXs, Wang minicomputers and IBM System/36s. There will always be companies that tie their star software product

See Q&A page 8

Q&A



Patricia Seybold

'Unix vendors are not working particularly well or hard to meet the needs of the office user.'

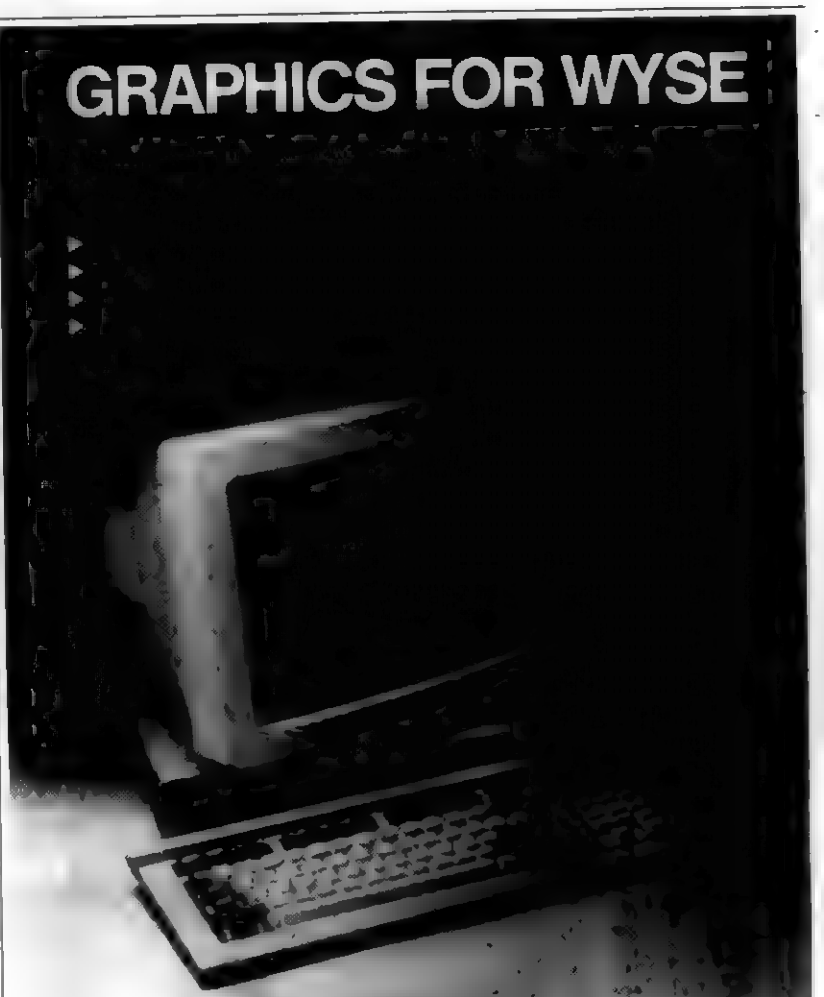
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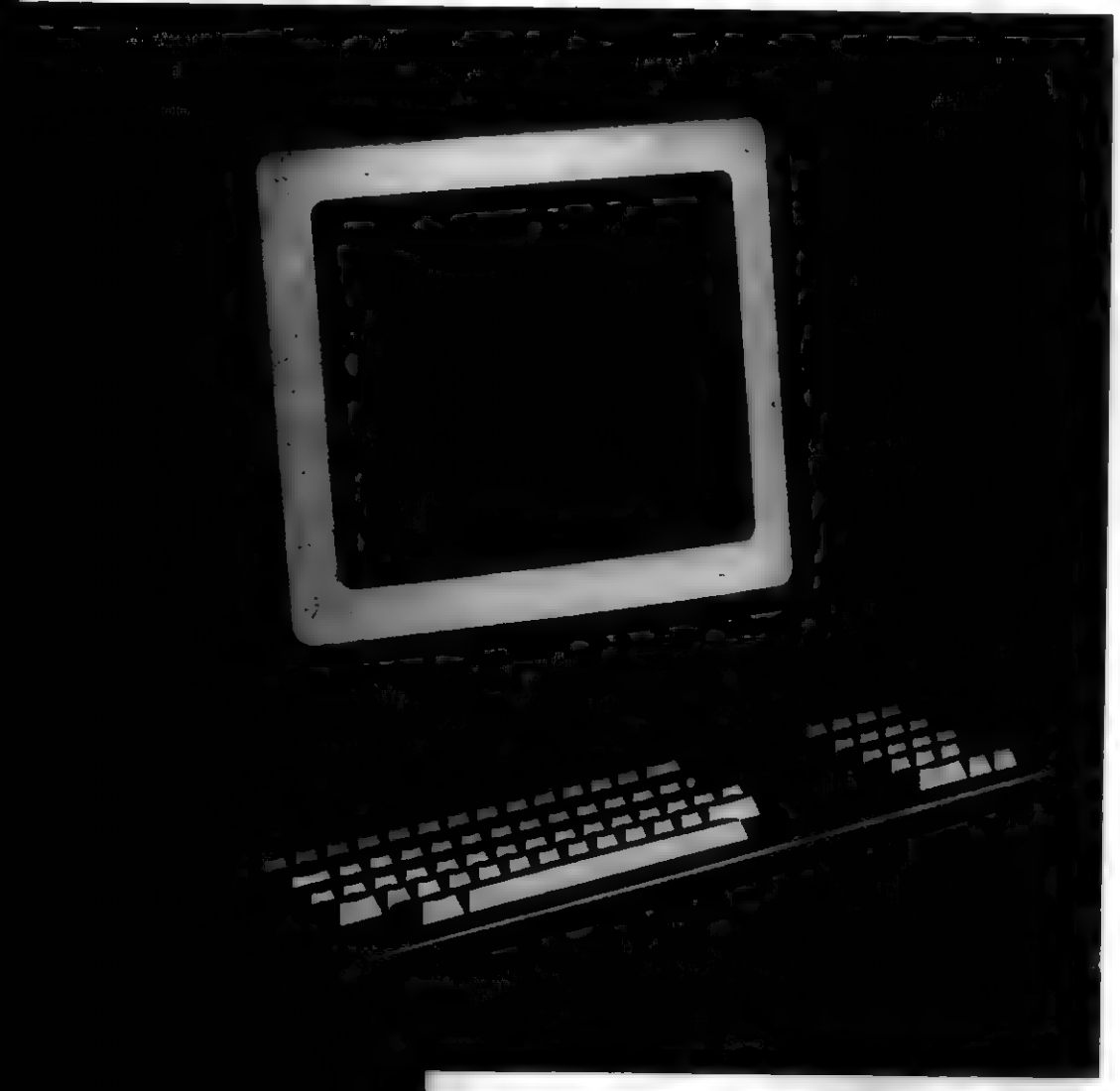
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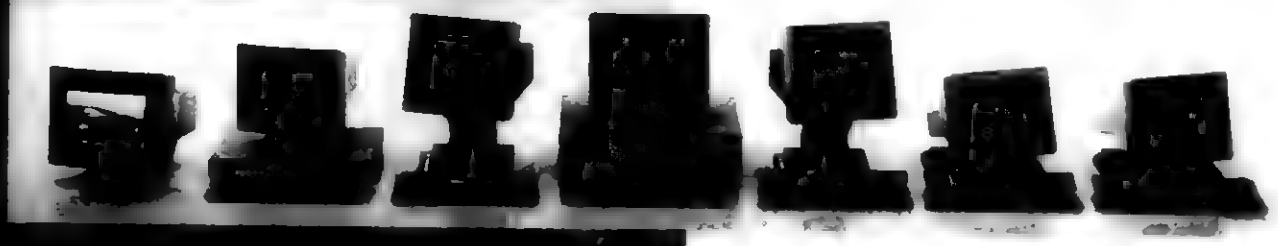
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UNIX VIEWPOINT

Q&A from page 6

to a particular supplier. But, there's an increasing number of software houses that want the flexibility to be able to bundle a system that is going to give them the biggest return. They perceive that the cost and the reliability of the hardware is such that they can mark up the software dramatically and still come in at a competitive price.

How have the quality and availability of Unix application tools improved over the past two years?

There are some improvements I can point to. One is the fact that we seem to be standardizing on one version of Unix. Developers feel a little safer knowing that they're at least heading in the direction of AT&T System V. Also, a lot of the compilers are much more robust than they were two or three years ago.

Third, and most important for the office systems market, is that a lot of the software products available have front ends that are designed for a level of customizability and integration. This is particularly true for data base software, but it is also true for things like generic office software. The assumption is that programmers can tailor the applications or tie in their own applications in a few days rather than a few weeks. This ability of an application to tie in with other software increases its worth by 50%.

Do you expect System V and University of California at Berkeley 4.2 versions of Unix to converge?

Yes, the convergence of System V and Berkeley is inevitable, but Berkeley will still be around. There's always room for a renegade to come up with capabilities that AT&T is too slow to implement. System V will always try to subsume anything in Berkeley worth subsuming.

The impact of this convergence is a positive one. Currently, the myth of one Unix is a real stumbling block for end users. They think that they should go with Unix in-house because it gives them portability. Then they discuss it with the technical people who tell them that there isn't one Unix, that it's just like any other operating system. There are different versions, and you still have to modify Unix as you move from one environment to another. This is throwing a wet blanket on people's enthusiasm.

How viable is the Unix operating system in the corporate office?

Unix is a viable contender in the office. The traditional suppliers of office systems can be divided into two tiers. The top tier includes IBM, DEC, Wang and DG. The second tier includes everyone else. The majority of second-tier vendors are planning to migrate their software to Unix, and one of the top four may be planning to go to Unix.

There is a tacit agreement that if you don't already have a leading proprietary office automation solution, you have more flexibility by shifting to a Unix strategy. First, it's probably faster to develop in-house code in a Unix environment than it would be in a proprietary one. Second, it's easier to attract more third-party software vendors.

What interest do office users have in Unix?

Most users don't see Unix as relevant. It's rare to find customers who actually insist on Unix outside the government sector. In the federal government, it's become fairly fashionable. In some areas, it's even required. In the commercial sector, most sophisticated information systems professionals, the ones who do the purchasing, consider Unix to be an anathema. They just don't think of it as a viable operating system. They are very naive about what's possible in Unix. They are also probably correct in their assessment of the differences in quality and commercialization of Unix applications.

> ”
>
> *'Information systems professionals, the ones who do the purchasing, . . . are very naive about what's possible in Unix.'*

Some leading-edge corporations are experimenting with Unix in two ways. First, they are using a Unix pilot system with the office system consulting group. Second, if a department has a data base requirement, one candidate is Unix. They're not choosing Unix, though. They are choosing a data base that happens to run on Unix.

How is Unix's ability to connect with DOS-based micros contributing to its acceptance in the office?

Unix is most likely to make a difference as an upgrade path to DOS. Users start with a PC and then find that they have a multiuser requirement. That requirement is usually satisfied by networking PCs in a DOS environment or by connecting PCs to a proprietary minicomputer system. A third alternative is to network PCs in a Unix environment. Users find themselves increasingly using Unix software to run the network or to provide a multiuser application for the network server. They are backing into Unix without realizing it.

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CIRCLE READER SERVICE NUMBER 273

UNIX VIEWPOINT

Readiness Is All: IBM Holds Defensive Stance In Unix Arena



BLUE BEAT

Dale Kutnick

IBM's Unix strategy is an offensively defensive posture currently driven by requirements of niche markets (education) and specialized/vertical markets (military, scientific/engineering and the government). Indeed, some of these areas demand Unix support because users believe that a "standard" operating system increases flexibility. But more importantly, IBM has entered these segments and will support Unix because these areas are multibillion-dollar markets and offer the opportunity to exercise new technology.

Unix's potential significance in the commercial distributed/departmental systems market — primarily as a personal computer server — forces even the likes of IBM to establish a beachhead in the Unix camp. This position enables IBM to monitor market conditions closely. And it is likely that opportunities will arise as Microsoft Corp. hybridizes future iterations of its MS-DOS with Unix (to attack the local-area network server market) on Intel Corp. 80386 and Motorola, Inc. 68020 processors.

IBM will undoubtedly participate in this market and may even use its own Unix-derived AIX operating system used on the RT Personal Computer.

Strategy grounded in economics

IBM's Unix strategy is firmly grounded in economics. If a substantial Unix market develops, IBM must be positioned not only to take full advantage of it, but to assume a leadership role as a means of maintaining account control. IBM can afford to lose a few operating system installations far more readily than it can afford to yield account control and its incumbent growth potential.

This position is similar to the one Digital Equipment Corp. has taken with Unix — quiet support. More importantly, both IBM and DEC offer proprietary implementations of Unix (AIX and IX/370 from IBM; Ultrix from DEC). This approach will enable the two firms to establish their own Unix environments that diminish the importance of Unix's alleged portability and hardware independence. But then, most Unix vendors offer a customized version — under the altruistic guise of fixing various deficiencies.

Clearly, hardware independence is not in the interest of DEC, IBM or most other established vendors. Nonetheless, these vendors will support the basic AT&T Unix System V and enhancements and/or University of California at Berkeley Unix Version 4.2 kernels. Typically, an independent software vendor requires one to three months to port Unix to a system with proprietary hooks.

The basic application remains constant, but the user interface and internal processing may change. Thus, IBM's proprietary Unix offerings enable it to compete in those markets where Unix is required, while still maintaining some measure of control. IBM is in a position to react quickly to Unix development and/or to drive de facto standards with its implementations. This is especially true on the RT PC, which could develop into a significant scientific/engineering workstation offering. I expect IBM to enhance the RT PC significantly in the next two years. Performance will more than double in the next year, and price/performance will become more competitive with the 68020-based machines.

Undoubtedly, IBM needs a product to compete with DEC's Microvax and workstations from Sun Microsystems, Inc. and Apollo Computer, Inc. among others. The battle will take many forms, not the least of which will be proprietary micros (a la Microvax and RT PC) vs. off-the-shelf micros (68020 and 80386 based).

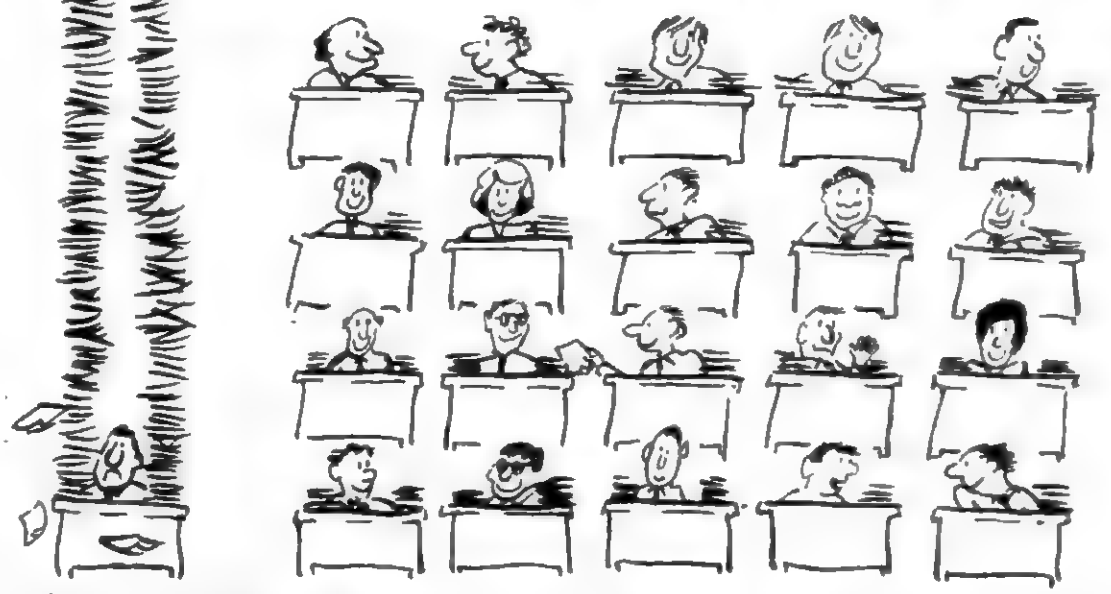
Nonetheless, IBM does not actively market Unix nor is it likely to do so soon. IBM is clearly positioning its VM operating environment against Unix in the departmental and scientific/engineering processor market. IBM has recently enhanced VM packaging, pricing and usability — specifically to compete in the commercial departmental market with low-end 4300s. Unix support on these hardware platforms will be tenuous at best unless significant applications programs and utilities become available and user demand increases. In the scientific/engineering world, IBM has enhanced VM technical performance by one and a half to two times on 4300-type processors. IBM emphasizes VM's ease of use and wide range of programs and mainstream IBM connectivity against Unix.

To this end, IBM has yet to deliver IX/370 (other than early support sites); it has instead bid Amdahl Corp.'s UTS in the few cases where Unix is required in a 370 environment. The RT has underwhelmed the market (less than 5,000 shipped) despite its potential. The lack of Unix applications has been an issue.

But IBM (and DEC) will continue to support Unix with proprietary environments as long as possible. Most large users will eventually employ Unix, and IBM will clearly want a hand in it.

Kutnick is executive vice-president of research at the Gartner Group, Inc., headquartered in Stamford, Conn.

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CIRCLE READER SERVICE NUMBER 274

UNIX VIEWPOINT

Technical Stargazing: DP Managers Must Forecast The Future



MANAGER'S CORNER
Jim Young

The data processing manager has never had a simple job. Today he must be a diplomat and adviser to top management; teacher, policeman and troubleshooter for users; and accountant and negotiator with vendors. To the DP department, he must be a motivator, confessor, organizer and delegator. And now he has an added role — forecaster.

The DP manager must anticipate the future of today's technology and react accordingly. Hardware and software decisions must satisfy immediate functional criteria but must be made with an eye on the future, particularly relating to obsolescence. Late purchasers of IBM's Displaywriters understand the dangers of not predicting the future. It is important to stay compatible with new peripherals, software and networks, even for stable products.

Those who have been following Unix could have predicted its importance based on AT&T's emphasis. Couple this hunch with an extrapolation of personal computer power and the need for increases in throughput, and it is clear why the microprocessor's role is changing from that of a single-user workstation to that of a multiuser, multitasking device used in group system situations. History seems to be validating this; whether the operating system turns out to be Unix, Microsoft Corp. Xenix, Pick Systems Pick or even some descendant, its fundamental direction was suggested by projecting emerging capabilities into the future.

The value of knowing the direction technology will take is obvious for vendor design engineers, computer scientists and software houses. After all, products and services not only have to meet user needs but must also include the productivity and compatibility advantages of new technology. However, for the DP manager, technical prognostication is more than an academic exercise. It will permit strategic positioning of information resources to capitalize on expected product capabilities. Forecasting may guide a choice between alternatives or even encourage a strategic postponement of immediate action.

Heed stormy forecasts

A good forecast can also provide a warning. Optical storage technology, despite the ballyhoo from some vendors, did not distract the majority of DP managers from continuing to invest in magnetic storage. In this case, understanding the science behind an emerging technology was critical in assessing its significance.

Since such foresight can lead to either victory or defeat, it may be instructive to note how others try to anticipate future trends without having to resort to psychic powers. One way is to evaluate the science itself. Years ago laymen got excited about using satellite communications in DP networks without accounting for the significant delays in getting a signal to travel over distances. A good forecast would have made allowances for this.

Another factor to consider is how close a technology is to being commercial. No one disputes the advantages of the gallium arsenide chip. However, the ability to produce it reliably and cheaply still remains an obstacle. Moreover, once this barrier is overcome, will the chip render existing systems obsolete, or will it just provide a new performance plateau for the migration of these systems? As a DP manager, it pays to know which technical changes can affect you directly and which will only have a remote impact.

It is also important to recognize which technologies will be adopted and which will not. The best barometer of product acceptance is the herd instinct of the industry. This instinct accounts for the fascination with vendor product direction in the industry press. In the diskette war, for example, 8-in. diskettes have clearly become passe, while the battle is hot and heavy between 5½-in. vs. 3½-in. diskettes. Will one size prevail, or will we have to contend with multiple types? The answer may not be much of an issue for installed PCs, but may make a difference in future purchasing decisions.

The adoption of technical standards (such as RS-232) can be another augur of things to come. With standards, of course, there is always the question of timing and interpretation, not to mention the typical battles that prevent agreement in the first place. However, these maneuverings are useful to watch as a means to categorize possible scenarios.

Corporate scorekeeping is another important indicator. The failure of a company can cause its technologies to collapse, taking users with it. And even industry giants are not immune: Remember 96-column cards?

And as the perpetual competitive struggle for technical leadership unfolds, the DP manager must assess the future and navigate safely around treacherous waters to safe harbors.

Young is principal and the director of consulting for Authur Young & Co., Worcester, Mass. He has worked in the industry for 15 years.

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CIRCLE READER SERVICE NUMBER 275

UNIX VIEWPOINT

Unix Hoopla Based On System's Symbolic Implications



ISSUES AND ANSWERS

Robert D. Gilges

Unix is one of those rare computer systems that is both a product and a symbol. Unix, the product, is encountered relatively infrequently in organizations. But Unix, the symbol, has a substantial history and continues to be the subject of considerable press attention.

A review of the trade press reveals that Unix has become the center of a software market, albeit a modest one. In 1986, there has been some coverage of new Unix-oriented application development facilities — a computer-integrated manufacturing system and a text processor. And anyone who does much software evaluation will probably say that applications oriented toward Unix (or Microsoft Corp.'s Xenix) are available to support any number of business processes.

In addition, the Unix market is described as ripe for rapid future growth. For example, some observers have suggested that the time is right to develop interactive office systems to be run under Unix. It is also reported that vendors are enhancing and adapting Unix to large-scale, on-line transaction processing.

Clearly, Unix and its associated application software markets have grown in the last few years. Nevertheless, by reading commentary about Unix from the time of the first AT&T computer hardware announcements, it is necessary to conclude that Unix has not had the kind of impact many observers expected. Certainly, it has not become a de facto operating system standard, nor has it provided AT&T with anything approaching market dominance. Yet both these results were expected to follow the commercial introduction and subsequent marketing of Unix.

Given the relatively low level of Unix market penetration, why does it continue to generate press and reader interest?

One basic factor is AT&T's support for the product. Unix is an important aspect of AT&T's computing strategy. At a winter 1986 Unix users group meeting, AT&T again claimed that its System V was positioned to be the universal standard for all computer-size classes.

Unix groupies

Also, Unix is a good product, with an influential following. Don't forget that for more than 10 years many computer science graduates have been trained in Unix environments. These professionals are more aware than most business systems people that Unix was far ahead of its time and that its more advanced concepts and functions were widely copied in later operating systems' designs. There is, in short, a sort of Unix sociology that contributes to its viability, especially in the fields of systems, systems utilities and scientific and engineering software development that attract fine programmers.

For most business computer users, Unix is not so much a leading product as it is a symbol. Unix — at least in its marketing and sales promotion — appeals to those who hold the view that improved connectivity, networking and software portability will make companies more productive and profitable. Unix's lack of quick success in the market points to what we all know: Achieving these benefits is not easy and calls for superior systems planning, fine project management and expenditure of considerable time.

That Unix is difficult for first-time users — not user-friendly — further emphasizes how difficult it is to achieve the kind of information resources management that modern businesses require to compete and win in today's economy.

Unix also symbolizes the fact that even advanced technology cumulates. Computerization and innovation are almost synonymous. Nevertheless, large IBM mainframe installations have big stakes in their existing operating systems and related business application portfolios. Despite Unix's perceived strengths, they simply have not been great enough to change the software market quickly.

The widespread incorporation of the advanced features of Unix into other operating systems also constitutes a marketing challenge. After all, greater availability of desirable features means that Unix is less unique and reduces incentives to use the system.

The irony is that AT&T was not in the computer business in the days when it could have made the most of Unix's advanced features. Information products succeed because a variety of factors — desirable technical features, solid financing and superior marketing/sales promotion — coincide at the right moment. The Unix case illustrates both the delicacy and importance of this coincidence.

Unix will continue to have a secure market niche and gain user acceptance, but it will also continue to be a reminder of the challenges awaiting both systems integrators and those who market advanced technology.

Gilges is partner in charge, Information Systems Services Consulting Practice, at Peat, Marwick, Mitchell & Co. in New York. This article was written in conjunction with Richard A. Willner, a manager in the practice.

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UNIX NEWS

Unix Providing Solutions For Users At All Levels

UNIX UPDATE

Action in the Unix arena has not been exactly fast and furious of late. But there have been some goings-on that bear watching.

Consensus has it that mainframe Unix is not a large market. In 1985, Amdahl Corp. of Sunnyvale, Calif., sold 55 mainframe Unix licenses while IBM sold 40, according to International Data Corp., a Framingham, Mass.-based market research firm. Except for some test sites, all of these Unix installations have been running under IBM VM.

Volume market demand is clearly not the impetus for mainframe Unix. Instead, the motivation appears to be the emergence of an all-or-nothing demand for mainframe Unix in two areas — the federal government and the scientific/engineering sector.

The federal government is now requiring Unix in its purchase order requests, including the ones for mainframes. Also, engineering/scientific users are beginning to upgrade from their Unix minis to mainframes.

One reason for this move is speed. "Jobs that take an hour on a mini take five or six minutes on a mainframe," said Andy Schroter, manager of systems programming for the AT&T Data Processing and Corporate Telecommunications Group in Piscataway, N.J.

Another reason is support. "It takes less people to support one mainframe with one operating system and one set of applications than it does to support several minis, each with its own software," Schroter explained.

Schroter, who maintains mainframes for AT&T's internal operations, is one of the earliest users of UTS/580, the native Unix operating system that Amdahl publicly introduced in February. For two years before the announcement, he ran one of 40 native UTS test sites, most of which were in AT&T.

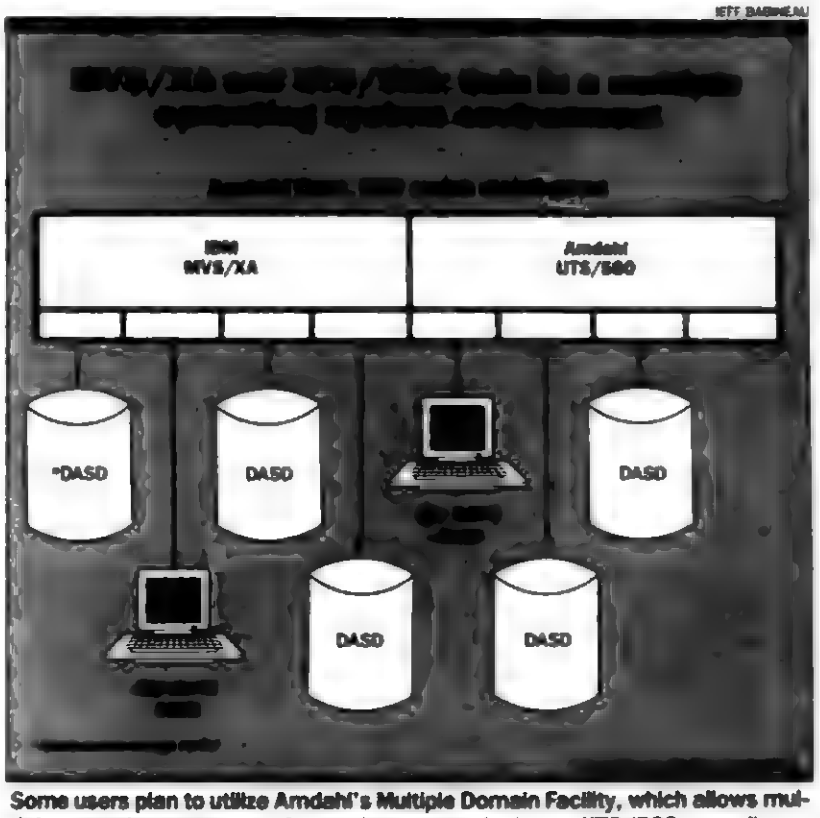
When Schroter first ran native UTS, he had certain concerns. "We got a vanilla Unix and [IBM] 3270 emulation," he said of the first version. "We had to educate Amdahl that Unix on a mainframe has to be a commercial product."

Schroter gives UTS a "B+/A-," but he still sees room for improvement. "UTS native is viable, but it's not as sophisticated as VM or [IBM] MVS," he explained. "But I don't think it will be too long before the tools are available."

One capability that is making UTS/580 more attractive is Amdahl's Multiple Domain Facility (MDF), which allows several operating systems to run concurrently (see chart this page). "MDF saved us a few million dollars," Schroter said. Instead of buying a Unix minicomputer, he explained, AT&T has used MDF to add Unix to an existing mainframe running VM.

Amdahl is now getting orders for UTS/580 outside of AT&T, several months after its debut. The firm has shipped two copies of UTS/580 with two Amdahl 580 series processors to Lawrence Livermore Laboratory in California. Amdahl officials said. And the National Aeronautics and Space Administration Ames Research Center in Mountain View, Calif., has ordered UTS/580 for its two Amdahl 5840 mainframes.

■



Some users plan to utilize Amdahl's Multiple Domain Facility, which allows multiple operating systems to be used concurrently, to run UTS/580 as well as a proprietary operating system from IBM.

For months, people speculated about the impact of IBM's Unix-based, reduced instructions set computing architecture microcomputer on the technical workstation market. In February, when IBM introduced the RT Personal Computer, some suggested that it might be a multiuser office system as well. Others wondered if it was an engineering workstation at all.

Micro Focus, Inc., a UK-based software supplier, is one of the latest companies to hail the RT PC as a business system. In announcing its plans to make four Cobol packages available on IBM's workstation, Micro Focus stated that business users are demanding business applications for IBM's RT PC. The reasons for this demand seem to lie in IBM's design and pricing of the system and in the applications it has chosen to support.

In a report for International Data Corp., a Framingham, Mass.-based market research firm, D. E. Followwill noted that IBM has designed the RT PC to support up to eight concurrent users while most workstations only support one or two. He also pointed out that the RT PC is not even competitively priced with similar products. For example, he said, a standard RT PC costs just more than $30,000, about $10,000 more than a Sun-3 workstation from Sun Microsystems, Inc.

The software available for the RT PC also hints that it is well if not better suited as a departmental office system. AIX, IBM's version of Unix for the RT PC, uses front-end menus to hide the nontechnical user from cryptic Unix commands, Followwill observed. He also noted that IBM's support of the full graphics software line from Visual Engineering, Inc., based in San Jose, Calif., gives the RT PC both engineering and business graphics capabilities.

Other applications that the IBM workstation supports are clearly designed for office users. Alis, from Westboro-based Applix, Inc., is an office automation package that provides word processing, spreadsheet, electronic mail and basic text publishing capabilities. SamnaPlus, from Samna Corp., located in Atlanta, is a WP package.

IBM's unofficial marketing of the RT PC is not hurting its reputation as a good business system either. According to a spokesman at Applix, IBM sales representatives are peddling the workstation to the market they know best — office automation.

■

"Unix to DOS" is a trendy catchphrase among Unix vendors and potential Unix customers, and several hardware and software companies are making products and deals about which they hope people will talk.

Sun Microsystems, Inc., has joined IBM and Apollo Computer, Inc. in promising to offer a Personal Computer AT-compatible coprocessor board for its workstations that allows Microsoft Corp. MS-DOS applications to run under Unix.

Sun is late in announcing its board, with shipment scheduled for the third quarter of this year. Apollo and IBM announced their boards in February, but they are not expected to make them available until later this year.

Sun also introduced PC-NFS, software that allows microcomputer users to have transparent access to files on any computer that runs Sun's Network File System. PC-NFS is available within 30 days of order.

Locus Computing Corp. of Santa Monica, Calif., and Microport Systems of Scotts Valley, Calif., announced that they will integrate Locus' Multisystem Merge interface, which allows Unix and DOS to run concurrently, with System V/AT, Microport's version of AT&T's Unix System V for Intel Corp. architectures.

What's In Store For Xenix?

Sometimes it's hard to understand where Bellevue, Wash.-based Microsoft Corp. is headed with Xenix, the company's Unix derivative for IBM Personal Computers and compatibles, especially in light of the company's apparent goal to make its MS-DOS operating system more like Unix to take advantage of the extra power of the Intel Corp. 80286 and 80386 microprocessors.

"Xenix is used for multiuser computing but so will MS-DOS 5.0," explained Bonnie Digrius, director of software market research at Input, Mountain View, Calif. "MS-DOS 5.0 is also supposed to be a true networking product, which will include windowing and multitasking features. I don't know where that's going to leave Xenix. It wouldn't be in Microsoft's best interests to produce an MS-DOS product that would carry all the attributes of Unix and take market share away from Xenix."

There are other factors veiling the future of Xenix. IBM started shipping its AT&T System V-compatible version of Xenix in March of 1986, and Microsoft is preparing a new version of Xenix that will be fully compatible with System V, expected out by the end of the year.

IBM's System V version of Xenix takes advantage of the protected mode of the 80286 microprocessor for multiuser and multitasking operations as well as for extended memory capabilities. To prep the market, Microsoft has been shipping the System V developer's kit to manufacturers.

Confused? So are the analysts. While Bill Gates, chairman of Microsoft, has gone out of his way to make statements that the company will continue to support Xenix well into the future, some industry observers are skeptical. Tim Bajarin, a vice-president at Creative Strategies Research International, Inc., San Jose, Calif., maintained that Xenix is a bridge product that has almost served its purpose and that Microsoft will soon discard it, replacing it with the more Unix-like MS-DOS releases.

Digrius disagrees. "MS-DOS and Xenix will coexist on the same processor, the 386," she said. "What this will do is take a big share of the growing market for MS-DOS/Unix software links. The pairing of MS-DOS and Xenix on the same machine is much more efficient than the kinds of links current software and hardware provides. I think that's part of Microsoft's strategy. They won't abandon the Xenix market. It's too profitable."

According to International Data Corp., a Framingham, Mass.-based research firm, the total 1985 Xenix market in low-end, multiuser systems amounted to about $450 million.

UNIX NEWS

Unix Supermicro Vendors Headed For Tough Times

Vendors of Unix-based supermicrocomputers might be in for a hard time in the departmental computing arena.

IBM has taken aim at grabbing a larger share of departmental computing by bolstering its line of System/36 and 38 minicomputers, and Digital Equipment Corp.'s departmental computing sales have been flying in the past year. The problems for supermicro vendors might be just beginning, however.

"IBM now has a clear strategy in departmental computing," according to Kimball Brown, industry analyst at Dataquest, Inc., a San Jose, Calif., market research company. "That strategy centers on the IBM Personal Computer AT."

Brown claimed that the PC AT has been far from fully utilized by IBM. "What you're going to see is a three-tiered departmental environment. At the low end will be ATs used as Unix workstations and file servers, connected to 32-bit Unix machines in the middle and further linked to an [IBM] 370-like mainframe environment. IBM is working on putting a 370 on a chip, and this will tie into its departmental strategy."

Effect on vendors

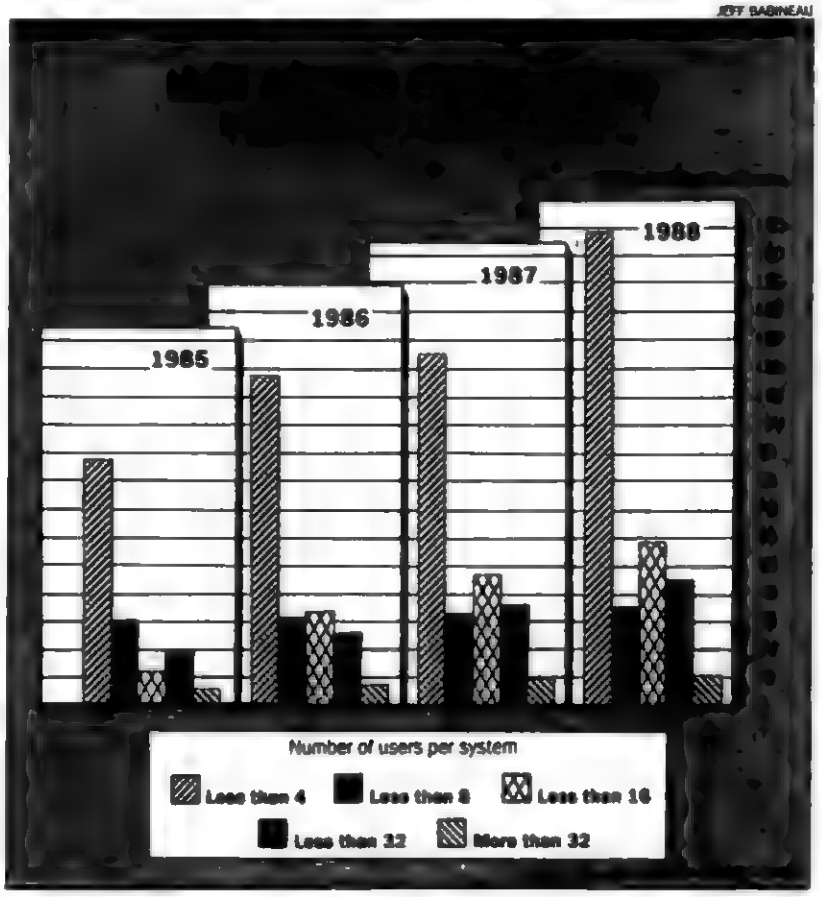
How will this affect supermicrocomputer vendors? A great deal, Brown said, because the Unix machines in the middle will increasingly be ATs and Intel Corp. 80386-based microcomputers running expanded Microsoft Corp. MS-DOS and Xenix and AT&T Unix System V operating systems.

"You can see everything coming together in a few years," Brown explained. "First of all, I don't think the System/36 and 38 are going to figure in departmental computing. The real battle will be between the IBM RT PC and 386-based machines.

"Let me set it up. The departmental operating system of choice will remain Unix. The RT PC runs Unix and so will the 386 machines. The RT PC could become an important file server for the engineering environment anxious to tap into commercial data bases, and the 386 machines will be supermicro departmental computers in the commercial area, meeting all the requirements of a departmental computer: 32-bit processor, acting as file server and serving a homogeneous community of users and applications."

There are other aces up IBM's sleeve that will put the squeeze on Unix supermicro vendors, Brown said. The first is DB2, IBM's relational data base application environment that Brown said will be migrated to the AT level and serve as an important application environment for departmental software. Next is IBM's commitment to providing better communications among its systems through the LU 6.2 protocol, which will give easier communications links across IBM and Unix systems. This last was a lesson learned from DEC, Brown said, which is closing more sales with its ability to provide tight communications across systems architectures.

JEFF BABINEAU



"LU 6.2 will be fully implemented next year, and MS-DOS 6.0 for the 386 processor, [which is] being worked on by Microsoft, will be out next year. But 1988 will be the big year everything comes together for departmental computing. That's when users will really start buying."

Until then, Dataquest sees departmental computing growing slowly, only 4.8% in 1986, for work group systems of two to 10 users, from a total market of $3.4 billion in 1985; and only 6.4% in 1986 for departmental systems of 10 to 20 users, from a 1985 figure of $2.9 billion.

International Data Corp., Framingham, Mass., put the worldwide supermicro market at $1 billion for 1985.

'So much promising stuff'

"You can't blame users for waiting to buy," Brown maintained, "there's so much promising stuff coming to the market in the next few years."

Where does that leave vendors of Unix-based supermicros? "Supplying connectivity to [IBM's] Systems Network Architecture, LU 6.2, DB2, PC ATs and 386-based machines," Brown said. "Unix will have to be incorporated into all of these to maintain its position of the operating system of choice in the departmental area. IBM wants this market, and IBM will be supporting Unix, but supermicro vendors — all vendors of Unix systems in fact — will have to plug into the IBM world to survive. I think [Altos Computer Systems, Inc.] has the right idea. They just expanded their 286-based multiprocessor line. That's the way the market is going."

John Mitchell, president of Motorola, Inc., whose Cupertino, Calif., subsidiary, Motorola Computer Systems, Inc., recently introduced its 8000 series of Unix departmental computers, countered that users are frustrated by proprietary computer systems that lock them into single vendors, even if that vendor happens to be IBM.

There will always be room for alternatives, Mitchell said.

Interest Of Corporate User Still Eludes AT&T System V.3

AT&T's introduction of Unix System V.3 was a big announcement. It was a big announcement that met with apathy from most corporate users.

Having postponed System V.3's introduction by four months and having flooded the press with leaks about its features, AT&T successfully eroded most of the industry's interest in the new release.

Among the DP sector of the industry, interest wasn't high to begin with. Despite AT&T's positioning of System V.3 as a "watershed in the commercial life of Unix System V," the focal point of the enhancements was the system's advanced support for network applications. Data processing managers have begun talking about networked environments, but few have Unix systems in their computing environments.

Commercial quality in question

Corporate DP managers are still concerned about Unix's ability to support commercial applications. System V.3 does not address this concern, according to Omri Serlin, who heads Itom International Co., a Los Altos, Calif.-based market research and consulting firm. "AT&T has not yet done support for data management," he explained, "so Unix is still not strong in any specific commercial sense."

AT&T's emphasis on the commercial importance of the System V.3 enhancements is not misdirected, though. Analysts agree that Unix will increasingly enter corporate departments as a part of a personal computer networking solution. The users on these networks will want to share information, but they will not want to know where on the network it is located. In System V.3, AT&T has provided two key features that will allow users to share resources along the network transparently: Streams and Remote File Sharing (RFS).

Streams is a mechanism that separates an applications interface from any network protocols. It consists of several modules, including the Transport Provider Interface, Transport Level Interface (TLI) and TLI library. These modules perform network services by isolating hardware dependencies. These features of Streams will serve as a base for the development of distributed processing applications that run independent of the underlying network.

AT&T's RFS software is partially based on Streams' TLI, making it independent of any network medium or protocol. RFS allows users to share resources transparently across a network because it treats all files and devices on the network as local files. To assure data integrity across the network, RFS provides file locking to prevent concurrent access by two or more systems and security features that enable a local system to accept or deny access to local resources by a remote system or user.

RFS vs. NFS

By incorporating Streams and RFS into System V.3, AT&T is attempting to set up RFS as an industry networking protocol standard. As such, RFS comes up directly against Sun Microsystems, Inc.'s Network File System (NFS). For many people, the question of which standard will win out has already been answered, but not everyone has the same answer.

NFS proponents point out that Sun has had a two-year lead in promoting its networking protocol. In fact, more than 60 manufacturers and universities have licensed Sun's NFS for their computer systems. RFS supporters point to the power of AT&T's backing.

One decision factor for users that Serlin sees is whether they need a network-wide file system for a heterogeneous or Unix-only environment. "RFS, as AT&T has postulated, is strictly Unix," Serlin explained. "NFS is not necessarily limited to Unix." Beyond this factor, there appears to be little else that will propel a user to one system or the other.

Unix vendors and analysts generally agree that NFS and RFS are very similar in design, and the functional strengths and weaknesses of each system seem to cancel each other out. NFS does not provide a mechanism for file locking; RFS does. RFS requires a single machine to manage the names in the network. If this "name server" machine fails, Serlin said, the entire network goes down. NFS does not require a name server.

"Depending on how you look at it," Serlin concluded, "NFS and RFS are equally acceptable or unacceptable. Each needs to be modified to be completely acceptable."

UNIX NEWS

Unix Finds Its Place In The Governmental Arena

Operating System's Portability Touted

Since the U.S. Congress decreed some years ago that federal government agencies must open up bidding on government computer contracts, Unix business has picked up considerably.

Let's back up a little. Unix has always found a spot in the U.S. government, mainly through sales by Digital Equipment Corp., which offered its version of the Unix operating system on its PDP-11 and Decsystem-10 minicomputers. There was a problem, however.

"Three years ago," explained Robert Borochoff, research computer scientist in the Federal Judicial Center, Washington, D.C., "Unix was a chancy proposition for us. Although Unix was portable and hardware independent, there were still few hardware vendors running Unix, and we considered it a rather restrictive computer environment. DEC was also not going to put in another generation of Decsystem-10s, and we needed more computing power."

A number of things happened in the meantime, however, to make Unix more attractive to government agencies. The first was a ruling by Congress, which indirectly said that government agencies would have to include Unix systems vendors in future requests for proposals. This ruling is regulated and implemented by the Office of Management and Budget, the controller of government purse strings, and the General Services Administration (GSA), the procurement arm of the federal government.

'Unix has stabilized'

This alone did not help the Unix cause in government, Borochoff said, because Unix was still viewed as a liability, with little software and few big-name supporters. In three years, however, the situation has changed. "Unix has stabilized and received more support from hardware vendors," Borochoff said.

The case of Borochoff's Federal Judicial Center is not unique in government computing. The center designs and develops applications for use in the 300 appellate, bankruptcy and various other courts located across the country. Borochoff said that the center is standardizing on Unix and will only consider those hardware vendors offering systems running it.

The center has drifted away from DEC systems because Borochoff said Ultrix, DEC's Unix operating system version, was closer to the University of California at Berkeley's standard than AT&T's System V, which the center and more government agencies have adopted.

The center is using Unix-based supermicros from Plexus Computers, Inc. and Pyramid Technology Corp. and workstations from Sun Microsystems, Inc. and AT&T to develop in-house applications.

Borochoff said that Unix portability across hardware systems and the growing support from Unix vendors has allowed Unix to make inroads into more federal government agencies.

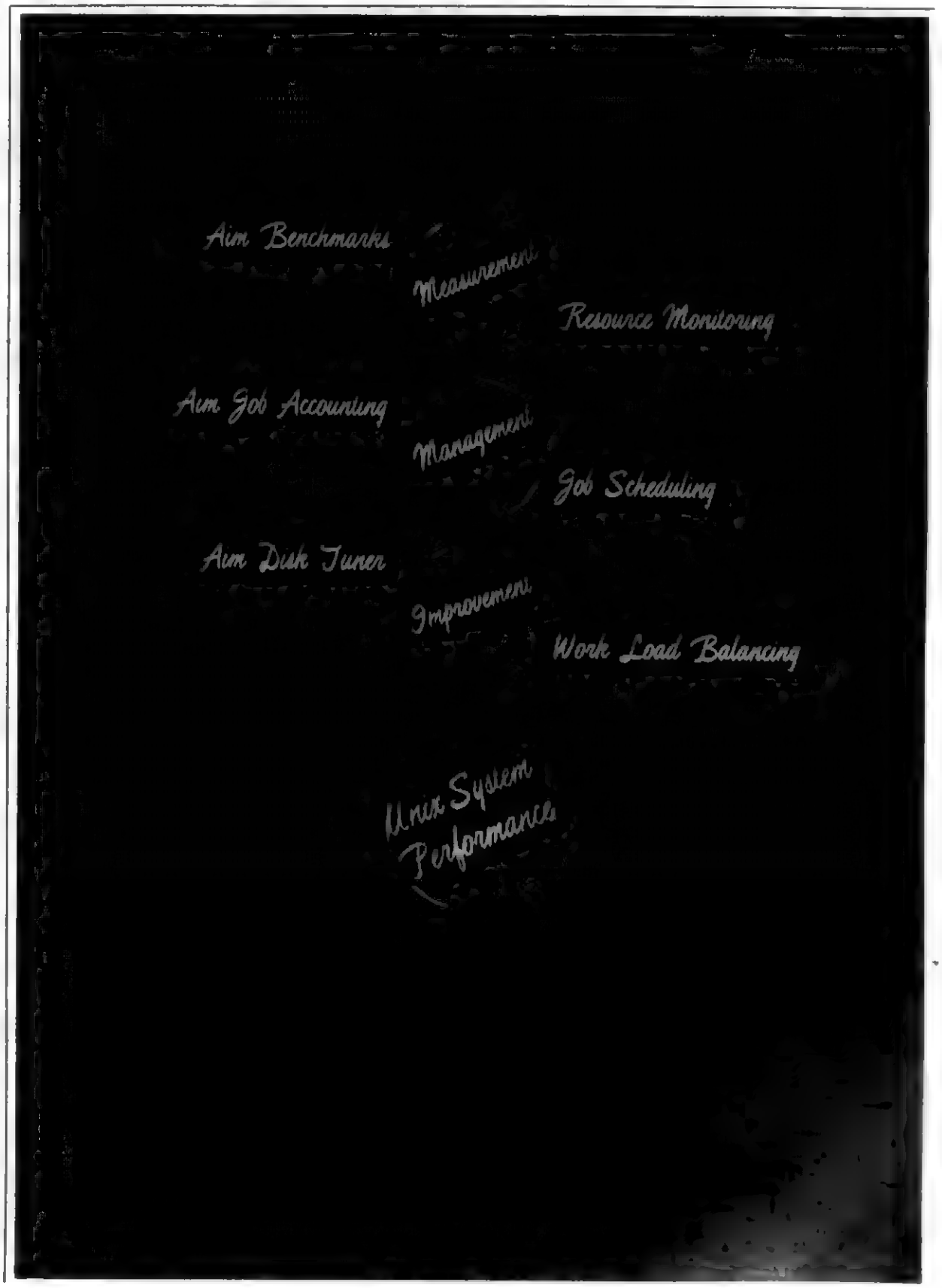
"AT&T has always been able to sell their services to the government, even before divestiture, but now they are much more competitive," he said, citing AT&T's contract with the National Security Agency worth nearly $1 billion and other contracts with the U.S. Department of the Treasury and the U.S. Drug Administration. IBM has also jumped in by supplying 24,000 IBM Personal Computer ATs running Microsoft Corp.'s Xenix to the Internal Revenue Service.

DEC, traditionally one of the big computer suppliers to the federal government, has been stung lately by the government's growing preference for AT&T's System V Unix standard.

"DEC has had real problems with how to handle Unix," Borochoff said. "However, the fact that Berkeley Unix and System V Unix are coming closer together is going to be a big plus for DEC in overcoming some complaints of incompatibility between Ultrix and System V."

Borochoff makes it clear, however, that the designation of the Unix operating system as a competitive factor in government computer purchases is not a fiat from above. "We are not under direct pressure to include Unix in all requests for proposals," he said.

However, since the Federal Judicial Center and other government agencies have to go through the GSA to purchase computer systems, one industry analyst said there is indeed economic pressure from the GSA for agencies to conform to the new emphasis on competitive bids, which means making sure Unix-based systems are in the running. Such pressure to conform can only be a boost for Unix for the future.



CIRCLE READER SERVICE NUMBER 265

CORRECTIONS

The Institute of Management Sciences was incorrectly written [*CW Focus*, July 9, page 34].

SAS Institute, Inc. owns the System 2000 data base management system [*CW Focus*, July 9, page 73].

George Rittersbach's name was not spelled correctly [*CW Focus*, July 9, page 12].

Mike Brody, an analyst with the Stamford, Conn.-based Gartner Group, Inc., was not fully identified [*CW Focus*, July 9, page 19].



IBM & DEC Take Up The Unix Challenge

BY JEAN YATES

IBM and DEC [illegible] ware, software and services. Why have the two [illegible] systems, around the Unix standard? The answers can be found by analyzing the Unix strategies of IBM and DEC and placing the two Unix strategies in the context of the two larger vendors.

DEC's software strategy is to [illegible] utilize DEC hardware effectively. The cornerstone of this strategy is VMS, the firm's major strategic software product. The Unix operating system is offered only when a specific client request [illegible] segment absolutely insists upon it. DEC [illegible] of their firm's Unix offerings or [illegible]

The [illegible] DEC salesman, faced with a customer who asks about Unix, is to steer him toward VMS and away from [illegible] search orientation and lack of business features. However, in [illegible] DEC would otherwise lose.

Why has IBM gone to the [illegible] VMS?

[illegible] First, DEC wishes to maintain [illegible] kets, and second, the amount of [illegible] try is in an economic down [illegible] the encroachment of Unix-based [illegible]

[illegible] procuring very large Unix-based [illegible] deal between AT&T and the [illegible]

MARKET ANALYSIS

Internal Revenue Service; and the Sperry Corp./U.S. Air Force sale, valued in excess of $100 million.

DEC cannot ignore this activity on its turf. Estimates by International Data Corp. (IDC), a market research firm based in Framingham, Mass., state that more than 40% of all federal mid-range systems purchases in 1986 will require a Unix operating system option. DEC cannot turn its back on such a large piece of the federal computer business.

Nor can DEC overlook the the dollar value of the Unix market. IDC said the overall sales of Unix-related hardware, software and services will exceed $4.2 billion in 1986, with a good portion of those sales in markets of keen interest to DEC.

Sales of Unix-based equipment are also especially strong in the automotive and aerospace industries. General Motors Corp.'s Manufacturing Automation Protocol standard for process control and factory automation uses Unix as its development environment. GM requires Unix on its workstations, which has influenced other manufacturers that had not previously considered Unix as an engineering operating system for its research and development requirements to take it seriously.

DEC recognizes the importance of specific markets with a strong interest in Unix and, in response to demand and market opportunity, offers a fully supported and integrated Unix product line. As its main Unix thrust, DEC provides Ultrix, a version of Unix encompassing the University of California at Berkeley Unix 4.2 with support for Unix System V.2. Ultrix is a member of the Digital Computing Environment, a set of operating systems and tools that makes up the backbone of DEC's software strategy. DEC fully supports Ultrix, which exchanges files and mail using Ethernet and Decnet with VMS and other DEC operating systems.

DEC's future plans for Unix

DEC has steadily expanded its resource commitment to Unix during the last few years. However, Unix is not a part of DEC's overall strategic plan to provide information systems that work the way people work and interconnect to share resources. That plan is tied to VMS and DEC's proprietary products.

DEC will not, in IDC's opinion, sell Unix anywhere it can sell VMS instead. For that reason, IDC does not expect DEC to offer Unix-based small business or general Fortune 500 data processing solutions. The firm will continue to provide its proprietary solutions in competition with Unix.

A particularly strong selling point against Unix has been DEC's All-In-1 integrated office system on VMS. DEC has the largest installed base of integrated office systems, and All-In-1 has an installed base of 3,600 units on DEC minicomputer networks, according to IDC.

The principal strength of All-In-1 derives from DEC's unified systems architecture. Its word processing is at about industry norm; while its electronic mail and filing system are less functional than those of competitors. However, Unix offers no equivalent in a cohesive user interface. Tying together a variety of different Unix applications programs into one system continues to require a set of crib sheets, manuals and knowledge of Unix command esoterica that turns off commercial users.

On the Big Blue front, IBM maintains a Unix strategy very similar to DEC's. IBM offers a range of Unix products, both stand-alone and running IBM proprietary operating systems such as VM. IBM does not actively market its Unix products, and its sales force, in general, does not understand Unix.

However, the IBM Federal Marketing Group is very involved in bidding for Unix-related procurements, and the recent IRS purchase of more than 20,000 Xenix-based PC ATs indicates that IBM is having some success at selling Unix-based systems.

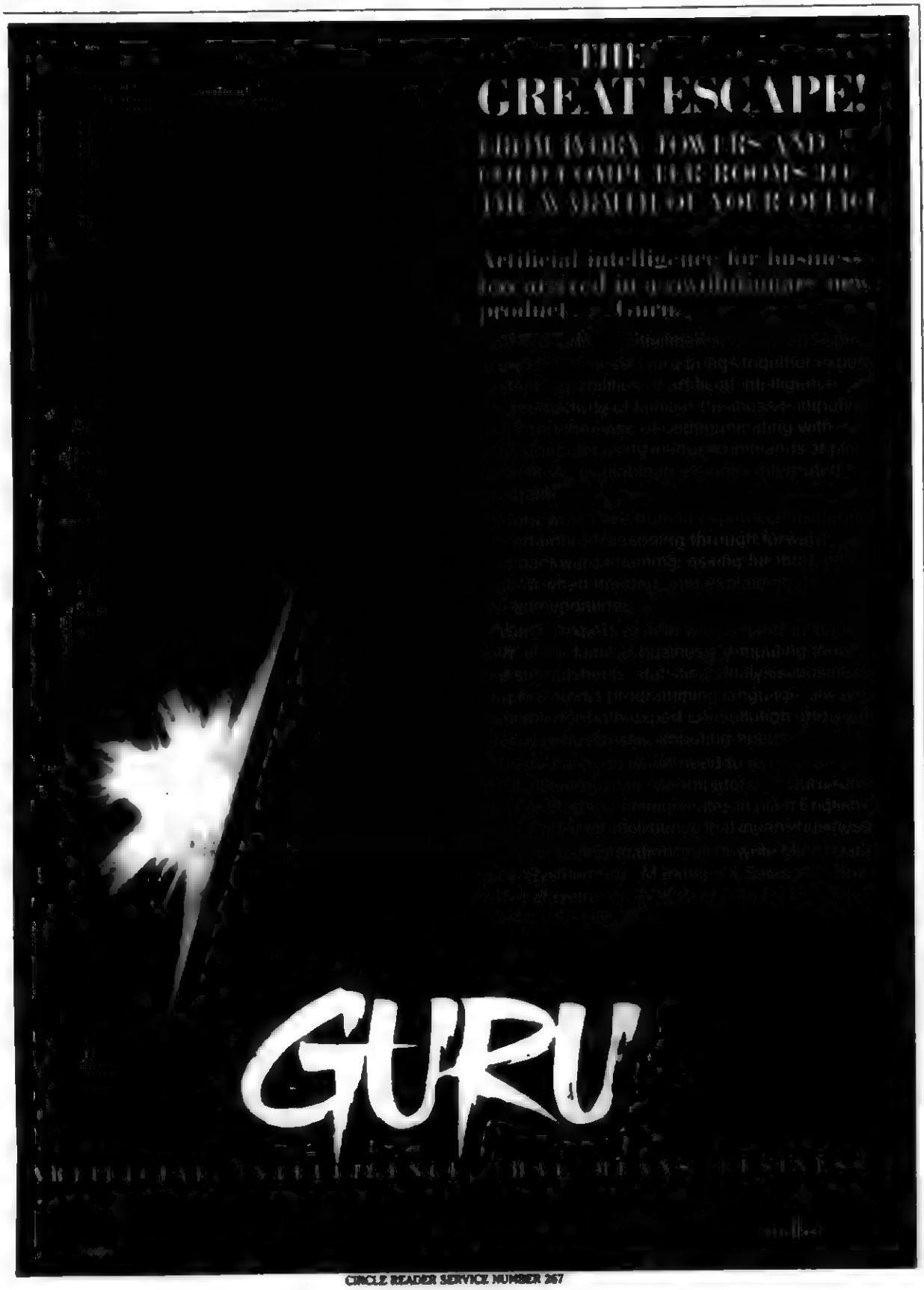
IBM's real target for its Unix effort is in the high-end minicomputer area. The majority of IBM Unix development resources are related to the IX/370 operating system product. The Unix port, based on System V with some Berkeley enhancements, runs over VM, with VM handling system administration and communications functions.

Unix users have responded with mixed reactions to the IX/370 concept. Many feel that the VM overhead is costly, degrades performance and requires VM-trained systems administrators. Until recently, an IBM Series/1 as well as a 4300 system was required to run Unix, adding to the cost. IBM has responded to these criticisms with the offer of very high-performance and competitive prices — but only in situations where IBM really wants the business.

IBM, like DEC, views Unix system sales as important only where they involve business that would otherwise go to another vendor. In addition, that business has to be large in dollar value and strategically important to warrant the use of IBM resources for non-IBM software sales. However, Unix is IBM's only non-IBM-developed operating system to be treated as a "Level One," fully supported "Program Product." This expenditure by IBM indicates that it is serious about getting Unix system sales, mainly at DEC's expense.

Particularly in the government arena, IBM can use Unix as an inroad into DEC VMS-dominated accounts. In federal government sales, an IBM VM vs. DEC VMS battle has often resulted in a DEC win. But an IBM Unix vs. DEC Unix sales situation makes things even on the software side and eliminates DEC's VMS advantage.

The IBM RT PC, introduced in spring of 1986, is IBM's Unix-based workstation



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MARKET ANALYSIS

product. Although competitively priced, IBM's software offerings and overall knowledge of particular requirements of Unix users does not equal that of its major competitors — DEC, Apollo Computer, Inc., Sun Microsystems, Inc. and Hewlett Packard Co.

A product without a home

The RT PC seems to be a product without a home and was rumored to have been moved from group to group within IBM before release. IDC views the RT PC as another IBM Unix product released to meet particular user requirements in government procurements and to try to tap the now $1 billion-plus Unix engineering workstation market. For the time being, IBM's commitment to the RT PC seems in line with its overall Unix strategy — offer it where it is required to make the sale, but otherwise sell IBM proprietary products.

IBM's recent experiences with the clone makers in the low-end PC market is probably going to affect its Unix philosophy as well. The RT PC with the open architecture Unix operating system is already susceptible to lower cost, higher function products from Sun and Apollo, and IBM may decide that the investment of resources is too great to build up a market only to lose it to inexpensive knockoffs.

Unix products at the high end of the computer market will not be as affected by clones because of the amount of proprietary and technical service and support that is required. Expect IBM to remain active at the high end of the Unix market when it needs to sell Unix to protect or gain a key account. Expect IBM to soft-pedal Unix at the low end, both because of its late entrance into the Unix workstation business and because of the hard knocks it has taken in the commodity PC market.

Only IBM, DEC and a few other computer manufacturers worldwide can afford to develop and maintain an integrated system of micro-to-mainframe computers.

The 150-plus connectivity-oriented products introduced by IBM this spring showed users and vendors alike the massive monetary resources required to pull together a cohesive desktop-to-mainframe network. Few other computer vendors have the money to develop solutions that will allow their computers to connect as a proprietary solution. Few computer vendors can even afford to develop proprietary connections from their existing equipment to IBM standards. Many of those smaller vendors' only alternative is the open architecture of Unix.

DEC, with a commitment to VMS, Decnet and All-In-1 as backbones of its one vendor, one integrated system strategy that stems from the early 1970s, is in the best position today to sell such an interconnect strategy and actually deliver. IBM, of course, has promised such functionality for years and is now actually delivering interconnected networks of its computers. Few other vendors can afford to develop the computer, software and interconnect products that could duplicate the IBM and DEC efforts. AT&T is a possible exception to this statement, but it has yet to live up to its potential.

An additional burden on other computer manufacturers is their users' requirements for interconnections to IBM and DEC standards. How can these vendors survive users' demands for these expensive and complex solutions? Sadly, the answer in many cases is, they can't.

Smaller computer firms will increasingly specialize in niche markets, but these markets, operating in isolation from the growing world of interconnection, are shrinking. Even vertical market computer users are beginning to demand access to standard networks and interconnection to a diverse range of equipment.

So where does Unix fit in? Simply put, it may be the only affordable solution for smaller computer companies that must offer interconnections to IBM and DEC computers.

Not one of these computer companies alone could fund the number of applications, utilities, tools, networking solutions and IBM interconnection utilities that are available for Unix. Without intending to, the Unix community has created a substantial start on a multivendor interconnection solution that could be competitive to IBM and DEC's proprietary interconnection solutions. For the smaller computer vendors, Unix may prove the only affordable way to provide the number and range of interconnection and communications offerings that users require

A substantial portion of the computer users in the 1990s will require a multivendor solution that expands beyond a two-vendor, IBM and DEC solution, although DEC is certainly hoping that it can offer as much of the non-IBM equipment required by users as possible. But for the rugged individualist users who want an NCR Corp. unit, Honeywell, Inc. system or a Fortune Systems Corp. word processing system tied into their networks, Unix may prove to be the umbrella under which they receive their interconnections to the IBM and DEC worlds

The smaller computer manufacturers will buy standard, Unix-based utilities that interconnect their systems to IBM and DEC and will sell special features and functions to users whose major information processing backbone network is from IBM, DEC or, perhaps, AT&T ■

Yates is a vice-president of the Framingham, Mass.-based research concern International Data Corp. and also runs the company's AT&T Advisory Services program. She is best known for her pioneering market research on the Unix operating system.

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CIRCLE READER SERVICE NUMBER 269

MARKET ANALYSIS

Big Blue's Product Moves Signal Plans For Unix

By Eddy Goldberg

While the Unix industry waits for IBM to endorse Unix officially and give the market the Big Blue seal of approval, IBM has steadily, though quietly, been making moves that indicate the company is very serious about its long-range involvement in Unix-based products.

Clearly the most significant Unix-related move by IBM in 1986 to date was the Jan. 21 introduction of the IBM RT Personal Computer, a Unix-based, reduced instruction set computing architecture workstation. "We've clearly positioned the RT to be the primary workstation for the technical professional," said W. Frank King, general manager of Advanced Engineering Systems in Austin, Texas, part of IBM's Industrial Systems Products independent business unit.

Another signal of IBM's interest in the future of Unix is that King, who is responsible for IBM's long-term Unix-based product strategy, recently was elected to the board of directors of the Unix /usr/group, which actively promotes Unix standards and its acceptance in the commercial marketplace. All previous requests to IBM to approve the nomination of an IBM executive to the /usr/group board in the U.S. had been declined, according to Lizabeth Reilly, executive director of /usr/group.

In his statement of purpose for running, King said, "The evolution of AT&T's Unix operating system into a viable commercial product and the development of multiple Unix-based IBM products has created a need for IBM to participate in users groups that are related to the coordination and promotion of Unix-based products."

The reason for IBM's increasing presence in the market for Unix-based products is clear: There is money to be made there. King singled out the government, engineering workstation and university markets in particular, but added, "IBM is going to sell Unix wherever that solves the customer need. It isn't going to be limited to any area. We're going to sell it wherever it solves the problem."

Another reason for IBM to be interested in the Unix market is that 44% of its business is overseas, says Brian Boyle, director of research at Novon Research Corp. in San Francisco. Boyle said the move to Unix standardization is stronger in Europe than in the U.S., and IBM is not likely to ignore opportunities to sell Unix in Europe.

IBM currently offers five Unix-based operating systems, all of which contain the Interactive Executive, or IX, label:

- PC/IX is a single-user system for the IBM PC XT.
- PC Xenix is a multiuser, multitasking version for the IBM PC AT developed for IBM by Microsoft Corp.
- Series/1 IX, for the Series/1.
- AIX, or Advanced Interactive Executive, for the IBM RT PC, is based on Interactive Systems Corp.'s IN/IX and contains all of AT&T System V.1, some features of V.2, some from University of California at Berkeley Unix plus IBM enhancements. The June flurry of product announcements included AIX Version 1.1, which supports the Transmission Control Protocol/Internet Protocol and Ethernet.
- IX/370 for its 370 architecture mainframes, also developed for IBM by Interactive Systems, which runs as a guest under VM.

"You may detect in our naming scheme an interesting pattern," King pointed out. "We do have an objective to have a common set of Unix interfaces across all of the products that support Unix." He said that all the above products are based on AT&T Unix System V except PC/IX, which is based on Unix System III.

When asked about the chance that Unix could wind up being used for communicating across the different IBM product lines running Unix versions, King replied, "What we will do with Unix over time is to incorporate the key IBM architectures to make our Unix products relate to each other in a maximum way and to make our Unix products relate to the other mainline IBM operating systems — MVS, VM and DOS — and the System/36.



"I think it's a matter of having a set of standard architectures that you put on all of the hardware platforms that we support. That's what gives you the connectivity. I don't think it's Unix per se that gives the connectivity," he explained.

Unix itself, as is now clear after years of hype, is not a panacea. It is just one more tool for MIS departments to use in solving everyday problems. "What will draw MIS to Unix is not traditional transaction or batch but new applications in the engineering and office areas," said Bernard Hill, vice-president of marketing at Interactive Systems. He said Unix is ideal for office software development or time-sharing in engineering departments.

In Fortune 1000 companies today about 20% of MIS directors express some interest in Unix, up from about 5% a year ago, Hill said. "To get [that] from the MIS side is wonderful," Hill said. However, that figure is about 80% for engineering center directors, he explained.

Hill said the importance of Unix on personal computers has been overemphasized. "Unix is more important on mainframes than micros. People tend to count the units shipped. Try looking at the dollar value," he suggested.

He said Amdahl Corp. claims it can support 200 to 300 users under UTS/580, its newest mainframe Unix. Hill pointed out that the cost per user on such a system is much lower than, for instance, tying several VAXs together.

Amdahl announced UTS/580 in January as the first native Unix operating system for 370 architecture mainframes. Donal O'Shea, software systems management director at Amdahl, is a strong proponent of UTS mainframe Unix. O'Shea, a 17-year IBM veteran before coming to Amdahl in 1982, said that in late June Amdahl shipped two UTS/580 operating systems on two Amdahl 580 mainframes to Lawrence Livermore National Laboratory, its first non-AT&T shipment of UTS/580. Amdahl has shipped about 45 native UTS versions so far, according to O'Shea.

IBM, which does not disclose its shipments, said IX/370 is currently available, but on a controlled, limited basis. However, King would say there is at least one IX/370 out in an MIS shop. However, IX/370 runs as a guest under VM, unlike UTS/580, a stand-alone mainframe Unix.

Although IBM is offering Unix-based products, there are still questions as to how it fits in with the rest of IBM's strategies. There are still many who think that IBM selling Unix-based products will be to the detriment of its proprietary operating systems, and stories abound about reluctance by IBM salesmen to offer Unix. "They have it, they know about it, but they'll tell you about it if it's the only way to save the sale," said David Coleman, an independent consultant in Palo Alto, Calif.

"It is not in IBM's benefit to push Unix," agreed Steven Milunovich, a technology analyst with First Boston Corp. in New York. "The more you open things up through Unix, the greater the likelihood that people won't buy IBM equipment."

He said that the government market and the engineering workstation market demand Unix to compete, but "even where they do use Unix, they try to differentiate it," he pointed out.

'Unix will become a generic platform'

Coleman said he sees major vendors offering their own enhanced Unix versions as one way to retain their market share while embracing Unix standards. "Unix will become a generic platform for proprietary products," he said. "All the major vendors can meet AT&T's System V Interface Definition or the IEEE 1003 standard, but they are all adding their own extensions to differentiate their Unix products," he said.

However, based on statements from IBM, its ever-increasing investment in Unix-based products and the rapidly growing government and workstation markets that demand Unix, IBM seems less reluctant with each passing day to make its Unix-based products known.

Finally, one of IBM's stated goals is to derive 50% of its revenue from software by the year 2000. Becoming a stronger player in the growing Unix market can only help.

Goldberg is a senior writer for Computerworld.



High Time For Performance Management

·BY·ROGER·L.·McKEE·

Unix's popularity has expanded so that today it can be found on every class of machine from personal computer to minicomputer to mainframe, with numerous companies specializing in providing Unix systems and traditional computer manufacturers offering it as an alternative to their native operating systems.

More than 300 Unix users in government, aerospace, industry and education were recently interviewed by Palo Alto, Calif.-based Aim Technology, Inc., a supplier of Unix system software, to determine what system software capabilities Unix still needs (see chart page 22). Users were asked the following questions:

- What is Unix being used for in your organization?
- What additional support software would you like to see for your Unix system?
- What is needed to make Unix more usable for your entire organization?

Comparisons were made between system support software available for mature mainframe operating systems and the needs of Unix system users. An analysis of the IBM mainframe market indicated that there are products being offered by third-party software vendors that do not exist in the Unix marketplace. These products, while supporting an operating system environment, are not part of mainframe operating systems but are augmentations and additional services. Just as these services are not found in mainframe operating systems, they are also absent in Unix.

The results of the survey indicated the majority of Unix user needs were in the area of system planning and performance. Users are primarily concerned about system measurement (benchmarks, analyzers and monitors), system management (resource management; job accounting; backup, archive and restore; and tape management) and system improvement (disk tuners, job schedulers and work load balancers). They want tools to monitor and analyze how well their system is accomplishing its tasks. They are also looking for efficient procedures for managing the resources that are available to their users and for improving their system capabilities.

Once a computer system is acquired and operational, management focuses on performance measurement and analysis (Is my system doing what I expected it to do? Is it performing tasks in the most efficient manner?). In smaller systems such as PCs and single-user workstations, the process of measurement and analysis is simplified. In multiuser systems such as those supporting Unix, the problem is complex. With a large number of users performing diverse types of tasks, it is difficult to quantify how much of the resources are being used and how to plan for future expansion. While one user may be experiencing satisfactory performance, others on the system may not. Typically, systems tend to prove Parkinson's Law: Work expands to utilize all of the available resources.

Monitors collect data on system usage during normal operations for after-the-fact analysis. The goal of an organization using computers is to ensure that sufficient data processing resources exist.

Where sufficient resources do not exist, the organization must make the proper investment decisions to provide the necessary resources. Performance monitoring facilitates making better decisions quickly and systematically. It also provides management with a secure feeling that sufficient capacity will be available to satisfy the commitments it has made.

Analyzers provide management with a series of reports, statistics and graphs that detail the use and performance of data. Information obtained can be used for trend analysis, tuning and diagnosing the causes of degraded response time.

Analyzers can help determine whether additional disk controllers, disks, CPU or memory will improve system performance.

Performance monitoring and analyzing are functions that should be considered essential for any multiuser system. When implemented properly, their effects will be minimal and benefits positive.

One area of system measurement that is unique to Unix is system benchmarking. Benchmarking is used to examine the internal structure of a Unix system for maximum performance within a defined environment. Benchmarking is also used to compare the performance of multiple Unix systems and generate results on which to base informed purchase decisions that match system capabilities with user needs.

System management is critical from the first day a computer system becomes operational. Proper tools enable managers to answer questions such as, Who is using my system? What resources are they using? Where can I put all that excess data? Where did I put all that excess data?

PERFORMANCE PLANNING

Most third-generation operating systems provide basic data on system use by job and/or users. Unix collects data when each user logs onto the system; for each program run, it saves name, user identification, CPU used, when it ran, how long it took to run and other information about the program. While comprehensive, there is no capability to save data on what happened during a specific time of day or specific day of the week. There is no Unix utility to tally disk use on a per-user basis and save the information so that it can be recovered.

What is needed is a job accounting and chargeback system that not only allows the user to charge back the work run on the system but also to extract performance data. Job accounting needs to track system usage; allocate system resource charges to users, users groups and projects; and generate charge statements. The system should use the information about login time and CPU use and gather additional information on disk use.

Job accounting should provide managers with the information necessary to supervise the day-to-day operation of a computer system, to charge usage of the system to various users on an equitable basis and to plan for new systems and new applications.

Unix utilities

Unix provides several utilities that are used for backing up, archiving and restoring files on disk.

A partial list includes FF, Volcopy, Finc, Frec, Dump, Tar, CPIO and Restore. However, these utilities do not provide for the full capabilities needed by most multiuser Unix systems. There are generally two types of backups — full and incremental. On active systems, incremental backups are done daily and full backups are done weekly. On most Unix systems, archiving is done reluctantly, if at all. There is no facility for keeping track of what files have been archived and on what tape they are stored.

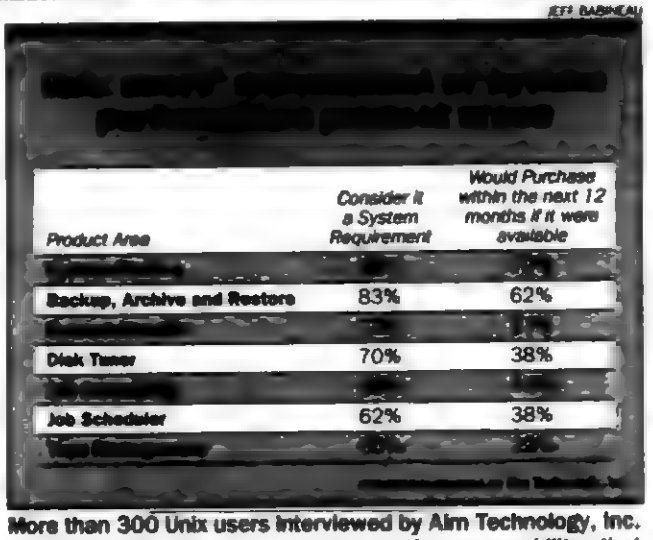
A primary need in Unix is the capability to generate and maintain a data catalog of backup and archive information and the ability to accomplish incremental backups and restores automatically.

Unix is a democratic operating system. Its basic message is: Use whatever resources you want, clean up after yourself, and don't interfere with anybody else. It is a good concept for smaller systems but requires a tremendous amount of restrain by users of larger systems. What is needed is a scheduling scheme to ensure that non-time-dependent processes do not use up so much of the available resources that the interactive processes suffer.

Job scheduling provides for system improvement by scheduling and monitoring job resource requirements.

The major purpose of job scheduling is to aid in planning and improving the overall performance of the system environment. It controls and adjusts the work load during execution, tracks jobs in response to inquiries and analyses problems. Job scheduling provides for setting threshold limits for all commands within the system environment, measuring the effects of those limits and dynamically changing them if necessary.

By using a job scheduling system to control and manage a Unix system, a manager can increase productivity, reduce operation costs and realize the full potential of the existing resources.



Product Area	Consider it a System Requirement	Would Purchase within the next 12 months if it were available
Backup, Archive and Restore	83%	62%
Disk Tuner	70%	38%
Job Scheduler	62%	38%

More than 300 Unix users interviewed by Aim Technology, Inc. voiced their opinion on those system software capabilities that Unix still needs.

Performance in a Unix system is heavily dependent on the efficiency of its direct access storage devices. Most people have heard Unix described as heavily dependent on disk I/O. This notion is true; however, this dependency is not unique to Unix. Ever since data has been stored on a disk, the problems involved in efficiently storing and retrieving data on a disk have been studied and modified. The University of California at Berkeley's Unix Version 4.2 attempted to solve the problem by restructuring the way data was stored within a file system, but the problem still remains.

Dynamic solution

The storage and retrieval problem is a dynamic one and requires a dynamic solution. As data on a disk is continually modified, the physical layout of the file system deteriorates. Files become fragmented and dispersed over the physical disk. Additional time is required for physical positioning (seek time) and rotational latency (interleave) to read a requested file. The random ordering of the file system becomes even more acute when files are used frequently or when files change size often.

Even program files that never change in size can become permanently scattered over the disk in a random pattern due to the physical placement of the free space available when the file was created.

Disk tuning is a solution to the file placement problem. The purpose of disk tuning is to consolidate the physical layout of the data in the file system to correspond to the logical usage of the disk.

Disk tuning consolidates and organizes files into a contiguous area based on frequency of access, thus ensuring that the optimal performance of the file system can be attained in a multiuser environment. It ensures that the most active files can be accessed in the least amount of time.

With disk tuning, the monitoring function operates on a periodic basis to record file system I/O activity. It records data on the files most frequently accessed. The analysis function identifies the files that are most active, ranks them in order of activity and provides statistical information. The reorganization function provides for the actual placement of data within the file system for optimal access.

Although we have defined a common set of needs existing in the Unix community today, solutions to these problems are presented with many challenges. Among these challenges is that Unix is used for a wide range of applications including document preparation, software development, office automation, business applications and factory automation in addition to the traditional uses in engineering, education and research and development.

Further, there is a wider range of hardware used to implement Unix systems than for any other operating system. The architectural diversity of disk drives and controllers in CPUs from micros to supercomputers, front-end processors, multiple processors and networked processors offers a greater challenge than traditional software support products have ever before had to address.

More style than substance

Also, the Unix operating system actually consists of a family of related versions including AT&T System III, AT&T System V, AT&T Version 7, University of California at Berkeley Unix Version 4.1, Berkeley 4.2 and other proprietary versions offered by hardware vendors. Though these differences exist, in reality it is more in style than in substance. Therefore, it is necessary to know in which manner each differs.

Even more subtle than the various versions of Unix are the differences introduced by human nature. The same version implemented on different hardware will contain minor differences. These "minor" differences show up when software development is 90% done and requires the other 10% to be complete. These differences must be addressed by both manufacturers and software developers.

McKee is vice-president of business development for Palo Alto, Calif.-based Aim Technology, Inc., a supplier of Unix system software. McKee specializes in software development and marketing.

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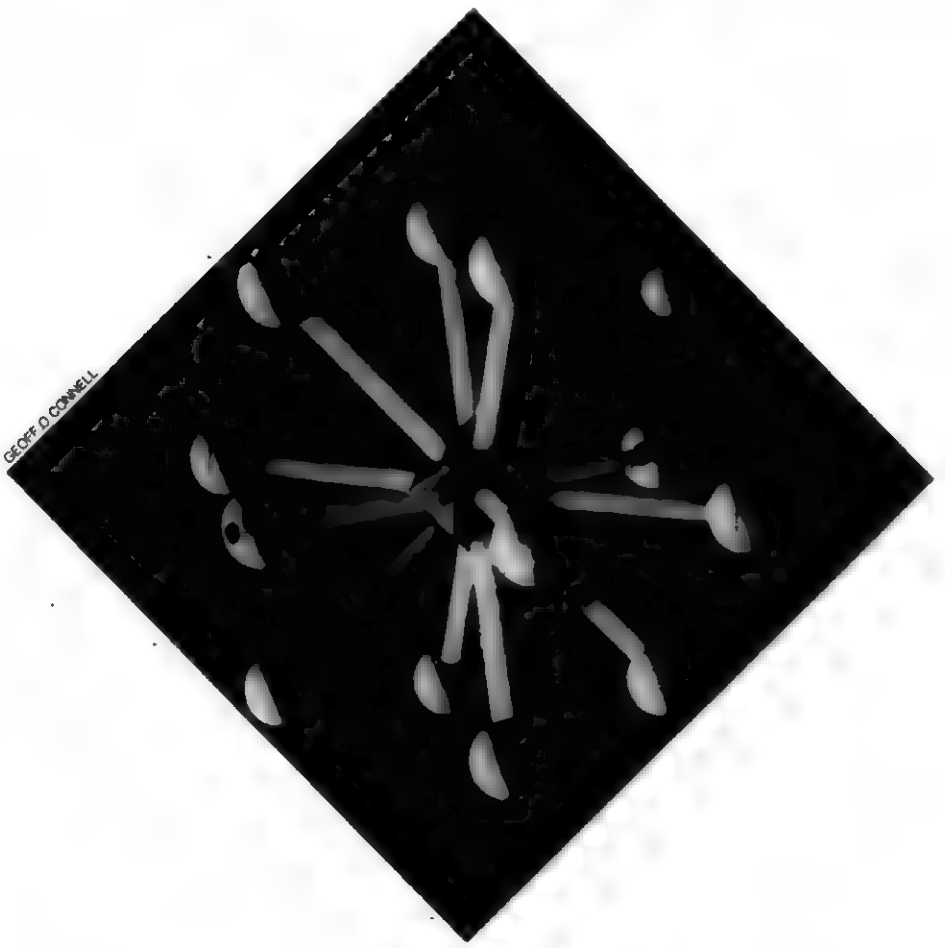
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PURCHASE DECISIONS



A Single Network Solution

• B Y • J U D I • U T T A L •

Different operating systems work best for specific computing needs, whether those needs relate to the individual user or to a group of users. However, connecting these seemingly disparate systems can solve many problems.

The selection of a computer and operating system is often driven by the reputation of the system manufacturer, the availability of appropriate application software and the overall system cost. However, a criterion often not considered is the functional characteristics of the computing problem.

Computing problems can be divided into two categories — personal and organizational. Personal problems relate to the individual; application software designed for personal problems includes word processing and spreadsheets. Organizational problems relate to a group; application software designed for organizations includes data bases, accounting packages, inventory control systems and scheduling programs.

These two types of applications differ in their computing requirements.

Personal applications are more suited for personal computers where the target operating system is usually Microsoft Corp. MS-DOS; organizational applications are more suited for multiuser systems where the target operating system is either a proprietary operating system or Unix. The table on page 25 outlines the task differences within these two categories.

Intel Corp. offers an example of the differences between personal and organizational tasks. Within the same physical area of the firm there are two separate marketing departments. One product marketing group, the OEM Microcomputer Operation (OMO), is responsible for managing the Intel Multibus board products. The second product marketing group, the Integrated Systems Operation (ISO), is responsible for managing the Multibus systems products. The responsibilities of both groups range from forecasting, pricing, writing fact sheets and developing presentations. Both groups are made up of six product managers.

Both OMO and ISO decided to automate their product marketing departments around the same time. ISO wanted to use a Multibus-based system and selected the multiuser Microsoft Xenix operating system. The choice of a multiuser system made sense because the group's products were strongly interrelated. The forecast for the number of Multibus systems served as input for the forecast for the two types of operating system packages. The forecast for the operating systems affected the forecast for application packages. This inherent interrelationship suggests that the application was primarily organizational in nature and that a multiuser system was appropriate.

OMO, on the other hand, decided to standardize on the IBM Personal Computer running MS-DOS. IBM PCs were preferred because of the application software available. The choice of a single-user system made sense for OMO because unlike ISO, OMO's products were not closely interrelated. The forecasts for the individual pieces of the board product

line — disk controllers, serial I/O boards and CPU boards — were fairly independent. Hence, the application was primarily personal in nature, and a single-user system was the appropriate choice.

Classifying work groups as being either personal or organizational in nature simplifies the selection of a computer system. With time, however, this simplification may lead to problems. At first glance, an application may appear to be either personal or organizational; in reality, most applications are made up of an assortment of personal and organizational tasks. As a company increases the demand on its computing facilities, these limitations become increasingly obvious.

Take, for example, the product marketing groups forecasting away on their new computers. With time the product managers get more and more dependent on their systems. The ISO product marketing engineers use the multiuser system more and more and discover that the computer is overloaded. They cannot get their forecasts out on time because it takes 10 minutes to update a spreadsheet. New PC programs suited to their needs proliferate, but they are forced to use awkward Unix commands like VI, which employs the visual text editor.

The product managers using the multiuser system look enviously at the PC users because they have complete control over their systems and have new tools available all the time because they are using MS-DOS.

At the same time the OMO product marketing engineers also increase their PC use. However, cost-cutting measures have limited the number of peripherals they can purchase, so they share a printer, setting aside one system for this task. These engineers stand in line to use the printer and talk about how much they would like a mail system.

As they start working on the annual plan, they work closer together, and all board forecasts must be assembled into one spreadsheet. They begin to look enviously at the multiuser system users who have an interrelated spreadsheet that rolls together all their numbers.

With time, each group realizes that its tasks are both personal and organizational. Each wants the independence, guaranteed performance and abundant software the PC provides,

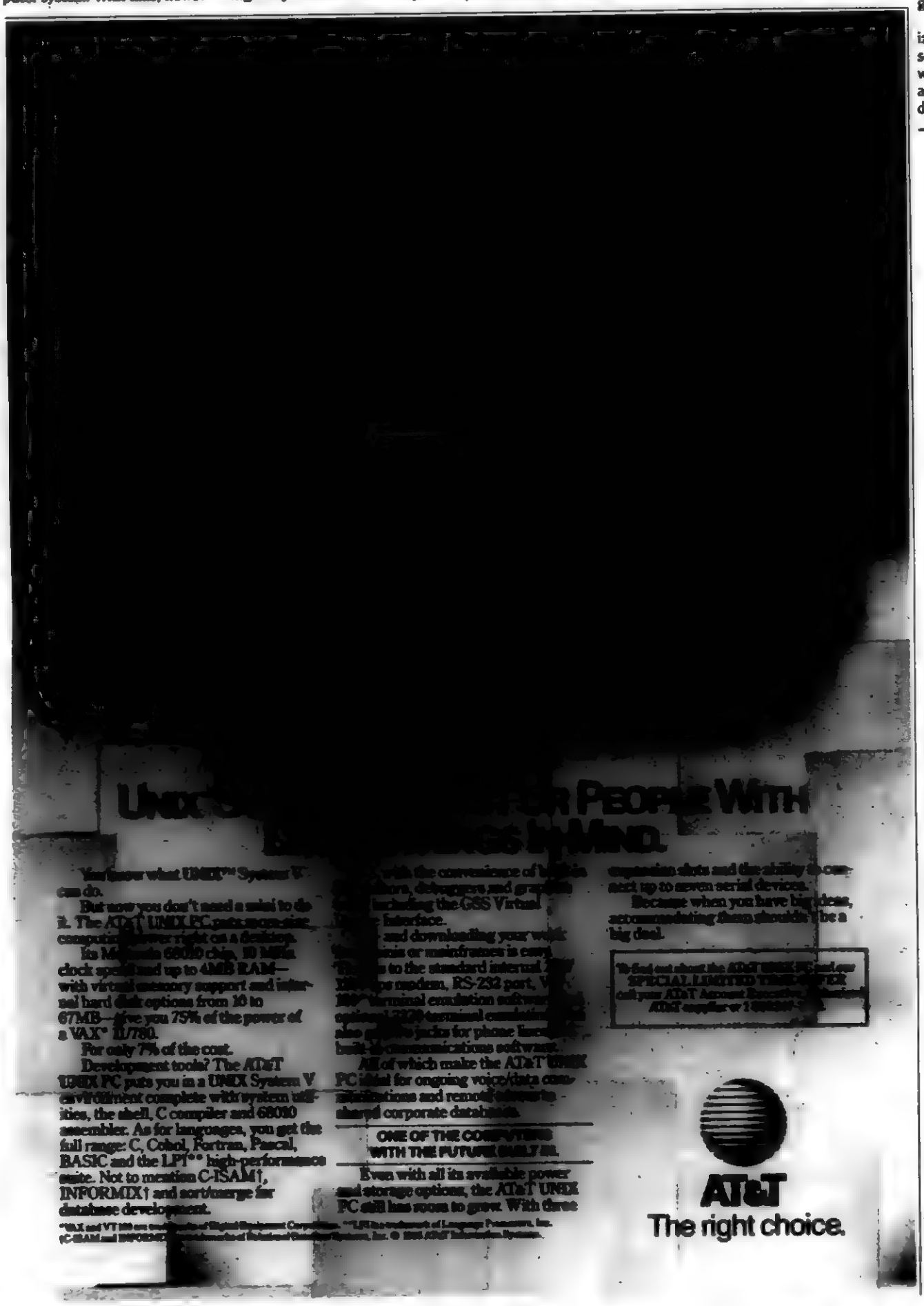
> *"Users want the freedom, guaranteed performance and abundant software the PC provides, but they also want to share printers, send mail and create interrelated applications.*

but it also wants to share printers, send mail and create interrelated applications.

Two operating systems

The solution to this problem can be a two operating system environment — where the personal tasks are executed on the PC and the organizational tasks are executed on a multiuser system. The fundamental considerations in designing a two operating system solution are the following:

- Both operating systems must share the same file system. The multiuser system should act as the centralization point and provide discretionary file security, password protection and backup capabilities.
- The solution must not affect the operating system interface, so that all applications run in the dual operating system environment.
- Resources such as printers must be centralized to allow access by all members of the work group.
- Performance of both operating systems must be comparable to either operating system



PURCHASE DECISIONS

running independently.

The dual operating system environment described above should be a networking product designed so personal tasks can be executed by the MS-DOS operating system and organizational tasks can be supported by the Unix operating system.

When this is the case, the Unix system becomes the centralized point of a PC-based work group. MS-DOS users may store files and MS-DOS applications on a Unix host and access them just as if they were on a local fixed disk. Both MS-DOS and Unix applications can access the same files. Because the operating system interface is not disturbed, MS-DOS programs such as Lotus Development Corp.'s 1-2-3 and Micropro International Corp.'s Wordstar can access Unix files.

> *When MS-DOS users utilize the Unix systems as a file server, security is preserved through the Unix protected file system.*

To obtain access to the Unix host would require providing a login and password. When MS-DOS users utilize the Unix systems as a file server, security is preserved through the Unix protected file system. The system administrator performs regular backup via the Unix backup facility.

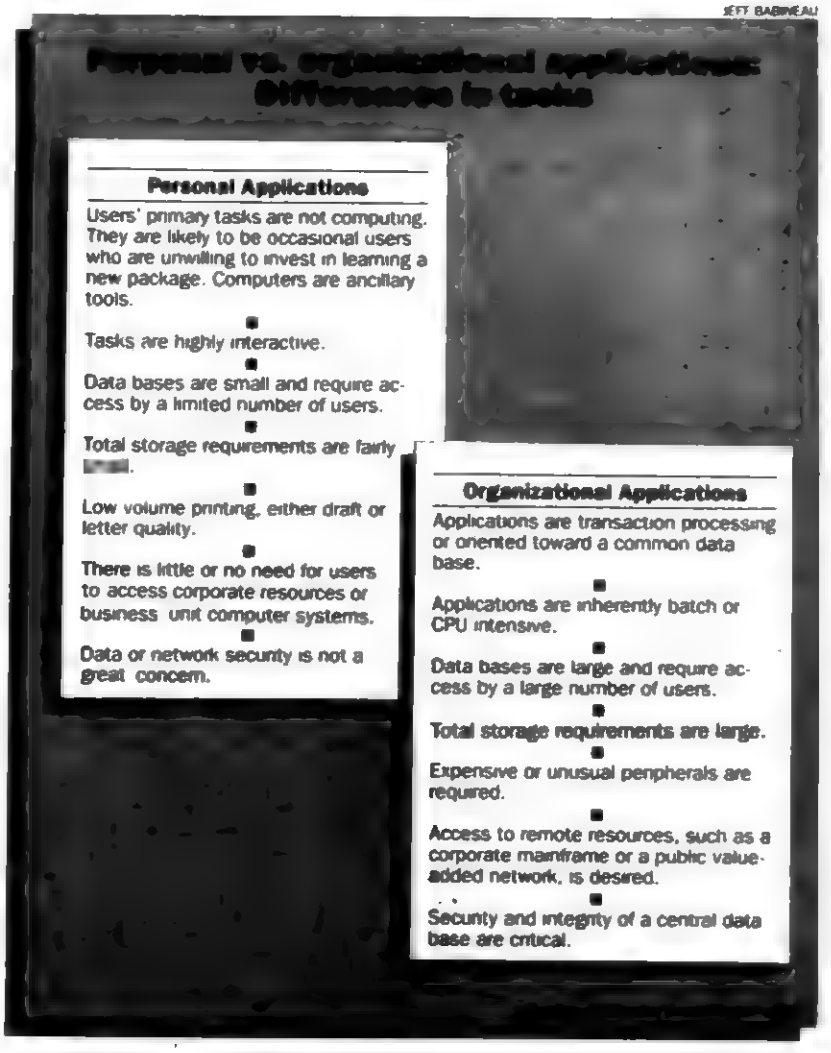
For ease of use, it is important that PC users and applications can transparently spool print requests to an attached Unix printer without user intervention. A user running Microsoft's Multiplan, for example, should be able to initiate a print request from the application and have it immediately spooled to the Unix system printer.

In addition, users should not notice any performance differences when accessing a file on the Unix disk rather than on a local disk. Performance continuity can be achieved with a networking product running over Ethernet. Access over RS-232 through a modem gives users remote access to the Unix file system.

The availability of Digital Equipment Corp. VT100 terminal emulation is an important feature to this configuration because it will allow the PC to double as a Unix terminal. In this way, both MS-DOS and Unix applications can run concurrently.

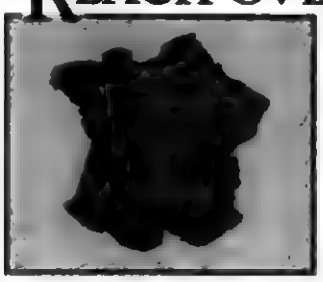
The use of this type of networking product is illustrated in a department similar to that of our product marketing groups. Each product manager is supplied with a PC and a Unix system

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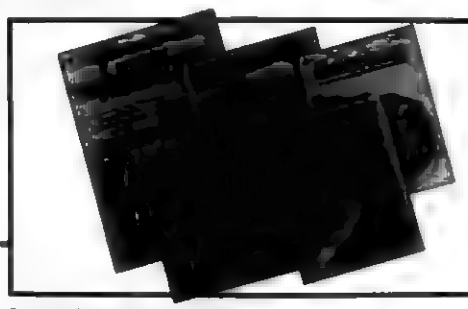
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account. All data and MS-DOS applications are stored on the Unix system. As the group's needs become increasingly organizational in nature, the system configuration can adapt.

Each group has both individual and shared spreadsheets. When the computing requirement is personal, the user maintains autonomy; however, as the environment changes, the computing resources adapt to allow the computing resources to be interrelated.

Any MS-DOS spreadsheet program is used. The data resides in a group account, and all updates to the forecasts are run on the product manager's PC so that when he is modifying and updating a spreadsheet, no incremental load is placed on the multiuser system.

When the spreadsheet is ready to be printed, the user issues the proper print command and the print request is immediately spooled to the Unix printer.

Backups are coordinated by a single system administrator. If one product manager accidentally deletes a data file, the system administrator can recover that file.

Thus far it has been shown that if you oversimplify within a computing facility, users become dissatisfied because of limited functionality or performance. Therefore, the computing facility should be set up to allow for both personal and organizational tasks.

A flight reservation system

For example, consider a flight reservation system. Entering and modifying the data is highly interactive; however, sorting and reporting the data is CPU intensive and can be done as a batch job. Data entry is a personal task, while sorting and reporting is organizational. The next level of computing environment optimization is to support distributed processing providing for applications that optimize CPU power by executing personal portions of programs on the PC and organizational portions on the multiuser system.

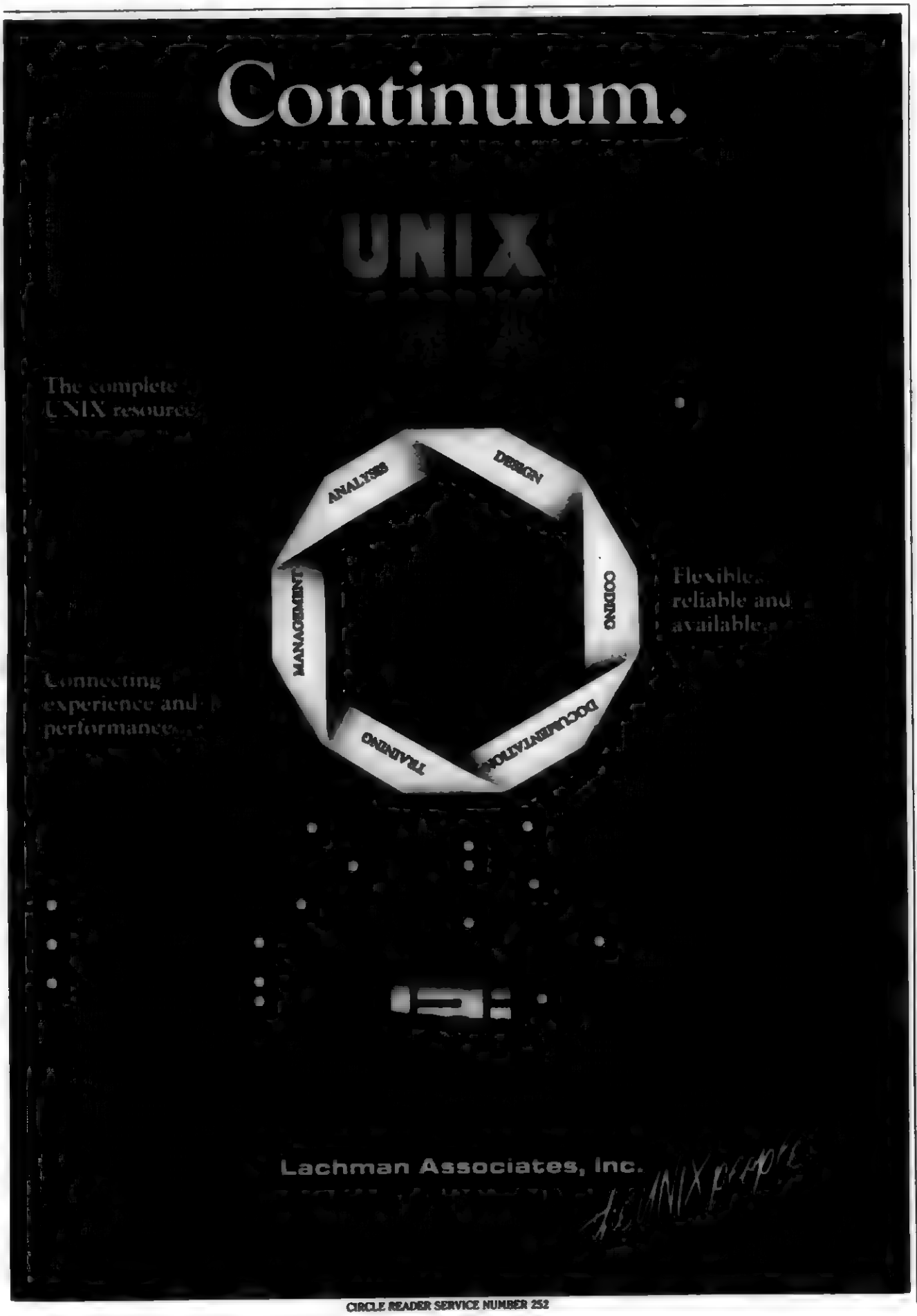
This functionality is necessary and can be made available through distributed processing commands. Programmers can design applications so the personal portion is running on the PC and a Unix process can be invoked directly from MS-DOS when an organizational task is required. Through the use of distributed processing commands, system managers can get the most power out of their computing resources.

To optimize computing facilities, a system manager must fully understand the nature of their uses and applications. Is the use primarily personal or organizational? How will the requirements vary as users mature?

The facilities should be designed to be flexible so that they may easily adapt. The first step is a network allowing the PC to be used for personal tasks and the Unix system to be used as a backbone for organizational tasks. In time, applications can be designed to maximize their use of the computing facilities through distributed processing. The best distributed processing systems must be both organizational/multiuser and personal/single user in nature to best meet the needs of users.

> ”
>
> *A dual operating system should be designed so personal tasks can be executed by MS-DOS and group tasks can be supported by Unix.*

Uttal is marketing director for Santa Monica, Calif.-based Locus Computing Corp., a firm specializing in software development. She has spent the last three years in marketing and new product planning in the Unix system marketplace.



CIRCLE READER SERVICE NUMBER 252

TECHNOLOGY TRENDS

Unix Joins The Party

With closer links being established between Unix and MS-DOS, the user indifference that has plagued Unix may just be changing for the better.

·BY·STAN·KOLODZIEJ·

After several years of relative obscurity, Unix burst onto the scene under AT&T only to wander, like a modern Moses, in a wilderness of customer indifference. With closer links being established between Unix and machines based on Microsoft Corp. MS-DOS, however, customers are beginning to listen.

A previous lack of network links between Unix systems haunted Unix vendors when the computer market stalled a few years ago. Before that, Unix vendors could see little reason to pressure their value-added resellers (VAR) and systems integrators to include networking in their Unix offerings.

Systems integrators and VARs concentrated on supplying users with customized software, feeling little customer pressure for connection to other Unix or non-Unix systems.

With a booming computer market, this strategy worked well. When the market stalled, however, Unix vendors found that customers were changing their purchasing strategies, and a big part of these strategies centered on networking and multisystem links. Isolated systems quickly became suspect. The new corporate emphasis on purchasing and systems control put MIS more in the driver's seat, and MIS executives are just now beginning to see that networking disparate systems can be a way of gaining control over departmental systems and reducing operating costs. Tying Unix machines to IBM systems has become a big asset in selling MIS on Unix.

The push by vendors to link Unix with IBM systems is not only centered on high-end IBM hardware. Unix vendors see a market developing for linking applications between Unix-based systems and the tens of thousands of IBM Personal Computers and compatibles running MS-DOS in offices across the U.S. Though this market is not new (MS-DOS/Unix software links such as PC-Interface from Locus Computing Corp., Santa Monica, Calif., and Tango from Computerized Office Services, Inc. (COSI), Ann Arbor, Mich., have been available for years), it is definitely on the upswing.

The reasons for joining the MS-DOS and Unix worlds vary, depending on whom you ask.

According to Collier Buffington, president of Vianetix, Inc., the Boulder, Colo., maker of Vianet, a networking product bridging MS-DOS and Unix, the company's decision to enter the market had nothing to do with user pressure.

"We saw the benefits of providing users with Unix and MS-DOS strengths," Buffington said. "The fact that Unix offers hardware independence and the similarities we saw in DOS and Unix made our decision easier."



RICH TENNANT

Judy Uttal, marketing director at Locus, said her company based part of its decision to enter the field a few years ago on conclusions reached by a Unix research company.

"Unix will continue to be used driving work group systems in dedicated applications environments," she said. "Some of this process, however, will now be spread out over Unix PCs and MS-DOS machines. That's a natural extension."

Jocelyn Young, analyst at Future Computing, Inc. of Richardson, Texas, is more blunt. "Unix users have been starved for software applications and are crying out. They see what's available in the MS-DOS market, and they want part of it."

The evolution of linking MS-DOS and Unix applications has gone through three stages, according to Young. The first had Unix systems vendors taking such popular MS-DOS programs as Multiplan from Microsoft Corp. and converting them to run on their machine hardware, a process that Young termed time-consuming and costly and that received little support from microcomputer software vendors.

TECHNOLOGY TRENDS

"The software vendors said, 'Fine, convert the program to Unix, but you port it and you support it.' " Young explained. "They had little interest in putting their money up to see their programs running in what was a small Unix market."

In the second stage, Unix systems vendors such as Altos Computer Systems, Inc. and Fortune Systems Corp. began providing add-in boards that would allow IBM Personal Computers and compatibles to act as Unix workstations. The conversion process, however, was often slow, usually providing only ASCII-level conversion.

> *'Software vendors said, "Fine, convert the program to Unix, but you port it and you support it." '*
>
> — Jocelyn Young, Future Computing, Inc.

The third stage involves third-party software vendors. "Today, the Unix/MS-DOS market is composed mostly of third-party vendors providing software resident in both Unix and MS-DOS systems allowing data transfer and conversion between both systems," Young explained.

"As always, however, the push to bring Unix and MS-DOS together is from the Unix manufacturers and users, not the MS-DOS side," she said.

Not everyone would agree with that assessment. Bernie Hill, vice-president of marketing at Interactive Systems Corp., Santa Monica, Calif., said many large organizations are now interested in using Unix systems as file and printer servers for MS-DOS-based micros to make up for the lack of power in most micro local-area networks (LAN).

"MS-DOS units can be connected as intelligent Unix workstations," Hill said. "Many corporations want the power of Unix machines to produce larger systems."

When asked about traditional MIS apathy toward Unix, Hill quoted a recent report from Forrester Research, Inc. of Cambridge, Mass., which stated that 21% of MIS managers surveyed in Fortune 1000 companies said they would be using Unix systems in the near future.

"That's a heck of a lot of Fortune 1000 customers that are interested in Unix. On top of that, add the government business, add General Motors Corp. and add all the scientific and engineering firms that have data processing departments and people who are familiar with Unix. MIS is not going to be able to handle all applications with IBM systems."

John Doherty, president of Rabbit Software, Malvern, Pa., agreed.

"The market seems to be evolving toward people who have thousands of PCs and who want to get at data bases," Doherty said. "There are two ways of doing it: One is a connection from LANs to file servers; the other is providing a gateway from a LAN to the mainframe. Many Unix-based systems are going to be used as file servers to take advantage of their power and speed and to give PCs multitasking, something which is currently lacking in stand-alone and networked PCs."

Brian Boyle, president of Novon Research Group, San Francisco, breaks the present MS-DOS/Unix market into three categories:

- The hardware approach, which uses coprocessors like those the IBM RT Personal Computer and AT&T Unix PC employ with software extensions.
- The systems approach, which runs MS-DOS as a task under Unix or side by side using software resident on both Unix and MS-DOS machines.
- Conversion at the applications level, such as Network Innovations Corp.'s Multiplex-PC, which can permit users to analyze data on the Unix system using MS-DOS programs such as Lotus Development Corp.'s 1-2-3.

Prices vary, but such hardware and software link products generally range from a few hundred to several hundred dollars,

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depending on the options.

"We did our own internal study of users," Locus' Uttal explained, "and found that most users would not pay more than $350 for the use of another operating system [Unix]. Users are accustomed to seeing operating systems come bundled."

Jim Guyton, director of information systems at the Rand Corp., Santa Monica, Calif., has used Locus' PC-Interface to connect several Compaq Computer Corp. PCs and other compatibles with three Digital Equipment Corp. VAX computers running University of California at Berkeley Unix Version 4.2 and 4.3. The PCs are used by Rand researchers and directors to access VAX data, which is gradually being migrated from the company's IBM 3032 mainframe into the Unix departmental machines.

"We had our PCs connected to the IBM mainframe, but it was slow and unreliable," Guyton explained. "PC-Interface works as fast as having the data on a floppy disk in most cases. The data is more immediate."

Guyton said he looked at other Unix/MS-DOS software links, but one of the attributes of PC-Interface that attracted him was the remote execution facility that allows PC users to transfer data to Unix workstations.

"It gives us a little more flexibility in moving files. The only problem we've experienced with the product is incompatibility with one of the PC compatible's operating systems. In these cases, users have had to run it on [IBM] PC-DOS instead of MS-DOS."

Another more ambitious project is under way at an AT&T private branch exchange manufacturing plant in Denver.

John Bongiovanni, information center manager at the plant, has already installed 100 copies of Touchstone Software Corp.'s PC Works software in AT&T 6300 PCs as part of a 15,000-foot Ethernet network linking 400 of the micros with several Unix-based AT&T 3B2 Model 300 hosts. Bongiovanni said he has used boards from 3Com Corp. for connecting the PCs to Ethernet and PC Works as the network front end to handle data transfer and conversion between MS-DOS and Unix.

Users of PC Works at the AT&T plant include support staff and managers for various administrative and research divisions who need to tap into larger departmental data bases. Bongiovanni said that Unix file protection is accomplished by Unix commands through the PC Works software.

"To a PC user, the system appears almost as a virtual hard disk," Bongiovanni said. "The thing that sold us on PC Works was its single command mode, making it easy for users. It also makes the PC, not the Unix machine, the main engine. Our group has heavy MS-DOS users, and we don't really need the power of the Unix machine to access Unix files occasionally."

COSI's Tango (also sold by VARs under the name Synchrony) works from the other end, Keith Burligh, group manager of product sales at COSI, said. "Tango puts the Unix machine in charge. We're aiming Tango at the MIS people who are concerned about maintaining data control over PCs and yet staying with departmental computing. Many PC users don't care to get involved with Unix commands or become Unix literate."

Burligh — who maintained that COSI is about to release Version 3.4 of Tango, which will provide remote file access allowing someone to go from a Unix workstation to a particular PC to access a file — contended that Tango performs several

> *'As always, the push to bring Unix and MS-DOS together is from the Unix [vendors] and users, not the MS-DOS side.'*
>
> **— Jocelyn Young**
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CIRCLE READER SERVICE NUMBER 259

TECHNOLOGY TRENDS

communications functions: terminal emulation, file transfer between Unix and PC machines and remote control from the PC processor. More link products, in fact, are offering such multiple functions.

Not all users are happy with the MS-DOS/Unix link packages that are available. The Federal Reserve Bank of Cleveland has looked at some programs and found them coming up short, especially in the area of converting files transparently at the applications level.

"There's still too much for the user to know," explained David Rich, the bank's system vice-president of communications. "Users need 99% true conversion for applications."

Walter Kozachek, editor/analyst at Datapro Research Corp., Delran, N.J., said he tested Alloy Computer Products, Inc.'s DOS plug-in board on the AT&T Unix PC and found it slow.

"You still have to go through MS-DOS and Unix, and you get screen delays," Kozachek explained. "The whole Unix/MS-DOS issue is still a technical one. The Unix operating system is still dedicated to technical users."

Though he said Datapro is just under way with research to study the MS-DOS/Unix market, Kozachek made it clear that he does not think that the market is a big one. "Unlike MS-DOS, Unix has a particular set of applications areas that don't cross MS-DOS. There are too many incompatibilities."

Jay Wettlaufer, principal at American Management Systems, Inc., a consulting firm in Arlington, Va., agreed. "Until you put some friendly front end on Unix, it won't have a chance with MS-DOS users," he explained. "The whole direction with MS-DOS is providing a great human interface product, while Unix is still only friendly with programmers.

"Unix needs more tightly coupled software that runs partly on Unix and partly on MS-DOS," Wettlaufer added. "The answer isn't in making your Mercedes so friendly that your grandmother can use it. The reason there isn't that much great software for Unix is that the Unix market is starving so much for software that developers reach a certain point and say [the software] is good enough."

Novon's Boyle said better MS-DOS/Unix interfaces are about to appear. "You have to remember that the three most important things to software developers are installed base, period. The base is increasing and so is the perception that Unix and MS-DOS are not competitors. There are more Unix users out there than is often reported. MS-DOS is stand-alone; Unix is multiuser. Many surveys just count systems, but there are an average of more than four users per Unix system, and Unix users are at their stations a lot more than PC users. DOS users only use their machines about three hours a week."

Help might be on the way. Locus has introduced Multisystem Merge (sold by AT&T as OS Merge), a software package that the company said allows simultaneous transparent execution of both Unix and MS-DOS operating systems in the same computer (Intel Corp. 80286-based PCs). Ray Norberty, director of sales for Touchstone Software, said the company is upgrading PC Works this summer to make it even easier for MS-DOS users and added that it will soon be coming out with a product that will incorporate into Unix an interface similar to Microsoft Corp. Windows. And Wettlaufer said American Management Systems has a front-end MS-DOS shell to Unix that will advance the user interface.

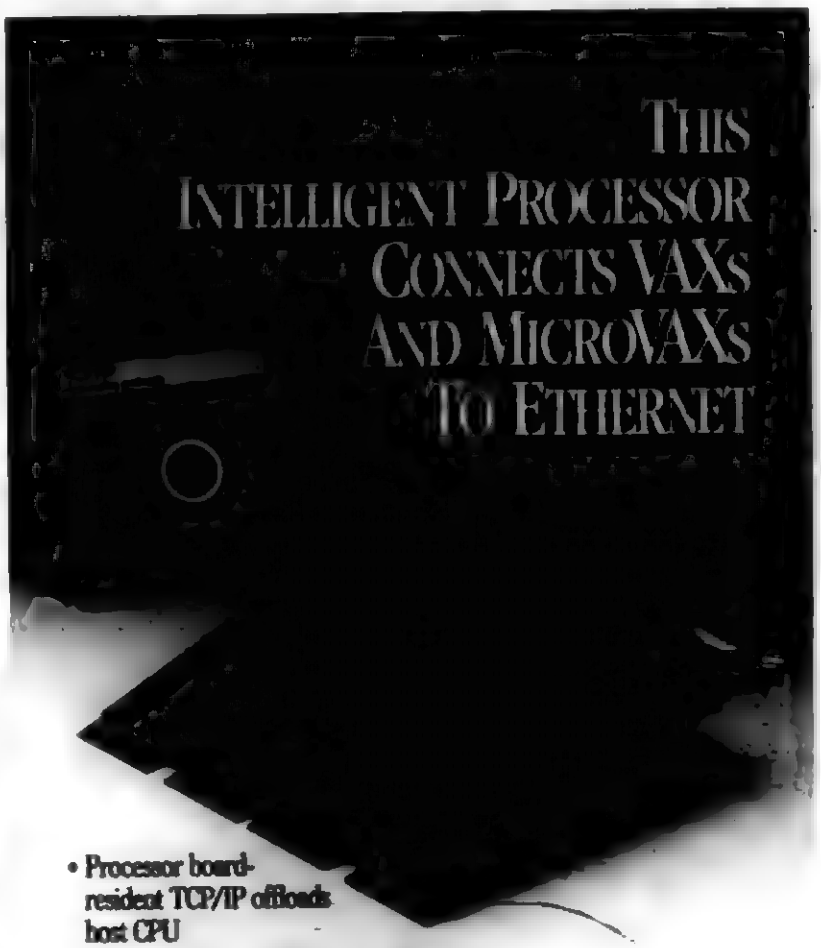
Others such as Interactive Systems and Phoenix Software Associates Ltd. of Norwood, Mass., are looking forward to the new Intel 80386-based micros, which are expected to start appearing in early 1987. Interactive's Hill said his company and Phoenix have entered a joint development and marketing agreement to market a product that would allow MS-DOS to run as a task under AT&T's Unix System V.3 on the Intel 386 processor. Intel has made sure Unix will be supported on the 386, leaving open the tight coupling of Unix and MS-DOS on the same machine.

Microsoft's slated MS-DOS 5.0 is expected to take advantage of the 386 processor's power and multiuser functions and will include networking features that will place it more into the realm of Unix, but many are skeptical that Microsoft will go far enough in this direction.

How big is the MS-DOS/Unix market? Research statistics will probably be in at the end of 1986. Right now it's an unknown part of a 1985 total Unix worldwide market of $3.6 billion as calculated by Don Bellamy, associate editor of Corporate Planning Services at International Data Corp., Framingham, Mass. "It won't be a spectacular market," Boyle said, "but it will grow steadily, like Unix in general."

Kolodziej is a senior writer at Computerworld Focus.

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>
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SPECIAL SECTION:
APPLICATIONS OUTLOOK

Making Inroads In The Office



DAVE RIDLEY

·BY·STAN·KOLODZIEJ·

What's wrong with Unix? Nothing that a little more market share couldn't cure.

Actually, the patient isn't doing that badly. Unix is gradually shedding its image of multiple personalities, gaining more vendor support and holding its own in the midsize systems range.

AT&T, Unix's patron, has been chastened and is keeping a lower profile, letting OEMs and software vendors ease Unix into vertical markets instead of trying to take the entire office by storm. More importantly, the force surrounding AT&T's Unix System V is finally strong enough to attract a growing roster of product support. System V is close to its claims of being the de facto Unix standard in the office, while University of California at Berkeley Unix Version 4.2 is gaining ground as the front-running operating system for engineering workstations.

There is finally a movement regarding Unix in the office. Unix vendors are making headway by either bypassing MIS or relating to MIS on its own terms, namely, IBM. Unix vendors still face the kind of Big Blue wall put up by MIS people. Consider the following comments:

"We have no need for [Unix]," said Richard Monnot, director of computer operations at Consolidated Natural Gas, Pittsburgh. "There's nothing it can do that IBM can't."

"I'm not sure what our departments are doing," said Bruce Burrows, manager of information systems at the U.S. Department of Justice, Washington, D.C., "but I know we're [MIS] happy recommending departmental computing through [IBM's] VM/CMS. Unix hasn't come into the picture."

Unix system vendors have gotten smart on the rebound, however. Instead of coming back directly at MIS, Unix vendors have been circumventing centralized control, dealing with companies on a departmental level, clustering 16- and 32-bit Unix supermicros running specialized, vertical applications. To penetrate further and gain MIS support, more Unix vendors have been courting MIS with links to large IBM Systems Network Architecture (SNA) installations.

The Unix vendors' success hasn't gone unnoticed. Until last year, the midsize, departmental market was a vacuum in IBM's strategy, with most of the large-vendor slack taken up by minicomputer maker Digital Equipment Corp., which offers Ultrix (its Unix version) along with its mainstay VMS operating system. (DEC's base of Unix users is not overwhelming but substantial. Of 8,000 DEC VAX user sites surveyed in 1985 by Computer Intelligence, a San Diego-based research firm, almost 10% were using Unix as the primary VAX operating system.)

IBM, however, is taking action in the departmental market, shoring up its System/36 and 38 product lines and taking aim at DEC and scores of Unix-based departmental vendors. The result is a scramble by Unix system vendors to expand their value-added offerings by providing more links to IBM's SNA, VM, CICS and other high-end operating environments.

Companies like Relational Database Systems, Inc. of Palo Alto, Calif., for example, have been merging Unix and IBM's SQL relational data base language for years. Such interfaces to IBM systems are expected to blossom in the Unix market to ride IBM's coattails as it attempts to add the mid-range market to its dominance in the mainframe and microcomputer arenas.

"It's a good idea. Unix vendors are going to see more middle ground lost to IBM," explained Larry Timmins, analyst with the Gartner Group, Inc. in Stamford, Conn. "As IBM plugs its mid-range systems into its mainframe base with LU 6.2 and other links, Unix vendors are going to come up more frequently against corporate MIS [departments] that are not going to take kindly to the idea of replacing MVS and CICS with Unix. Unix will only be considered as something in relation to IBM, [scrutinized for] how it


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will work with SNA, with LU 6.2, with DB2 and so on. Unix will be successful only as a node in an IBM environment."

Timmins added that a huge potential for Unix in the office lies in providing SQL on Unix machines. "Our research shows that up to 40% of new programs written in 1990 will be SQL based. SQL on Unix machines will help get them into corporations, at least in the short term."

The mainframe arena has always been a closed book for Unix — and may always be. Unix was developed originally for minicomputers, and those few companies trying to sneak Unix into the mainframe field have been burned. For example, Computer Intelligence recently released a survey of 11,000 IBM mainframe sites and found two installations using Unix as their primary operating system. Not exactly a massive assault.

In the low-end office market, Unix vendors again came up against an IBM wall and have changed strategy. Unix vendors are now trying to use Microsoft Corp. MS-DOS/Unix interfaces as a driving wedge into the stand-alone office microcomputer market. Unix is getting some help here. The multiuser, communications strengths of Unix are being noticed in light of the market slowdown and general user disappointment with available micro local-area networks (LAN) and micro-to-mainframe links. Another plus for Unix has been IBM's half-hearted attempt to expand the capabilities of its Token-Ring Network. Also helping Unix is the fact that multiuser Unix systems are providing better price/performance ratios than most micro LANs and stand-alone systems.

One way to get more MS-DOS users over to Unix is by discounting some of the traditional negatives attributed to Unix. One bugaboo has been the lack of application software. Over the past two years, however, that gap has been filled. "AT&T's manual of [Unix] programs is an inch thick," said David Fiedler, president of Infopro Systems, Inc. "The number of good Unix programs by third-party vendors has exploded into the thousands."

Another problem has been understandable confusion over Unix versions. About two years ago there were more than 30 versions of Unix in different markets, each version usually tied to the hardware of a specific machine. Though most Unix versions could exchange data with each other and could be ported fairly easily from machine to machine, many were proprietary enough to warrant extra programming to enable the systems to work together more effectively. Many such Unix work-alikes have faded away, while only a limited number of Unix systems (for example, Venturcom, Inc.'s Venix and Whitesmiths, Ltd.'s Idris) have been licensed with AT&T or even come closer in line with AT&T's System V specs.

Such holdouts, however, are not really geared toward the general office application market. Brian Boyle, president of the Novon Research Group, San Francisco, said that these smaller Unix versions make up only about 2% of the total Unix market, filling specific market niches, especially with applications requiring fault-tolerant, real-time processing, where Unix has proven weakest.

There is no doubt AT&T's System V is finally gaining momentum and more support. AT&T has recently helped its cause by coming out with System V.3, which added a long-awaited file transfer capability across multivendor networks as well as a file locking facility. Some analysts are saying V.3 will provide more punch for Unix in commercial applications. Others say it is a major link in making System V the de facto Unix standard in the office.

Users do seem to be taking notice. Out of the past confusion with Unix operating systems and vendors, the direction of Unix seems to be much clearer.

"For expansion and price/performance, Unix is better now," explained Bob Bologna, director of systems and programming in the reservations department at Sheraton Corp., Braintree, Mass. "We looked at Unix a few years ago and were not impressed. What we see now are vendors falling in line with System V and a lot more help coming from AT&T in the way of tools to optimize the Unix environment. We've also seen the level of Unix expertise out there change dramatically for the better."

Unix and its C programming language are certainly in the running in the scientific/engineering workstation market. In fact, it's basically the only game in town now, replacing Fortran and the brief but fading star of Pascal as the workstation operating system of choice. According to one research group, there are currently about 80 vendors offering Unix on their workstations, and that number is expected to grow as more vendors target the hot workstation market.

Sun Microsystems, Inc. of Mountain View, Calif., has been in the forefront in making Berkeley Unix 4.2 probably the most supported operating system at the middle and low-end workstation markets.

Sun has helped change the workstation market dramatically in the past two years. The company first put great pressure on mainstay workstation vendors such as Apollo Computer, Inc. and Computervision Corp. by introducing powerful, low-cost 32-bit workstations running Unix. Both Apollo and DEC were forced to introduce lower priced Unix workstations earlier this year in response to Sun's foray into the MIS market with a line of Unix-based workstations starting at under $8,000. Even IBM, which introduced a new line of workstations using reduced instruction set computer (RISC) architecture, offers a variant of Unix called AIX (from Interactive Systems, Inc.) that consists of enhancements to Unix System V.1, including features from System V.2 and Berkeley 4.2.

Apollo and IBM have raised the workstation ante a bit by introducing IBM PC AT-compatible coprocessor boards to plug their workstations into the MS-DOS applications world. Sun has answered with its own PC AT coprocessor board but raised the stakes by including a package allowing IBM PCs and compatibles to communicate over Sun's Network File System (NFS), a set of protocols giving the ability to communicate over a multivendor workstation networks.

Just as Ethernet baseband cable and the Transmission Control Protocol/Internet Protocol from the Defense Advanced Research Projects Agency have become de facto networking standards in the Unix workstation community, Sun's NFS and the recently introduced Remote File System (RFS) from AT&T are in the lead as the primary network file transfer systems for Unix machines.

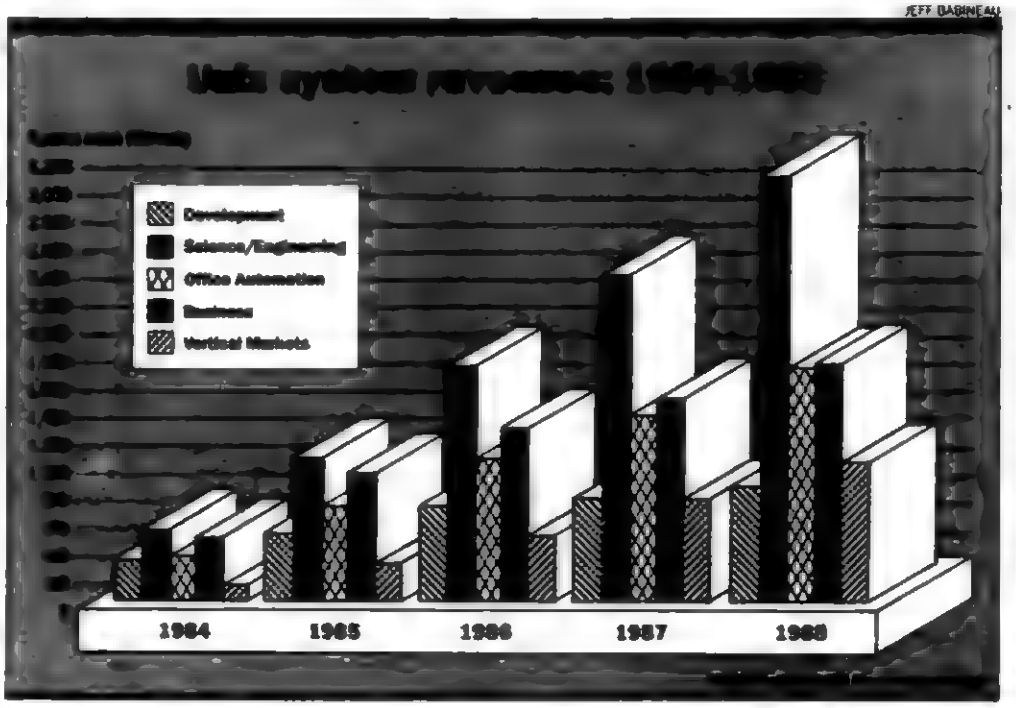
"We're supporting AT&T's RFS but not NFS," explained Mark Hatch, group manager for networking and operating systems at Apollo, Chelmsford, Mass. "We still think a big drawback with NFS is its lack of concurrency control, which AT&T has addressed [through file locking]. There is a two-year probation period for new products, and Sun might get some initial support for NFS, but the stature and support from AT&T for its RFS will win out. NFS is temporary."

Although Sun has attained surprising support for NFS from Unix hardware vendors (such as as Sequent Computer Systems, Inc., Gould, Inc. and Pyramid Technology Corp.), software communications vendors as well as third-party vendors supporting DEC VAX systems, Hatch said it would take patronage from the likes of DEC or IBM to give NFS staying power.

Regardless of the ultimate primacy of NFS or RFS, there are signs that the Unix marketplace is finally coalescing around proposed de facto and official standards. "I think the Unix industry has learned its lesson about muddying the market with too many versions of the same thing," said Carl Machover, president of Machover Associates Corp., White Plains, N.Y.

One area where Unix promises to make some inroads is on manufacturing shop floors, where Ethernet baseband cable is being used for harsh environment LANs. (General Motors Corp.'s steamrolling networking facility, the Manufacturing Automation Protocol, specifically ties Ethernet into its architecture.)

Unix has been given a big lift in the manufacturing arena from Electronic Data Systems Corp. (EDS), the GM subsidiary responsible for the long-range revamping of GM's computer systems. EDS has officially stated to computer vendors that if they want part of the huge automobile manufacturer's future computer business, they will need to supply Unix with their products.



Vendors are putting Unix manufacturing systems in place, gearing up for what is becoming a hot market. A good example is Logisticon's Unix-based Dispatcher manufacturing and shop floor control system that runs on Hewlett-Packard Co.'s new RISC minicomputer systems. Dispatcher contains modules taking users through shop floor control to purchasing and cost accounting, all running on HP-UX, HP's version of AT&T's System V. DEC, Honeywell, Inc. and others are also expanding their Unix manufacturing systems offerings either in-house or through third parties.

"Unix will always do well in the manufacturing and research fields," according to Novon's Boyle, "because of its steady hiring of those people who have come out of the academic environment with a love for Unix. As manufacturing MIS comes in closer contact with these [Unix] people, they will give Unix more clout."

Boyle's faith in the rise of Unix rests in the scientific/engineering market where Novon predicts that revenue from shipments of Unix-based systems will jump from a 1985 figure of 1.1 billion to 3.2 billion in 1988 (see chart this page). Novon is not as optimistic about Unix making headway in the office, however. The company is expecting Unix business systems revenue to climb only to 1.7 billion in 1988 from 1 billion in 1985.

"One of the biggest obstacles to Unix in the office might be in overcoming a huge misconception," Infopro's Fiedler said. "People still place Unix in the domain of long-haired academics and programmers. The fact that it's no longer difficult for the end user is beside the point. Old perceptions die hard."

Seems so. A recent user survey conducted by a research firm for Honeywell posted a curious conclusion. "It is striking to note," the study said, "the total lack of interest on the respondents' part to Unix. Our perspective is that they are uninterested in and perhaps oblivious to base-level technologies, concentrating instead on the application-level functionality that will be delivered."

Unix for the office is obviously still a tough sell. ■

Kolodziej is a senior writer at Computerworld Focus.

SPECIAL SECTION:
APPLICATIONS OUTLOOK

Finding Answers Through Unix



DAVE RIDLEY

·BY·REBECCA·HURST·

Looking for corporate Unix users is like looking for oases in the Sahara desert. They are hard to find, but they are teeming with life.

In the vast, IBM-dominated territory of large corporate users, only about 1% of MIS department computer systems run the Unix operating system, according to the Gartner Group, Inc., a Connecticut-based computer consulting firm. Unix evokes little more than apathy in most MIS departments, but within a small group of offices with Unix-based systems, most users praise the operating system and the applications that run on it.

In part, the apathy of MIS directors can be attributed to the fact that, until the early 1980s, MIS directors were primarily responsible for a company's mainframe system, explains Lawrence Timmins, a Gartner Group analyst. The extent of MIS' influence on departmental minis and supermicrocomputers, he says, was limited to its agreement not to resist a group's purchase request for such systems. Consequently, MIS directors have had little contact or use for the minis and supermicros on which the Unix system chiefly runs.

The MIS directors of IBM shops interviewed by *Computerworld Focus* uniformly maintain that no applications are driving them in the direction of Unix. "We're more application driven than technology driven," explains Timothy Hensley, director of business systems for Clorox Corp. in Oakland, Calif. "If an application required us to use Unix, then we would consider it. Nothing is forcing us in this direction, though."

Company departments are still primarily responsible for choosing computer systems that meet their local needs. For example, Honeywell, Inc.'s Avionics division, based in Clearwater, Fla., installed an Interleaf, Inc. text publishing system a year ago. "In our company, when a user wants to get a computer, he contacts the business computer group. The group asks what kind of computer he wants, what operating system and what the computer will be used for," says Donald LaLuzerne, systems analyst at Honeywell Avionics.

And even though General Motors Corp., Troy, Mich., adopted Unix as the standard for computers for its manufacturing facilities, the decision was not initiated at the MIS level. The adoption was a two-year process, according to John Williams, chairman of GM's Unix System Implementation Task Force, who describes the Unix choice as a bottom-up decision that made it through the system. "The original decision came from the engineering levels from engineers like myself," he explains. "It took us a while to get the standard through the levels of management."

Another factor contributing to MIS' apathy toward Unix is the predominance of IBM computers at the MIS level. According to International Data Corp. (IDC), a computer research firm based in Framingham, Mass., 71% of all installed mainframes are IBM systems. While IBM offers several versions of Unix, an IDC report on mainframes in the Unix market contends, "IBM reluctantly accepted AT&T's Unix System V, mainly because the government chose it as a standard." IBM does not actively promote its Unix versions, and its general policy appears to be that it will only sell Unix to customers who request it. It seems that without a strong endorsement from IBM, MIS directors are unlikely to purchase Unix-based computers.

While IBM shop MIS directors state their indifference to Unix, others see potential in it. John Johnson, vice-president of DP for the First Federal Savings Bank of Colorado, based in Lakewood, Colo., who basically runs a Sperry Corp. shop, says he is looking at installing Unix in the future. "We have had some discussion of using Unix to get a personal computer network," Johnson explains. "We're looking at the ability for users to develop applications that deal with their specific areas."

For Johnson, Sperry's endorsement of Unix is an important consideration. "Sperry has a

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much larger commitment to Unix than IBM," he notes. "I'm more of a mainframe person, so Sperry's support of Unix has influenced my decision."

Despite IBM's lack of support for Unix, some DP shops that were previously all IBM have begun to set up Unix departmental systems and are turning to other companies that can provide capabilities IBM cannot.

The United Virgina Bank in Richmond, Va., began setting up test sites several weeks ago, using an AT&T 3B2 minicomputer and two Unix PCs to offload its IBM 3081 and 3090 mainframes. The computers run versions of Information Builders, Inc. Focus relational data base management system (DBMS) and Quadratron Systems, Inc.'s Q-Office office automation software.

"When we started the office automation project," says Steve Dominick, who heads information center control for the bank, "we looked at IBM, and they did their dog-and-pony show. And we looked at AT&T, and they did theirs. AT&T came in cheapest, and a lot of people like what it can do because it has a single operating system."

Like all the Unix users *Computerworld Focus* spoke with, the bank considered portability a deciding factor in its purchase. "We like the concept of Unix; it kind of separates you from the hardware," Dominick explains. More importantly, Dominick says, a Unix-based computer offers potential savings. If the bank had an IBM System/36 and wanted to move to a System/38, Dominick points out, it would have to change the operating system. As a result, he says, "We would have to retrain our support team or hire new people," which can become very expensive. With Unix, a user just has to recompile the system software.

Additionally, the AT&T computers offer communications capabilities that the IBM systems do not. "We have an in-house private branch exchange phone system, and with AT&T we can use our own phone lines and switches," Dominick says.

This doesn't offer advantages for local terminals because Dominick uses coaxial cable to connect them to an AT&T 3B2 or IBM System/36.

However, with long-distance calls, Dominick explains, "A person can just dial in to connect to the 3B2. For the System/36, we would need to set up a dedicated line. With IBM, it's just not that easy and not that flexible."

Another incentive for choosing Unix-based computers is if an affiliated organization, company or department already has the operating system in place. The American Chemical Society (ACS) in Washington, D.C., is a nonprofit organization that uses two Digital Equipment Corp. VAX-11/785s with Unix System III to run Unify Corp.'s Unify relational DBMS, Access Technology, Inc.'s Supercomp 20 spreadsheet and Interactive System, Inc.'s Ined word processing package. "We chose Unix because our sister organization, Chemical Abstract Service [Columbus, Ohio], had already adopted Unix as a standard for office automation, and we decided to follow their lead," says Carole Shermer, head of office and information systems for the society.

GM's Williams' reason for backing the Unix System V standard for his firm's manufacturing facilities suggests that an increasing number of affiliated groups may turn to Unix-based computer systems. Williams states that GM adopted the standard because the company was "destroying" itself. "We're broken down into independent business units, and I'd be working on a project in my area while someone in another area was working on the same kind of project," Williams explains. "We'd find out two years later that we were working on the same thing. We could have worked together, but my installation had A company's computers, and his was using B company's computers."

By reason, GM should be able to save a considerable amount of time and energy in its research and development efforts, but it may take several years for the company to find out. GM has not actually installed any Unix-based systems, Williams says. "There may be some pocket areas where they are trying to develop transportable applications using Unix, but I don't know which ones are." Also, he says, Unix will be used primarily for new applications. "We want to maintain as much of our investment as possible," Williams explains. "You have to build a very good argument to replace an existing application." Thus, it may be a few years before GM installs any appreciable number of systems and is able to evaluate the cost-effectiveness of these systems.

Evaluating at a snail's pace

Many MIS directors who are staunch IBM customers are taking their time in evaluating Unix's utility. Compared with IBM's MVS and VM operating systems, Unix is relatively new and lacks many of IBM's sophisticated functions designed for business applications. Also, because of Unix's inception in Bell Laboratories' research labs and its association with the University of California at Berkeley, the system is not seen as a product for the corporate office but for the scientific and engineering arenas. Finally, it has been less than three years since AT&T began its promotion of Unix System V as an operating system for business applications and an industrywide standard.

Not surprisingly, a backhanded compliment about Unix by Daniel Yomine, director of corporate information systems for Chicago-based Sara Lee Corp., echoes that of many large, corporate MIS directors. "Unix is an excellent



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engineering product," Yomine says. "Once the Unix environment is more business-oriented, the fact that it can run on mainframes and PCs will make it a significant force."

An unfriendly system?

Many Unix users have concerns about the complexity and security of Unix, but they report that the potential benefits outweighed the system's weaknesses when it came time to make a purchase decision. For these users, the most critical issue is still user-friendliness.

"Unix assumes that you know about the system," ACS' Shermer says. "Users have to have a sense of the file structure and know the directory structures to use the system effectively." Shermer notes, though, that the operating system is fine for a programmer who can fine-tune Unix so that it performs functions automatically for the end user.

Most of the 220 users at ACS do not have what Shermer terms "computer sophistication." They are clerical workers, managers and professionals who primarily use the computer system's word processing software and are happy with the system, Shermer reports. "If you can equate happiness with dependency, that's what has happened over the past three years," she says. "Our users are more dependent on the system and more aware of its capabilities."

According to LaLuzerne at Honeywell, part of the user-friendliness problem in applications is the result of a lack of utilities in third-party applications software. For example, the operations people in the technical publishing group that use the Interleaf publishing system have had to program in the Unix shell language to set up routines and command files for putting files on tape.

"Interleaf did not supply us with the utilities for backing up the system," LaLuzerne explains. "We have to use system commands, and that's a real hassle." He noted that Honeywell was one of the first customers to report this problem to Interleaf. "Interleaf was not aware that they really needed them," LaLuzerne said. "Most people don't realize the backup they need, but the technical publications group already had a computer and knew what it needed."

Many of Interleaf's customers are print shops, LaLuzerne says. "Once their text is typeset, and the job is done, they can erase the old text," he explains. If a print shop loses a file, it hasn't really lost anything because the file would have been destroyed anyway, according to LaLuzerne. But at Honeywell, there is a lot of repeat business. "We may get a proposition," he says, "and six months later, a government contractor may ask for a similar system." The technical publications group will then pull information from an old file and modify it. "If you use a file repeatedly," LaLuzerne stresses, "you have to be guaranteed that it will be there."

LaLuzerne says that Interleaf is now looking into adding the utilities.

Despite the work that is required to allow users to back up their documents, LaLuzerne recommends Interleaf because if the technical publishing group has a Unix machine, it can add any other software it wants. "Previously," he explains, "they had purchased a system from [Penta Systems International, Inc.], and they could only run whatever software Penta had in stock."

Security is another concern of some Unix users. "An area where Unix has all the tools we need is data security," ACS' Shermer says, "but there are subtle ways of getting around commands that restrict access. A true hacker can use other commands to get around them." Because ACS has no high-security information, Shermer is not concerned. "A sophisticated user can view the data, but he shouldn't be able to obliterate it," she explains. She also notes, "This is a criticism that you can make of any other operating system."

In general, Unix users appear to feel that they have gotten the better end of the trade-off between the strengths and weaknesses of their Unix-based computer systems. Users who have been running Unix for more than a year state that they intend to purchase Unix-based products in the future.

The technical publishing group at Honeywell has used the Interleaf system for more than a year, and in other departments, some VAXs have been running Unix for as long as three years. LaLuzerne notes that while Honeywell uses several operating systems, he expects that the company will purchase more Unix-based computers. "When the mainframe gets overloaded, a lot of departments get departmental systems to off-load it, and some of those will probably be Unix systems," LaLuzerne points out.

"If we have a computer running one operating system, and we get a second computer, we'll probably stick with the same operating system."

At ACS, Shermer is working on acquiring several software products. ACS is planning to move from a System III-based version of Unix to DEC's Ultrix-32 with System V enhancements. "We're going to System V," she says, "because we see features that will help us. The ability to have concurrent users accessing the same file will be appreciated."

Shermer also is evaluating word processing applications in response to users' demands for a better package. "That's a good kind of complaint," she says. "It shows that the users know how to use the software, and they're saying that we can make it better."

Shermer adds: "As our computing grows more complex, we plan to continue buying Unix-based products." ■

Hurst is a senior writer at Computerworld Focus.

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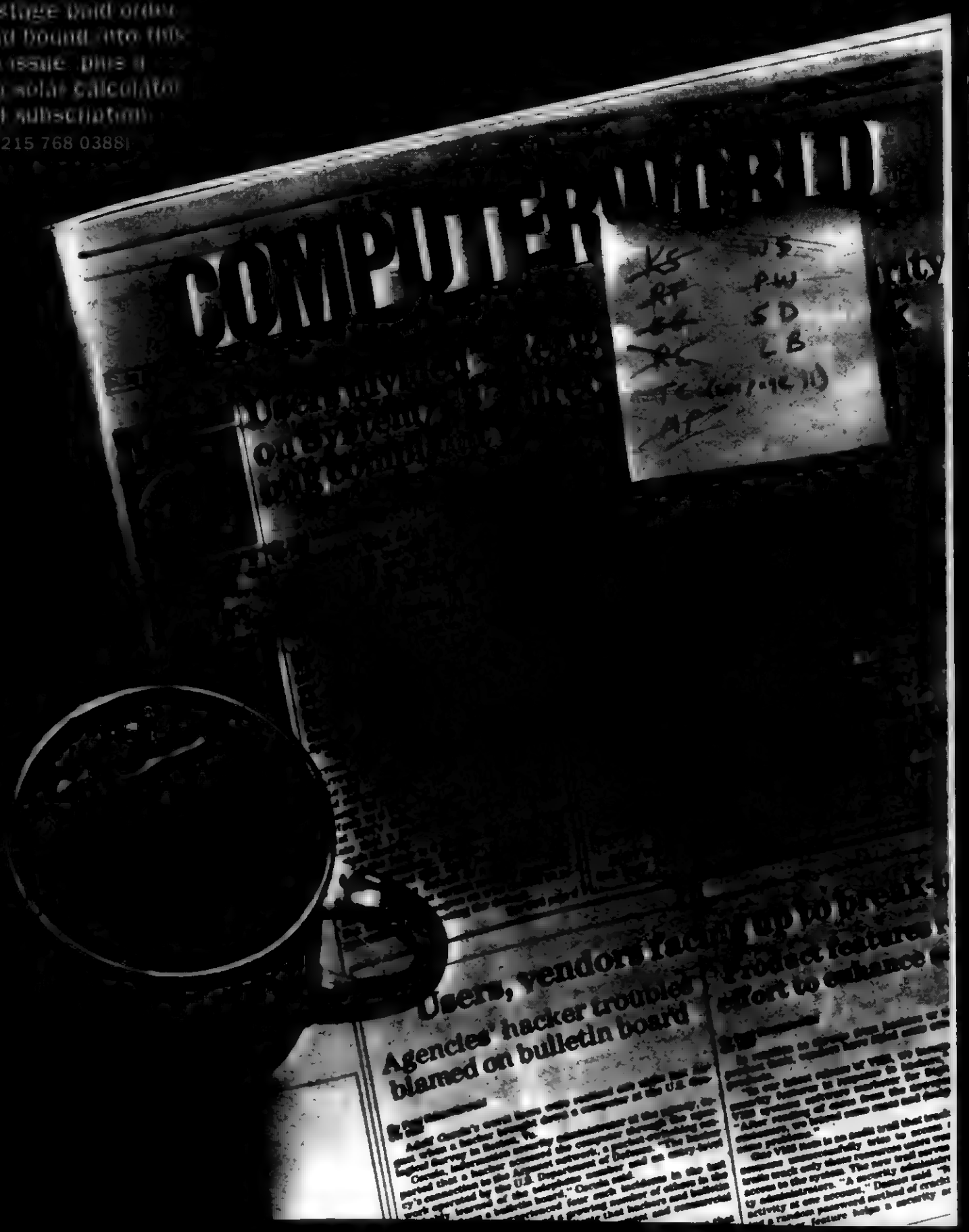
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SPECIAL SECTION:
APPLICATIONS OUTLOOK

Developing New Tools For Unix



DAVE PIDLEY

·BY·NICOLAS·C.·NIERENBERG·

Unix was developed at AT&T Bell Laboratories as an operating system environment for software development. Given this, it is sometimes difficult to understand why more applications are not available for Unix and why Unix has not caught on more rapidly in MIS departments and the government. However, a look at the kinds of tools available to the Unix application developer coupled with a little knowledge of Unix history clarifies this situation.

Unix was created by programmers working in a technical environment for use by programmers working in a technical environment. As has often been the case when a product's creators are also a product's major audience, Unix ended up with many characteristics that are indecipherable to anyone else.

The Unix file system is one area that troubles commercial application developers. Unix was designed for a multiuser, software development environment, where each user was doing small jobs in a highly interactive mode. As a result, Unix's file system is oriented toward small text files.

These abilities are fine for programming, text processing, writing research papers and using many Unix facilities. However, they are not needed for many traditional mainstream business applications. Until very recently, Unix offered little in the way of shared management of data, file locking mechanisms or interprocess communications — with the exception of Pipes, the Unix command to pipe data from one task to another. Even Pipes, though, is geared toward the technical programmer and is only good at transmitting data between tightly coupled tasks.

Unix's history and development facilities should not shoulder all the blame. There is a second half to this equation — that is, the effects of DOS on the single-user and low-end Unix marketplaces.

The proliferation of IBM Personal Computers caused a rush of development tools and talent to focus on that market because the sheer number of systems made it too attractive for most software developers to resist. However, that rush diverted attention away from Unix just when it needed it most.

It was obvious even then that Unix was overkill for desktop, single-user PCs. Developers, however, began to divide applications between DOS and Unix by types. PC applications tended to have fewer lines of code and run smaller amounts of data. Unix applications tended to be bigger and more complicated and to handle more data. A recent survey of data base management system (DBMS) users bears this out. Only 25% had 20,000 or fewer records in their data base, while more than 35% had in excess of 100,000 or more records. The largest data base contained 1.2G bytes of data.

One last point: DOS raised expectations about what a good user application program should be. Help messages, windowing and other ease-of-use features became standard on most popular programs, and Unix had a hard time keeping up.

Current Unix development tools and environments are a series of trade-offs. Some are good at one type of application, some at another. No one tool is good for all things.

Four major kinds of tools are now prevalent: third-generation programming languages, relational DBMS, fourth-generation programming languages and application generators. Limited combinations of these tools are also common.

Despite the availability of many third-generation languages under Unix, only two — Cobol and C — play a major role. Of the two, Cobol makes up the most significant portion of the business applications, while C accounts for almost everything else.

Third-generation languages are highly flexible tools good for developing applications that are computational in origin and geared toward the input but not the manipulation of data. Word processing, computer-aided design and process control are prime examples.

SPECIAL SECTION: APPLICATIONS OUTLOOK

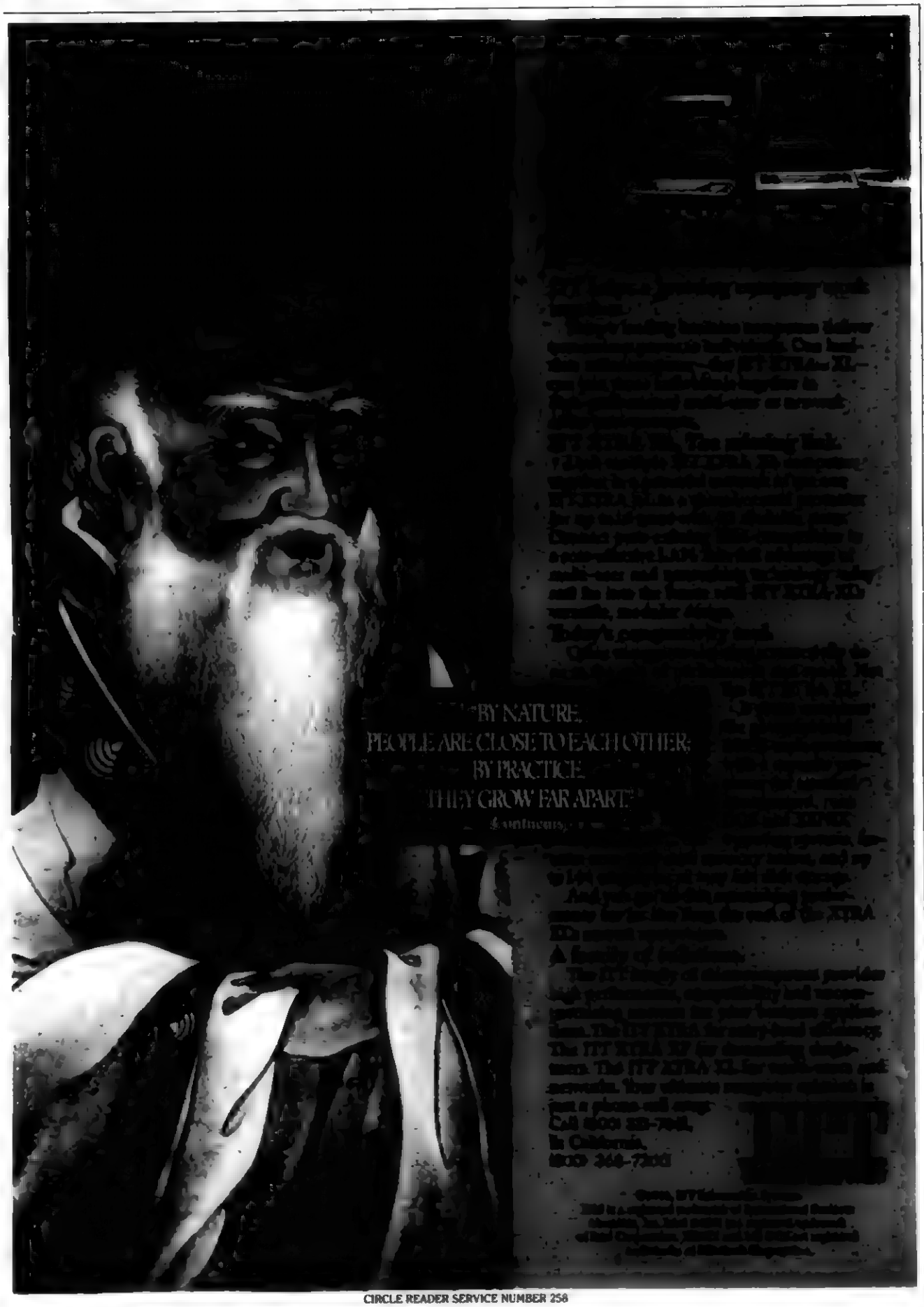
Third-generation languages, however, bring with them many difficulties. They are complicated and require experienced (and expensive) programmers. They also require long development and debugging cycles and are expensive to maintain.

Relational DBMS were once pitched as replacements for third-generation languages. Instead, both are frequently used in combination. In this scenario, third-generation languages provide interactive programming while the relational DBMS does just about everything else — user interface, data manipulation, security.

Relational DBMS — the only kind to proliferate in the Unix community, by the way — shorten development cycles and give users greater flexibility in how they access data. Manufacturing requirements planning and accounting are popular business applications for which this tool is used. Nevertheless, many of the same problems still arise with third-generation languages because relational DBMS also require programming and debugging in complex applications.

Fourth-generation languages are higher level languages that are useful for developing business applications. Fourth-generation languages have some advantages over third-generation ones: They are easier to use and are often combined with a relational DBMS.

Unfortunately, fourth-generation languages have two main drawbacks. First, because they are programming languages, programming, testing and debugging are still required. And second, these tools frequently eat up valuable computer resources. Often larger machines with more memory are needed to run fourth-generation language-based applications.



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Application generators are powerful programming tools that address many of the same needs as fourth-generation languages. But these generators have a singular advantage — they require no programming. Instead, they create programs by presenting a series of questions and menu options to the user. Their greatest strength is that they let an end user develop his own programs.

However, application generators are limited in their flexibility and customization capabilities. They simply can't ask all the questions needed to build every user's applications. The fact that no application generators have been tremendous commercial successes attests to their limitations. Those that have had moderate success tend to be application specific.

Relieving the user's load

In the past, software tools put most of the burden on the software developer or end user. But today, many users — especially in Fortune 1000 DP/MIS and government computer communities — demand that more of the nitty-gritty work of programming be provided as standard capabilities in prepackaged application development tools.

To meet this challenge, users should expect application development tool vendors to address the following areas: interactive development systems; front-end/back-end distribution of processing and bridges to other operating systems; the man/machine interface; networking and distributed applications; and artificial intelligence.

• **Interactive development systems.** These systems are a new class that combines the best of the current generation of tools in a smooth and easy manner, offsetting the weaknesses of one by integrating the benefits of another.

For instance, an application generator is good for screen presentation and user interfaces but a poor tool for programming.

On the other hand, a fourth-generation language is good for programming but poor at screen presentation and user interfaces.

A typical interactive development system includes a fourth-generation language, a relational DBMS, an application generator and sophisticated user interface capabilities. With such a tool, a generator can be used to get a new application up and running, while the fourth-generation language and DBMS can be used to finish it.

The addition of interactive development system abilities helps developers and DP/MIS management overcome application backlog by speeding the development process.

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operating systems. PCs are priced so low today that they are becoming viable replacements for terminals in applications where response time is critical. As a result, many MIS and DP departments will want to take advantage of the extra processing resources and offload tasks to those desktop PCs to preserve valuable host mainframe resources.

In response, software development tools will have to be capable of interfacing both to the front-end PC user and the back-end mainframe, which will perform many of the data management tasks. Users will also require consistency of operation across terminal types. In other words, development tools will have to operate in exactly the same way on PCs as they do on dumb terminals.

> *Users will require consistency of operation across terminal types.*

Multivendor computing environments are a fact of life in the Fortune 1000. Application development tool vendors will address this in two ways. First, they will offer their products across a variety of operating environments. Second, development tools must be constructed so that applications developed under one operating system environment can easily move to another. In Unix's case, this means between DOS and Unix and, to a lesser extent, Unix and Digital Equipment Corp. VMS and Unix and IBM hosts.

- **User/system or man/machine interface.** PC-style applications such as Lotus Development Corp. 1-2-3 and Microsoft Windows are driving this technology. As a result, application development tools will have to be constructed to give software developers DOS-type interfaces to the end-user applications they develop. These facilities must be made available with a minimum of effort.
- **Local-area networks and distributed applications.** Development systems must provide developers with the tools necessary to accommodate such environments.
- **Artificial intelligence.** While the incorporation of AI techniques and expert system technology may be the most productive in terms of relieving the programming burden, they are at least five to 10 years away from practical applications. When they do come, AI techniques in development systems should help smooth the application development process by aiding the programmer in data definition and the linking of program and/or program fragments, programming logic and the like.

The Unix environment is not alone in needing to overcome a dearth of application software. The DP and MIS departments in the Fortune 1000 and government now face a seemingly overwhelming backlog of application requests from their users, a situation aggravated by the limited development tools available until just recently.

The Unix system, combined with fourth-generation tools such as relational DBMS, fourth-generation languages and application generators, can help MIS and government users get rid of the application backlog. This combination will provide sophisticated, reliable tools in a standard development environment. And because Unix is the DOS equivalent for multiuser systems, users will achieve maximum application portability.

Advanced development technologies, just now emerging, will combine with fourth-generation tools and set the stage for the next generation of applications. These tools will provide an expanding range of Unix applications that will offer sophisticated user interfaces, distributed processing capabilities, portability to DOS and other environments and, eventually, even AI techniques. ■

Nierenberg is the president and chief executive officer of Lake Oswego, Ore.-based Unify Corp., a developer of software application products for the Unix and Microsoft Corp. MS-DOS markets.



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TECHNOLOGY INSIGHT



The Move To Integration

Unix's open architecture combined with the integratability of applications software and the creativity of the systems integrator will give the full power of micros to the business world.

·BY·ERWIN·MORTON·

In the complex maze of micro, mini and mainframe software, which comes in a variety of independent flavors, corporate MIS/DP management is looking for solutions to simultaneously pull together the increasing flow of information and offer more flexibility in data retrieval and manipulation. Attempts by corporations to standardize on one or two software packages to meet the needs of everyone have not been notably successful.

As acceptance of the Unix operating system grows, it is becoming possible to organize different applications and computer equipment into a single operating environment. The open architecture or integratability of Unix and of the applications software developed for Unix allows the MIS/DP department to choose packages from different vendors and integrate them into corporate software.

Not long ago, the office was seen as the archetypal horizontal market. It was widely assumed that the computing requirements of people in one office were the same as those in another. This implied that a few standard software packages could cover everyone's requirements. In practice, however, people have purchased a wide variety of software applications that now cannot work together or share data.

The office is not, in fact, a unified entity. It is appropriate to characterize each department in a corporation as a miniature vertical market composed of people with specialized needs. The MIS/DP manager has begun to pull together the appropriate software for these mini vertical markets and has become, in effect, an in-house systems integrator.

The Unix operating system provides an effective platform for creative systems integrators because the open architecture allows disparate third-party applications to communicate and share data dynamically in a multiuser, multitasking environment. Very powerful office systems can be created to perform functions that could not have been anticipated or provided for in an off-the-shelf IBM PC-DOS integrated package.

An integrated package built for DOS typically has one very powerful component, usually a spreadsheet or a relational data base. This central component becomes the primary selling point and is used by 90% of the users 90% of the time. The other components are usually too limited to be used effectively, and it is generally impossible to integrate separate packages from different vendors.

The problem with DOS-based integrated packages is that they are closed systems because DOS itself is a closed system. It may be possible to tailor a software package (create templates and so on), but the environment around the package cannot be changed or enhanced.

The key advantage of the open architecture or integratability of Unix software is that each application can become a building block for a system. Each application can be chosen because it is the best program for the job. The software can be mixed and matched — and tied together — to suit the needs of the department and the corporate strategy.

An off-the-shelf Unix package can invoke a second package, extract needed data, then use that data to drive a third package. In other words, systems integrators can build bridges between existing, independently developed applications.

System integration is extremely easy under Unix because applications from different software vendors can be hooked together. The sharing of applications can save months of development time, and at the same time, the MIS/DP manager or systems integrator can provide an office automation system that is tailored to the installation's specific needs.

Data transfer is facilitated by multitasking, file sharing, interprocess communications and Pipes. The shell (command interpreter) is a powerful prototyping

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tool: applications or modifications that would normally require substantial work to code can quickly be developed as shell scripts. Pipes permits tinkering — plugging together existing applications in new and useful ways.

Some Unix systems enable DOS to be run as a task, so that scripts, Pipes and so on can be used to enhance the DOS applications. Unix allows off-the-shelf DOS applications to transcend the limits of DOS.

Desktop publishing under Unix goes beyond mere page layout software. The marriage of off-the-shelf Unix word processing with standard Unix typesetting tools results in an extremely powerful system that can typeset an entire 500-page document in one sitting rather than prepare it page by page. The user can globally coordinate the formatting of a large number of documents. The ability to hide the mechanism and make the entire process transparent to the user is inherent in the software design.

When choosing integratable software for a multiuser environment, it is important to consider the user interface. The multiuser interface problem differs fundamentally from that on a personal computer. In the DOS world, one word processor can be acquired for the executive who puts out an occasional memo, and another, quite different one can be chosen for the secretary who is at the keyboard all day, as long as the two parties work independently.

When the decision has been made to establish a multiuser environment and coordinate the secretary, the professional staff, the middle manager and the executive, it is important to select a single software package that is accessible to both experienced and occasional users. Here are a few criteria for choosing a departmental or corporatewide software package:

- Predictability and consistency of the interface across a variety of hardware.
- Speed (both response and performance), so the software does not interrupt your train of thought and the system cost per user is kept to a minimum.
- Simplicity (both ease of learning and ease of use), so the package can be accessible to the occasional user, but not get in the way of the experienced user. One solution to this seeming paradox is to build a command syntax around soft keys that take on different functions, depending on the task, and that are unobtrusively self-documenting on the screen as they are being used.
- Context-sensitive assistance for every prompt, for every diagnostic and for every field of every menu.
- An interface based on a natural model of the office. A real office does not look like or work like a rectangular array (spreadsheet) or a set of ordered pairs or trees (data base). The natural office is largely composed of documents, filing systems and communications, with multiuser access and flexible methods of organization.

Today users have the opportunity to use the open architecture of Unix, the integratability of the applications software and the creativity of the systems integrator. This dynamic synergy will help make the full power of today's micros available to the business world and provide the information tools necessary for the 1990s and beyond.

> *When choosing integratable software for a multiuser environment, it is important to consider the user interface.*

Morton is president and co-founder of Santa Clara, Calif.-based Syntactics Corp., a software development firm providing business applications packages for the Unix operating system. He has 15 years of experience in systems and scientific computing.



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STANDARDS UPDATE



GEOFF O'CONNELL PHOTO

Designing A Standard

Based on Unix, IEEE 1003.1 is the first standardization of an operating system environment.

·BY·JIM·ISAAK·

The Institute of Electrical and Electronics Engineers (IEEE) has recently published the IEEE 1003.1 Trial Use Standard for Portable Operating Systems for Computer Environments. Based on the Unix operating system, it is the first standardization of an operating system environment and was developed from years of work by IEEE and /usr/group, the commercial Unix users group.

The standard has arrived in time to assist with the widespread adoption and specification of Unix-compatible systems by vendors and purchasers. For MIS and others in a corporation, it is important to understand what this standard does and does not address and future directions of the work. As a published standard, it can be referenced in conformance testing, purchasing specification and as a guide in development work.

The 1003 effort traces back to 1981 when /usr/group formed a standards committee to provide a base-level document for application portability. Language standards are limited in providing sufficient specification of the facilities needed for application portability. Many areas of I/O interfacing, memory and process management have been beyond the scope of language standards or subject to implementation-dependent characteristics.

By defining a standard for an operating system environment, another level of application portability can be attained. In 1984, /usr/group published the 1984 /Usr/Group Standard, which provided a base for both the IEEE 1003 effort and the C language standards work being done by the X3J11 committee. The /usr/group committee merged with the IEEE 1003 effort to provide a basis for raising the operating systems standards to American National Standards Institute (ANSI) and International Standards Organization (ISO) levels of acceptance.

In March 1985 the IEEE standards board adopted the 1003 document as a Trial Use Standard. Trial use implies that a follow-on document is planned that will provide additional materials to complete the standard and that will also incorporate feedback received during the trial use period.

While all ANSI standards require maintenance and updates, the IEEE Trial Use designation is a recognition of the value of widespread availability and is in use by implementors, application developers and buyers prior to a complete specification. The 1003 document contains a number of appendixes to describe functions that may be incorporated into a final version. The 1003 document is seeking to include terminal device control and a set of definitions of terms; however, both of these warrant feedback from the computer community prior to full use.

IEEE has established the trademark "Posix" for use by conforming systems and conforming applications. It is common practice to refer to popular standards by a trade name: take, for example, the name Multibus for IEEE 796 or Ethernet for IEEE 802.3. However, because, in the case of 1003, Unix is a trademark reserved by AT&T, the term Posix provides a generic title available for wider use. The name Posix is formed from a combination of portable operating system — POS — and the popular "ix" ending used in various operating system product names.

The value of a generic name associated with well-defined functionality can be seen in the specification of Unix-compatible operating systems. There are more than 100 systems vendors that run products compatible with or derived from variations of Unix. Most of these implementations are highly compatible, and Posix tries to characterize that common ground. The need for this common ground is clear: It has been estimated that about 70% of the U.S. government's requests for proposals for multiuser systems now specify some variation of Unix compatibility, and firms like General Motors Corp. and countries like Sweden are publicly moving toward the specification of a Unix-based standard for operating systems in a range of application areas.

Clear specification of the operating system environment is a concern for a number of groups.

The X/Open group of manufacturers, which includes all the

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major European manufacturers as well as Digital Equipment Corp., Sperry Corp. and Hewlett-Packard Co., has adopted a Unix-based operating system model, added language and data base functions and provided a well-defined common application environment.

AT&T has published a document called the System V Interface Definition, which provides a specification of System V functionality, and has backed this up with a verification test suite.

The National Bureau of Standards (NBS) sponsored a set of software testing workshops in June with testing of a Posix-based Federal Information Processing Standard as one of the major workshops.

Fortunately, these efforts are not operating independently. X/Open, AT&T and NBS have all been quite active in the IEEE effort, and there has also been additional coordination between these groups. For the most part, Posix is a subset of the System V Interface Definition, and the System V Interface Definition is a subset of X/Open's Portability Guide.

Review by these groups with comments to both the 1003 group and others involved will tend to converge these documents even though subset relations will continue to exist because of the differing scope and objectives of the groups.

The Posix effort is aggressively moving from trial use to a full-use document. This is currently targeted for approval in the summer/fall of 1987. IEEE has formally initiated the ISO process, recommending that a project be started through Technical Committee 97, Subcommittee 22.

If the timing is right, ISO feedback can be incorporated into the document in the IEEE approval cycle to avoid a level of variation and recycling.

In addition to the full-use effort of the 1003.1 group, other working groups and subgroups have not been idle. One of the most active areas is real-time extensions. Here a 1003 subcommittee exists along with a /usr/group technical committee and the General Motors Symposiums on Real Time Unix Systems. The coordination model is for requirements to be identified by the GM symposiums, implementation alternatives to be discussed in the /usr/group committees and actual proposed functional specifications to be finalized and incorporated by the 1003 subgroup. There is also a lot of common membership between these groups.

Two other working groups have been identified for complementary work to the Posix 1003.1 effort. A 1003.2 project has been approved that will address the shell- and tools-level facilities. The project is targeted at defining the facilities involved in application installation and as a method for applications to initiate services of some predefined application-level facilities.

> *The ultimate objective of any standard is to have vendors with implementations and buyers with purchasing specifications that build on that standard.*

This effort is not targeted at defining a user interface, because the value of the commonly available shells as ease-of-use, end-user interfaces is questionable. Finally, as a result of the NBS software testing workshops, an additional 1003 working group has been proposed to address verification testing criteria. Verification testing will be an essential element in the adoption of Posix as a Federal Information Processing Standard.

The Posix standard has limitations that affect the ways in which it may be useful in the traditional MIS world. It is an interface for the C language. While it would be possible to have Cobol, PL/I, Pascal, Fortran and other interfaces to a Posix environment, the document is based on C.

What is defined in 1003.1 is the system call interfaces, not the tools.

The 1003.2 effort will address this from the Unix-oriented users view, but buyers should seek application-level facilities for ease of use. (It has been suggested that users use applications, not operating systems.)

The facilities provided do not define methods for record management, indexed access to data files, transaction processing or networking. Some of these areas are outside the scope of Posix and are being addressed by the System V Interface Definition, X/Open and /usr/group technical committees. Other areas are potential candidates for 1003 action as extensions to Posix or as separate standards.

There are applications that can be developed within the current scope for Posix. There are currently systems that provide extensions, either at the operating system level, library level or data base management level, to address these areas.

Family resemblance

Finally, Posix looks a lot like the Unix operating system, which is similar to Honeywell, Inc. Multics (and other systems with a Multics heritage: DEC VMS, Prime Computer, Inc. Primos, Data General Corp. AOS, among others). Standards were designed to establish baseline functionality and measurable conformance, not perfection. One of the guidelines of the 1003 group has been to avoid breaking existing applications.

In general, quirks of Unix have remained, rather than logical improvements. However, there are points where the established approach was considered to be incorrect, and these changes have been made.

The ultimate objective of any standard is to have vendors with implementations and buyers with purchasing specifications that build on that standard. We have the first elements of this falling into place. There are widespread implementations of operating systems similar to Posix and widespread specification of Unix-compatible operating systems. These need to be compared with the Posix standard.

From this, statements of conformance can be established for both implementations and for applications. Also, buyers can start requiring at least a clear statement of exceptions, if not adherence to the Posix standard at this point.

One of the first federal specifications referring to the 1003.1 standard is forthcoming from the National Aeronautics and Space Administration Ames Research Center in California, with more expected as the Posix document gains visability. It will be at least six months before vendors can document their implementations and/or bring them into conformance; some will wait for the full-use document.

However, requiring statements about exceptions to the Posix standard and seeking both implementations and applications that conform to it is one key step buyers can take. It may be appropriate to designate a shell and set of tools, languages, data base facilities, networking and communications facilities as well as system characteristics such as disk capacity, memory, word size and bus standard.

A Posix Conforming Implementation would provide all of the required facilities from the 1003.1 Trial Use Standard as well as vendor-defined extensions. A Posix Conforming Application would document all facilities required outside of the 1003.1 document. This does not assure portability but provides a way for the buyer to make sure that the implementation provides the facilities required by the application.

> *Standards should be designed to establish baseline functionality and measurable conformance, not perfection. One of the guidelines of the 1003 group has been to avoid breaking existing applications.*

Some areas of portability are beyond the scope of portability standards. For example, running an application from a 32-bit machine on a 16-bit system may never work due to differences in linear address space.

One of the appendix definitions is for a Posix Conforming Portable Application. Such an application would not use facilities that are not defined in the Posix standard or X3J11 C language standard. There is information useful in comparing both implementations and applications in the "limits.h" section of the standard and in Appendix H. These describe numeric values that may affect applications portability.

Feedback is strongly encouraged, particularly prior to this year's September and December meetings. This will permit comments to be incorporated into the revised version of the document.

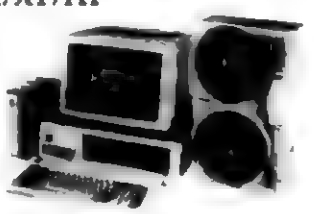
To obtain copies of the IEEE 1003.1 Trial Use Standard, please contact the IEEE Computer Society at (714) 821-8380 or write to P.O. Box 80452, Worldway Postal Center, Los Angeles, Calif. 90080. The cost of a copy is $19.95 plus $5.00 for shipping.

To participate in one of the working groups, please send your name and address to Jim Isaak, Charles River Data Systems, Inc., 983 Concord St., Framingham, Mass. 01701.

Isaak is director of Strategic Marketing for Charles River Data Systems, Inc. He has been involved in the International Standards Organization Open Systems Interconnect, General Motors Corp. Manufacturing Automation Protocol and Boeing Computer Services Co. Technical and Office Protocol.

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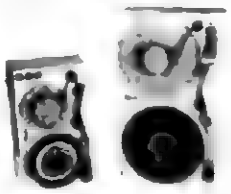


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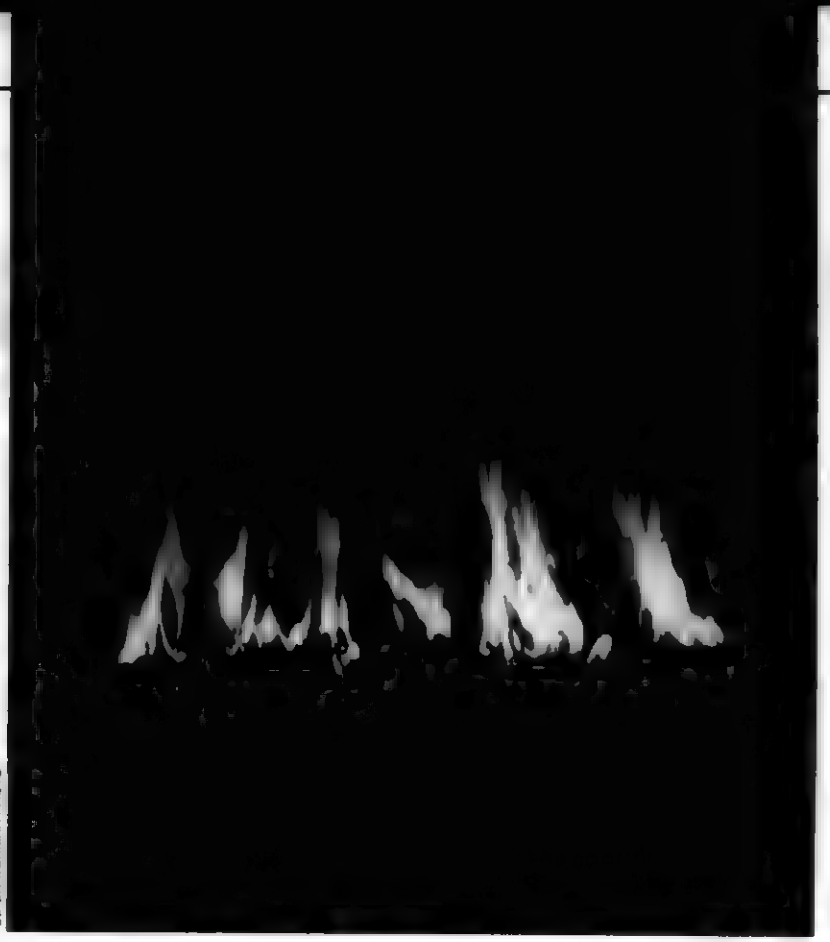


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Ten Ones!



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Before going shopping for your Unix product, look at the following list of good buys to show you which tools pay off in terms of integration and price/performance.

A few years ago, any "watch" list might have mentioned that Unix products shared the following characteristics: a technical orientation, a bad user interface and sluggish performance. Things have changed since then, however. Many Unix tools today are business oriented and incorporate friendly interfaces, while hardware advances have overcome performance deficiencies.

The 10 Unix products examined in this article rely on characteristics that appeal to a wide user audience — namely, integration and price/performance. Integration is so important that the first five products deal almost exclusively with that topic, ranging from corporatewide, heterogeneous networks to the merger of DOS and Unix at the desktop level.

The remaining five are just plain, old-fashioned good buys and offer users performance that crosses critical price points. In the commercial area, price/performance approaches $2,000 per user, and on the technical side, price/performance breaks the $10,000 per million instructions per second (MIPS) barrier.

Numbers 1 and 2. The era of mixed-vendor, heterogeneous corporate networks is upon us, yet users are still struggling to come up with the means to make that environment a reality. Networking protocols are not enough. To provide transparent access to all resources on a network to all users, distributed file systems are needed. Two emerging distributed file system standards are Sun Microsystems, Inc.'s Network File System (NFS) and AT&T's Remote File System (RFS), which incorporates the Streams communications facility.

NFS and RFS provide an underlying structure for managing file systems, shared resources and transparent data base access across a mixed-vendor network. By using one (or both) of these Unix-based distributed file systems, corporations would be able to integrate incompatible hardware, some of which may be running different operating systems, into a single, cohesive network. Users at any workstation would then be able to access shared network resources including files, data bases and printers.

Both products work with AT&T Unix System V. However, NFS can also accommodate University of California at Berkeley versions of Unix, IBM PC-DOS and Digital Equipment Corp. VMS systems. Sun got an early lead against RFS and, so far, has signed up almost 60 NFS licensees including Hewlett-Packard Co., DEC, Data General Corp., Harris Corp. and more than 50 others.

However, RFS should not be counted out just yet. Rumored for months, RFS was officially unveiled at the June 1986 National Computer Conference in Las Vegas as an enhancement to AT&T's latest release of Unix, System V. 3. As such, it will be included with all Unix operating system licenses from now on.

Moreover, AT&T has indicated it will use RFS as a cornerstone of a new strategy to penetrate the Fortune 1000. AT&T will play up RFS' ability to connect diverse computers, pitching it as the backbone environment for integrating personal computers, minis and mainframes. The Streams facility is an important part of RFS because it provides a protocol-independent interface between different computers and networks.

In its initial release, Streams will support AT&T's Starlan local-area network. However, AT&T has committed itself to support other international networking standards such as the International Standards Organization's Open Systems Interconnect reference model, the U.S. Department of Defense's Transmission Control Protocol/Internet Protocol, General Motors Corp.'s Manufacturing Automation Protocol, Boeing Co.'s Technical and Office Protocol, the international IEEE packet-switching protocol X.25 and, eventually, IBM's Systems Network Architecture.

Numbers 3, 4 and 5. While NFS and RFS address the issue of corporatewide, distributed networks, a more immediate need — which way to go for multiuser applications — is at hand within the departments of many large firms.

Until not very long ago, users had to choose between multiuser Unix and Microsoft Corp. Xenix supermicros and networked PCs. That is no longer the case. Xenix-Net, developed jointly by Microsoft, Bellevue, Wash., and The Santa Cruz Operation, a Santa Cruz, Calif., Unix software house, lets users off the hook for now.

Xenix-Net provides networking, distributed file system capabilities and transparent file sharing in mixed environments consisting of Xenix System V.2- and DOS-based systems. With Xenix-Net, DOS users can open, read and write to files on a Xenix-based network file server, while other users are accessing the same file as well.

While Xenix-Net integrates DOS and Unix on a departmental basis, the integration of DOS and Unix at the desktop level remains the aim of two other products — Santa Monica, Calif.-based Locus Computing Corp.'s Multisystem Merge (also known as OS/Merge and Merge/286) and Interactive Systems Corp.'s recently announced joint venture with Phoenix Software Associates Ltd., the

PRODUCT WATCH

leading supplier of IBM PC-compatible read-only memory BIOS.

Locus' Multisystem Merge is best known as AT&T's Simul-Task facility for its PC 6300 Plus. Developed jointly by Locus and AT&T, the product was introduced last spring as OS/Merge with the PC 6300 Plus. Multisystem Merge, which requires an Intel Corp. 80286 microprocessor, currently runs only on the PC 6300 Plus.

Multisystem Merge weds Unix and DOS in the same single-user PC. With it, DOS applications can run as a task under Unix, a capability that offers users a combination of the best of both operating systems — the powerful communications and multitasking nature of Unix coupled with the sophisticated and easy-to-use software of the DOS world. In addition, Unix and DOS files can be accessed and manipulated transparently from either mode. Users simply toggle back and forth between DOS and Unix.

Competition in the Field

Locus, however, is going to have some competition. Just a few weeks ago, Interactive Systems, a Santa Monica, Calif., Unix porting house, and Phoenix Software Associates disclosed that they have teamed up to combine Unix and DOS into a single environment on Intel's 32-bit, 80386 microprocessor.

Bernie Hill, Interactive Systems' director of systems and services, said the resulting product — to be called V 86IX — will be available in two releases: a single-user version in the fourth quarter and a multiuser version about the middle of next year. Both will take advantage of the unique hardware capabilities of the 386 microprocessor, Hill explained.

The 386 permits multiple, virtual 8086 modes. This will allow multiple DOS programs to run as tasks under Unix System V. Currently, Multisystem Merge allows only one task to be run as a guest under Unix, though the firm is believed to be readying a 386 version of its own that overcomes that limitation.

Numbers 6, 7 and 8. Integration is one reason to watch some Unix products; more bang for the buck is the other. The Altos Computer Systems, Inc. 3068, DEC Microvax II and AT&T 3B2/310 — three multiuser supermicrocomputers — deliver some of the most aggressive price/performance in the multiuser market today.

According to Brian Boyle, managing director of the Novon Research Group, all three machines offer end users powerful multiuser configurations at prices under $2,000 per user, including a terminal.

"That's a magical price point," Boyle said. "At that price, the Altos 3068, DEC Microvax II and AT&T 3B2/310 begin to bump heads with the per-user cost of networked PCs, offering a powerful, cost-effective and cost-competitive alternative for departmental applications," Boyle said.

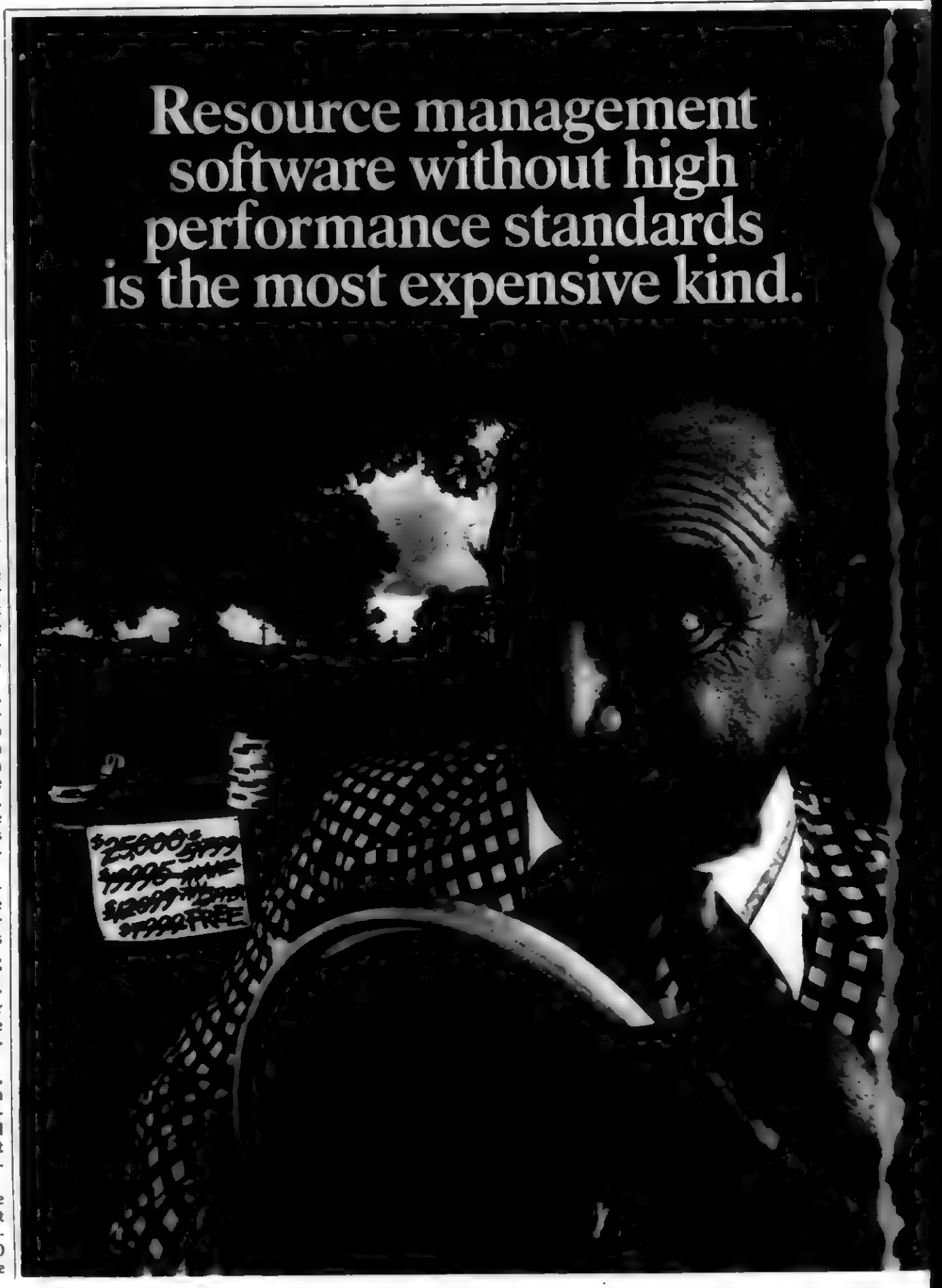
"People can't [complain] about Unix anymore," he added.

Among the things to watch for with these three is a possible port of DEC's All-In-1 integrated office software, popular among large corporations, to its Ultrix-32, AT&T Unix System V/University of California at Berkeley 4.2 operating system. This would make the Microvax II an attractive and cost-effective departmental office automation product at many corporations.

Number 9. With its Sun-3 workstation family, Sun has made quite a name for itself. The blend of off-the-shelf hardware and software (including Motorola, Inc. 68020 microprocessors and VMEbuses and Berkeley 4.2 Unix), an open architecture philosophy, industry-standard networking and aggressive pricing has earned this firm widespread recognition as the No. 2 company in the technical workstation market, moving up on market leader Apollo Computer, Inc., Chelmsford, Mass.

Sun customers today are usually confined to scientific, engineering, technical and university areas as well as computer-aided design applications in larger industrial concerns. However, Sun workstations are beginning to appear in the more mainstream precincts of the Fortune 1000 as well, usually in applications where an IBM Personal Computer AT just doesn't deliver enough horsepower.

For instance, the Sun-3 workstation family is a vehicle for corporate in-house electronic publishing systems and is the hardware of choice for one of



PRODUCT WATCH

those software products, Interleaf, Inc.'s Office Publishing System (OPS). Applix, Inc.'s Alis, a publishing-quality document preparation and office automation software system, is also frequently used on Sun workstations.

Sun also appears intent on retaining its technology and price/performance leadership. Earlier this month, Sun upped the ante on the price/performance end of the technical workstation market, introducing the 4-MIPS Sun-3/200 workstation. Based on a 25-MHz Motorola 68020 microprocessor, the 200 series is priced at $38,000 for a system with 8M bytes of main memory. That's $9,500 per MIPS, purportedly the lowest in its class. DEC VAXs cost an average $100,000 per MIPS, according to Sun.

Number 10. The IBM RT Personal Computer remains an important force to contend with in the Unix market if for no other reason than it is made by IBM. Without question, it indicates IBM is serious about Unix at last: The company has attended major Unix trade shows; it has aggressively discounted development systems for independent software vendors; it has offered PC-style documentation; and it has made available an abundance of technical information and free training classes.

More than a micro

The RT is also more than a PC. It can be a powerful multiuser system supporting up to eight users. A variety of business-oriented, commercial-grade applications software is already available and more is certainly on the way — all of which has many suspicious of IBM's ultimate intentions for the machine. Some suspect the RT could become an important departmental processor offering.

IBM has priced the RT aggressively — although not as aggressively as Sun's machines. According to one software house, a multiuser RT with a 150M-byte hard disk, a 120M-byte streaming tape drive and graphics capabilities is available to developers for about $24,000; a similar Sun-3 workstation configuration costs about $20,000.

Still, the RT is not without need for some improvements. IBM is aware of these shortcomings, and most expect the computer giant to address these needs shortly.

A second version of the machine based on a faster, more powerful version of the RT's 801 reduced instruction set computer (RISC) chip, networking and a sophisticated windowing system are among the enhancements that are expected soon.

Other Unix-based products that are worthy of attention include Sequent Computer Systems, Inc.'s Balance 8000 and Balance 21000 parallel processing systems; Interleaf's OPS in-house electronic publishing system; and MIPS Computer Systems, Inc. new RISC-based microprocessors.

Sequent stands out because the company has done a great deal to educate and inform the computer-buying public on the issues of parallel processing. In addition, although the company's Balance computer series appears to be sold primarily to scientific and technical customers, the corporation's Balance computer series has begun to sell well in business environments also.

Interleaf is something of a standard for high-end, in-house electronic publishing applications among the Fortune 1000 companies. Interested parties should be on the lookout for the introduction of an Interleaf version for the MS-DOS environment.

Meanwhile, the MIPS Computer RISC-based microprocessors promise to bring even more power to desktop computers. Observers estimate the chip's processing capabilities at somewhere between 5 MIPS and 8 MIPS.

That kind of performance opens up entire new possibilities in desktop workstations, some equivalent in power to today's mainframes, in the years to come. Many, if not most, will be Unix based.

Gill is a six-year veteran of the computer industry and the former editor-in-chief of Unix/World Magazine. *He is currently a free-lance writer living in San Mateo, Calif.*

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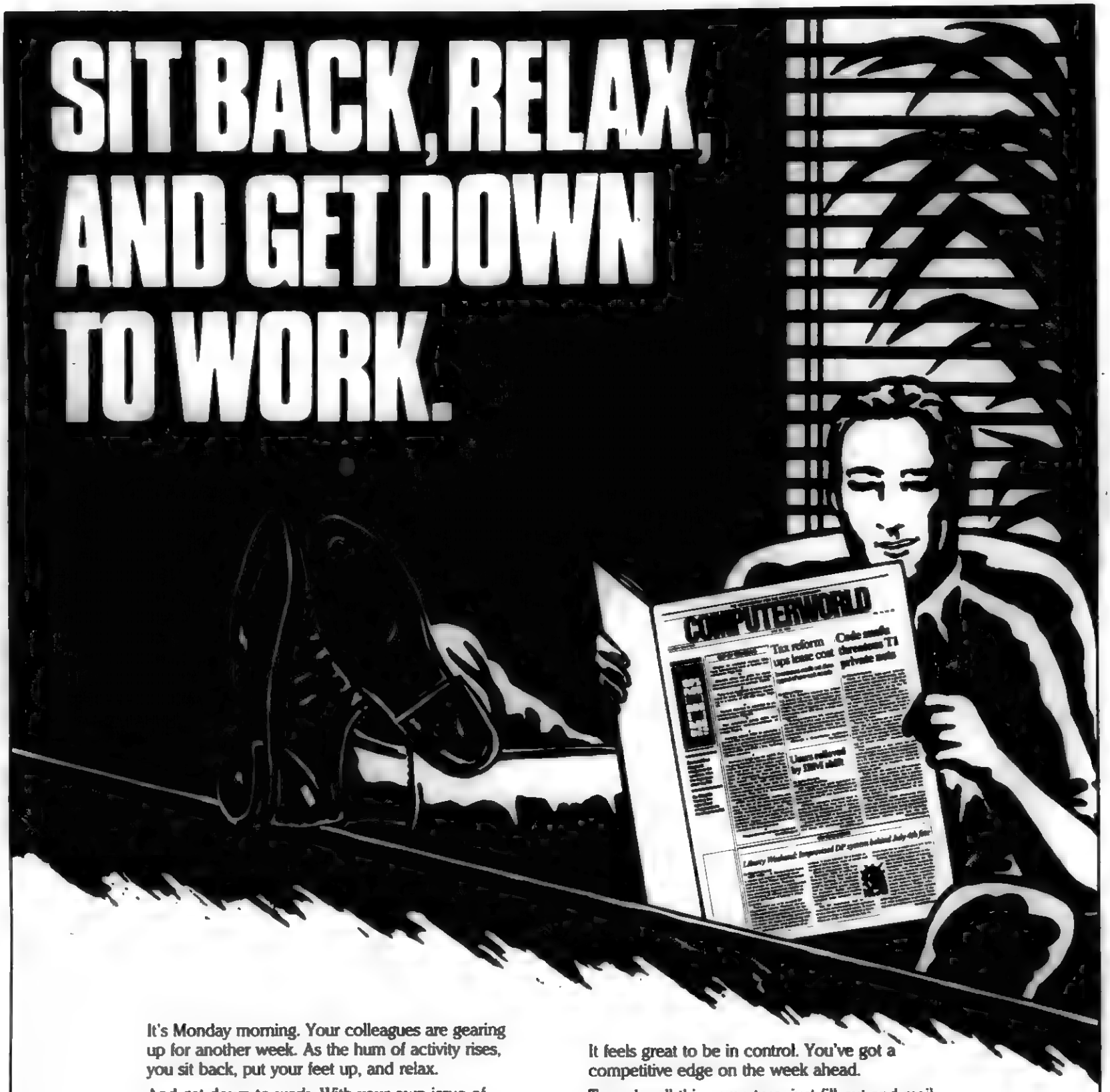


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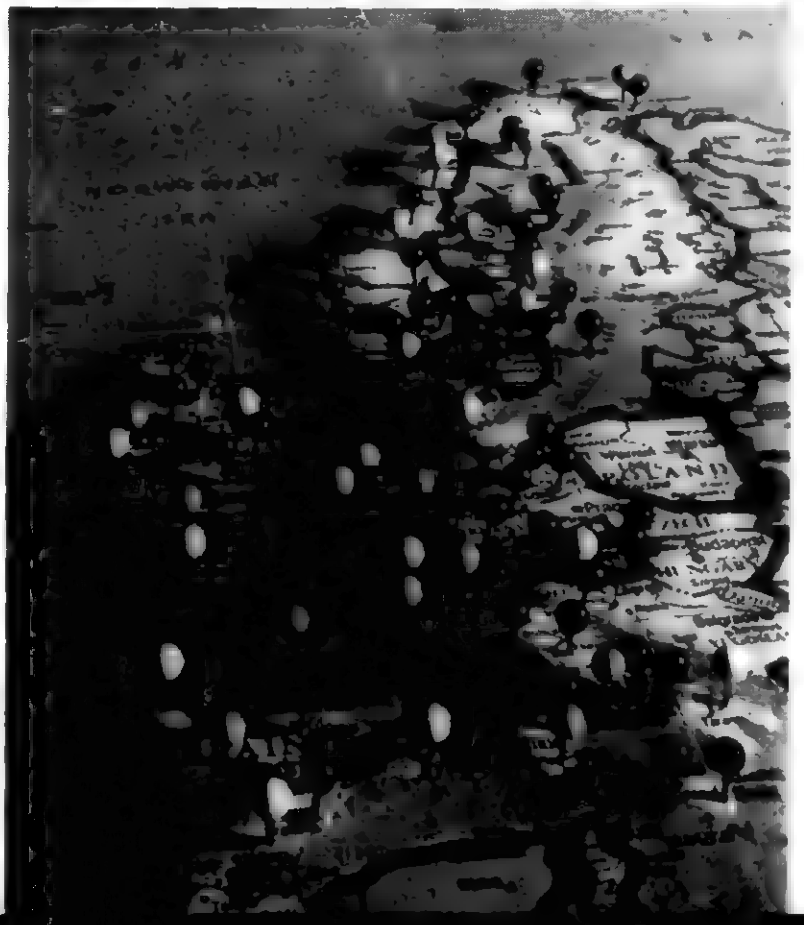
·BY·TONY·HEYWOOD·

Developed some 17 years ago by AT&T Bell Laboratories, Unix has become the standard operating system for modern multiuser computer systems. On both sides of the Atlantic, users have found that Unix satisfies their needs by providing machine independence; software portability; true multiuser, multitasking capabilities; and an environment in which programmers can be most efficient.

In the evolution of Unix as a viable operating system, the European computer industry and end-user base have traditionally followed the lead set by their American counterparts.

In terms of development cycle, innovations that take place in the U.S. generally migrate to Europe a year or two later. There are many reasons for this, but the primary reason is that that U.S. market is far larger than the European market. Therefore, the U.S. user base has encouraged the birth and growth of many more development companies.

Unusual in the history of business computing, Unix became available on both sides of the Atlantic at the same time, and while U.S. companies concentrated on their home market, European software companies began Unix development for the European end-user marketplace with little or no external competition. Without this competition, Unix developed as the operating system of choice in Europe and was recognized as such much earlier than in the U.S.



GEOFF O'CONNELL

By the time the Unix concept was accepted in the U.S., many U.S. firms were already committed to installing large computer systems, generally supplied by a single manufacturer that for the most part did not support Unix. Such solutions created problems for users when the time came to upgrade or expand an existing system. In such instances, the costs and difficulties of adopting alternate hardware or software were out of proportion to the eventual benefits. At the very least, a change in hardware at this level requires all data to be transported across systems. At worst, these changes force users to become familiar with new applications software and new hardware and adopt new business procedures.

In contrast, the European user base began to consider the benefits of complete office automation when the Unix concept was already established in Europe. The Unix concept was first promoted abroad by a number of trade and technical magazines. In addition to adopting refinements to Unix made by U.S. vendors such as Microsoft Corp. and Unisoft Systems Corp., European software development houses also began their

INTERNATIONAL OUTLOOK

own enhancements to Unix, shaping the operating system for the European commercial market. While many European developments were several years ahead of contemporary market demands, the market itself was becoming aware of the capabilities and facilities of Unix — especially in an office environment. Trends in the U.S. business computer industry had indicated that Europe would eventually require complete OA systems; Unix was available at the right time and in the right place.

The U.S. and European Unix marketplaces are currently about the same size. However, the many separate countries of Europe present a series of unique problems that have contributed to the shaping of the European Unix industry.

A software product sold in the U.S. usually only needs to be available in English. A software product marketed in Europe needs to be available in at least four languages to achieve equal market penetration.

Second, because of the limited size of each country's market, a successful European-based company is by definition an international company. Many European corporations have offices throughout Europe, all of which need to communicate with one another. In the U.S., computer communications can be achieved by ensuring system compatibility throughout an organization. In Europe, the problems of system communications are more difficult. Even if European firms implement the same hardware throughout an organization and thus achieve system compatibility, they must still address the problems of applications software. For the same applications product to be run on all systems, it must be available in a variety of languages.

Third, European companies tend to be nationalistic and will support their own country's computer industry if possible.

Thus, a typical large European company consists of several offices located throughout Europe, each with a different spoken language, each with hardware supplied by different European manufacturers and each running different applications software.

> *Within a short period following Unix's release, most European manufacturers had announced their intention to develop or support Unix-based systems.*

Unix has ensured that the hardware installed in each European country supports the same applications software. The emergence of Unix encouraged many new European hardware manufacturers to design machines specifically to support Unix. Within a relatively short period following AT&T's commercial release of Unix, most European manufacturers had announced their intention to develop or support Unix-based systems. Conversely, major U.S. hardware manufacturers such as Digital Equipment Corp. and IBM continued to promote their own proprietary operating systems and have only within the last year committed resources to Unix.

In doing so, U.S. hardware manufacturers presented Europe's relatively small computer manufacturing industry with an unequaled marketing opportunity. By adopting a common operating system, Europe's hardware manufacturers provided the basis for software and data compatibility. This provided the impetus for software development houses to make their applications available in different languages. The timing of Unix in Europe encouraged an OA solution, whereby products provide all of the normally required OA routines such as word processing, data bases, spreadsheets and electronic mail in an integrated environment. This concept was very attractive to Europe's large multinational organizations because the same applications product was available for a variety of languages and a variety of computer systems.

Manufacturers and suppliers are not the only ones to contribute to Unix's success in Europe. Within Europe, many major system end users — such as the Swedish government and department of defense — adopted Unix at an early stage, providing further fuel for systems development and encouraging the adoption of the Unix operating system by other organizations. Systems development responded to the demands for OA.

In contrast to the U.S., European Unix manufacturers joined an independent standards committee for Unix — the X/Open Group — whose task was to adopt a single, standard operating system for European industry. The X/Open Group, among other things, established a standard for the creation, manipulation and management of indexed data files.

The slow acceptance of Unix in the U.S. may also be attributed to the recent growth of the single-user desktop computer market. This market spawned a rapid development cycle of powerful and attractive software that has had no equal in the Unix environment until very recently.

The migration of computers from the data processing department to the office desk, made possible by the birth of the low-cost business microcomputer, greatly influenced the packaging and presentation of business applications software. To be successful, applications packages had to be presented in a friendly and attractive way to a new generation of computer users. Simple menu structures lead the user through applications, comprehensive Help screens resolve any queries or problems that arise and business graphics and ergonomics are industry buzzwords. This packaging is one area in which the European Unix community has lagged behind the U.S.

The European user first encountered the PC business applications considerably later than the U.S. user. However, Europe now demands the same standards — but from a Unix system. The Unix market in the U.S., with its base in the scientific and technical community, has less of a requirement for such features. In Europe, however, Unix houses developed such standards of presentation along with their products.

While Unix is a powerful and comprehensive operating system, in its raw state it is best described as unfriendly. To counteract this, European companies have developed ergonomic, menu-driven front ends to Unix, allowing users to select options to invoke Unix routines. The menu structure is carried through various applications, providing common interfaces between the user and a range of features — which have become more extensive as complete OA products are announced.

Complete, integrated OA product

The OA part of Unix has evolved in Europe from a series of reasonably interrelated applications into a complete, integrated product combining word processor, spreadsheet, data base, electronic mail, diary and more. Two important enhancements to Unix developed in Europe are the implementation of Unix OA systems in vertical markets and the integration of Unix OA products with other Unix applications software.

With many European companies now installing major computer systems, European software houses have been quick to address the particular requirements of various professions. Because Unix OA products are written in the C programming language they can be tailored to specific professions with little additional investment and with substantial commercial benefits.

A legal OA system is cosmetically different from a medical OA system, but the routines, capabilities and features of the systems are identical. By tailoring such systems, many specialized European Unix companies have established themselves with various vertical markets and have further contributed to the growing success of Unix.

Unix also provides for the integration of a range of business applications within the European OA environment. The key to the acceptance of the Unix operating system within Europe has rested with the availability and compatibility of software applications, providing users with the opportunity to implement a complete system that provides data compatibility.

Unix emerged in Europe at a time when the commercial marketplace was becoming highly computerized. Unix provided the means for the same applications to run on different types of hardware and also allowed a high degree of data compatibility between applications. It has enabled companies to implement powerful multiuser systems that provide user-friendliness while solving European requirements for multilingual versions of the same product.

In the U.S., Unix is only now being recognized for its potential as an easily upgraded and portable standard solution for commerical operating environments. As the need for multiuser environments increases in U.S. industry, Unix will soon achieve a level of market penetration close to that already found in the European community.

Haywood is vice-president, marketing, for Dallas-based Uniplex Integration Systems, Inc. He has also participated in the development of software and office automation systems.

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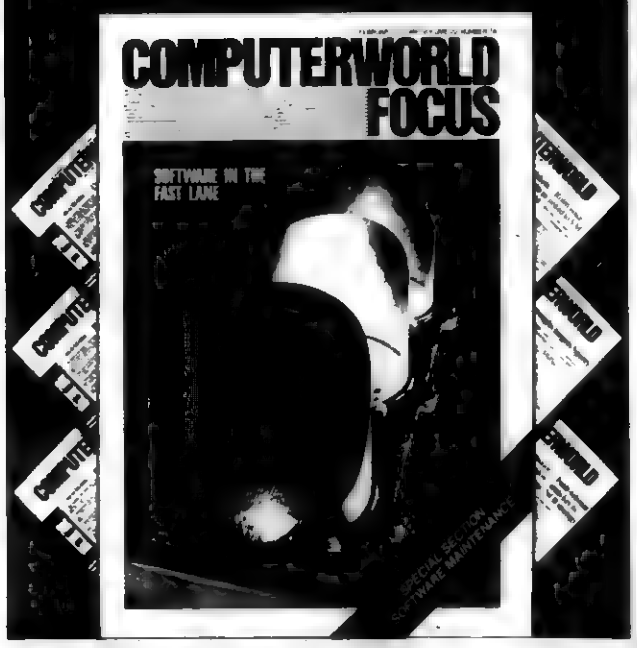
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GREG WENZEL

The debate over which solution is best for departmental computing applications in the corporate environment — networked personal computers or multiuser Unix-based supermicros — has been resolved at long last. The winner is Unix *and* DOS.

Confused? Don't be. Despite the sometimes acrimonious rancoring during the past few years over the two solutions to multiuser business applications, Unix and DOS are emerging as complementary rather than adversarial forces in today's corporate computing environment.

For many large corporations, the choice between networked DOS and multiuser Unix systems has never been the black-and-white issue their respective proponents have often portrayed it to be. Consider, for example, the following scenario that is now emerging in the departments of many large corporations. PCs are becoming the favored desktop workstations for managers and professionals in the Fortune 1000. In fact, PCs have become so ubiquitous at some large companies that they have even replaced many older, less intelligent desktop terminals such as IBM 3270s as well as other dedicated word processing and data processing systems. Typically, these PC-based desktop workstations perform a variety of personal productivity applications like word processing, spreadsheet and financial analysis, graphics and the like. Lotus Development Corp.'s 1-2-3 continues to be a favorite.

Meanwhile, although Unix systems have taken a backseat to PCs for many office applications, some firms have chosen to recast them in the role of departmental workstation instead of using large clusters of PC work groups. These Unix systems offer substantially more than large disk capacities. They provide a common shared data base, shared program development facilities, access to sophisticated printing and electronic publishing facilities, front-end communications processing and the ability to run compute-intensive tasks such as large spreadsheets.

In addition, numerous bridge products are available — such as Touchstone Software Corp.'s connectables family and Computerized Office Services, Inc.'s Tango — that enable PCs to act as front-end, desktop workstations hosted by Unix supermicros. AT&T has even gone so far as to merge DOS and Unix at the workstation level with its recently released Simul-Task feature for its AT-compatible PC 6300 Plus. This product enables DOS to run as a task under a standard AT&T Unix System V operating system.

With the push for departmental networking and multisystem links, Unix and MS-DOS are emerging as complementary rather than adversarial forces in today's corporate computing environment.

Moreover, current product and technology development trends such as heterogeneous file systems and distributed data bases assure that the merger — indeed, perhaps the marriage — of DOS and Unix is well under way.

The debate began when the first commercially oriented, Unix-based, multiuser computer was introduced at the 1980 National Computer Conference by the now-defunct Onyx Systems, Inc. The Onyx C8000 was based on the 16-bit, Zilog, Inc. Z8000 microprocessor and ran the first AT&T Unix Version 7 licensed to a commercial computer manufacturer. Previously, universities were the only places outside of AT&T itself to have Unix licenses.

Because the Unix micros had such aggressive price/performance, many people expected them to replace minicomputers for multiuser, small-business and Fortune 1000 departmental applications.

Such a grand future was not to be, however. Although other factors came into play, IBM's introduction of the Personal Computer, shortly after the Onyx C8000, proved the critical turning point. It was not long after that many corporate managers and professionals embraced the IBM PC as the preferred desktop computing device, leaving many Unix supermicrocomputer vendors without the mass market they had anticipated. Sales of Unix supermicros suffered.

Soon, however, both PC and Unix advocates realized networking and the sharing of information between individual PC users would become a necessity and, eventually, a priority. This would be especially true in the Fortune 1000 market.

The two camps quickly took sides and began leveling criticism at one another. Sometimes the

If the space program had advanced as fast as the computer industry, this might be the view from your office.

And space stations, Martian colonies, and interstellar probes might already be common place. Does that sound outlandish? Take a look at these facts in mind.

In 1960 [illegible]

[illegible] today a $2,000 portable can add and subtract more than 20 times faster [illegible] 1960 [illegible]



debate grew acrimonious as each side sought to convince the computer-consuming public that only its solution would do.

Current product, technology and market forces are creating complementary roles for Unix and DOS. First, it is clear that user preference for DOS and DOS-based applications software at the desktop level remains strong and virtually unchallenged. Despite many years and many millions of dollars worth of effort, Unix applications software remains less popular, less sophisticated and more expensive than DOS equivalents.

Second, the major microcomputer manufacturers have done little to promote the use of Unix or Microsoft Corp. Xenix on PCs. Without such a push, Unix or Xenix on PCs have been doomed from the start.

Third, DOS is growing up, becoming more sophisticated and more Unix-like with every release. Recent releases of Xenix and DOS C compilers are also helping to blur the distinctions

Unix leads MS-DOS in certain areas

At the same time, Unix's commanding lead over DOS in the areas of networking, file sharing, heterogeneous file systems, distributed data base and communications capabilities continues to advance. Networking and distributed data base technology are better developed for Unix than DOS.

For instance, the U.S. Department of Defense's Transmission Control Protocol Internet Protocol (TCP IP) — a requirement in many research, defense and government computer networks — is a virtual standard in the Unix community. Little, however, has been done with DOS networks in this area. Moreover, many corporations have begun to realize the limits of PC networks. What worked for three or four users is no longer effective for 23 or 24. For one thing, disk capacities on typical PC network file servers are limited to less than 100M bytes. On the other hand, it is not uncommon for Unix supermicros and minicomputers to offer many hundreds of megabytes of storage.

DOS' hardware shortcomings are just the beginning. The sophistication of DOS networking software is also a limitation. Unix provides industry-standard communications protocols such as TCP/IP and Ethernet, while work on other protocols such as IBM's Systems Network Architecture, 3270 and Document Content Architecture/Document Interchange Architecture is well under way. Finally, Unix itself provides some interesting communications capabilities like advanced electronic mail functions and even interactive conversations between on-line terminals.

> *Those who think that Unix needs to capture the desktop of commercial users from MS-DOS to succeed are wrong.*

Perhaps most important, DOS network manufacturers have not even begun to address the issues raised by the trend toward mixed-vendor, heterogenous networks. Under Unix, however, developments in this area are rapidly advancing. Both Sun Microsystems, Inc.'s Network File System (NFS) and AT&T's Remote File System (RFS) enable a user on any computer in a mixed-vendor, heterogeneous network to access files and data anywhere in the network regardless of what hardware is being used, what operating system that hardware is running or where the data is physically located.

Moreover, Unix-based relational data base management system companies are developing distributed data base systems that provide the same function at the DBMS level over a similar network of disparate and incompatible computers as NFS and RFS seek to achieve at the network and file system level

These developments, different from anything for DOS networking environments, will further strengthen Unix's role as the backbone communications and integration tool for corporate computing environments.

The integration of DOS and Unix could offer users the best of both possible worlds. With Unix as a background operating system, mixed-vendor, heterogeneous networks would be possible. In the corporate world, most users would opt for DOS-based, PC workstations to do 1-2-3 spreadsheets and word processing. Unix-based supermicros or minis, meanwhile, would operate in the background, out of view and transparent to users.

These back-room, Unix-based computers would provide a wide variety of auxiliary computing services best handled by the more powerful processors on which they are based. These services would include networking and electronic mail between individual PC users and other computers and work groups on the corporate network; off-loading communications for micro-to-mainframe links; providing common access to shared data bases of telephone directories, spelling dictionaries and the like; hosting expensive shared peripherals such as sophisticated laser printers, large-capacity disk drives and possibly even optical disks used for corporate archives; and off-loading other compute-intensive functions such as running large spreadsheets.

Mix and match

This mixed environment would also allow for low-cost incremental growth of the network, as users could mix and match processor types and sizes. This ability would allow firms to tailor their networks to address specific functions and applications. Everything from micros to supercomputers could be added as needed.

For instance, array processors could off-load many of the iterative, numeric processing tasks now inefficiently done by more general-purpose systems in large companies.

Unix has always been adept at iterative numeric processing — just the kind of tasks that would be off-loaded onto the Unix-based background servers.

Moreover, dynamic load balancing, now only a pipedream for many MIS and DP managers, could become a reality. Excess processing tasks could be shifted from one system to another on the network not working at full capacity.

Finally, because Unix is inherently multiuser, corporations would be able to save on hardware costs. Companies would not be forced to purchase a new PC for each additional user as the network grows; casual users could easily be accommodated on the network by adding a much less expensive new terminal. The DOS-based networks, on the other hand, simply are not capable of providing these features and, likely, never will be.

In general, a multiuser Unix system is recommended when a centralized, shared data base is at the core of the applications. Accounting, order entry and inventory systems are examples.

Additionally, despite decreasing hardware costs for both PCs and multiuser systems, multiuser systems continue to hold a price advantage over PCs when adding incremental users. If cost is critical, multiuser systems are generally recommended.

Finally, something must be said to dispel the myths surrounding Unix applications software. The availability of Unix applications software is no longer an issue — but availability of PC-based software for shared network environments is

AT&T currently lists 500 packages in its 3B2 software catalog. It has pledged to raise that to 1,200 to 1,500. There are, however, no official counts of software capable of operating in a shared mode across a PC network, although one Infocorp analyst recently suggested there were no more than 25 or so programs available. Of that, only one was an accounting program.

PCs, of course, remain the recommended and preferred solution in most corporate environments, especially when the applications require that computing power be dedicated to one user (such as in the case of large spreadsheets and financial analysis or heavy work processing).

Those who think that Unix needs to capture the desktop of commercial users from DOS to succeed are wrong. Unix, although not the favored operating system for desktop business applications in the Fortune 1000, has much to offer the commercial user. Networking and distributed files systems and data bases are just a few examples.

Unix's dynamic networking capability alone will encourage some commercial computing sites to use Unix-based systems to make up a back-end communications network. Unix will succeed in commercial computing, albeit not in the highly visible way its earliest advocates had assumed. ■

Krieger is president of Unipress Software, Inc., an Edison, N.J.-based publisher of Unix software.

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UNITECH

CIRCLE READER SERVICE NUMBER 270

UNIX PRODUCTS

HP RISC-Based Technical Series Bows

PALO ALTO, Calif. — Hewlett-Packard Co. has introduced its first Unix-based technical computer system using the company's Precision Architecture, which is based on reduced instruction set computing (RISC) principles.

The HP 9000 Series 800 Model 840 machine uses the company's HP-UX Unix operating system, a 4.5 million instruction per second processor, up to 24M bytes of main memory and, the company claimed, up to twice the system throughput of the Model 550, the Model 840's predecessor. Bundled into the 840 is HP's Allbase/HP-UX data base management system, which is based on IBM's SQL.

The HP 9000 Series 800 Model 840 is priced at $113,500 and includes the system processor, floating-point coprocessor, 8M bytes of main memory, cabinet, power supply, central I/O channel, access port card set with six-channel multiplexer, HP-IB disk interface and a 16-user HP-UX with a C compiler, symbolic debugger, assembler, device I/O library, real-time package and Port/HP-UX for porting Hewlett-Packard's Real-Time Executive applications.

HP also announced that it is offering Logisticon, Inc.'s Dispatcher system for materials management applications; and the Minx Information System, a financial and manufacturing applications system from Minx Software, Inc., for the HP Model 840.

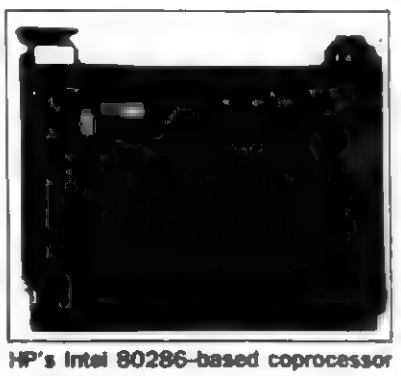
Dispatcher starts at $100,000, and the Minx system is priced at $25,000 for a four-user system.

In a separate announcement, HP introduced an 80286-based coprocessor interface card that provides IBM Personal Computer AT/Microsoft Corp. MS-DOS software compatibility to Hewlett-Packard's 9000 Series 300 technical workstation.

The 300 MS-DOS coprocessor package contains an Intel Corp. 80286 coprocessor direct I/O card (with a socket for the Intel 80287 coprocessor) and associated emulation software.

Hewlett-Packard said the coprocessor system requires either an HP-UX 5.1 application execution environment or the HP-UX programming environment and 2M bytes of total system random-access memory (RAM).

Special features include operation of MS-DOS as a task in the multiwindowing HP-UX environment; ASCII file transfer capability among HP-UX, MS-DOS and the Basic or Pascal operating systems; multiple personal computer-supported display adapter emulation; and software emulation of the Lotus/Intel/Microsoft Expanded Memory Specification, the vendor said.



HP's Intel 80286-based coprocessor interface card

The HP Series 300 MS-DOS coprocessor card costs $950. Also available is an HP Series 300 DOS/Memory enhancement kit (including 1M byte of RAM and the coprocessor system) for $2,195.

For further information, contact Hewlett-Packard Co., 3000 Hanover St., Palo Alto, Calif. 94303.

Circle Reader Service Number 259

Samna Unwraps Two WP Packages

ATLANTA — Samna Corp. has introduced Write Power 1 and Write Power 2, two software products resulting from a joint development effort with AT&T.

Samna said that Write Power 1 offers all the basics of word processing — such as underline, bold, justify, copy and so on — as well as features such as IBM Data Interchange Format and Document Content Architecture and ASCII. It also includes file transfer, mail merge, a pop-up telephone message window and the ability to use AT&T's Model 7500S Electronic Typewriter as an I/O device.

Write Power 2 contains the above features plus an integrated spreadsheet and Samna's Wordbase Manager, a facility enabling users to search through files on a disk to locate any word or group of words.

Both products also work with Microsoft Corp.'s MS-DOS operating system. Write Power 1 costs $495; Write Power 2 costs $745.

Two new versions of Samna+

Samna also announced two new versions of its Samna+ office automation software program, one for the AT&T Unix PC and the other for the IBM RT Personal Computer.

According to the company, the Unix version of Samna+ offers the following features: the ability for users to access Unix functions without closing the document on which they are working; the execution of shell commands without requiring users to first close the documents on which they are working; a terminal emulation program allowing personal computers such as the IBM Personal Computer and the AT&T PC 6300 to emulate terminals; support for windowing; and support for several types of printers.

The RT PC version of Samna+ supports workstations with a maximum of eight users and runs on IBM's Unix-based AIX operating system.

Samna+ for the Unix PC is priced at $745. The RT PC version is marketed and sold by IBM.

For further information, contact Samna Corp., 2700 N.E. Expwy., Atlanta, Ga. 30345.

Circle Reader Service Number 261

Plexus Offers 32-Bit, Entry-Level P/55 Machine

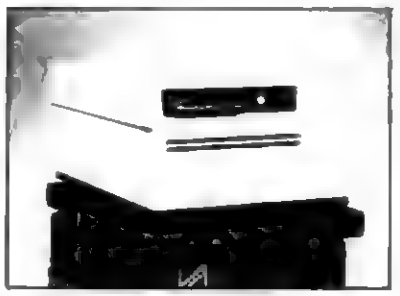
SAN JOSE, Calif. — Plexus Computers, Inc. has unveiled the P/55, a Unix-based computer system supporting up to 32 users.

The company called the P/55 an entry-level, 32-bit system, built around the Motorola, Inc. 68020 microprocessor and Plexus' Advanced Communications Processor (ACP).

In its basic configuration, the P/55 supports 16 users, 1M byte of main memory, a 72M-byte disk drive and a 60M-byte cartridge tape for backup. The maximum configuration includes an optional Motorola 68881 floating-point math coprocessor, two ACPs, 8M bytes of main memory, up to 435M bytes of high-speed disk storage with the addition of an optional storage expansion module and a 60M-byte cartridge backup tape, according to the vendor.

Plexus claimed its system flexibility allows an entry-level P/55 with 16 users and 72M bytes of disk storage to be field-upgraded to 32 users and 435M bytes of disk storage.

For further expansion, the company said multiple P/55s can be linked in a local-area network by adding an optional intelligent Ethernet controller and Plexus Network Operating System.



The Plexus Unix-based P/55

Plexus also announced Multiplex, a networking software package that links such IBM Personal Computer programs as Lotus Development Corp. 1-2-3 and Symphony and Ashton-Tate's Dbase II and Dbase III to Unix operating system data bases.

Plexus said Multiplex requires little retraining for most PC users, with Help menus provided, enabling users to string together frequently used commands that can then be executed with a single keystroke.

The product uses asynchronous telecommunications; Plexus computers and PCs are linked through RS-232 serial ports.

Pricing for Multiplex starts at $1,100, the vendor said.

The P/55 costs $25,250 in its base configuration, and prices for the storage expansion module begin at $11,000 for the cabinet and one disk.

For further information, contact Plexus Computers, Inc., 3833 N. First St., San Jose, Calif. 95134.

Circle Reader Service Number 260

Compaq PCs Get Multiuser Operating System

HOUSTON — Compaq Computer Corp. has introduced Xenix System V/286, a multiuser, multitasking operating system for the company's Deskpro 286 and Portable 286 personal computers.

The vendor said the Xenix System V/286 consists of three distinct modules.

The Base Operating System module contains the Microsoft Corp. Xenix kernel and standard utilities, including those to access Microsoft MS-DOS formatted disks.

The Software Development System module is said to contain a C compiler, a linker, a macro assembler, a source code control system and other software development utilities, including those for developing MS-DOS-based applications.

The Text Processing System module includes text formatters, macro packages and other document and word processing utilities, including spelling and grammar checkers, a typesetting program and a mathematical formula preprocessor.

Xenix System V/286 requires a minimum hardware configuration of a 20M-byte fixed disk drive, 512K bytes of random-access memory (RAM) and a 1.2M-byte floppy disk drive.

Using Compaq computers, the company said that three users may be logged onto the system at the same time, and more users can be added with the installation of a third-party multiport board.

Uses protected mode of 80286

According to Compaq, the System V/286 takes advantage of the protected mode of the 80286 microprocessor, providing memory management and protecting multiuser programs from accidental interaction, allowing the user to address the full 8.1M bytes of RAM available in the Deskpro 286 and 2.6M bytes in the Portable 286.

Compaq also claimed that the System V/286 offered some advantages over previously released versions of Xenix System III and Unix, including increased printer support in multiple configurations; easy transfer of files between MS-DOS and Xenix on fixed disks; and increased number of programmable keys.

The company added that System V/286 also allows the end user to install third-party device drivers without requiring the use of the software development package.

Finally, Compaq said that the product supports a range of third-party peripheral devices, including the IBM Enhanced Graphics Adapter and Display and the IBM Color/Graphics Adapter and Display.

Both the Base Operating System and the Software Development System have a suggested retail price of $599 each, while the Text Processing System has a suggested retail price of $199.

For additional information, contact Compaq Computer Corp., 20555 FM149, Houston, Texas 77070.

Circle Reader Service Number 262

UNIX PRODUCTS

Harris Unix Line Debuts

FT. LAUDERDALE, Fla. — Harris Corp. has introduced four new Unix-based supermicrocomputers and superminicomputers aimed at challenging Digital Equipment Corp.'s low-end and middle-range VAX product lines.

Both the Harris MCX-3 and MCX-5 series machines use the Motorola, Inc. 68020 microprocessor and are geared toward the computer-aided design and engineering markets. The MCX line includes the single-processor MCX-3 Model 40, the single- or dual-processor MCX-3 Model 60, the single- or dual-CPU MCX-5 Model 60 and the two- to four-CPU MCX-5 Model 70. Harris claimed the machines provided 1.5 million instructions per second (MIPS) for the basic CPU and 3.6 MIPS for each CPU with a floating-point accelerator.

The basic MCX processor is the pedestal-style MCX-3 Model 40, which contains two printed-circuit boards with a 16.7-MHz 68020 and room for a Motorola, Inc. 68881 floating-point processor. The processor also offers an 8K-byte cache memory, a 12M byte/sec. memory bus, up to 10M bytes of main memory and supports up to 12 users. The Model 40 costs $18,700.

The cabinet version MCX-5 Model 70 provides up to four processors and supports up to 64 users in high-performance applications such as real-time simulation, according to Harris. The Model 70 supports 4G bytes of virtual address space per process, 128M bytes of physical address space and 32M bytes of random-access memory. The system costs $73,000.

For further information, contact Harris Corp., 2101 W. Cyprus Creek Road, Ft. Lauderdale, Fla. 33309.

Circle Reader Service Number 263

Unipress Offers Shell Script Compiler

EDISON, N.J. — Unipress Software, Inc. has introduced Unishell, a Bourne shell script compiler.

The company explained that because shell scripts are simple to create, many Unix users write shell scripts rather than design and code programs in C or another language. This interpreting of shell scripts, rather than compiling them once, requires many more CPU cycles, the company claimed.

Unipress said that Unishell takes the shell script and translates it into the C language, compiles it using the system C compiler and then produces an executable program.

Unipress also claimed that Unishell programs run faster than shell scripts. The company said Unishell is available for a range of systems and costs $395 for micros, $695 for workstations, $995 for Digital Equipment Corp. VAX-11/750s or 780s and $2,500 for supermini[illegible].

Source code is available for any size machine for $4,995.

For further information, contact Unipress Software, Inc., 2025 Lincoln Highway, Edison, N.J. 08817.

Circle Reader Service Number 264

Motorola's Series

SCHAUMBERG, Ill. — Motorola, Inc. has introduced the System 8000 and Vision/32 line of supermicros using its MC68020 32-bit microprocessor, VMEbus architecture and the company's System V/68 operating system, which is based on AT&T's Unix System V.

Motorola said the System 8000 comes in two models, the Model 200, which can support up to eight users, and the Model 400, which can support up to 32 users. Both systems can be configured with up to two 70M-byte Winchester disk drives, a 60M-byte streaming tape drive and controller, various speed impact and nonimpact printers and Motorola's Business Assistant Office Information Services software programs.



One of the newly announced Motorola System 8000 supermicrocomputers

The Model 400 is priced beginning at $22,335. The Model 200 is priced beginning at $15,690.

Motorola said its Vision/32 system is a low-end, on-line transaction processing product supporting one to eight users and comes bundled with Vision, the company's application development, data base and communications software. A minimum system configuration includes an expandable VMEbus chassis, a 16.67-MHz CPU, 2M bytes of random-access memory, a Winchester diskette controller, 67M-byte Winchester disk drive and streaming tape controller and drive. The system price begins at $17,195. For further information, contact Motorola Computer Systems, Inc., 10700 N. De Anza Boulevard, Cupertino, Calif. 95014.

Circle Reader Service Number 265

UNIX PRODUCTS

IBM PC ATs Get Unix Version

APTOS, Calif. — Microport Systems, Inc. has introduced the System V/AT, the company's Unix operating system for IBM Personal Computer ATs.

Microport described the System V/AT as a full adaptation of AT&T's Unix System V.2, Version 1. It contains the following features: a virtual screen windowing system; dynamic disk buffer allocation for random-access memory disk performance; a file system hardening feature, which the company said reduces the chance of data loss during a power failure; and several University of California at Berkeley Unix programs.

Microport claimed that because the System V/AT contains all of the advanced features present in AT&T's System V.2 and is binary compatible with the AT&T PC 6300 Plus Unix operating system, it will allow Microport to upgrade, "virtually overnight," to AT&T's Unix System V.3 versions for Intel Corp. 80286 and 80386-based machines.

System V/AT is available in three packages: the Runtime System, priced at $159; the Software Development System, priced at $169; and the Text Processing System, priced at $169. A single package of all three systems is available for $439.

For further information, contact Microport Systems, Inc., 10096 Soquel Drive, Aptos, Calif. 95003.

Circle Reader Service Number 266



Alcyon's Model 80-MP multiprocessor Unix system, shown in tower chassis

Alcyon Announces 10 Unix Systems

SAN DIEGO — Alcyon Corp. has introduced 10 single and multiprocessor, Motorola, Inc. VMEbus-based Unix systems.

The product line consists of the company's A68VME single-board VMEbus computers supporting one to 16 users and offering 10M to 40M bytes of hard-disk storage. Alcyon said the 10 systems are made up of five models, each model available in single or multiprocessor configurations. Alcyon's Regulus Unix operating system runs on the single-processor systems, and the company's Psos operating system kernel runs on the multiprocessor systems, which Alcyon claimed speeded up context switching time to 120 microseconds.

The company said its systems are geared toward such real-time applications as robotics, real-time data acquisition and control, medical/laboratory instrumentation, communications, computer-aided publishing and graphics.

Prices for the 10 systems range from $7,490 to $49,990. For further information, contact Alcyon Corp., 5010 Shoreham Place, San Diego, Calif. 92122.

Circle Reader Service Number 267

MMB Tool Introduced

ROLLING HILLS ESTATES, Calif. — Teamate, a software tool that enables Unix users to develop, organize, share and file data in a multiuser environment, has been introduced by MMB Development Corp.

MMB said that Teamate is available for multiuser computers, such as IBM Personal Computer ATs and Altos Computer Systems, Inc. machines running the Microsoft Corp. Xenix operating system.

The company claimed Teamate is an integrated system that can support any Xenix editor or word processor and data base management software while also supporting any terminals that can be hard-wired or linked by phone lines to the host processor.

Teamate's features

Features MMB listed for Teamate include multiuser outline mode; dynamic data base entry and reorganization; any type of binary data handled as entry attachments, including graphics, Ashton-Tate's Dbase and Lotus Development Corp. 1-2-3 data; computer conferencing; a full on-line Help facility; direct interface to any Unix file; and integrated backup and recovery. MMB added that Teamate users can utilize any name up to 72 characters in length to describe the contents of their files.

Teamate costs $3,990 for the Altos 2086 system and $1,995 for the IBM PC AT. A separate IBM PC AT Teamate Upgrade Kit (which includes Santa Cruz Operation, Xenix System V, Relational Data Base Systems, Inc. Informix, Santa Cruz's Lyrix word processing system, memory expanded to 2M bytes and four serial port expansion) is also available for $4,500.

For further information, contact MMB Development Corp., 753 Deep Valley Drive, Rolling Hills Estates, Calif. 90274.

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CIRCLE READER SERVICE NUMBER 277

UNIX PRODUCTS

Venturcom Software Creation Environment Targets Unix V.3

CAMBRIDGE, Mass. — Venturcom, Inc. has introduced for the AT&T Unix System V.3 a version of its Prelude Information Management System, an environment for creating software for specific, data-intensive applications.

Venturcom said that the modular structure of Prelude allows the product to take full advantage of the Remote File Sharing (RFS) and Streams connectivity features in System V.3 and allows it to overcome the physical boundaries between machines. The company said that Prelude provides several tools for developers to create applications.

At its most basic level, Prelude reportedly uses all the features of the Unix command interpreter, known as the shell, while also providing menu programs that organize options for the end user.

Quickly builds customized screens

According to Venturcom, the Prelude system's forms entry program quickly builds customized screens for applications in which data entry fields are embedded or extensive validation is required.

Lastly, Prelude's programmable information component allows application developers to give context-sensitive help on specific applications, the vendor claimed.

The company said that Prelude's architecture allows users to gain access to shared files, within security restraints, from an IBM Personal Computer disk drive, a file server or a minicomputer tape drive.

Prelude [illegible] Personal Computers and compatibles running under Venturcom's Venix operating system, Digital Equipment Corp.'s VAX computers and AT&T's 3B computers running AT&T Unix System V, Venturcom said.

Prelude's communications facilities work with AT&T's Starlan or Ethernet cabling and Excelan, Inc. networking cards.

Pricing for Prelude is based on hardware configurations and number of users.

A [illegible] for IBM PC XTs costs $1,800.

A configuration of 16 PC XTs linked with a DEC VAX supporting another 16 terminals is priced at $57,600, the vendor said.

For further information, contact Venturcom, Inc., 215 First St., Cambridge, Mass. 02142.

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Sybase Releases Relational DBMS

BERKELEY, Calif. — Sybase, Inc. has announced a relational data base management system providing networking architecture.

The product consists of two components: the Dataserver, a relational DBMS that runs on supermicros and minicomputers providing data simultaneously to a variety of computers; and the Data Workbench, a visual interface that Sybase said requires no programming for doing queries, reports, applications and data base design. The Data Workbench runs on hosts ranging from personal computers and bit-map workstations to minis.

Sybase claimed the Dataserver can support more than 100 users accessing multigigabyte data bases and still provide a subsecond response time. Users can continue to utilize the data base during backup or schema changes, and the Dataserver can be used during recovery of one or more data bases, the company said.

Sybase said the Data Workbench contains the Visually Oriented Query Language, allowing users to construct SQL statements using menus and icons. The Data Workbench also contains the Report Writer for defining reports and the Application Writer, a visual tool for specifying data entry forms, designing menus and defining pre- or postprocessing for fields and forms. The product uses icons and windows and is compatible with both bit-map and character terminals.

Sybase claimed its products have solved the problems of distributing applications, maintaining centralized control and updating multiple data bases that are involved in networking relational DBMS. These problems are overcome, the company claimed, by storing the application in the data base, providing integrity in the Dataserver rather than in the Data Workbench and by providing a distributed transaction system.

The first release of the Dataserver is on Sun Microsystems, Inc.'s Sun-3 workstations running under University of California at Berkeley Version 4.2 of Unix. The Data Workbench will be available on bit-map and Digital Equipment Corp. VT100-compatible terminals. The Dataserver costs $18,000 to $90,000, depending on the size of the CPU. The Data Workbench costs $1,000 to $30,000 depending on the hardware selected.

Contact Sybase, Inc., Suite 110, 2910 Seventh St., Berkeley, Calif. 94710.

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UNIX PRODUCTS

Sun Tools Out

MOUNTAIN VIEW, Calif. — Two new products that provide compatibility with the IBM Personal Computer AT and allow Microsoft Corp. MS-DOS applications to run in a window under Unix have been introduced by Sun Microsystems, Inc.

The Sun Integrated Personal Computer (SunIPC) is a 10-MHz Intel Corp. 80286 coprocessor board for Sun workstations, and the PC-NFS is software for IBM Personal Computers and compatibles that the company said allows them to access files transparently and network peripherals through the Sun Network File System (NFS) on an Ethernet network.

The SunIPC board has 1M byte of memory and supports the Lotus/Intel/Microsoft Expanded Memory Specification, enabling PC applications running on a Sun workstation to access up to 4M bytes of memory. The SunIPC is a Motorola, Inc. VMEbus board that executes color or monochrome applications written for MS-DOS requiring either the IBM AT color graphics adapter or the Hercules Computer Technology, Inc. monochrome adapter.

The company said its SunIPC carries one parallel port and allows the use of two workstation ports as standard serial ports. An optional 8-MHz Intel 80287 math coprocessor as well as external 1.2M-byte and 360K-byte floppy disk drives for MS-DOS software access and transport are also available.

SunIPC includes MS-DOS 3.1, Microsoft's GW Basic, transparent file sharing software for NFS and utilities to convert ASCII files between MS-DOS and the Sun operating system.

PC-NFS is a client version of NFS that runs on IBM PCs and compatibles. The company claimed that by using a PC or compatible with as little as 512K bytes of main memory and one floppy disk drive a user can enter standard DOS commands to access files from any other computer on the network including workstations, minicomputers and even supercomputers.

The PC-NFS software automatically converts local MS-DOS file names to network-compatible NFS path names. Although other network users cannot directly access files residing on the PC, Sun said the micro user of PC-NFS can transparently save local files on a network server where other users can also share them.

Offers printer spooler to Sun units

The company added that in addition to transparent file sharing, PC-NFS offers printer spooling to Sun Laserwriters on the network.

According to Sun, PC-NFS prices vary for different unit volumes and product configuration. In quantities of 100, the PC-NFS software with documentation sells for $305 per unit or $255 per unit for the software alone. When bundled with an Ethernet interface and documentation, the per-unit price of PC-NFS for quantities of 100 is $955.

The SunIPC board is $1,995 in single quantities, and the accompanying software is $395 for the single-user version. The multiaccess version is $995.

For further information, contact Sun Microsystems, Inc., 2550 Garcia Ave., Mountain View, Calif. 94043.

Circle Reader Service Number 271

Implementation of Information Builders' Focus 4GL/DBMS To Run Under Unix On AT&T 3B Machines

NEW ORLEANS — Information Builders, Inc. has introduced an implementation of its mainframe Focus fourth-generation language and data base management system to run under the Unix operating system on AT&T's family of 3B computers.

The company said its Unix Focus contains features such as a dialogue manager for generating user-driven, interactive procedures. The products also contains a maintenance facility to collect, validate and monitor data for multiple file processing.

Additional features include a screen manager for development of CRT screens for data entry/display; a full screen editor for the creation of Information Builder's Focus procedures and test files; data base management, whereby transaction processing is done through English statements; and reports and ad hoc request generation.

AI features help productivity

Artificial intelligence-based facilities allow new users to become productive quickly. According to the company, the product also features bidirectional transfer of data and source files between a Unix computer and an IBM mainframe through either an asynchronous connection or an IBM 3270 emulator card provided by AT&T.

Unix Focus is priced from $2,895 for the low-end AT&T 3B2/300 and $44,000 for the AT&T 3B20 computer, the vendor said.

For additional information, contact Information Builders, Inc., 1250 Broadway, New York, N.Y. 10001.

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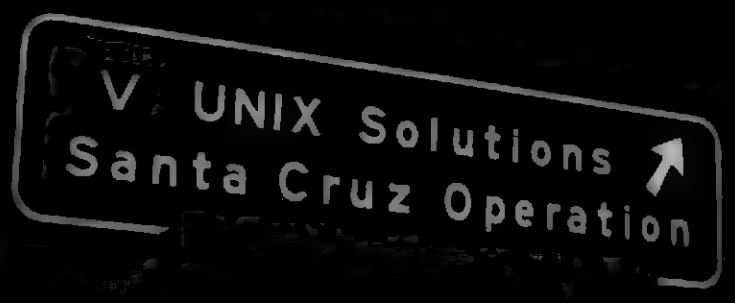
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TOP OF THE NEWS

Corvus Systems takes lead in the 80386-system race, shipping a workstation and file servers. **Page 5.**

■

Cullinet delivers first losing quarter, but CEO David Chapman sees brighter days ahead. **Page 110.**

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Wide spectrum of opposition builds against proposals aimed at discouraging private-line use by large firms. **Page 8.**

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Ryan-McFarland wins Cobol 85 certification. **Page 4.**

■

Tandem user benchmarks VLX processor claims. **Page 39.**

■

Despite predictions that Compaq would introduce a laptop unit featuring a gas plasma display by the end of the year, the largest seller of portable computers officially has no plans to enter the laptop market. Chief Financial Officer John Gribi told securities analysts last week, "You just can't deliver everything you want in a personal computer in a laptop. As the technology evolves, someday there may be a Compaq that works like a laptop, even though it doesn't look like one."

■

AT&T this week is scheduled to unveil the first members of a family of computer and networking products tailored for industrial settings. AT&T has modified its Personal Computer 6300 and PC 6300 Plus with special fans, filters and housings to fit the rugged conditions of the industrial workplace.

■

Originally slated for mid-1987 delivery, the first configuration of IBM's most powerful 3090 mainframe was shipped from the company's Kingston, N.Y., manufacturing facility last week. The first 3090 Model 400 quadratic processor upgrade package will be installed at the Green Bay, Wis., market research firm, A. C. Nielsen Co. Officials at A. C. Nielsen said they hope to complete the process of

See **NEWS** page 5

Millennium to back DB2

M&D relational backing includes IDMS/R tools

By Maura McEnaney

RENO, Nev. — Applications vendor McCormack & Dodge Corp. last week joined the growing parade of systems software houses that have endorsed IBM's emerging relational data base standard, DB2.

M&D used its ninth annual users group meeting in Reno to announce the release of Millennium:SDT DB2, a version of its systems development tool designed to support DB2 on IBM 370, 4300 and 3000 series mainframes running MVS.

Before 1,750 attendees, the company also announced the first in a series of products it says will work with Cullinet Software, Inc.'s IDMS/R, a major competi-

See **MILLENNIUM** page 12

Protection axed on Dbase, others

By Douglas Barney

NEW YORK — Ashton-Tate, the last of the three largest microcomputer software firms to address corporate purchasing and support concerns, last week announced a program that left many corporate users critical.

The Ashton-Tate program announced here last week removes copy protection from all company products but does not provide lower prices or limited liability for the illegal copying of software — two chief concerns of Ashton-Tate users.

"The high price of Dbase precludes us from doing anything significant with that

See **PROTECTION** page 6

User buying unaffected by tax reform

By Clinton Wilder and Mitch Betts

The tax reform compromise that the U.S. Congress seems certain to approve in early fall is unlikely to spur more computer purchases by U.S. businesses, according to interviews last week with computer users, vendors and analysts.

The proposed legislation approved by congressional negotiators is expected, however, to reduce taxes for some members of the computer industry, particularly software vendors.

IBM and other vendors have placed part of the blame for the industry slump on customers waiting for the outcome of the tax reform effort before buying. Now that the end of the two-year tax debate is in sight, user corporations said the positive effect of more tax certainty is offset by the loss of the 10% investment tax credit used by large computer buyers.

Resolution won't boost purchases

"The vendors are whistling in the wind if they think that getting the issue resolved will spur new purchases," said Glenn W. White, director of the tax department at Dow Chemical Co. in Midland, Mich. "We have known from the outset that the investment tax credit is dead, so it hasn't played a big part in our recent decisions. Now everything will cost roughly 10% more."

"Tax reform won't cause either a slump or an industry increase," added Dan Cavanagh, senior vice-president of data processing at New York-based Metropolitan Life Insurance Co.

"We've assumed the loss of investment tax credit since September 1985. It won't cause a 'no go' on major projects, although it might impact a marginal one," he said.

See **BILL** page 10

CW SPECIAL REPORT

Beta sites: Pioneer users take risks to grab technical edge

By Alan Alper

In an age when U.S. business is more information dependent than ever, many firms seek a strategic advantage over competitors by volunteering to become beta-test sites for new computer products.

For financial service companies especially, beta testing new hardware and software is inextricably tied to the corporate mission. "At certain companies, there is a policy to be on the leading edge of technology. It's part of the corporate culture," notes Gary Venner, director of research programs at the Diebold Group in New York.

But being a beta-test site is not for the faint of heart, according to several leading MIS managers. The experience can be fraught with problems, especially when firms are testing products that have not been adequately alpha-tested.

In many cases, documentation of beta-test versions of software is technically inadequate, making diagnosis of program failures a trying experience. "Beta testing is not for the unsophisticated," warns Larry Stouder, data center manager for Continental Grain Co. in New York. "It's for the power user who has an experienced staff."



Gillette's Moody

Kavin Moody, director of MIS at Gillette Corp. in Boston, agrees. "You can't go into it without expecting to have to shake down problems," he says. "You usually get good support of the developer or the beta team, but often a feature doesn't work or bugs develop."

Despite the problems, many companies are desperately eager to participate with vendors in a beta test.

When Gillette heard 18 months ago about a powerful office automation and communications software package that Digital Equipment Corp. had under development for its Rainbow microcomputer, the company knew it had to become a beta-test site. "We begged them," Moody recalls. "They

See **BETA** page 15

Home-based workers watch as exploitation debate flares

By Mitch Betts

WASHINGTON, D.C. — An estimated 300 U.S. corporations employ data entry and word processing clerks who work at home, but a national debate has erupted over whether those home-based workers are exploited and whether the practice should be banned by the government.

Unions say businesses can easily exploit home-based workers, turning telecommuting into an electronic sweatshop that should be banned. The U.S. Department of Labor, however, last week proposed to repeal the existing ban on homework in six garment industries, a move that observers said makes it highly unlikely that a ban on home-based computer workers will be added.

"The Labor Department move on garment workers is a tremendous symbolic action for telecommuters in the data processing field and elsewhere," commented Gil E. Gordon, a Monmouth Junction, N.J.-based consultant on corporate telecommuting.

Nevertheless, the department's proposal has renewed the debate over whether businesses exploit home-based workers, and Congress is putting pressure on federal agencies to increase enforcement of existing laws that protect home workers.

Firm statistics are not available, but Gordon estimates there are roughly 300 U.S. corporations with telecommuting programs, and Congress' Office of Technology Assessment estimates there are 3,000 to 5,000 home workers using computers for outside employers or clients.

J. C. Penney Co., for example, since 1981 has run an experimental program with 20 telephone sales associates who work at home with terminals to take incoming catalog orders and transmit them to IBM hosts.

Reduction in office space

Proponents of telecommuting say it boosts productivity, reduces office space requirements and transportation problems and retains valued employees who stay home to care for children. Carl Kirkpatrick, who manages J. C. Penney's telecommuting program from the Milwaukee office, said his firm has very good relations with its home workers because it treats them like office employees.

"There's only one way to go, and that's to treat them like any other associate in our telephone sales centers. They don't pay for any equipment, they are paid the same salary, they have the same benefits and vacations," he said.

Paul Edwards, cofounder of the Association of Electronic Cottagers in South Pasadena, Calif., said exploitation is very rare. He added that the vast majority of home workers like their working conditions and that union attempts to ban telecommuting would "throw the baby out with the bathwater."

In a 1983 resolution, the AFL-CIO called for a ban on computer homework on grounds that employers may deny home workers fringe benefits and minimum wages and pay piece rates rather than salaries. The dispersed nature of homework means that federal and state officials cannot protect workers from unfair labor practices, the union warned.

Dennis Chamot, associate director of the AFL-CIO's professional employees department, said that the ban against homework in the garment industries was instituted 44 years ago because of horrendous sweatshop conditions and that the union is concerned that such conditions could occur in the 1980s as well.

"If we're seeing these problems with the very tiny numbers that are involved in computer homework today, then surely the potential for more serious problems grows year by year," Chamot warned. "With no regulation at all, the marketplace sometimes tends to drift to the lowest level," he said.

A ban on computer home workers would cover only low-level employees, because administrative, managerial and professional employees, such as computer programmers, are not covered by the Fair Labor Standards Act, Chamot noted.

Critics point to the case of Cal-Western Insurance Co. in Sacramento, Calif., reported by Gordon's "Telecommuting Review" newsletter. Eight claims processors who worked at home as "independent contractors" for Cal-Western sued the firm early this year for back benefits and punitive damages.

The workers charged that the firm controlled their work as though they were actual employees but improperly classified them as independent contractors to avoid paying fringe benefits. The firm is contesting the suit and maintains the telecommuters were treated as independent contractors.

Proper classification important

Gordon, the telecommuting consultant, said the Cal-Western suit has opened employers' eyes to the importance of properly classifying home workers. "In my mind, there is no good reason for employers to cut corners on pay and benefits. There are enough built-in financial benefits to telecommuting, when it's done right, that it's approaching greed to cut back benefits when they really shouldn't," he said.

The importance of the distinction between employee status and contractor status was underscored by a recent report on home-based clerical workers by the U.S. House of Representatives' Committee on Government Operations. Independent contractors do not get health, pension, worker's compensation or unemployment insurance benefits, giving employers a financial incentive to misclassify home workers, the report notes.

The committee urged the Labor Department and the Internal Revenue Service to vigorously enforce existing laws to ensure that home workers are properly classified and to agree on standard definitions of employees and contractors to remove loopholes.

To further study the employee/contractor issue, the IRS this fall plans to survey the 1984 employment tax returns of 3,500 employers to measure the extent of misclassification, Gordon said.

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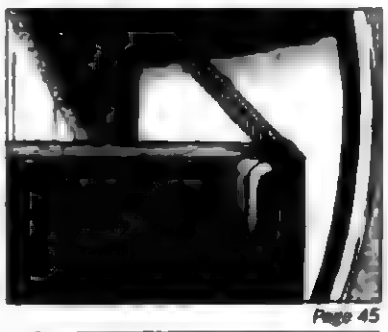
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Compiler clears agency's Cobol 85 check

Users split on value of GSA certification

By Jeffry Beeler

ROLLING HILLS ESTATES, Calif. — The General Services Administration (GSA) last week certified a Ryan-McFarland Corp. compiler for compliance with the ANSI 1985 standard for Cobol.

In certification tests run Aug. 21 by the GSA at Ryan-McFarland's Los Angeles area headquarters, the company's Cobol 8X reportedly met all requirements for conformance to the Cobol 85 standard's intermediate level.

The test results came a little more than a month after another compiler supplier, Micro Focus, Inc., demonstrated a similar intermediate-level compliance with the Cobol 85 standard.

Within 3% of high-level qualification

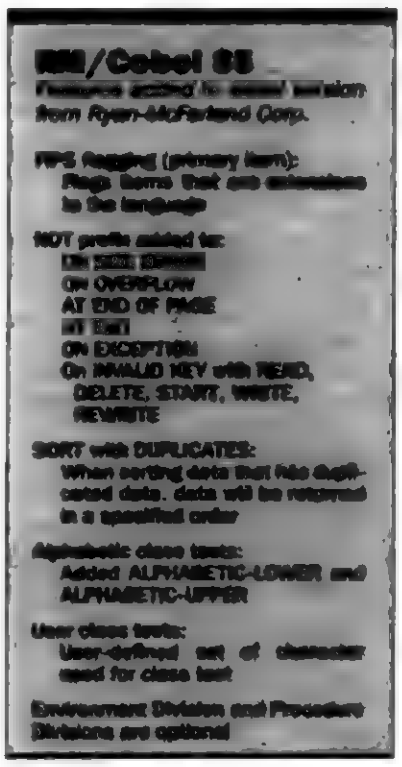
Cobol 8X also tested to within about 3% of qualifying for high-level Cobol 85 certification, but that qualification was not the goal of last week's GSA tests, according to Ryan-McFarland's Marketing Vice-President Charles Runge.

The only portion of the Cobol 85 standard that the compiler has yet to conform to are the features that deal with nested source programs, Runge said.

For users, much of the Cobol 85 standard's appeal can be found in its support of structured programming constructs. Users also cite the standard's ability to accommodate large programs as another appealing feature, according to Runge.

But some see other advantages to the standard as well as to the GSA certification.

"The main significance of certification is that it ensures portability of our product," said Kurt Lawrence, the development director at Curtis Information Systems, Inc., an Atlanta-based supplier of turnkey medical



systems.

Curtis's proprietary software runs on IBM Personal Computers and System/36s.

"What Cobol 8X does for us is to give us a way of keeping our code standard among different operating environments, so we can move readily between boxes as demand changes in the marketplace," Lawrence said. "It's critical for us to be able to do this."

The users' views

Not all users, however, view the Cobol 85 standard as an important consideration.

According to John LaBranche, manager of systems software at Blue Cross/Blue Shield of Florida in Jacksonville, Cobol-8X provides so many benefits over its Ryan-McFarland predecessor, a Cobol 74 compiler, that "whether 8X is certified to the standard or not makes no difference to us."

Compared with the earlier Ryan-McFarland compiler, Cobol 8X reportedly provides up to six times faster sort times. The Cobol 8X is also said to provide 50% faster compilations.

"But from our standpoint, the biggest advantage of 8X is that, when files are converted, data occupies up to 55% less space with the new product than with the old," LaBranche said.

Met most requirements last year

Cobol 8X met most of the requirements of the Cobol 85 standard's intermediate level when the product was announced late last year.

"Our decisions about what features to include in the initial release and what features to leave out were dictated by the input we solicited from a large number of our users," Runge said.

Since then, Ryan-McFarland has reportedly incorporated into Cobol 8X all the intermediate-level features the vendor initially omitted because its users assigned them a low priority.

Bus glitches force DG to drop workstation

By Rosemary Hamilton

WESTBORO, Mass. — Data General Corp. recently canceled plans to market one of the two workstation models it announced late last year, citing development problems primarily with a very high-speed bus.

The DS7700, which had been out at beta sites and missed its April shipment date, was quietly discontinued, and the DS7500 model was repositioned with price cuts, serving as the vendor's primary workstation product.

According to Dave Ellenberger, director of technical products marketing, DS7700 beta users "will be upgraded in a manner worked out between Data General and the customers. Most will likely get DS7500s."

The main snag in the DS7700 development was a new 44M bit/sec. Interprocessor bus. "The problem involved getting it to function properly," he said.

Bus 'was overkill anyway'

Faced with shipment delays, the vendor decided that the bus "was really overkill anyway, and most of our customers didn't require that speed," Ellenberger said.

The DS7500 has a 12.5M bit/sec. bus, which Ellenberger said DG has found to be adequate for its custom-

Meanwhile, the DS7500, which was originally priced at $28,250 for an entry-level monochrome version, now sells for $15,900.

The entry-level color version, which carried an original price tag of $37,050, costs $25,800.

The basic DS7500 comes with 4M bytes of main memory and a 70M-byte disk drive.

The DS7700, which had a planned starting price of $29,000, would have come with 2M bytes of main memory.

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TOP OF THE NEWS

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upgrading their year-old 3090 Model 200 dual processor early next month.

■

Factory-made IBM 3090 Model 400s, rather than Model 200 upgrades, are now scheduled for October shipment. The shipment date already had been advanced twice since the Model 400 was announced in 1985.

■

At least 70 of the 325 attendees at Boston-based Yankee Group's seminar on Digital Equipment Corp. in New York last week were representatives from competing vendors. A list of attendees included 30 people from IBM, five from AT&T, six each from Data General and Honeywell, 15 from Hewlett-Packard and a sprinkling from Wang Laboratories, Prime Computer, Harris and others.

■

National Data Corp. said it is close to reaching an agreement with a buyer of its Rapidata time-sharing division. In May, National Data said it would close down Rapidata if it could not find a buyer.

With the disposition of Rapidata, National Data will leave the time-sharing business and will instead concentrate on credit card services, corporate financial services, health care data services as well as telemarketing. Rapidata had $11 million in revenue in 1986, down from a high of $31 million in 1982.

■

A version of Inset, a $149 memory-resident program that gives word processors graphics capability, will be announced next month by the American Programmers Guild Ltd. of Danbury, Conn.

The program will have full graphics editing capability, variable sizing of graphs and the ability to preview both text and graphics on the same screen, according to Mark Skiba, vice-president of research and development at the firm. Inset is resold by Ashton-Tate for its Multimate word processing software, by Micropro International Corp., Enertronics Research, Inc. and Office Solutions, Inc.

■

IBM last week confirmed it will offer its first C language compiler for the 370. The IBM C Licensed Program Version 1.0 was codeveloped for IBM by Whitesmiths Ltd. of Concord, Mass., and Unisoft, AB, a small software development house in Goteborg, Sweden, during the past year.

IBM C Licensed Program for the 370 provides a C language software environment for host program development under VM/CMS, MVS and MVS/XA. IBM's C language compiler will be compatible with the emerging ANSI standard from the X3J11 Committee, dated April 1985.

IBM C Licensed Program will reportedly provide IMS data base access for MVS/370 and MVS/XA through a DL/I interface, as well as support for CMS data address spaces up to 999M bytes with CMS/Extended Data Array Capability on VM/XA System Facility.

Corvus ships 80386 unit to undefined mart

Price, lack of PC-DOS may slow acceptance

By David Bright

SAN JOSE, Calif. — Corvus Systems, Inc. last week announced that it has begun shipping an IBM Personal Computer AT-compatible system built around Intel Corp. 32-bit 80386 microprocessor.

Corvus' announcement was greeted skeptically by industry observers who said it was overpriced. Corvus also announced 70M-byte and 126M-byte file servers that incorporate the 80386 chip.

Corvus is targeting the systems at software engineering, computer-aided design and manufacturing and networking environments, said George McMurtry, general manager of the distribution division.

However, considering the Series 386's hefty $12,795 price tag and the fact that no IBM PC-DOS operating system is yet capable of taking advantage of the chip's advanced features, analysts expect few users to be seriously interested in buying any of the systems from Corvus.

"Corvus has totally misread the market," said Yankee Group's Michael Goulde, when informed of the workstation's pricing. Goulde said that it would be a "drastic mistake" for Corvus to attempt volume shipments.

"No one is going to buy it," agreed John McCarthy, research manager at Forrester Research, Inc. of Cambridge, Mass. According to McCarthy, Forrester's research indicates that 80386-based systems in general will appeal to only a very small market segment. McCarthy said that only 28% of some 4.8 million IBM Personal Computers installed in the U.S. are AT-class machines and that few AT owners have a need to upgrade to 80386-based systems.

The Corvus file servers, priced at $16,595 for a 70M-byte version and $19,795 for a 126M-byte version, include 60M-byte tape backup drives and Novell, Inc. Netware software.

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American Airlines parent launches information subsidiary

Sabre not included in reservation system

By David A. Ludlum

DALLAS — Joining a trend among sophisticated users of information technology, AMR Corp., parent of American Airlines, has spun off several of its information operations as a profit-driven subsidiary.

The move signals AMR's heightened interest in selling other companies the type of services provided by its highly profitable Sabre airline reservation system, which is credited with giving American Airlines a competitive edge over rival carriers.

However, the recently formed subsidiary, AMR Information Services, Inc. (AMRIS), does not include Sabre, which remains a component of the airline. The subsidiary includes a smaller system for tracking reservations and other information for airlines and three other operations.

AMR has appointed Russell J. Harrison, formerly senior vice-president at Bankamerica Corp., as president of the subsidiary. Max D. Hopper, American Airline's senior vice-president for information systems, is vice-chairman and chief executive of AMRIS.

"My challenge is to develop, or acquire, small companies with good people and good ideas then help them grow into significant profit centers, all without squelching the entrepreneurial spirit that made them interesting in the first place," Harrison said.

Harrison left Bankamerica in May after working on its technology strategy, for a time with Hopper, who went to work for the banking company in 1982 after helping develop Sabre at American in the 1970s.

Hopper left Bankamerica as executive vice-president and the company's top information systems executive last November, citing as reason an offer to return to American Airlines. But reports also linked his departure to the expense and limited success of a major systems development project [CW, Nov. 11].

Before working on technology strategy at Bankamerica, Harrison managed the firm's retail banking systems in California and wholesale systems and other operations in London.

At AMRIS he will oversee four operating units: Airline Automation Systems, which offers information services to airlines; AMR Cable Services, which provides such services to cable television operators; Caribbean Data Services, which does data entry and transmission; and AMR Automation Training, which offers training in automation systems.

Airline system acquisition

AMRIS acquired the airline systems unit through buying Automation, Teleprocessing and Management, Inc. of Austin, Texas, which was in receivership, according to AMR spokesman Joe Stroop. The operation currently has one client, Southwest Airlines of Dallas.

American Airlines' Sabre system provides reservations and other information services to eight other airlines, including one major one, Pan American World Airways. Last year Sabre generated revenue of $300 million and profits of $100 million, according to Stroop.

AMR is keeping Sabre part of American because the services it sells to other airlines share mainframes and data bases with systems that support American. Separating them would be a massive task, according to Stroop.

Last week, AMRIS said it will make more acquisitions. "We like the concept of finding small companies that embody a good idea but are having trouble getting going," Stroop said. AMRIS aims to turn such operations around through AMR's marketing muscle, he said.

In an interview earlier this year, AMR Corp. Chairman Robert Crandall said the company might invest as much as $1 billion in potentially profitable information service ventures [CW, June 9]. One potential venture, according to Crandall and Stroop, is a worldwide airline freight-tracking system.

"Eventually AMR Corp. is going to be as well known for its information services as its airline," Stroop said.

AMR's services subsidiary spin-off follows similar moves by large companies such as Security Pacific Corp., Boeing Co., Grumman Corp. and Weyerhaeuser Co.

Protection axed on Dbase, others

From page 1

product. The price makes you look for alternatives," said Dick LaRue, director of technical development support for the Federal Home Loan Mortgage Corp. (Freddie Mac) in Washington, D.C.

A program announced earlier this month by Lotus Development Corp. offered large corporate users direct sales, removal of copy protection and limited liability but also drew criticism for the lack of lower prices, high volume requirements for direct sales and the removal of copy protection limited to large users.

"In the past year, issues such as copy protection, site licensing, volume purchase agreements, corporate pricing, distribution and the overall need for increased support have become crucial industry concerns," said Ashton-Tate Chairman and Chief Executive Officer Edward J. Esber Jr.

Users welcomed the support programs and the removal of copy protection, but said the firm did not provide answers to demands for site licensing, volume purchases or distribution. Ashton-Tate will not sell large quantities direct to corporations, nor did it provide a method for corporations to save money on large software purchases. Ashton-Tate will, however, sell its service and support programs direct.

One Ashton-Tate official privately claimed that price is not a major issue with large customers, and the firm could not determine a way to reduce the price without losing revenue.

The bulk of Ashton-Tate's program addressed user demands for higher quality support. "The renewed involvement of MIS managers who are cognizant of minicomputer and mainframe software policies and the budgeting for — and control of — personal computers and PC standards in the corporations have created higher expectations [for support]," Esber said.

In addition to free 90-day support, Ashton-Tate will sell a variety of support programs (see related story, this page).

Ashton-Tate offers four-tiered plan

• Ashton-Tate announced an immediate end to copy protection on all of its products, including the removal of protection on the 2-month-old Dbase Mac. Users who purchased Ashton-Tate's Dbase III Plus 1.1, LAN Pack 1.1 or Framework II 1.1 prior to July 8 will pay $40 to upgrade to unprotected versions, and users who purchased these products after this date will receive free upgrades.

Ashton-Tate native-language products sold internationally will remain copy protected.

• A four-tier Custom Support Program will be composed of the following:

Basic Support. A free-of-charge, 90-day basic support program available for every product purchased, including unlimited technical telephone support.

Extended I. For $50 per year, users can make up to 10 technical support calls.

Extended II. For $80 per year, users can make up to 20 support calls.

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Software Care Program. Users have two options. Under the Annual Maintenance Plan, the firm pays one price per product and automatically receives all product upgrades for one year. Quantities of one to 24 cost $675 each, and for more than 100, the cost per package is $200.

Members of Ashton-Tate's Corporate Advisory Board, a group of the firm's largest customers that had a hand in the development of the program, generally applauded the firm's efforts. "We are willing to spend more to get the best product and service," said Kathleen McKinney, manager of applications and integration for Nynex Service Co. in Boston.

Most users agreed that support is worth paying for, but some questioned the level of support Ashton-Tate will provide. "It is worth paying if there is level of quality and the prices seem reasonable. But it remains to be seen just how responsive they will be," LaRue said.

A highlight of the program was the total removal of copy protection from all Ashton-Tate products, including Dbase III Plus, its best selling data base package. The move was a response to user complaints that copy protection made the use of software more difficult. Lotus had announced the removal of copy protection for its largest customers only.

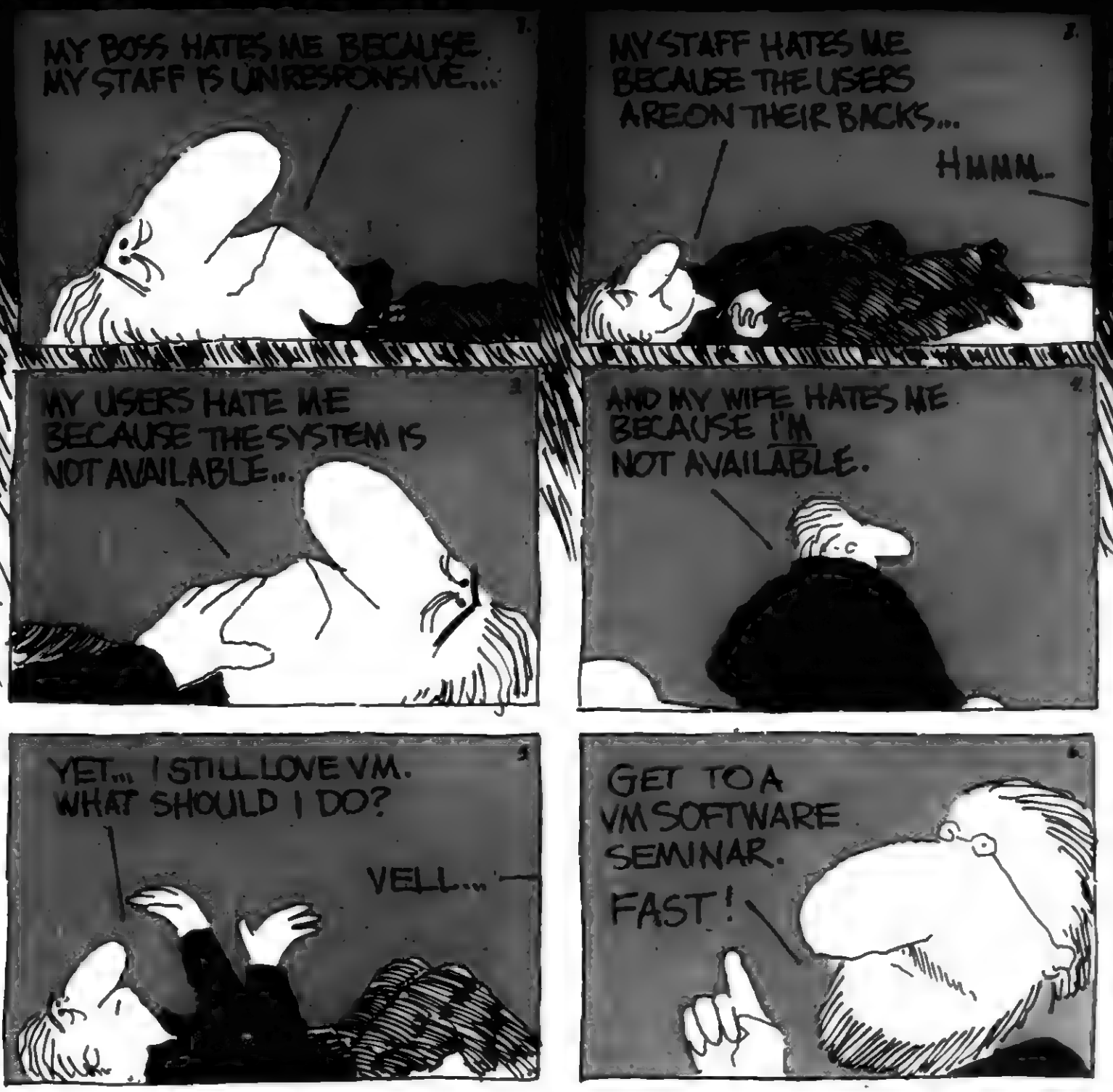
Despite the wholesale removal of copy protection, Ashton-Tate refused to provide limited liability contracts, under which corporations are only liable for the retail price of software illegally copied by employees. The lack of limited liability irked many Ashton-Tate customers.

"In reality I would find it difficult to believe that they would pursue a minor instance of piracy through the courts when they take the chance of incurring the wrath of a large company," said Les Helgeson, senior training specialist at Beatrice Foods Co. in Chicago. "But rather than leave things like that hanging, they should have a limited liability policy," he said.

Other users were less concerned with limited liability. "If you are a corporation that is concerned with piracy, with policies against it that are enforced, and if in spite of that, copies get made, that can be dealt with without a big-splash lawsuit," said Jeff Knepper, director of advanced technology tax for Touche Ross & Co. in Washington, D.C.

Ashton-Tate argued that limited liability could increase software piracy and vowed to continue its aggressive prosecution of pirates. "If they violate the law, we will — under appropriate circumstances — prosecute them to the fullest extent that we can. To some extent, limiting their liability limits their desire to police, and we want their desire to be high," Esber said.

Users' complaints about the lack of lower product pricing indicate that the issue is still very much alive. "Sooner or later someone will ask, 'What about price?' " said Bill Bremer, project manager of group systems for Metropolitan Life Insurance Co. in New York. However, for many users, including Bremer, price is less important than the product quality and support. "I think all major software is overpriced, but that isn't a real big issue with us," Beatrice's Helgeson said.



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12:30 p.m. Complimentary Lunch

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Chicago, IL October 9	**Montreal, PQ** October 30	**St. Louis, MO** October 14
Cincinnati, OH October 10	**New Orleans, LA** October 17	**San Diego, CA** September 29
Cleveland, OH October 7	**New York, NY** October 21	**San Francisco, CA** October 2
Columbus, OH October 6	**Orlando, FL** November 6	**San Jose, CA** October 1
Dallas, TX October 15	**Ottawa, ON** October 29	**Seattle, WA** November 13
Detroit, MI October 8	**Pittsburgh, PA** October 27	**Toronto, ON** October 28
Edmonton, AB November 12	**Research Triangle Park, NC** November 5	**Washington, DC** November 7
Hanover, NJ October 22	**Rochester, NY** October 24	**White Plains, NY** October 20
[illegible], TX October 16		

Private net users fight Nynex tariff proposals

Protest measures' aim to hamper bypassing

By Elisabeth Horwitt

NEW YORK — Private network users and long-distance carriers have united in opposition against two regulatory proposals by Nynex Corp. that are aimed at discouraging large customers from using private lines, the company admitted.

The proposals represent yet another salvo in the divested Bell operating companies' continuing battle to discourage large users from bypassing the public-switched network, observers say.

Both filed in late June, the proposals prompted a spate of objections from user and carrier organizations, the last of which finished filing earlier this month. One is a petition for a waiver that, if granted by the Federal Communications Commission, would allow Nynex's divested Bell operating companies to charge customers directly for long-distance access costs, instead of passing costs on to the long-distance carriers.

The other proposal is a tariff that would restructure telephone rates so that private-line customers would bear the brunt of long-distance access charges.

Under the proposed tariff structure, private network customers would pay monthly access charges of approximately $4.21 per private line. At the same time, the divested telephone companies would offer savings of 11% to 34% over present rates to users with more than 5,000 minutes of long-distance calling per month, thus encouraging large business users to remain on the public-switched net. "Discouraging customers from bypassing the public network is certainly a principal reason why we've filed the tariff," said Nynex Service Co.'s Joseph Gagen.

The tariff would mean long-term benefits to all users, Gagen claimed, "because if we continue to see large-volume users leave the service, it will be more costly in the long run to the remaining customer base, who will have to share the burden of network operating costs."

A sizable industry segment is contesting the fairness and long-term advantages of Nynex's strategy. Among the organizations that have filed objections to Nynex's proposals are MCI Telecommunications Corp., AT&T, U.S. Sprint Communications Co., the New York State Attorney General's Office, the International Communications Association (ICA) and Telecommunications Association (TCA).

User organizations TCA and ICA objected to Nynex's stated purpose of using special access surcharges to try to force them off private lines. "The divested operating companies want to keep users on WATS and other public-switched services through charges that bear no relation to their use of telco facilities," said R. Michael Senkowski, a partner at TCA's general counsel, Wiley, Rein & Fielding.

If Nynex's tariff structure is adopted in some form by the majority of divested Bell operating companies, it will be "plain bad news" to companies that use multidrop private lines to connect sites across the U.S., noted Jeffrey Held, group manager of Fairfax, Va., consulting company Network Strategies, Inc.

One such firm, On-Line Computer Library Center in Columbus, Ohio, uses private lines to connect 80% of its 10,000 customer terminals in the U.S., noted section manager of network administration Brian Cousins.

"We've been hit every month and a half with rate hikes from a different area. We'd like for the FCC to agree to a set national rate that would apply for a year," Cousins said.

The center received close to a 40% increase from Bell Atlantic Corp. on August 16, a recent 37% increase in Arkansas and a 70% increase that will go into effect on Sept. 4 in Idaho, Cousins reported. "It seems the local telcos feel that they are not making enough money on private lines, so they keep raising rates, and the FCC is letting them," Cousins said. "It's killing our users and us." The center's current monthly bill is approximately $800,000 for private-line use.

The center is evaluating T1 and satellite facilities as a way for some users to bypass local public-switched facilities entirely, Cousins noted.

MCI believes the tariff would "create billing chaos," forcing customers to pay two different carriers for the same call, said company spokesman Robert Jackson.

"Interposing the operating company between the customer and the long-distance carrier is inappropriate and an attempt to redefine access as a direct local telco service when the FCC defines it as part of long-distance service," AT&T spokesman Paul Karoff said. Nynex's proposal is likely to be followed by similar submissions from other divested Bell companies, Held noted.

Bell Atlantic is "still evaluating an alternative tariff structure to Nynex's but basically approves of the plan "to recover traffic- and nontraffic-related costs by directly charging the end user," claimed company spokeswoman Chris Valmannei. "The crux of the matter is that we don't want to price our large customers off the network."

Regional service limits struck down in appeal

Divested companies may buy independents

By Stanley Gibson

WASHINGTON, D.C. — In a ruling that promises to add momentum to telephone industry deregulation, a federal appeals court recently overturned a ruling by U.S. District Judge Harold Greene.

The decision removed geographic limits on where regional holding companies can provide business services.

A panel of three judges unanimously upheld an appeal filed by Bell Atlantic Corp., U.S. West and Pacific Telesis Group of Greene's ruling forbidding them from providing such services as paging and cellular telephone outside their region.

The justices also said that Greene erred in ordering the regional holding companies to stop providing these services.

Some regional holding companies said the ruling also means they will be able to acquire independent telephone companies in each other's areas. "That's our interpretation. . . . It will enable us to acquire independent phone companies," said Bill Hensley, a spokesman for Ameritech.

However, none of the holding companies contacted by *Computerworld* would say what their possible acquisition plans might be. "We have nothing immediate in mind," Hensley commented.

The court, however, rejected a novel argument by U.S. West that Greene's 1982 Consent Decree was not binding on the regional holding companies because they were not parties to it.

In February, Greene had ordered Bell Atlantic to divest itself of its A Beeper Co. subsidiary, a decision Bell Atlantic appealed.

Bell Atlantic had not obtained a waiver from Greene to purchase A Beeper, an Atlanta-based paging company, although other regional holding companies had obtained similar waivers from Greene after requesting them.

"It was like 'mother may I,' " said Brian Farley, spokesman for Bell Atlantic. Greene had granted nearly all the waivers that regional holding companies had requested, he pointed out, but seemed to be insisting that his approval first be requested.

Farley said Bell Atlantic had discussions with the U.S. Department of Justice regarding its intended acquisition of A Beeper and did not apply for a waiver from Greene, believing that it had received the Justice Department's assent.

"It's a crack in the wall for Judge Greene," said Joaquin Gonzales, a telecommunications analyst for the Gartner Group, Inc. of Stamford, Conn.

The appeals decision also means that Southwestern Bell Corp. will not have to receive a waiver from Greene to complete its $1.65 billion acquisition of Metromedia, Inc.'s cellular-telephone and paging operations.

Gonzales said the decision's scope went far beyond the questions surrounding the beeper and paging companies.

"The future of A Beeper Co. is the least important thing about the decision," he said.

Gonzales said the reversal of Greene was part of a larger pattern of events that will lead to eventual freeing of the holding companies from regulation.

A spokesman for Pacific Telesis Group concurred, "We will have better opportunities to move these things through the regulatory process."

Aetna picks Novell LAN over IBM

By Alan Alper

HARTFORD, Conn. — A division of one of IBM's "true Blue" customers last week confirmed it is installing $8 million worth of Novell, Inc. local-area networks (LAN) after passing over systems bids submitted by IBM and other vendors.

Aetna Life & Casualty Co.'s Commercial Insurance Division is installing the LANs, which consist of Novell's Netware S-Net systems running on IBM Personal Computer ATs, at its 52 field offices nationwide. The networks are being implemented to further automate the division's commercial underwriting procedures.

"The new application program runs on PCs and combines new procedures with some previously done on dumb terminals and some that were done manually," noted Wes Zinn, a telecommunications consultant at Aetna. "The LANs will connect over leased lines to an IBM mainframe in Hartford to access permanent policy records, using a minicomputer as a communications controller."

Performance under heavy load

Zinn said Novell was chosen over a number of competitors, including IBM, because of S-Net's ability to perform under a heavy work load. "We compared the Novell network to a number of minicomputer solutions," he said. "In this application, you can have over 100 PCs on the network, and while not all will be used at one time, users will not be running light Lotus 1-2-3 files but will be working with heavy underwriting files.

While Aetna is considered a true-Blue shop, Zinn pointed out that the firm's Commercial Insurance Division is less wedded to IBM than most divisions in the company. The division did not consider using IBM's Token-Ring network because it was not fully implemented at the time product evaluations were done last September, he noted.

He added that the decision to spurn IBM was a tough one. "It was a decision that a lot of people had a hard time swallowing."

Wes Pullen, president of Computer Communications Co. of Weston, Conn., the value-added reseller that initially approached Aetna with S-Net, said that in addition to IBM, Digital Equipment Corp. and AT&T competed with Novell for the contract.

According to Pullen, "IBM proposed using the Series/1 computer as a file server with PC Net, but they didn't push too hard since they were getting a contract for 2,500 souped-up PC ATs worth $10 million."

Both AT&T, which bid its 3B computer and Starlan network, and DEC, which proposed its Microvax II, had problems with their products as well, Pullen claimed.

"AT&T's solution was to use two 3B2s or run the 3B5 — that's expensive," Pullen said.

Working with Novell and Microserve Technologies Corp., a Needham, Mass., distributor, Pullen convinced Aetna that S-Net was the way to go.

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INTEGRATED INFORMATION TECHNOLOGY FOR THE 90s AND BEYOND.

DCA ties PC LANs to mainframes, extends Irma migration

Targets Netbios, Token-Ring users

By Alan Alper

NEW YORK — Digital Communications Associates, Inc. (DCA), last week unveiled a series of products said to enable IBM Personal Computers and compatibles in Token-Ring or Netbios-compatible local-area networks (LAN) to communicate with mainframes.

The LAN-to-mainframe link products, called Irmalan, provide 3270 terminal emulation and mainframe file exchange capabilities for IBM PCs on a LAN, without the need to equip each PC with the company's micro-to-mainframe connection Irma board, said Richard Darby, DCA's LAN product manager. Instead, software on each PC enables users to access IBM mainframes via a gateway: either an IBM PC emulating a 3274 controller or an IBM PC connected to a 3274.

Irmalan is aimed at resolving the dilemma users face in choosing between LAN or micro-to-mainframe connections, said John C. Bacon, DCA's marketing vice-president of the Irmalan products. "Users now can have both," he declared.

Migration path

Analysts last week viewed the Irmalan introduction as part of DCA's continuing strategy of offering Irma board users a migration path from stand-alone micro-to-mainframe communications to LAN-to-mainframe communications.

"What they're doing is in recognition of a trend toward LANs, which, although they are in their infancy, are growing in importance," said Mark Dunkle, an analyst at Robinson-Humphrey Co. in Atlanta.

DCA unveiled two gateway products that transform a PC in a network into a communications server linking the LAN to the mainframe.

SDLC Gateway is a hardware and software product that allows a PC to emulate IBM 3274 and 3276 controllers. The gateway handles up to 32 mainframe sessions for PCs on the network. Sessions can be pooled for access on a contention basis or dedicated to particular users.

Priced at $1,195, SDLC Gateway will be available in late September.

DFT Gateway, also a hardware and software product, links a PC on the network to an IBM 3274 controller operating in a distributed function terminal mode over coaxial cable up to 5,000 feet in length.

One PC can support up to four DFT Gateway cards, each handling up to five concurrent host sessions, DCA said. These sessions can be pooled for access on a contention basis or dedicated to particular users. Available in October, the gateway lists for $1,195.

Software packages

DCA introduced two software packages that provide Irma functionality to PCs and compatibles by communicating with a gateway product over the network.

SNA Workstation enables PCs on a LAN to emulate IBM 3278 and 3279 models without additional hardware. Using the software, PCs can also emulate an IBM 3287 printer.

SNA Workstation also supports file server software that conforms to Netbios, enabling users to download mainframe files to a server disk, where it can be shared by users throughout the network, Darby said. Available in late September, the package will list for $495.

The APA Graphics Workstation combines SNA Workstation functionality with all-points-addressable mainframe graphics capability. It enables a PC to display host applications written for the the 3179 Model G, 3270-PC Model G and the 3270-PC Model GX that use Graphical Data Display Manager 4.0. It will be available in late September for $995, DCA said.

Bill seen no spur to buying

From page 1

Overall, the historic rewrite of the nation's tax code would raise the tax burden on U.S. businesses by an estimated $121 billion during the next five years. For capital-intensive manufacturing firms that will be hit the hardest, the reform bill essentially crystallizes the trade-off between cutting expenditures and investing in computer technology for a future competitive edge or a gain in productivity.

"Is the tax bill going to take money out of business's hide? Yes. Does it mean they'll buy fewer computers? No," said Ted A. Heydinger, vice-president of the Computer and Business Equipment Manufacturers Association (CBEMA).

"I can make the argument that they better buy the best machines they can to conduct business more efficiently," he added.

Some user companies would agree. "We can't just cut back or decide not to buy or lease any equipment for the future," said the MIS director of an Atlanta-based service company. "The cost of our operations is going to go up, which will cut into the company's profits, and there's nothing we can do about it."

But others, particularly in smokestack manufacturing industries, predicted a chilling effect on information systems purchasing. "When the pool of capital gets smaller, you buy less," said Dow Chemical's White. "Basically, computer purchases are going to be down."

Leasing, rather than buying, computers does not present a better alternative because leasing firms are already raising their rates to compensate for their own loss of investment tax credit benefits. "The lease/purchase decision comes out as a wash," said Metropolitan Life's Cavanagh.

In addition to its effect on MIS capital spending decisions, tax reform will necessitate changes and modifications in industry-specific software applications. "We are going to have to modify a good deal of our banking applications to be able to accommodate all the tax reform changes, which can be costly in itself," according to Fred Cisewski, vice-president of MIS at Bank South in Atlanta.

In the retail business, major rule changes on the capitalization of inventories may require users to buy new applications and hardware, according to Jim Godbout, a partner in the national tax office of Big Eight accounting firm Ernst & Whinney. "People will have to buy bigger and newer computers just to figure out how the tax bill works," he joked.

On the other side of the vendors' balance sheets, however, a potentially lower tax burden could improve computer industry profits. While the real estate, banking, insurance, utilities and steel industries lost significant tax benefits, the computer industry fared relatively well under tax reform.

"We were disappointed that we did not get the R&D credit permanently extended at the current level, but we were able to hold our own on other provisons and thus we remain supportive of tax reform," CBEMA's Heydinger said.

Tax conferees extended the research and development tax credit for three years at a rate of 20%, instead of the 25% rate that applied from 1981 through 1985 when the credit expired. They also kept computer equipment in the three-year depreciation category.

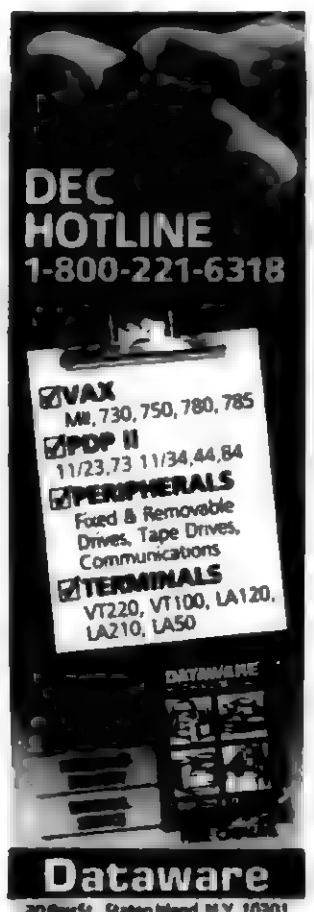
A major feature of the tax reform package is reduction of the top corporate tax rate from 46% to 34%, a very beneficial change for the software industry, analysts said. Hardware vendors have an average effective tax rate of about 30% and thus will see little or no change. But software firms typically have a high effective tax rate of 42% to 44%, which will drop to 34%, according to Coopers & Lybrand.

IBM, a tax reform supporter, believes the bill will be "mildly favorable" to its own tax ledger, a spokeswoman said. If the long-term forecasts are correct in predicting that the tax reform bill will improve U.S. economic growth, "the effects will be positive on us as well as the industry, but only time will tell," the spokeswoman said.

ADAPSO, the leading software and computer services trade group, was ecstatic that tax conferees excluded software firms from the personal holding company tax and that they made software eligible for the new version of the R&D tax credit. "We got two-thirds of a loaf," said Mary Jane Saunders, ADAPSO's assistant general counsel.

Saunders said ADAPSO was disappointed that the R&D tax credit was reduced and that accounting firms — which compete with ADAPSO's computer services companies — will be able to use a more favorable accounting method for computing taxable income.

Correspondent James A. Martin contributed to this report.





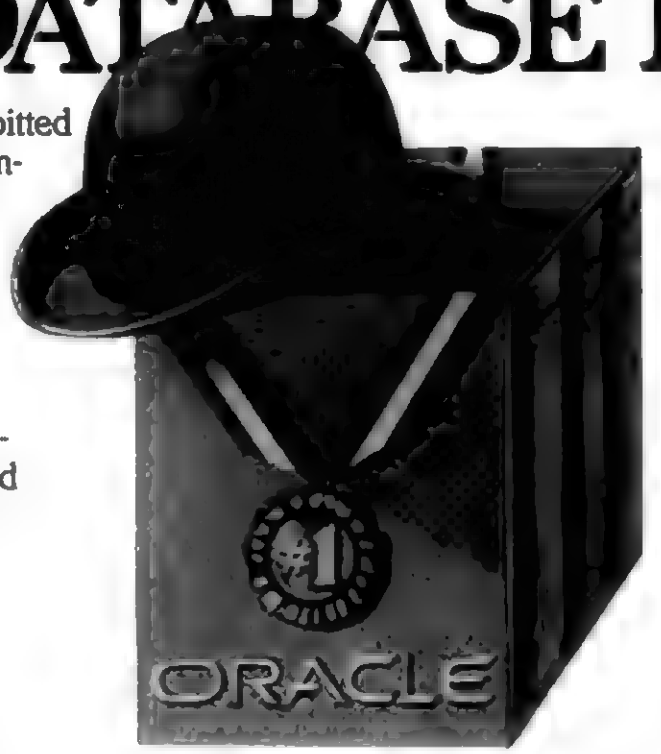
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Grand Rapids ..... Oct 16
MN Minneapolis ..... Jul 22, Sep 9, Nov 4, Dec 18
MO Kansas City ..... Nov 12
St. Louis . Jul 30, Sep 26, Nov 19
MS Jackson ..... Sep 11
NC Charlotte ..... Nov 6
Raleigh ..... Oct 8
NE Omaha ..... Sep 24
NJ Cherry Hill ..... Nov 20
Convent Station .. Aug 7, Aug 28
Iselin ..... Jul 22, Sep 16, Oct 9, Oct 30, Nov 13, Nov 20
Princeton ..... Sep 25
NM Albuquerque .. Sep 16, Dec 10
NY Albany .. Jul 23, Sep 11, Nov 20
New York City ... Jul 24, Aug 12, Aug 26, Sep 3, Sep 17, Oct 2, Oct 22, Nov 6, Nov 25, Dec 9
Rochester ..... Aug 13, Sep 9, Oct 15, Nov 18, Dec 10
Syracuse ..... Aug 19, Oct 21, Dec 16
OH Akron ..... Jul 23
Cincinnati ..... Aug 5, Oct 21
Cleveland ..... Jul 22, Sep 23, Oct 28, Nov 13
Columbus ..... Aug 12, Sep 24, Oct 29, Nov 12
Dayton ..... Sep 9, Nov 5
OK Oklahoma City .. Sep 3, Dec 3
Tulsa ..... Aug 26, Nov 19
OR Portland .. Jul 24, Sep 23, Nov 6
PA Allentown ..... Sep 11
Harrisburg ..... Nov 6
King of Prussia ..... Jul 24
Philadelphia ..... Oct 9
Pittsburgh ..... Aug 7, Oct 16, Dec 9
Scranton ..... Aug 5
SC Charleston ..... Oct 7
TN Memphis ..... Sep 18
TX Amarillo ..... Oct 9
Austin ..... Sep 18, Nov 6
Dallas ..... Jul 22, Sep 9, Oct 14, Nov 18, Dec 11
El Paso ..... Dec 18
Ft. Worth ..... Sep 23, Nov 13
Houston ..... Aug 19, Sep 11, Oct 16, Nov 20, Dec 4
Lubbock ..... Oct 2
San Antonio ... Aug 27, Nov 5
UT Salt Lake City .. Aug 6, Sep 16, Oct 7, Dec 4
VT Burlington ..... Aug 6
VA Richmond ..... Sep 10
WA Seattle ..... Oct 23, Dec 11
WI Milwaukee ..... Sep 9, Nov 13

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Halifax ..... Oct 15
Montreal ..... Aug 20, Sep 17, Oct 15, Nov 24, Dec 17
Ottawa .. Aug 7, Sep 11, Oct 9, Nov 13
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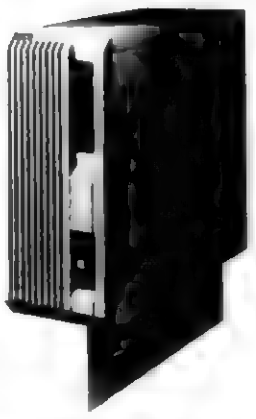
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NEWS

Siggraph focus shifts from technology to marketing

By Rosemary Hamilton

DALLAS — Siggraph last week lived up to its reputation as the premier technology show in the graphics industry. But after 13 years, the Association of Computing Machinery's annual conference was also showing signs that, like other trade shows, it is increasingly becoming a marketing vehicle for vendors.

There were few products at the show for the traditional large and mid-range systems. The three major computer-aided design and manufacturing companies — IBM, Intergraph Corp. and Computervision Corp. — did not have booths at the show.

Although the show floor held few surprises, the overall Siggraph package, with the tutorials and technical papers bundled in, impressed many of the estimated 25,000 attendees.

"I want to keep up with the state of the art, and this is where the present research work and latest industry growth is," said Ron Lusen of the applications software engineering staff at the Plasma Physics Laboratory of Princeton University.

Included in the personal computer-related announcements last week was a three-dimensional graphics display system from veteran graphics vendor Megatek Corp. The $24,900 911 Graphics Engine can use either an IBM Personal Computer AT or an RT Personal Computer as a host, according to the vendor.

Adage, Inc. introduced two plug-in graphics boards for the PC AT and compatibles. The PG Model 10, a $2,895 board that uses one PC AT slot, offers 1,280- by 1,024-pixel resolution in either a four-plane (16 colors) or eight-plane (256 colors) configuration. The PG Model 20, a two-board set that costs $4,895, offers the Model 10 board with a processor board based on the Intel Corp. 80286 microprocessor.

Ramtek Corp. introduced its Ramtek Owl, a $5,595 color display unit for the IBM PC AT that requires one expansion slot.

In the workstation arena, Symbolics, Inc. rolled out its Scope System, which is based on the Pixar Image Computer, a system that reportedly processes 40 million instructions per second from Pixar.

The $299,900 Scope System, which will be available in October, was developed by Symbolics' West Coast Graphics Division and will be marketed to government agencies but can also be used in number-crunching graphics applications such as animation.

Millennium to support DB2

From page 1

tor to DB2.

The systems development tool, which previously allowed users to develop on-line applications under its Millennium architecture, now lets CICS users enter IBM's SQL commands from Millennium screens and create ad hoc queries.

The DB2 capability gives users the option of performing transaction processing or analytical work, eliminating the need to log off a CICS session to perform a time-sharing option function, the company said.

The announcement serves as yet another endorsement for IBM's emerging relational data base. Earlier, Applied Data Research, Inc. of Princeton, N.J., Cincom Systems, Inc. of Cincinnati, Sterling Software, Inc. of Rancho Cordova, Calif., and others stated they were providing support for certain products to operate in conjunction with DB2.

"DB2 has suffered from a lack of tools and a lack of third-party applications," said M&D Corporate Vice-President John Birch. "We are not going to wait for the market to happen; we are going to make it happen."

Beta release of Millennium:SDT DB2 is slated for the first quarter of next year. The product is priced at $108,000.

While several meeting attendees said their companies were evaluating DB2, others said they have no plans to move to a relational system, and M&D's release would not change those plans.

Northrop Corp.'s aircraft division in Hawthorne, Calif., dropped the idea of implementing IBM's IMS data base management system not long ago.

The Northrop division currently uses M&D's General Ledger system and is considering its Human Resources and Accounts Receivable packages, project administrator Mel Gettleman said. "We are going to stay with CICS and VSAM because a large number of M&D personnel are CICS/VSAM experienced," he said.

Extensive use of IBM's IMS/DC DBMS for a data entry system in its European operations is preventing LSI Logic Corp. from turning to DB2, MIS manager Steven Chazan said. While his company plans to stay with current versions of M&D's Purchase Order system, "going to DB2 is the right move for M&D," Chazan said.

In addition to support for the IBM relational system, M&D announced a Millennium version of its general-ledger package for Cullinet's IDMS/R DBMS for the IBM 370, 4300 and 3000 series mainframes.

Other M&D packages for IDMS/R, including Interactive PC Link and Millennium SDT, are expected over the next several months, the company said.

Available in October, GL:Millennium IDMS/R lets users run batch programs against on-line data bases. It is priced at $178,000.

Data base consultant Shaku Atre remarked that M&D's entry into the data base arena is a little late. "Getting into the DBMS market today is not as easy as it was four or five years ago," she said. Nevertheless, M&D stands to benefit from a large base of IMS users waiting to move into DB2. Although IDMS/R sales have dropped off, there are still more than 2,000 users who could take advantage of the M&D applications, she said.

NEWS

Micro data base package merges SQL with QBE

By Douglas Barney

SAN FRANCISCO — Wordtech Systems, Inc. this week will announce DBSQL, a $349 microcomputer data base package that incorporates Query By Example (QBE), Structured Query Language (SQL) and embedded SQL and uses the same file structure as Ashton-Tate's Dbase III.

The product will be aimed at the corporate market and will formally be announced at the Data Base Derby, a data base competition to be held in San Francisco, according to Michael Gardner, director of development for Wordtech.

One Wordtech customer contacted was pleased with the firm's current product, Quicksilver, a Dbase III compiler, and expressed interest in the new product. "There may be some good applications for the QBE, perhaps for workers experienced in data base technology," said Richard Hendricks, systems analyst for the Lynn Product Data Center in Lynn, Mass., part of General Electric Co.'s Aircraft Engine Business Group.

For less experienced users, Hendricks develops menu-driven applications written in Dbase. Hendricks was also pleased with Wordtech's support and upgrades. "It is easier for me to get a hold of them than it is to get a hold of Ashton-Tate."

Earlier this year, Wordtech introduced DBXL, a Dbase III-compatible data base. "That is where the Dbase compatibility comes from," Gardner said. According to Wordtech, users can run applications written for Dbase and also use Dbase data disks. The new system has speed and record capacity comparable to Dbase. Although DBSQL is said to handle up to two billion records, the system has only been tested with 20,000 records, Gardner said.

QBE, a key selling point of Paradox, a data base package from Ansa Software Co. of Belmont, Calif., allows users to create queries and update files by filling in the blanks or giving the program an example of what is needed. "QBE requires a minimum of training. It is the easiest interface, and it is unquestionably very powerful," Gardner said.

"That is obviously useful for a layman user, there is no question about it. None of these things, however, turn out to be the best thing since sliced bread," said Sam Lyles, director of R&D for Business Records, Inc., a Dallas computer firm.

SQL is a command-oriented data base language that is being popularized on IBM's DB2 mainframe data base program. With SQL, users trained on DB2 can easily adapt to the micro-based applications.

"On micros we are facing an uphill battle with SQL, but I think SQL is really going to take off. If you are coding applications, SQL is one of the most efficient ways to do it," Gardner noted.

Embedded SQL is a set of extensions to SQL that provide the ability to execute SQL statements from within programs. "We are the first one to embed SQL in a microcomputer data base language," Gardner claimed.

The system requires an IBM Personal Computer or compatible. The firm recommends 640K bytes of random-access memory and a hard disk.

Hyundai PC XT clones debut

Korean giant expands wares, offers micros

By David Bright

BOSTON — By mid-September, $699 IBM Personal Computer XT-compatible microcomputers built by Hyundai Electronics of South Korea should be on the shelves of hundreds of department stores across the country.

Test marketing of the system, which resembles Leading Edge Products, Inc. models, began last week in 16 Boston-area Caldor department stores by Phoenix-based Blue Chip Electronics, Inc.

Blue Chip said it obtained sole distribution rights for the machine from Hyundai Electronics, a division of the Hyundai Group, which is best known for bringing low-priced automobiles into the U.S.

While some mail-order houses offer lower priced systems, the Blue Chip Personal Computer is believed to be the lowest priced system available in retail stores.

Blue Chip originally expected the machine to appeal primarily to the educational market, but in a recent market test in Phoenix, 80% of the systems were bought for business purposes, said Blue Chip President John Rossi.

In both business and nonbusiness markets, there is a "pent-up demand for that price point," Rossi claimed. On the business market side, Rossi expects small and medium-size companies to be the primary targets.

According to Rossi, 35,000 units are on the way to 260 Target department stores in the Midwest and West. Rossi said the Blue Chip machine may also be sold by Best Products Co., a 250-store chain based in Virginia, and the 120 Caldor stores, which are concentrated mainly in the Northeast. To avoid "overdistribution," no more than five or six chains will carry the system, Rossi added.

With its attractive pricing, many potential users expressed interest in buying a Blue Chip Personal Computer for their homes, as well as their businesses.

The basic Blue Chip system comes with 512K bytes of memory, one 360K-byte floppy disk drive, six expansion slots and a 130W power supply for supporting a hard disk drive. A second floppy retails for $129, and a Blue Chip monitor costs $89. Although Blue Chip does not offer a hard disk drive, a half-height, 20M-byte drive can be internally mounted, Rossi said.

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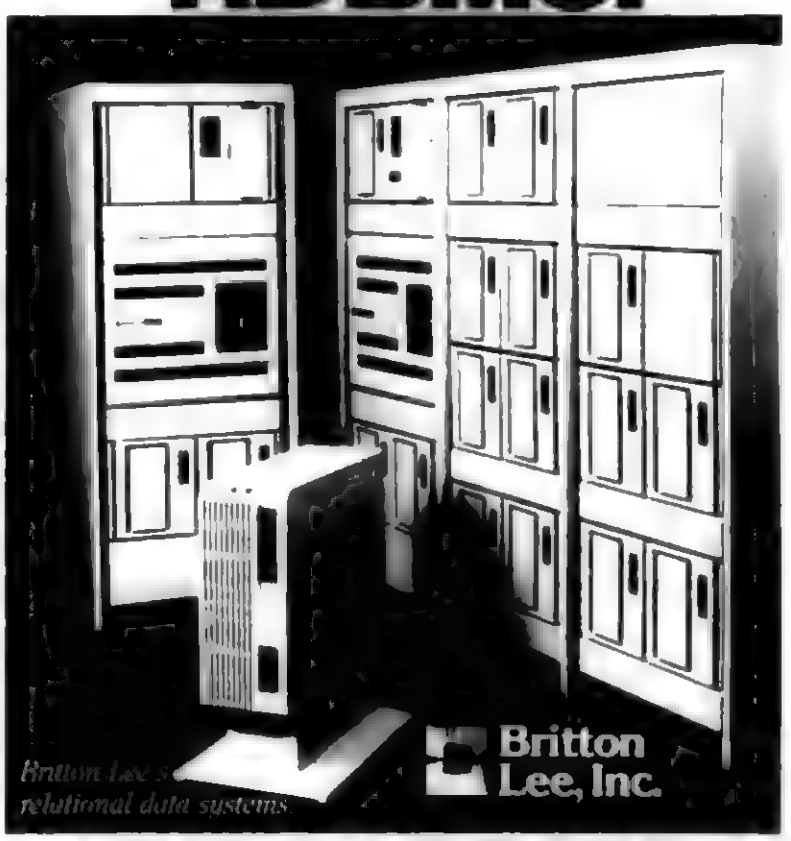
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Borland unveils Turbo Pascal for Macintosh

Sculley welcomes debut; users mixed

By Peggy Watt

SCOTTS VALLEY, Calif. — Another tool for computer professionals who use a Macintosh was announced last week by Borland International, which is scheduled to release its popular Turbo Pascal language product for the Apple Computer, Inc. product this fall.

Borland's unveiling of the new language product, which President Philippe Kahn said is the first in a complete family of Borland products for the Macintosh, was welcomed by Apple Chairman John Sculley, who attended the announcement. This was the third time in two weeks that Sculley has helped launch a third-party product for the Macintosh.

"We had to learn the hard way that a computer is more than a closed piece of hardware," Sculley said. "We had to open it up, we had to get application software on it, and we had to make it possible to do programming. That was one of the successes of the Apple II that we overlooked."

Mixed reaction

Users had mixed reactions to the announcement. Some programmers, less than impressed with Borland's implementation of the Sidekick utility program on the Macintosh, are wary of other Borland products for the Mac, according to Richard J. Hubert, president of the new Apple Programmers' and Developers' Association in Renton, Wash.

"There's an interest in Pascal, but the programming community is not holding its breath for a Borland product," Hubert said.

Macintosh programmers, however, will welcome a Borland Pascal package that lives up to the reputation of the IBM Personal Computer version, according to Mike Bailey, program planning specialist at Lockheed Missiles and Space Co. in Sunnyvale, Calif., who leads several internal Macintosh program development projects.

"There's a lot of people waiting for that Pascal," Bailey said. "They're using Apple's Mac Pascal now and complaining about it." The Macintosh has lacked a good Pascal compiler, he added.

Turbo Pascal for the Mac is Borland's third Macintosh product; Macintosh versions of Sidekick and Reflex were previously released. According to Kahn, Borland will also release a Macintosh version of Turbo Prolog, which is now available for the IBM PC.

Turbo Pascal for the Mac will be priced at $99.95 and will ship Nov. 15 at Comdex/Fall '86, Kahn said.

The program requires 256K bytes of memory and can take advantage of the Macintosh Plus hierarchical file system but can run on a 512K-byte Macintosh. It draws on the familiar Macintosh interface of pull-down menus and multiple editing windows, which allow the user to edit, compile and execute each window separately.

The program flags syntax errors and other debugging procedures. The user can compile to disk or memory or compile and run the program. Kahn claimed that the architecture and more efficient compiler in the Mac version would be implemented in future versions for the IBM PC.

Kahn said Borland does not plan to release a Turbo toolbox for its Macintosh version, as it has for the IBM PC, but that third-party developers may supply those utilities.

BBN wins federal contract for parallel system

Hopes to build 8,000-processor Butterfly successor

By James Connolly

CAMBRIDGE, Mass. — BBN Advanced Computers, Inc., which last month enhanced its Butterfly parallel processor, has won a federal contract that the company hopes will lead to development of a successor for the Butterfly.

Under the three-year pact announced last week, BBN will develop an 8,000-processor prototype computer for the Defense Advanced Research Projects Agency (DARPA).

The Butterfly, which has been installed in about 60 sites since it was developed in 1981, was also the product of a DARPA research contract.

The Butterfly was designed to support up to 256 parallel processors.

A BBN spokesman said the technology used in the prototype to be developed under the $4.8 million contract could be utilized in a massively parallel system to be offered sometime during the 1990s.

Proprietary BBN technology

He added that key elements of the prototype would use proprietary BBN technology, including custom very large-scale integration components.

"This activity represents some of the most advanced work in the field of parallel processing. These developments will have significant impact for science and engineering, where increasingly complex problems lack sufficient computing power. This computer design, which features shared memory instructions and general-purpose processors, will be capable of billions of floating-point operations per second," maintained Randy Rettberg, vice-president of research and engineering at BBN.

Rettberg also said the prototype will offer several gigabytes of memory, a 1G byte/sec. I/O capacity and a design that eliminates cabling among the switch, memory and processors.

Newly formed subsidiary

BBN Advanced Computers, Inc. was formed last month as a subsidiary of Bolt, Beranek and Newman, Inc. At that time, the company announced the availability of 1G bytes of shared memory, optional Motorola, Inc. 68020 and 68881 processors and an extended Fortran 77 compiler for the Butterfly.

While the Butterfly has the capacity to include 256 processors, the largest systems to date are 128-processor configurations at the University of Rochester in New York and in a DARPA installation.

World Digest

Japan PC trade levels

TOKYO — Japanese shipments of personal computers during the April 1 to June 30 quarter almost leveled off compared with shipments of a year ago, 425,000 units, according to a Japan Electronics Industry Development Association survey released in Tokyo last week.

The total number of units shipped included 258,000 delivered to the home market, up 7% from a year ago, and 167,000 for overseas markets, down 9%.

PTT naysays IBM

BERN — IBM sales representatives left Bern with empty order books when the Swiss Postal Telephone and Telegraph authorities (PTT) reportedly refused to sign a $43 million contract at the last minute for a computer-based telephone project dubbed Terco.

When the PTT realized that the IBM contract did not guarantee fixed prices, it balked.

The PTT also accused IBM of proposing only the most expensive equipment for the project and gouging it for IBM advisors on the project (IBM systems analysts cost the PTT $210/hour).

The project has subsequently experienced a temporary delay to negotiate cost-cutting measures.

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Beta testing worth the risk

From page 1

had a system that no one else had that solved our particular need at the time."

Gillette knew that the package, called Rainbow Office Workstation, would enable its salespeople, using DEC Rainbow microcomputers at home, to communicate over phone lines with the VAX minicomputer at Gillette's headquarters. Sales personnel would then be able to take advantage of a number of host-based services, such as accessing data bases, entering orders or sending and receiving electronic mail.

Although beta testing of the package went smoothly, Gillette had some problems with the product after it was installed. "It's working well now, but in some sites where our people live, one batch feature is not supported. It's a problem with some of the local telephone companies that we can't work around."

Computer vendors usually select beta environments that are optimally configured to provide the most accurate performance appraisal of their products. Vendors are biased toward firms with which they have worked before, large customers or prospects or avant-garde applications of their products.

"We view them as privileged," says Richard Moore, director of marketing at VM Software, Inc. in Reston, Va. "They're perceived as people who can handle the latest and the greatest."

Young vendors, however, take more of a shotgun approach, accommodating most firms that offer to become beta-test sites. "Hardware start-ups, for the most part, just want to get their boxes out there," says Kim Schlesinger, a research analyst with the Gartner Group, Inc. in Stamford, Conn. "The only way for them to generate sales at that point is through reference accounts."

> ***'When a Lotus or a Banyan comes to you and asks what they should change in a product, it's fun and beneficial to both parties.'***
>
> — Larry Stouder
> Continental Grain Co.

Overall, vendors view beta testing as a key sales promotion tool once a product is launched. "If you can say so-and-so is using the product and they're a prestigious company, it's of great marketing assistance," Diebold's Venner concludes.

Users usually seek to become beta-test sites after discovering that a product that fits a particular need or an expected future requirement is under development. The user then requests to test the product.

Vendors generally acquiesce, particularly if the user is a customer in good standing or is considered a hot prospect.

Many end users, searching for solutions to unique problems, find that becoming a beta-test site can often be the right tonic.

A couple of years ago, General Electric Co.'s Automation Controls Division in Charlottesville, Va., wanted its 200 software developers using IBM Personal Computers to have access to its DEC VAX minicomputer. The division searched until it discovered a small New York firm, Coefficient Systems Corp., that had developed a VT100 emulation package for PCs called VTERM.

"We heard about it through a networking group," recalls John Owens, a software analyst with the GE division. "We called [Coefficient] to ask if we could try it out."

After testing VTERM and looking at other packages, the GE division chose Coefficient's software. "Since we had beta-tested their software, we felt we'd be in a better situation," Owens says. "As a matter of fact, they took most of the suggestions we gave them and incorporated them into the next version of the product."

Ends don't justify means

Not all MIS operations are wedded to the beta concept, however. Some companies claim the ends often don't justify the means.

"We don't beta-test micros anymore because it's not worth the trouble," notes a technical guru at a major life insurance company who requested anonymity. "You have to devote your top technical staff, and it takes more time than it's worth."

Others embrace beta testing as a means of resolving unique problems not addressed by products already on the market. "It can help a user get a feature that is not available elsewhere," suggests Sunday Lewis, president of New York consulting firm Techvantage, Inc.

For avid testers of technology, the payback can be enormous.

As product life cycles shrink, beta testing has taken on increased importance as a means of staying abreast of technological innovation. "Given the shorter product life cycles, if you can get a product early in the cycle, you can use it longer," declares Peter Murphy, second vice-president of data processing at the Travelers Cos. in Hartford, Conn. "In accounting terms, you can depreciate it more quickly."

Beta testing can also be used as leverage when it comes to negotiating prices with vendors, says Bernard Weinstein, vice-president of branch information systems, communications and programming at E. F. Hutton & Co. in New York. "If you're one of the first to use a product, you can get more aggressive with pricing because you're helping to create a market."

Active beta testers also say it enables them to attract higher quality employees. "Beta-testing implies leading edge," Traveler's Murphy stresses. "You can get better people right out of university or experienced hires by telling them, 'If you join Traveler's, you'll do new exciting things as opposed to working on technology that's five years old.' "

Firms in depressed industries, such as oil or energy, contend they are no longer able to commit the financial resources or manpower that proper beta testing requires.

"A few years ago, we did a lot of beta testing, but business isn't what it used to be," laments Jerry Kramer, division manager for computer services at Marathon Oil Corp. in Findlay, Ohio. "With the belt tightening that's going on, we found that the excess people capacity is not there anymore."

Kramer emphasizes that even without beta testing he stays apprised of technology that's hot as well as technology that's not. "We get word of who tests what through user groups and such," he says. "We can get a lot of commentary that carries as much weight as beta testing."

> ***'If you're one of the first to use a product, you can get more aggressive with pricing because you're helping to create a market.'***
>
> — Bernard Weinstein
> E. F. Hutton & Co.

Beta testing is less significant, Kramer says, because having the biggest and the first computer is not as big an issue as it once was. "People today are paying more attention to the economies of computing, things like decision support systems," he concludes.

Yet, by playing their cards right, firms that allow themselves to become technological guinea pigs have the opportunity to help mold the development of the products to fit their needs. In many cases, vendors concede, user feedback contributes to the last-minute enhancements made before products are officially released. This input usually affects next-generation versions of the product as well.

"We enjoy developing a close relationship with a manufacturer so that we can influence the direction and enhancement of software and hardware," Continental Grain's Stouder admits. "When a Lotus or a Banyan comes to you and asks what they should change or get rid of in a product, it's fun and beneficial to both parties.

"In some cases the initial product may not fit," he continues, "but future products do."

The privately held, $12 billion commodities trading firm says it feels it's better to place products directly into a production environment rather than test products on the side. "It's riskier and you have to be willing to throw the whole thing away if it doesn't work out, but we feel we have the technical staff to get us through any situation that arises."

Most companies look askance at such an approach. "There's a real potential for getting burned," warns Murphy at Traveler's. "When you bring in new hardware or software, there may not be a problem with that particular product by itself, but it could hurt other products in the environment. There's a little bit of a risk involved."

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VIEWPOINT

EDITORIAL

Home work

For more than 40 years, U.S. organized labor has waged war on the concept of home-based work, charging that the practice allows employers to shortchange their off-site workers — in wages, benefits and working conditions. In the latest skirmish, the AFL-CIO is sniping at a U.S. Labor Department proposal that would cancel existing federal bans on home-based work and substitute employer reporting procedures designed to guarantee that home-based workers are paid a legal wage.

Further, the AFL-CIO and some independent unions argue that the bans should not only be retained but expanded to prohibit the growing phenomenon of home-based computer work. This development, with its strong appeal to data entry clerks, word processors, programmers and the like, raises the spectre of an odious electronic sweatshop, and organized labor wants to stop it dead right now.

This position is based more on big-labor rhetoric left over from the '30s than on home work realities of the '80s. Today's telecommuters not only scoff at charges they are exploited, but speak with enthusiasm of the flexibility that home-based work allows them. Their employers speak with equal enthusiasm, because it allows them to retain mature, experienced employees whose personal circumstances would otherwise keep them from accepting positions in a traditional workplace.

So who is the loser? Organized labor comes to mind. Thanks largely to computer technology, as much as one quarter of the U.S. population may work at home by 1995, according to researchers at MIT's Sloan School of Management. For the AFL-CIO, such predictions paint a clear — and bleak — landscape of a future in which an increasing number of workers will be beyond its reach and control.

This is not to say that home-based workers do not need protection against exploitation. They are, after all, isolated from the peer support structure of the workplace, where human resource abuses are quickly noted (if not always corrected).

Care must be taken, first of all, to assure that home workers are classified correctly as *employees* who are entitled to normal benefits, rather than as independent contractors who are not. As noted in a recent congressional report, the Labor Department and the Internal Revenue Service must work together to agree on standard definitions for the two categories, to close loopholes in classifications and to vigorously enforce existing laws to ensure that home workers are properly classified.

Additionally, the Labor Department must guarantee that home-based workers receive reasonable wages by showing it is serious about enforcing the new regulations it proposes. These regulations would require employers to log and report detailed information on home workers, so that federal inspectors can determine whether minimum pay laws are being observed.

Finally, corporate executives, especially MIS and other managers directly responsible for telecommuting programs, must act with enlightened self-interest in treating home-based workers as they do other employees. This means, at minimum, comparable pay, benefits and work conditions. Such self-regulation will bring all the benefits of telecommuting, including the built-in cost savings for companies and needed flexibility for employees, without onerous government regulation.



LETTERS TO THE EDITOR

Shrink-wrap laws mischaracterized

Jay BloomBecker's In Depth article, "Lobbying for protection" [CW, Aug. 4], mischaracterizes Software License Enforcement Act laws (that is, "shrink-wrap" statutes) as being anticonsumer legislation. Such laws seek to ensure that certain terms contained within license agreements accompanying mass-distributed software will be binding upon persons acquiring such software, even though such persons do not indicate their consent to the agreement by signing it or have an opportunity to negotiate its terms.

BloomBecker criticizes shrink-wrap licenses and legislation validating them because such licenses permit a software vendor to disclaim warranties and limit liability, thereby enabling it "to avoid the responsibility of standing behind its product."

In fact, the validity of such provisions will very likely be unaffected by the presence or absence of a shrink-wrap statute. More important, excluding warranties and limiting liability is expressly permitted under, and governed by, state and federal statutory law and is a practice followed to varying degrees by most commercial vendors. Absent a compelling reason to hold software vendors to a higher duty, fairness suggests that software vendors receive the same rights as other commercial vendors.

BloomBecker also contends that shrink-wrap licenses and laws validating them do not prevent piracy, which he restrictively defines as any violation of U.S. copyright law. This contention is unsupported, and the definition on which it is based is far too narrow.

The value of software lies in the copyrighted code and trade secrets inherent in the software that often require hundreds of thousands of dollars to develop. Such code and trade secrets constitute the logical mold from which the software is manufactured. While it is possible to use software without viewing or understanding the logical mold, it is impossible to distribute the software without distributing the logical mold.

Unless proper steps are taken, the logical mold can be analyzed and used to develop identical or derivative software at a fraction of its initial development cost.

While U.S. copyright law prohibits most copying and distribution of the actual software code, it does not prohibit a user from using the trade secrets inherent in the software.

Vendors of mainframe and minicomputer software have addressed this problem by not *selling* software, but rather only *licensing* users the right to use the functionality the software is designed to provide.

All other uses (that is, disassembly, decompilation, modification and using the software to develop competing software) are prohibited unless expressly agreed to by the vendor. Shrink-wrap licenses constitute an attempt by vendors of microcomputer software to do the same.

Such licenses and laws validating them do not hurt consumers other than individuals desirous of performing an autopsy on the software to facilitate developing a competing package. These people are at best unoriginal and at worst thieves; in either event, they are not worthy of protection.

While such licenses and laws may also prevent well-intentioned people from modifying software for personal use, the difficulty of modifying most off-the-shelf software suggests that the average consumer is not affected by this issue.

Admittedly, many software licenses overreach under the guise of protecting intellectual property rights. For example, prohibitions against preparing backup copies and absolute prohibitions against transferring software are arguably unnecessary to protect proprietary rights.

Fortunately, many vendors realize that their software license is also an important marketing tool that must, therefore, strike a balance between effecting necessary legal protection and granting usage rights consistent with end-user environment realities.

Assuming legislation is necessary to validate licenses accompanying mass-distributed software, consumers should oppose only those laws that fail to establish the above described balance.

Michael P. Brownell
Berman, Roberts & Kelly
Chicago, Illinois

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VIEWPOINT

Focus on office realities, not industry myths

It is now apparent that "office automation" is a misnomer.

Many in the industry — the press, the copywriters, the consultants, the marketers — gleefully pounced on the term and tried to make an industry out of it. But like distributed processing, another fuzzy buzzword, OA steadfastly refuses to become a concrete reality (as the American Federation of Information Processing Societies discovered when its office automation conference died of terminal vagueness).

The concept of an automated office is proving to be an anachronism because it implies some sort of rigid technological system imposed from above on hapless office workers. The term denies today's reality. There is a much more complex and fascinating jumble of activity taking place in the office: Instead of office automation, we have integrated office systems, end-user and departmental computing, the push for connectivity . . . in short, a host of new technologies, new systems and new work relationships that are changing the face of the office and the entire information processing function.

MIS's role in the face of all this varies considerably from shop to shop. What is clear, however, is that MIS managers must master three basic skills to handle the rapidly growing demand for integrated office systems.

First, MIS managers must be current on the technology and the industry — no easy task. Recently, knowledge about telecommunications has been added to the list as the Integrated Services Digital Network and other efforts to merge voice and data begin to materialize.

Second, MIS directors must be skilled managers. More is called for here than being an effective supervisor. Because the information systems function is an integral part of the business enterprise, MIS must be thoroughly versed in information resource management techniques. Information is a critical asset and must be managed with the same intensity and creativity that is applied to human and financial resources. This includes dealing with the often unsettling effects of innovation and change. Also, the importance of the information resource has grown. Like it or not, the MIS manager has had to learn to function in the rough-and-tumble arena of corporate politics.



By JOHN L. KIRKLEY

Finally, there is the most ambiguous of the three skills, concerning the squishy world of interpersonal relationships. With the rise of end-user and departmental computing, with interconnectivity becoming a reality, with the blurring of organizational lines and the increasing technological sophistication of top management and users alike, the need to master the deceptively simple skills of active listening, empathy, awareness of one's own strengths and failings — in short, the myriad complexities of human interaction — becomes essential. Too often DP managers have exhibited a preference for machines over people. This subverts the reason for the machines' existence; they are tools, not ends in themselves.

But mastery of the technology, of management techniques and of interpersonal skills is not enough. Critical to the MIS manager's success is how these skills are used. And this, in turn, depends on which of three paths the manager chooses: the reactive, the responsive or the creative.

The reactive MIS manager, sensing the winds of change, uses his skills to fight a relentless rearguard action to maintain the status quo. He hates personal computers; talk of distributed data bases makes him break out in a rash. Control is his goal; fear is his motivator. If he has mastered the three basic skills mentioned above, he can be a formidable adversary.

The responsive MIS manager is different, usually an affable, if somewhat harried, individual who is trying to respond to changes crashing in from the outside. As each new situation arises, he attempts to cope, using the three skills to frantically juggle demands and resources. Somehow his management and users are never satisfied. He wears his beeper to bed.

The creative MIS manager is the change maker, the driver. He and his management are committed to information resource management, long-range planning and involving users and management alike at every critical stage of the information process, from early planning sessions to hands-on applications development and implementation. One of his favorite tools is prototyping, building pilot systems and bouncing the results off his constituency. Quite often he has created an information center and trained a cadre of consultants to assist the users.

He understands that creativity is a complex and sometimes messy business: Organizational boundaries have to be crossed, and people, with all their idiosyncracies and foibles, have to be listened to and understood. All the problems associated with human interaction come into play.

Given the ferment that is just now beginning to take place in today's office, neither the responsive nor the reactive response will work for long. Clearly, creativity, innovation and flexibility are the order of the day.

Kirkley, a former editor of Datamation *magazine, is an industry consultant currently acting as editorial advisor to Patricia Seybold's Office Systems Group.*

Managing vendors: Be reasonable, flexible and valuable

READER'S PLATFORM

By BERTRAM S. REESE

Data processing managers are becoming more and more dependent on a variety of vendors for their organization's data processing. Often the DP group is becoming more a resource manager than the large-scale software development house of the past.

In managing multiple vendors, the wise DP manager applies several important rules:

Rule 1. Always keep yourself in a position to leverage the vendor. Positive leverage strategies include paying the vendor promptly and giving the product a positive reference. Negative leverage techniques include spreading bad publicity, going to a vendor's upper management, complaining to the customer base, delaying payment, pitting the marketing fellows against the support people or just suing the vendor outright.

Rule 2. The vendor that is already running a system in your facility has control over other vendors that are trying to get into your shop and interface to the on-site vendors' system. If you are looking for a vendor to interface to an existing system, be assured that it will be the new vendor that will have to make all the changes. Why? Because if it does not, it will not get the business.

Rule 3. Offer to provide funding to identify the source of a problem. In a multivendor shop, finger pointing will happen. A vendor who can successfully deflect a problem to another vendor can, at least temporarily, avoid the expense of fixing it. By offering to fund problem resolution, said funds to be reimbursed later by the vendor that created the problem, you encourage a vendor to admit guilt.

Rule 4. Be willing to fund software development that may be unprofitable to vendors. They typically do not like to do development and certainly will not do development that does not have a good return on investment. If the feature is valuable to you, you must be willing to pay for it.

Rule 5. Do not abuse the vendor's organization. That is, do not constantly go over your representative's head. Use mutually agreed upon suspension dates for action items. When the representative fails to perform, then take your request to someone further up in his organization. Constantly going around your representative gets you a reputation as a whiner, and the vendor will ignore you.

Another effective way to get the vendor's attention is to get its representatives' home phone numbers. Armed with these numbers, you no longer need be lonely when you have to get up at 3 a.m. to handle a vendor's problem. This is by far the most effective way to get action, and you will find even spouses will help you out.

Rule 6. Have a good solid contract. Of course, this is not always possible. The vendor negotiates its contract all the time — DP managers only handle it a couple of times in a lifetime. Obviously, regardless of the negotiations, the contract will always be to the vendor's advantage. But one safeguard should be noted. Vendors will negotiate for data-driven contracts; you want an event-driven agreement. Vendors will want so much money down, so much in three months, so much in six months and so on. Your position must be such that when a vendor gives you a product and when it is operational, then you will pay. This helps keep the vendor honest.

Rule 7. Pay your bills. The key is to stay credible in the vendor's mind. Do not be a complainer, and always pay for services performed. Then when you have a problem, your problem will be perceived to be the exception rather than the rule.

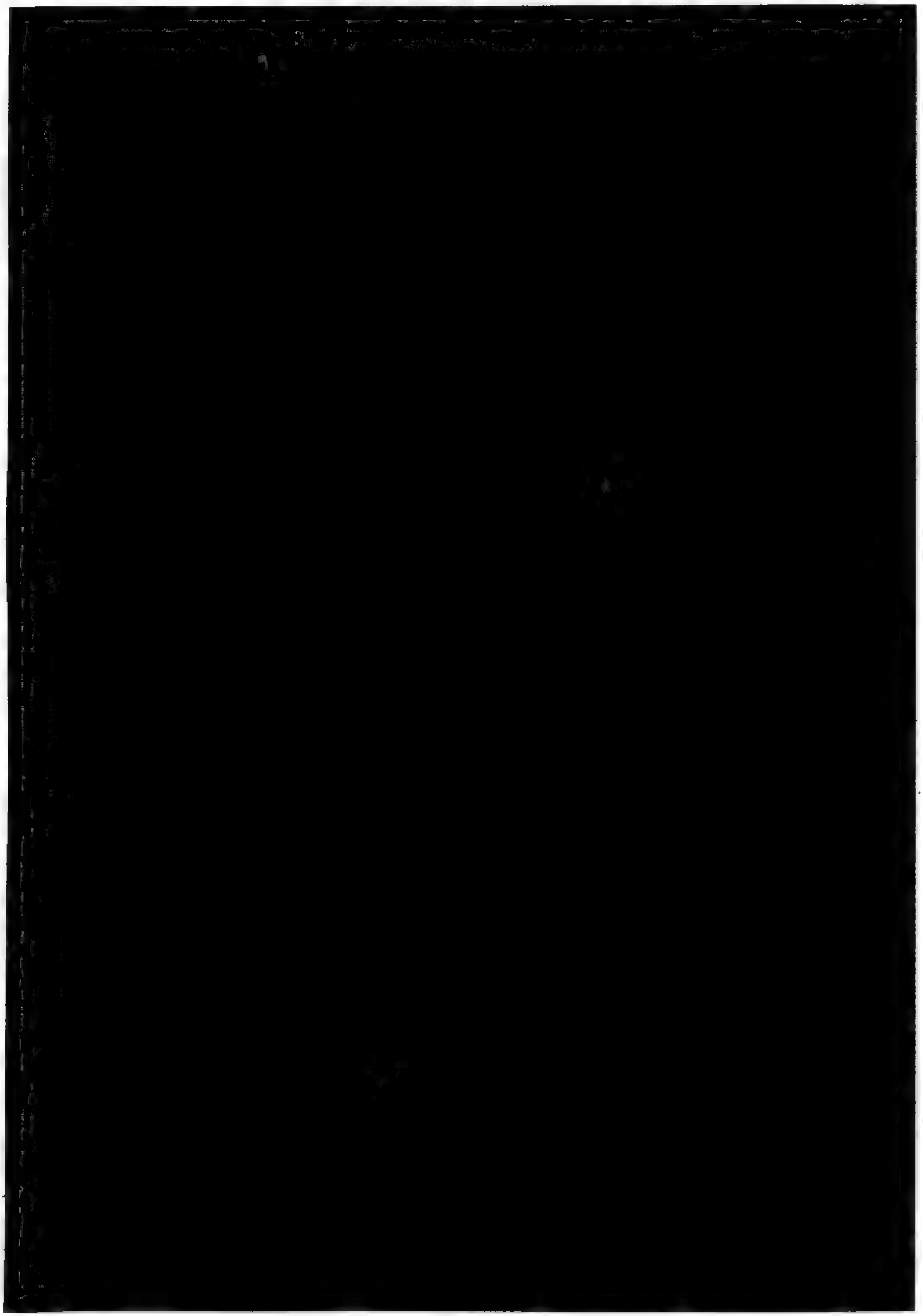
Rule 8. Be active in the vendor's users group. In good users groups, you can find our whether you are crazy or not, that is, whether you are the only one having this particular problem or whether the entire client base is affected. Also, in the users group you can, if you get enough support, leverage the vendor to provide the development or enhancements you require. Users groups also provide a forum for the interchange of ideas such as available features used in a different way or alternative approaches to problem solving.

Rule 9. Have the vendor audit your performance. You have paid a substantial amount of money for a vendor's hardware and software. It is good to bring the vendor in from time to time to evaluate how well you are running it. This is not a free service, but it will give management an idea of just how well DP is doing, this time from the vendor's perspective. It will also give the vendor a feeling for the unique characteristics of your site as it relates to its system.

Rule 10. Always be on the lookout for alternatives to current systems. It keeps you abreast of what is going on in a highly volatile environment, and it keeps the current vendor interested in continuing to provide you with high-quality service.

The key to successful vendor management is to be reasonable and flexible in your approach. Also, evaluate your position from the vendor perspective and provide your vendor with something it wants and, at the same time, obtain the needed service for your organization.

Reese is corporate director of MIS at Alliance Health System, Norfolk, Va.



COMMUNICATIONS

DATA STREAM
Walter Ulrich

Selling execs on innovation

A senior executive at a major company recently told me, "I do not see major expenditures in communications paying off. Companies here in New York have paid a small fortune for advanced telephone systems and intelligent workstations. Head count has not decreased in those companies, and the return on investment fails to meet even minimum requirements. We still have our old telephone system, and I can place a telephone call more easily than my counterpart down the street."

Many nontechnical executives retain doubts about the potential benefits of telecommunications technology. What makes them so hard to convince?

First, communications technology makes many of them uncomfortable because they do not understand it. Trained to deal with sales, marketing, finance or operations, they regard communications as a complicating factor — or worse, an unknown factor.

Second, many communications projects are technical successes but business failures. Time, effort and money are spent without advancing business goals and objectives. Executives get turned on about projects that solve problems, attack market share and improve profitability. They are turned off by making a change that only maintains current levels and services.

Third, when a communications system does fail, it has an immediate impact. Everyone in the organization ex-

See SELLING page 21

Ulrich is president of Houston-based management and technology consulting firm Walter Ulrich Consulting.

DEC supports MCI E-mail

All-In-1 users can send documents over distance

By Elisabeth Horwitt

VAX Mailgate for MCI Mail, which enables users of Digital Equipment Corp.'s All-In-1 to send documents over MCI Communications Corp.'s electronic mail service, has been jointly unveiled by the two companies.

The alliance is "very important to MCI," MCI spokesman John Houser said. "DEC tells us that All-In-1 has an installed base of 12,000 systems. We see this as a very good growth market for MCI Mail." All-In-1 users can use the MCI Mail service to send documents to Telex users and to users of Compuserve, Inc.'s electronic mail services, Infoplex and Easyplex.

"MCI Mail is a good match," said DEC marketing manager for electronic mail Richard Derosier. "For example, salespeople on the All-In-1 system for sales and marketing can use MCI Mail to reach customers and each other."

All-In-1 and MCI Mail use similar commands to send documents, Derosier noted. MCI Mail is the only electronic mail service directly supported by DEC. The computer vendor may unveil gateways to other services "during the interim before X.400 is widely implemented," he added. "Strategically, X.400 is the most important multivendor interconnect system." X.400 is an electronic mail protocol that is currently being finalized as part of the the Open Systems Interconnect from the International Standards Organization.

DEC already has implemented X.400 in its own office automation systems. MCI is "working on X.400" but has announced no implementation schedule, MCI's Houser said. Both DEC and MCI indicated that an X.400-based connection between All-In-1 and MCI Mail would be a logical step once MCI has implemented the protocol.

VAX Mailgate for MCI Mail costs $7,500 and will be available in September.

TRW LAN family gets PC net with broadband links

By Peggy Watt

TORRANCE, Calif. — Recently unveiled additions to the Concept 2000 family of local-area network (LAN) products from TRW, Inc.'s Information Networks Division enable users to link IBM Personal Computers on a variety of Ethernet LANs over either baseband or broadband coaxial cable, according to company spokesmen.

The Information Networks Division designs and implements communications systems that are based on its own line of broadband interfaces, plus a growing selection of other vendors' products resold under the TRW label. The division's recent announcements include the TRW PC Connection family of products, which includes internally developed Ethernet interfaces,

See TRW page 21

NP line future bridge to OSI

By Elisabeth Horwitt

BOXBOROUGH, Mass. — Announcing an "access platform" for multivendor networking, Micom-Interlan, Inc. recently extended its Network Processor (NP) line to support the VME bus, the Unix V.3 operating system, the IBM RT Personal Computer and AT&T's Starlan. Currently supporting the Transmission Control Protocol/Internet Protocol (TCP/IP), the NP series will provide a stepping stone to the International Standards Organization's Open Systems Interconnect (OSI) standard, Micom-Interlan claimed.

"By building TCP/IP into all of our intelligent protocol processors, we address customers who want multivendor networking now. But we also plan to implement OSI protocols, so that users won't feel stuck in a dead end," said Micom-In-

See NP page 20

INSIDE

Hi-Net Communications provides a videoconferencing solution to cope with disasters/**20**

NEW THIS WEEK

- Fibermux 48-channel multiplexer debuts
- Leemah Datacom offers an access control system for its modems

For more on these and other new products, see pp. 75-80.

INSTANT ANALYSIS

"A lot of users are finding that the easiest and most cost-effective way to install a new bridge or cable is via sneakernet: You sneak it into the office after hours, when MIS isn't around."

— Ronald Coleman, partner, management consulting services, Coopers & Lybrand

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Hi-Net volunteers to serve in time of disaster

By Elisabeth Horwitt

MEMPHIS — Businesses that need to reach employees or customers during a disaster are being offered complementary transmission time on Hi-Net Communications' satellite-based videoconferencing network, the company announced recently.

"We see it as a marketing move and as a public service for companies that have been hit with a natural disaster or product tampering," explained vice-president of sales and marketing Jim Hines.

Hi-Net, a co-venture with Communications Satellite Corp., currently does audiovisual broadcasting to 900 hotel locations around the country. Companies can use these hotel videoconferencing facilities to communicate vital information to employees, customers and the press during a disaster.

"During the first Tylenol scare in 1984, Johnson & Johnson used videoconferencing to communicate its position. I saw that broadcast, and I saw what happened during this year's Tylenol crisis when the company chose to slug it out directly with the media," Hines said. "Without videoconferencing, the message gets edited; you don't have as much control. They weren't as effective this time around."

"Video technology can play an important role in recovering from a catastrophe," agreed Walter E. Ulrich, president of Houston-based Walter Ulrich Consulting. "When you have a catastrophe, you don't have time to write memos, play telephone tag and fly back and forth to resolve issues."

Hi-Net will not charge business disaster victims for the airtime, which costs between $3,000 to $5,000 for a typical event of this kind, according to Hines. Companies still must pay the cost of delivering the transmission to the site — approximately $200 per site.

Companies can also choose to have Hi-Net set up videoconferencing facilities at their local plants. It costs approximately $1,000 to have a portable satellite dish set up at a company site, Hines said.

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NP line future bridge to OSI

From page 19

terian vice-president of marketing programs Gabe d'Annunzio. Micom-Interlan has contracted with Retix Corp. to implement the Santa Monica, Calif., company's OSI protocols across the entire Network Processor line, he added.

Micom-Interlan's announcement of Starlan support across its NP line came only a few days after the Institute of Electrical and Electronic Engineers, Inc.'s approval of the 802.3 standard that is similar to, but not entirely compatible with, Starlan. Both Starlan and 802.3 define a low-cost, 1M bit/sec. network using carrier-sense multiple access/collision detection protocols.

Micom-Interlan has also unveiled the Nistar, a link-level Starlan controller on an IBM Personal Computer, Personal Computer XT or AT half-card. The basic Nistar product will be available in August for $325, with a $395 version, which includes IBM's Netbios, coming out in November.

"We felt that our multivendor networking products would get much bigger play with Starlan," d'Annunzio said. "IBM's Token-Ring is much more expensive to install." Starlan equivalents of the company's NP100, 200, 300, and 600 Protocol Processors for the Digital Equipment Corp. Qbus and Unibus, the Intel Corp. Multibus, and PC AT systems will be available in September.

Micom-Interlan plans to provide a direct link between its NP300 Multibus Protocol Processor running TCP/IP and systems running Interactive Systems' version of Unix V.3.

Also in conjunction with Interactive Systems, Micom-Interlan will offer the NP624, a protocol processor that provides a direct link between an RT PC running the AIX operating system and either Starlan or thin-wire Ethernet running TCP/IP. The $850 product will ship in December.

Another Micom-Interlan introduction, the NP621 Protocol Processor, links PC ATs running Microsoft Corp.'s Xenix System V to standard Ethernet or Starlan networks supporting TCP/IP. Priced at $1,490, the NP621 will be available for shipment in September. In October, the company plans to ship the NP700 Protocol Processor, connecting VMEbus Motorola, Inc. 68000-based workstations with TCP/IP-Ethernet local-area networks. Priced at $1,890, the NP700 will be available in both thin-wire Ethernet and Starlan versions.

Micom-Interlan's across-the-board support of thin-wire and Starlan versions of Ethernet reflects its strategy of targeting departmental and work group network installations, "for which 802.3 is more than adequate," d'Annunzio claimed.

CORRECTIONS

The article, "Joint development effort spawns optical-fiber PC networks," [CW, June 30] incorrectly depicts the relationship between Codenoll Technology Corp., 3Com Corp. and Sytek, Inc. Codenoll currently has separate and distinct development agreements with 3Com and with Sytek.

Selling execs on innovation

From page 19

periences it directly as an inconvenience. The loss of credibility due to a major communications failure can set back new communications applications for years.

It is the communications manager's responsibility to win the executive over to technological innovation. Memos and exhortation will not do the job. Skill is needed in three areas: technical, business and sales.

Technical skill ensures that a technology is well received by delivering smooth operating performance consistently to the end user.

This requires an awareness of products and services, technology trends, integration issues, vendor viability, maintenance and support considerations and user requirements. Sound technical management is innovative but also prudent and deliberate. Major communications failures are not tolerated.

Business skill puts communications technology in the context of corporate and broader business environments. Business decisions are rarely made on technical merits alone. A communications manager must learn the language of his company and industry. Recommendations must be couched in simple terms, focused on user needs and motivated by business impact.

Presentations that drone on and on about bandwidth, error rates and traffic patterns are often futile exercises and annoying interruptions for the busy executive. He assumes, rightly, that such technical issues are the responsibility of the communications manager. Executive presentations should show solutions to business problems. Workaday examples of business improvements can breathe life into an otherwise routine report. Achievable hard-dollar savings also attract notice.

Salesmanship is part interpersonal skills and part packaging. Ideas need to be presented and supported in a way that attracts attention and encourages positive consideration. Well-written documents, articulate arguments and personal persuasion all play a role.

Experienced managers work closely with all involved parties to improve their proposals and build support. They make compromises to gain a consensus. Technical competency does not excuse interpersonal incompetency. Technical managers must build people networks as well as communications networks within their companies.

Skeptical executives, such as the one I talked with in New York, can be won over. He became more and more interested when I told him that new communication systems could get him better operating information faster and explained how communications could solve a bottleneck at the warehouse. When I described a scenario where new price lists could be received by the entire sales staff right away, he was more than interested — he was convinced.

People will become excited about new communications technology — and support its implementation — if it is presented in their language and appeals to their interests.

TRW LANs get PC net, links

From page 19

and the TRW PC Server, which is based on network servers manufactured by Banyan Systems, Inc. of Westboro, Mass.

These offerings, TRW's first in the PC LAN arena, are "aimed at the company with 50 to 100 PCs spread over a large area that wants individual departments to have their own server but may want to be able to connect every department into a central service," said TRW General Manager Edward Snyder.

The TRW PC Server consists of a Motorola 68000-based file server and expansion cards that link IBM PCs to the server over either broadband or baseband cable.

The server can interconnect up to four different LANs. Networks currently supported include TRW's own Concept 2000 broadband network, the IBM PC Network and Token-Ring, Pronet from Proteon, Inc. and Net/One from Ungermann-Bass, Inc.

The server runs Banyan's Virtual Network System (Vines), which includes electronic mail, file and peripheral sharing, network diagnostics and administration. The $13,900 server's 43M-byte memory can be expanded to 120M bytes.

IBM PCs equipped with TRW's PC-Elink Ethernet controller card can communicate with the server over standard Ethernet cables. PCs equipped with the firm's PCU-2001 broadband card can interface with a broadband LAN at 2.5M bit/sec. via a link to the server. The PCU-2001 card is $645; the PC-Elink costs $650.

The TRW E-Modems enable IBM PCs equipped with Ethernet boards to communicate at 10M bit/sec. over broadband cable. The TRW E-Modem Repeater connects existing standard or thin-wire Ethernets to TRW's broadband backbone network. The E-Modem is available for $4,350 for a two-port model and $5,350 for an eight-port version. The E-Modem Repeater costs $6,250 for single- or dual-cable networks. Modem products are set for September availibility.

"TRW is more an integrator than a vendor; acquiring Banyan's line may establish their presence in the marketplace," commented Eric Killorin, publisher of Hanover, N.H., industry newsletter, "PC Netline."

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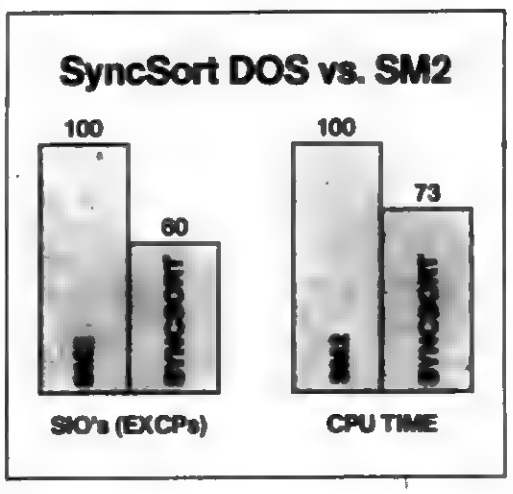
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SOFTWARE & SERVICES

SOFTLINE
Bao Nguyen

SQL spoken here

The huge applications software backlog at most MIS shops creates two serious problems: It works as a brake on the ability to achieve productivity gains in other areas, and it creates a situation that facilitates the production of bad software.

Research has shown that the computer language used in programming is one of the three major variables affecting programmer productivity.

One of the biggest advantages of the relational data base model is the availability of high-level query languages. Of these, the most widely used today is SQL. It was developed by IBM for SQL/DS and is used in IBM's DB2.

SQL simplifies the task of handling data for a relational data base management system. SQL also makes data query, report writing and data manipulation facilities available to a wide variety of users.

SQL commands cover a broad range of functions, and they can be used directly from display terminals or embedded in application programs written in languages such as Cobol, PL/1, assembly and soon in Ada.

SQL is well suited for use with data subject to query activity. It enables users to access data directly, without the need for a user-written application program. Multiple users can access data simultaneously, query and manipulate data or create reports while others are working with other data in the same tables.

SQL commands can accomplish many common data processing activities, such as locating and updating a certain item or group of items, sorting data and performing calculations using values

See SQL page 28

Nguyen is an information systems expert for the Air Force Assistant Chief of Staff/Systems for command, control, communications and computers.

Users applaud Ingres 4.0

Performance gains cited, only one hitch reported

By Eddy Goldberg

Three users of Version 4.0 of Ingres, the relational data base management system and fourth-generation language released six months ago by Relational Technology, Inc., are finding that the system is measuring up to the claims made for it.

At Nestle Enterprises, Ltd. in Toronto, Ingres Version 4.0 is being used on a Digital Equipment Corp. Vaxcluster, consisting of a VAX 8600, two VAX 780s and "a slew of Microvaxes" to develop applications, including manufacturing systems, said Michael Davidson, manager of systems development.

"Jobs run much faster, screens come up faster and retrieves in the data base run faster," Davidson said.

Using the Teleprocessing 1 standard bank transaction benchmark and his own internal applications, Davidson found a minimum 35% to 40% boost in CPU performance and a decline in the direct I/O count when he compared Version 4.0 with the 3.0 version. "I was really surprised. It worked out a lot better than I expected," he said.

At the Canadian firm, MacDonald Dettwiler & Associates, Ltd. in Richmond, B.C., MIS manager Bud Dawson uses Ingres Version 4.0 on a VAX 780 for internal data processing functions, including human resources and accounting. He found a 30% to 35% overall system performance gain after installing Version 4.0.

The firm's data administrator, Hardy Reinert, said the biggest problem with Ingres is that it does not implement complex query algorithms. "If you have complex queries, you have to go through the data several times to achieve them. We're looking for nested queries and the implementation of null values," he said.

Dawson said the addition of assignable function keys allows developers to standardize those keys across different applications in the company. "It may have been a small thing from a development point of view, but it sure is a good thing for our users," he said.

At Genrad, Inc. in Bolton, Mass., development engineer Keith Manning put Ingres Version 4.0 through his own series of performance tests on a VAX 750, using five sample queries he said he felt represented his applications.

For CPU-intensive queries, he noticed average performance gains of 20% to 25%,

See USERS page 28

SOFTWARE NOTES

CDC division goes software route

Business Information Services, the division of **Control Data Corp.** obtained in 1973 as the result of an antitrust action against **IBM**, is about to undergo another transformation, this time becoming a software vendor.

The Greenwich, Conn., computer services company will offer its most popular applications as software packages, beginning with Marksman, a series of modules for sales, marketing and advertising executives; Activator, a system used by process manufacturing companies; and Yield Management, a set of modules for travel and hospitality companies.

See NOTES page 26

CICS tester rates high efficiency

By Charles Babcock

BIRMINGHAM, Mich. — Two users say the new version of a tool for testing CICS programs is easier for application programmers to use than its predecessor.

Compuware Corp. of Birmingham is offering the product, Release 2.1 of CICS Playback. It was designed to enhance the stability of CICS systems by conducting regression and stress testing before the systems go into production, said Michael Lobsinger, vice-president of the Systems Software Division of Compuware.

CICS Playback captures production-type transactions and stores them in a special VSAM file, from which they can be called up for a simulation run of the application. "You can rerun them at will. It makes it easy to test," said Mary Lawson, CICS systems programmer at the Signature

See CICS page 26

INSIDE

Cullinet to support SQL/28

Consilium, Inc. enhances its Work-In-Process software/28

NEW THIS WEEK

- Stratus upgrades its operating system
- Target Systems offers Target Sales software for VAX

For more on these and other new products, see pp. 75-80.

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Cullinet announces SQL support, shies away from DB2

By Charles Babcock

WESTWOOD, Mass. — Cullinet Software, Inc. has made it official: The company will provide support for IBM's SQL in its products. But it has no intention of taking the next step that has proved logical to other companies, to provide support for IBM's DB2, Cullinet officials said after making the recent announcement.

SQL is the query language used to access data in IBM's relational products, DB2 under the MVS/XA operating system and SQL/DS under the VM operating system.

"Support of the SQL standard is a key element in our systems software product strategy," claimed David Litwack, senior vice-president of product development for Cullinet.

SQL support will first be introduced in Release 10.2 of Cullinet's Online Query product scheduled for beta testing in October of this year. Online Query accesses data in Cullinet's IDMS/R data base management system, and the product will be given the capability of using SQL's Select statement in the initial implementation.

Cullinet also plans to provide the capability of embedding SQL statements in Cullinet's Application Development System, which would allow customers to define and use tables in IDMS/R. It also plans to provide support for use of SQL in Cobol, but on both of the latter commitments, Cullinet declined to project when the support would be available.

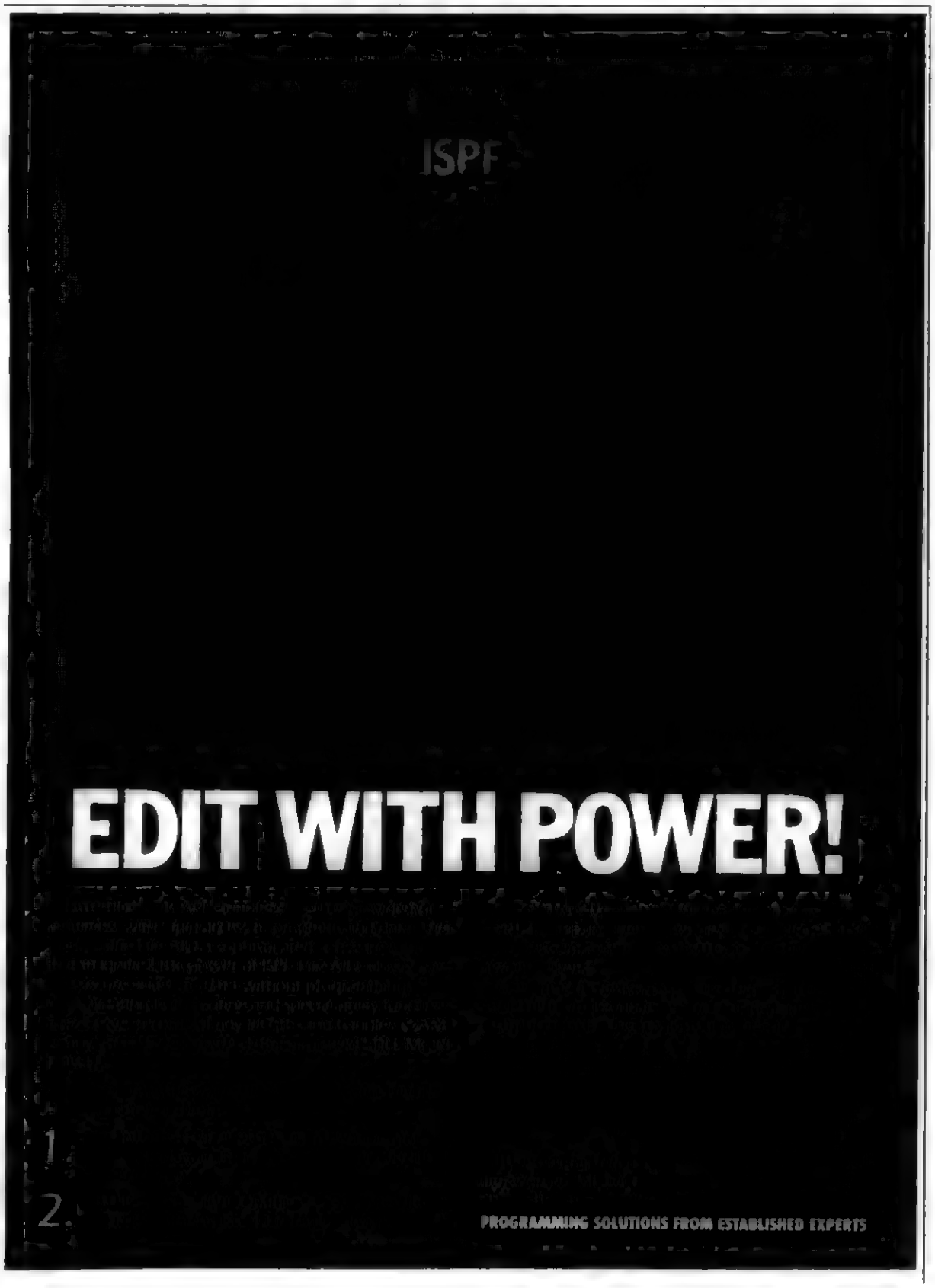
"Everyone seems to be saying the same thing," said Chris Mortenson, senior analyst with Alex Brown & Sons in New York, commenting on the rash of announcements of support for SQL and DB2 from independent software houses.

"It's hard to tell what degree of support and integration will take place. It's one thing to offer SQL as an option and another to embrace it and make it part of your product line," he said.

Vendors of software for minicomputers, such as Oracle Corp. or Relational Technology, Inc., have accepted SQL as a standard throughout their products in contrast with the more piecemeal approach, he said.

Cullinet has stopped short of saying it will also make its products compatible with DB2. As a vendor of its own relational system, the company will continue to compete with IBM in that arena, according to company spokesmen.

Cullinet's support for SQL was broadly hinted at in its announcement of the acquisition of Esvel, Inc., a San Jose, Calif., vendor of a relational data base management systems for the Digital Equipment Corp.'s VAX line. Esvel's expertise in developing products that support SQL will be used to enhance IDMS/R, Cullinet spokesmen said.



CICS tester rates high efficiency

From page 23

Group in Schaumburg, Ill.

By running the transactions through a test, the tester can get an idea of how efficiently the application runs. The monitor program in CICS evaluates the test transactions like a production run, yielding measures of CPU cycles, I/O demands and response times, Lawson said.

The previous release was run from a single CICS screen; the current release has a menu selection process that makes it easy for an applications programmer to invoke a CICS test without the aid of a systems programmer, Lawson said.

David R. LaRue, CICS systems programmer at MCI Corp.'s data center in Rockville, Md., also uses the new release of CICS Playback and said its ability to run a simulation of a CICS application without tying up dozens of user terminals is a big plus. The new release includes a facility to create virtual terminals for the simulated run, eliminating the need to tie up actual terminals for testing, he said.

CICS Playback is available immediately. It is priced from $12,500 to $25,000, depending on CPU size.

Notes: Pansophic to buy Fusion

From page 23

Pansophic Systems, Inc. has signed a letter of intent to acquire **Fusion Products International, Inc.** of San Rafael, Calif., in a stock transaction valued at $7.2 million. Founded in 1981, Fusion is a developer and marketer of information retrieval and report writing systems with data dictionary, query and personal computer links for IBM System/36 and 38 computers.

■

On-Line Software International, Inc. has named Howard P. Sorgen, 48, as president and chief operating officer. The position is a new one at On-Line Software. The position of president was previously occupied by Jack M. Berdy, 39, company founder, who retains the title of chairman.

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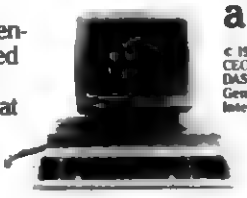
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SQL spoken here

From page 23

obtained from sorted data.

Putting such activity in SQL commands instead of in an application program uses the power of the DBMS effectively and reduces data handling by application programs. An application program can sometimes be replaced by a few SQL commands executed from a terminal.

IBM's primary objective in developing SQL was to enhance the productivity of people who work with data. With SQL this is done by the following:

- Requiring minimum preplanning.
- Requiring minimum skill levels.
- Providing data access to professionals not trained in data processing.
- Reducing program maintenance caused by changes in data management.

After several years of usage, users, overall, give high marks to SQL, but some think it is a little difficult for non-DP professionals. In practice, SQL is commonly used by application programmers and managers, but all users like it because of faster systems development.

There are several reasons to adopt SQL as a standard. It is an easy-to-learn and easy-to-use English-like language. Improved ease of use is directly related to increased productivity.

It has been in the public domain since 1979 and is widely used by DBMS vendors. SQL offers better system performance because the programmers not only produce and fix more code, they produce better code.

SQL has better program portability. It offers interoperability and improved data sharing between systems by either facilitating direct access by one system to a data base maintained by another system or by maintaining separation of data bases but facilitating the means by which one system furnishes data to another.

Because it is easier, ad hoc processing provides increased user participation resulting in more timely availability of data. SQL better uses the limited and expensive time of trained professional programmers. Data is easily converted when changing hardware.

Major DBMS vendors now support SQL in addition to their existing data access language.

The European Computer Manufacturers Association Remote Data Base Access Service and Protocol Specification also makes use of SQL, which is currently the subject of standardization by both the American National Standard Institute and the International Standard Organization.

E. F. Codd, the originator of the relational concept, is very concerned with the lack of support for some important features and numerous restrictions.

I fully support Codd in his appeal to have the standard modified to be more faithful to the model before its ratification.

WIP-A version tracks assembly production

Bill of materials function added

By Rosemary Hamilton

MOUNTAIN VIEW, Calif. — Consilium, Inc. recently introduced a version of its Work-In-Process software, which it has marketed exclusively to the process industry for assembly manufacturers.

A bill of materials function, which will allow assemblers to trace components used in production, has been incorporated into the vendor's Work-In-Process Advanced (WIP-A) module.

WIP-A is one of 17 modules that make up Consilium's Comprehensive Online Manufacturing & Engineering Tracking System software that runs on Digital Equipment Corp. VAX and Microvax computers.

The bill of materials function has been added at no extra cost, the vendor said.

The WIP-A ranges in price from $62,500 for a Microvax license to $210,000 for a VAX 8600 license, according to the vendor.

Prior to this announcement, Consilium marketed WIP-A to process manufacturers, such as semiconductor makers.

The software enables users to keep track of the various stages of processing, from lot creation to the shipping of finished goods.

In addition to those capabilities, assembly manufacturers now are said to have the option of tracing individual components, which helps users control the quality of assembled goods.

Reporting system bows

DALLAS — Uccel Corp. has announced a Summary Reporting System and a float management capability for its item processing software used by financial institutions.

The Summary Reporting System controls the process and reporting of data in five areas: items per institution, operational work flow, item processing, rejected item analysis and item research, according to P. J. Hoke, director of marketing communications.

The reporting system is an enhancement to Uccel's Infopoint:Super Micr item processing software.

The float management capability added to Infopoint: Super Micr allows a financial institution to calculate and manage float with more flexibility, Hoke said.

The Infopoint series consists of 20 applications for managing deposits, transactions, customer loans and financial management.

With the enhancements, it will retail for $67,000 running under IBM's DOS operating system and higher prices for MVS versions, according to Hoke.

Users rate Ingres 4.0

From page 23

but for one disk-intensive query, the newer release actually was slower than Version 3.0.

The test query asked the system to count all the records in each one of five tables in his data base.

Manning said Ingres Version 4.0 ran about 5% slower than the 3.0 version in this test.

He said he suspected the reason it ran slower is that Ingres Version 4.0 performs more locking on the data than the Ingres 3.0 version.

Increased lock quota

Manning said that Relational Technology recommended increasing the quota of lock requests for each user account with its Ingres Version 4.0, which he did not do.

He wanted to compare the two versions with as few changes as possible.

Increasing the quota of lock requests also allocated more system resources to Ingres users, which initially he decided against, Manning added.

Users wait for resources

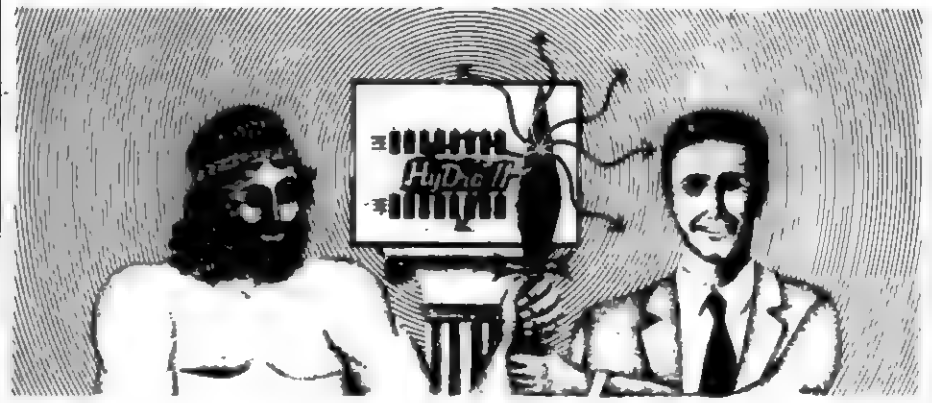
However, when users hit the limit on their allocated resources, they must wait for system resources to be free.

Increasing the quota would probably make the test run as fast or faster under Version 4.0, according to Manning.

Another query showed what Manning called a dramatic improvement, which reportedly reduced the 72-sec. retrieval time required with Ingres Version 3.0 to only 30 sec. with the later release.

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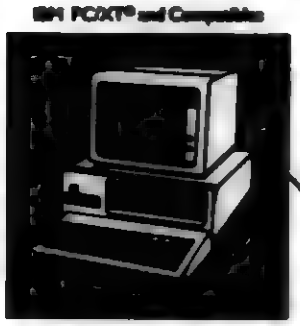
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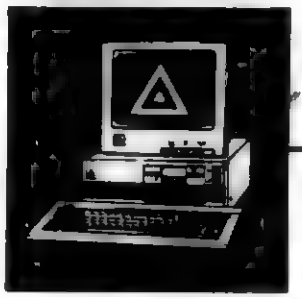
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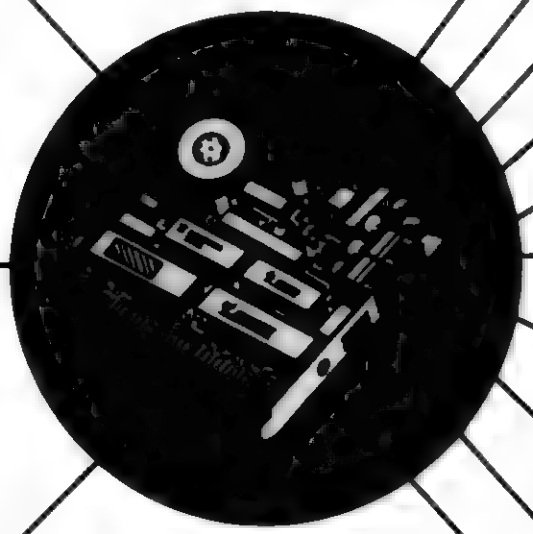






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MICROCOMPUTERS

SMALL TALK
James A. Fletcher II

In defense of Compaq

Alas, lately, much of the computer industry and almost the entire financial community appears to be worried about poor little Compaq Computer Corp. In what seems like countless publications, Wall Street and industry analysts alike are describing how Compaq is going to get caught in the cross fire as IBM wages a price war on the low-cost clone vendors.

Not to worry, ye of little faith. Compaq will not only prosper during this new era of the personal computer hardware business but will continue to enjoy substantial growth. Of course, it will not duplicate the meteoric rise in revenue accomplished from 1982 through 1986. But what company in any industry could?

Why will Compaq be able to rise above these market dynamics? Foremost, Compaq has demonstrated intrinsic strengths that make the kind of stumbling and problems hinted at highly unlikely, and the elasticity of the PC hardware business will surprise both market researchers and analysts.

Compaq has consistently shown an ability to precisely execute that which evades all other PC vendors. Whether it is Compaq's original Portable being able to create a completely new component of the PC market, its skill in establishing the best dealer network in the industry, its upping the ante of desktop computing with the introduction of the Deskpro series or its setting a new stan-

See IN page 35

Fletcher is a Houston-based management and technology consultant who specializes in end-user computing and information management.

DG rolls out AT compatible, aims to retain market share

By Rosemary Hamilton

WESTBORO, Mass. — Data General Corp. introduced an IBM Personal Computer AT-compatible system recently, a move one analyst termed part of a trend among minicomputer vendors to minimize IBM's impact on their low-end business.

"Data General and the others are facing an issue: The IBM Personal Computer family has become the accepted terminal," said Jay Stevens, first vice-president at Dean Witter Reynolds, Inc.

"Digital Equipment Corp. has found that out, and DG is finding the same thing. They have to offer an IBM compatible, or they'll lose a piece of their business," Stevens said.

DG's Dasher/286, based on the Intel Corp. 80286 microprocessor, had a low-key debut as part of a DG press conference that focused on the firm's recently introduced engineering software products.

The PC AT compatible, with an entry-level price of $3,395, operates at a clock speed of 10 MHz, 25% faster than the IBM PC AT, the vendor said. It comes standard with 640K bytes of memory, whereas the IBM PC AT comes standard with 512K bytes, and it also reportedly has a 30% smaller footprint than the IBM model.

"What Data General has done is not unique," Stevens continued. "DEC has found that within its installed base there are a lot of IBM PCs."

DEC has been expected to announce an IBM PC AT-compatible system by year's end, possibly as early as next month.

The Dasher/286 will be offered as a general-purpose personal computer, but DG said it will emphasize the system's role as an extension to the Comprehensive Electronic Office (CEO) product line, according to John Barlow, manager of personal computer product marketing.

CEO is a DG software environment that provides integrated office productivity tools to a network of DG systems. Dasher/

See DG'S page 34

Expert tools brought within reach

AI show features packages for nonexpert developers

By Eddy Goldberg

PHILADELPHIA — An abundance of inexpensive micro-based products that allow casual users to develop expert systems were displayed along with more complex programming packages at the recent AAAI-86 show, the Fifth National Conference on Artificial Intelligence.

Softsync, Inc. of New York released an expert system development package that uses a spreadsheet-like interface enabling nonprogrammers to create expert systems without programming or entering rules. Superexpert, which runs on the IBM Personal Computer and Apple Computer, Inc. Macintosh, comes in three versions with varied levels of capability and costs from $199 to $1,200.

Whereas traditional expert systems require users to enter a large body of rules to solve a problem, thereby creating an expert system out of those rules, Superexpert accepts a set of examples and induces its own rules.

A link to another Softsync program, Reports Plus, has been built into Superexpert. Reports Plus is a query system and report generator that can select data from popular spreadsheet programs and data bases. For an introductory price of $99, it reportedly allows users to easily select only the information they require from files and present it in a report of their own design.

Softsync also has renamed Expert-Ease for the IBM PC and cut its price from $695 to $99. Now known as Expert One, the expert systems development package also

See EXPERT page 34

NEW THIS WEEK

- Computer Peripherals offers voice-controlled enhancement board for PCs

For more on this and other new products, see pp. 75-80.

INSTANT ANALYSIS

"The leap from 80286 to 80386 technology is going to be about as significant as was the jump from CP/M to MS-DOS."

— Michael Cronin, vice-president of marketing, Computer Associates, Inc., Micro Products Division

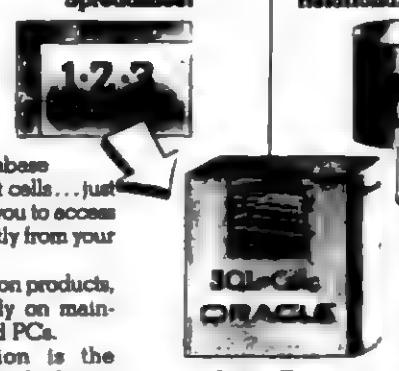
Oracle's SQL★Calc makes a relational DBMS as easy as 1-2-3.

Oracle Corporation has developed a Lotus 1-2-3 compatible spreadsheet and integrated it with its ORACLE® relational database management system (DBMS). The new product, SQL★Calc,® is the first to combine a mainframe-class relational DBMS with an easy-to-learn and familiar PC spreadsheet user interface.

SQL★Calc is designed for 1-2-3 users who've run out of memory, flexibility and patience. SQL★Calc allows you to put SQL database commands into spreadsheet cells... just like formulas. This permits you to access large amounts of data directly from your spreadsheet.

Like all Oracle Corporation products, SQL★Calc runs identically on mainframes, minicomputers and PCs.

SQL★Calc's foundation is the ORACLE relational DBMS, which provides users with a complete set of SQL commands through which they can create, retrieve, modify and otherwise control their data. SQL is the industry standard database command language for large computers. The SQL commands available in ORACLE are identical to the SQL commands in IBM's premier mainframe relational DBMS products, SQL/DS and DB2.



Built on this powerful DBMS foundation is a Lotus 1-2-3 compatible spreadsheet that allows users to put SQL commands into spreadsheet cells in the same way as they enter formulas. When a SQL command for data retrieval is entered into a spreadsheet cell, information is automatically retrieved from the database and placed into the spreadsheet. SQL★Calc also permits users to modify the database – and even create new database tables – directly from the spreadsheet.

SQL★Calc is easy to learn because its menu and command structure are compatible with those of Lotus 1-2-3. And SQL★Calc's ORACLE DBMS requires no supplement: It is vastly more powerful than the database components of 1-2-3, Symphony, Framework, dBase II, dBase III, or any other PC DBMS.

SQL★Calc is available immediately for IBM PC/XTs and ATs for $995.* SQL★Calc will soon be available on a wide variety of systems, including IBM mainframes, DEC, DG, and other superminis, and most UNIX systems.

For further information, or to order your copy of SQL★Calc, call 1-800-345-DBMS. Or write Oracle Corporation, Dept. CS, 20 Davis Drive, Belmont, CA 94002.

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Expert tools within reach

From page 33

uses a spreadsheet-like format for the entry of examples. Expert One is an inductive rule generator, which allows the user to enter examples of decisions from which rules are induced.

Programs in Motion, Inc. of Wayland, Mass., unveiled Version 3 of its 1st-Class expert system tool for the IBM PC at AAAI-86.

Another spreadsheet-like expert system development package, 1st-Class allows expert system developers to build forward- and backward-chained expert systems by entering examples or by building rules on a graphic decision tree.

The new version adds three advanced features. Global variables let a factor's values carry over to other rules in a chained system, allowing a user to answer a question only once, instead of whenever it is asked.

Other features include improved report generation, which allows for testing, debugging and refining the knowledge-base design; and a trace facility that permits developers to try sets of example data or rules and immediately test the effects on expert system performance.

1st-Class Version 3 requires an IBM PC or compatible with a minimum 256K bytes of memory and IBM PC-DOS 2.0 or above. It is not copy protected and can be used with a hard disk. It is priced at $495 and is available now. A demo disk can be purchased for $20.

Clisp, a fully functional LISP library and programming environment for the C language, is now available from Frederick J. Drasch Computer Software of Ashford, Conn. It is priced at $189 and will run on the IBM PC, Personal Computer XT and AT with either the Microsoft Corp. or Lattice, Inc. compiler.

Clisp will allow the addition of intelligence to existing programs or the construction of hybrid programs combining the power and portability of the C language with the symbolic processing capabilities of LISP.

Clisp is written entirely in C, is Common LISP-compatible and consists of more than 100 functions, including all LISP primitives, predicates and conditionals, association lists and property lists and an interpreter with hooks to add user-written functions.

> ***Clisp will allow the addition of intelligence to existing programs or the construction of hybrid programs.***

Systems Designers Software, Inc. of Woburn, Mass., is offering Sage, its expert system shell, for $99 during the month of August. Sage, which normally retails for $499, is available for the IBM PC and compatibles.

Systems Designers is also offering a $499 credit toward the price of Envisage, its expert system shell for the Digital Equipment Corp. VAX VMS environment, to anyone who purchases Sage at either $99 or $499 before Feb. 28, 1987.

Envisage costs from $15,000 for the Microvax to $40,000 on the VAX 8600.

DG's AT compatible

From page 33

286 users will have access to CEO residing on a DG host with the CEO Connection software, which sells for $295 per Dasher license.

The system also comes bundled with Microsoft Corp.'s MS-DOS 3.1, making it software compatible with the IBM PC AT.

In addition to the 640K bytes of main memory and MS-DOS 3.1, the standard system comes with a 1.2M-byte floppy disk drive, two serial ports and a parallel port.

The same system with a 20M-byte hard disk sells for $4,095.

Dasher/286, which is expected to ship within 60 days of order, comes with either an IBM PC AT-style keyboard or a CEO keyboard.

It is reportedly available in a desktop or floor-mounted version.

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In the defense of Compaq

From page 33

dard for transportables with the Portable II when the old standard appeared quite adequate, Compaq's talent to move on ideas, user requirements, market trends and the availability of new technology has made this company different from the rest.

More important, though, is not this past history of performance but the fact that Compaq's history translates into countless corporate and business buyers who believe this pattern of excelling and rising above the pack will continue and who maintain that, for them, Compaq is a safe bet.

Certainly Compaq will lose percentage market share; however, the company's dollar market share should not suffer to nearly the same degree. In the short term, Compaq's soon-to-be-announced system based on the Intel Corp. 80386 will certainly help the company withstand increased market pressures, as will its forthcoming laptop. In the meantime, the clone vendors will serve to demonstrate the significant elasticity that exists in the PC hardware business.

More than anything else, the low-cost clones are succeeding in opening up the bottom part of the market while at the same time adding to overall market confusion. My research points to the reality that clones are primarily being purchased by price-sensitive buyers and technical buyers who are willing to put up with the uncertainty of doing business with a clone manufacturer vs. an established compatible manufacturer.

Overall, the aggregate market expanding to accommodate both of these groups of buyers is good for the microcomputer industry as a whole. In the long run, with the obvious exception of IBM, many vendors will benefit from the increased competition and choices, and users of all types will also benefit. In some cases, members of the traditional group of business purchasers that have been Compaq's primary customers will move into the more price-sensitive purchaser group.

A well-considered response

Although Compaq has to address problems that increased competition will bring, the company realizes just how unforgiving the microcomputer marketplace is and can be counted on to respond with well-considered actions and product introductions.

One of the most visible examples stems from pricing pressures as clone prices drop and major suppliers adjust their prices in response. Compaq's steady increase in gross margins, which now exceeds 40%, should give it plenty of room to respond. Moreover, Compaq's talent for introducing products that are both well positioned and well timed should bolster margins that will suffer from price cuts on current products.

Additionally, Compaq is going to have to come to grips with the changes that are developing in the dealer distribution system that has served it so well to date. These changes have the potential of becoming a much more severe problem than the requirement to respond to price-cutting pressures.

Moreover, the complexities of the conventional dealer distribution system's evolution is still very much a mystery, regardless of what dealer executives say.

Tools emulate IBM, Tektronix workstations

Attachmate Corp. and Grafpoint Co. each introduced terminal emulation software packages last week.

With Attachmate's IBM 3270 Personal Computer Emulation Program, users can put up to four active mainframe sessions, two notepad programs and an IBM PC-DOS application into windows. The $395 program also supports IBM products such as the host-based file transfer, Personal Services/PC, and the 3270-PC Application Program Interface.

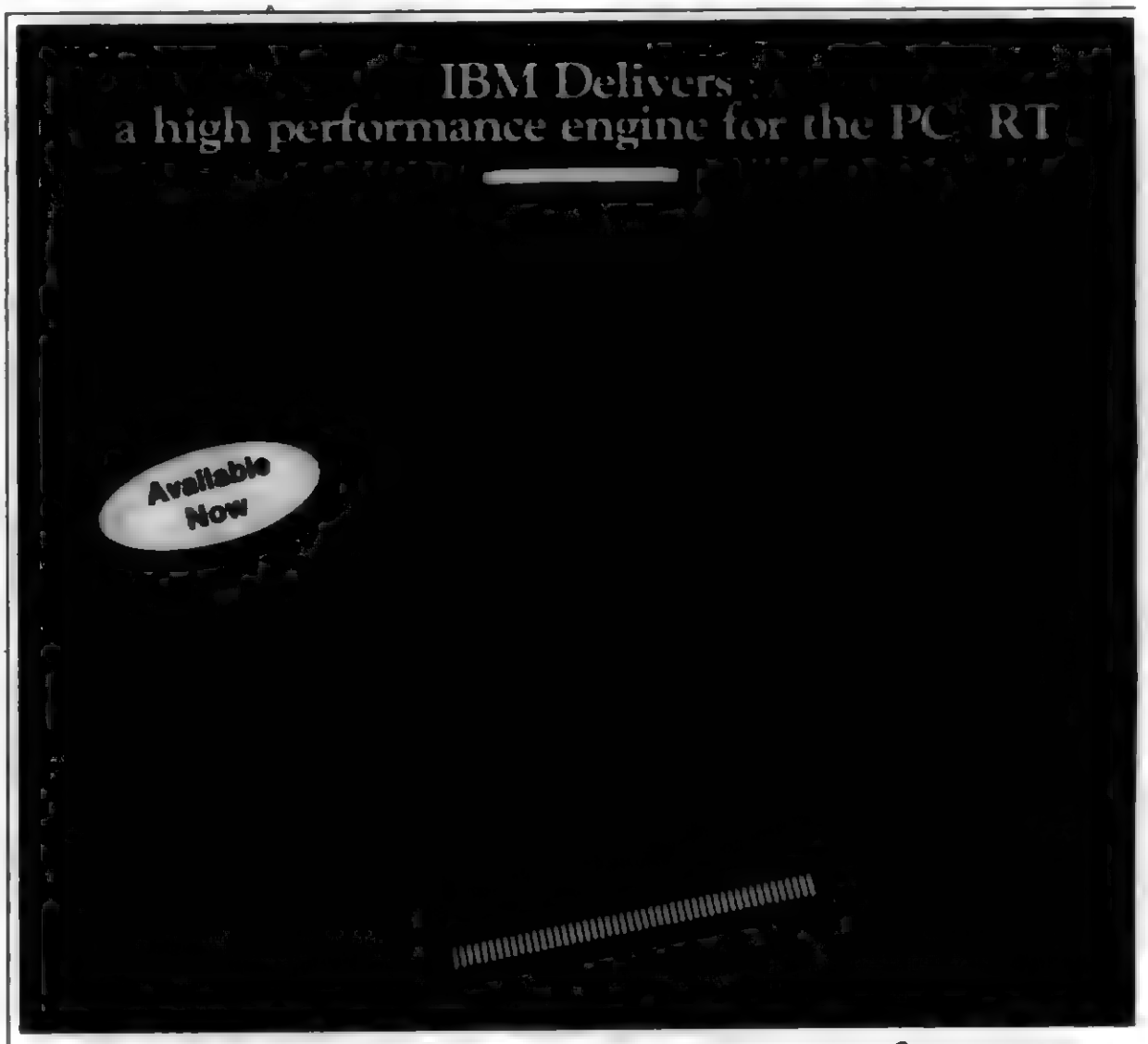
Attachmate's 3270 Host Graphics Program allows high-resolution mainframe graphics to be displayed, edited and printed on the Personal Computer. This $595 graphics option requires no additional hardware and is compatible with both IBM's standard Color Graphics Adapter and its Enhanced Graphics Adapter.

Both programs are now available for use with IBM's 3278/3279 Emulation Adapter.

Grafpoint's Tgraf-15 enables IBM PCs and compatibles to emulate the Tektronix, Inc. 4115 graphics terminal. According to Grafpoint, a fully configured IBM PC with a graphics board and Grafpoint software costs only half as much as a comparable dedicated graphics terminal.

Depending on the color graphics board used, Tgraf-15 can create images of up to 1,280 by 1,024 pixel resolution with 256 colors out of a palette of up to 16 million colors.

Shipments of the $1,995 Tgraf-15 are set for November.



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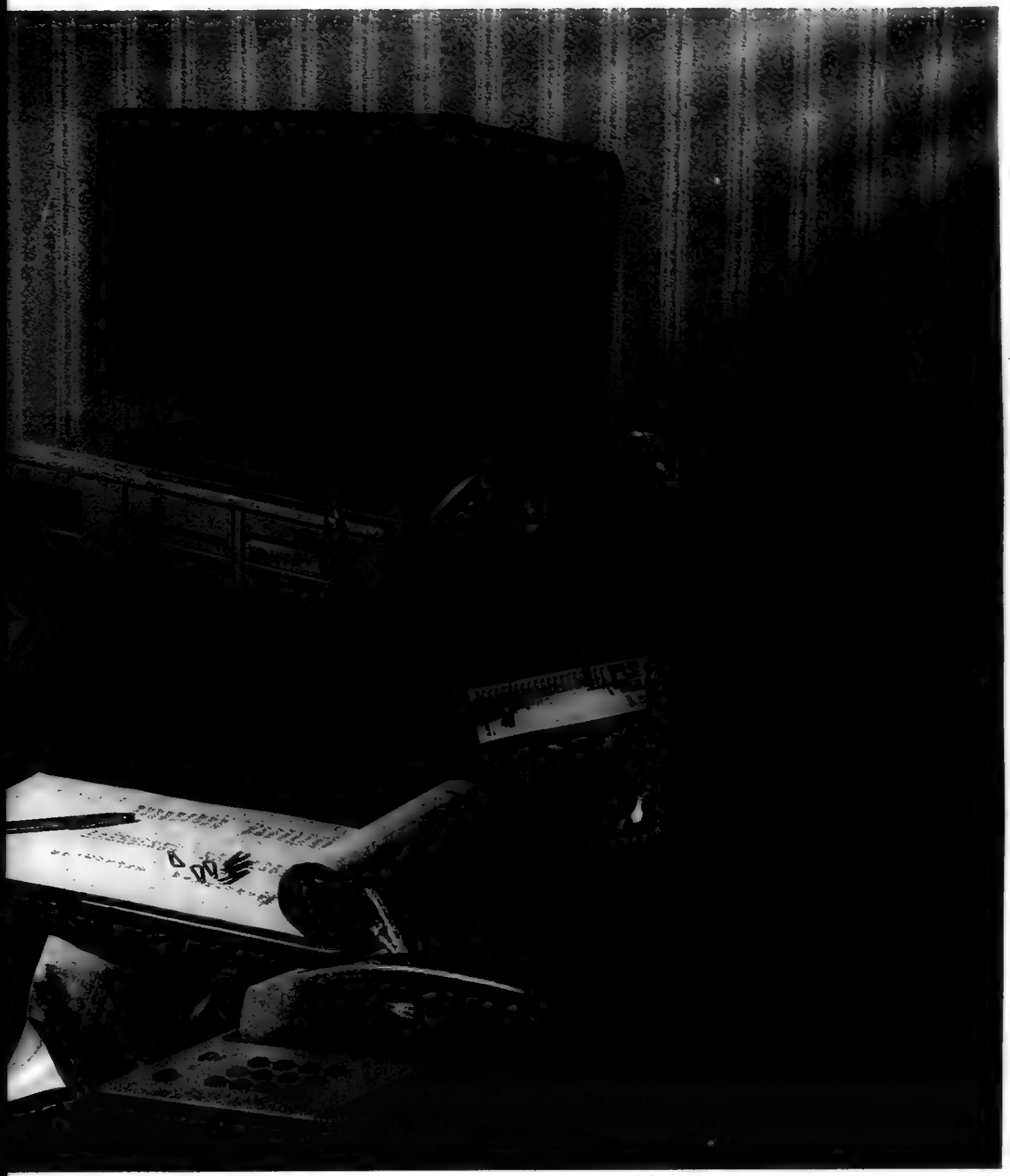
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*1986 Computer Intelligence Corp. survey of 7800 VAX sites. Market share: INGRES 44.8%, DEC 28.6%, Oracle 25.6%.

SYSTEMS & PERIPHERALS



HARD TALK
James Connolly

Rumors fly about 4300s

Rumors can be laughable. They can be scary. Classify this one as intriguing.

It is the type of rumor — actually an outright statement by a fairly well-placed source — that makes one think, "Nope, they'd never do that. But then again. . . ."

The report came out of IBM a couple of weeks ago: IBM is telling its Marketing Assistance Program participants that it is pulling its 4300 family out of the commercial DP market in favor of the System/38 — including a new, more powerful System/38 model — and is targeting the 4300s toward customers in the engineering and scientific fields.

Analysts and consultants quickly said there was no way that the report was true. IBM quickly said it doesn't comment on that type of report.

But even assuming that the original report is off base, it does provide fodder for speculation about where the 4300s are bound, and there are arguments to be made for aspects of the scenario.

Marty Gruhn, vice-president of the Sierra Group research firm in Tempe, Ariz., says she would be surprised if the rumor were true, particularly the part of the report that says IBM will take affirmative action to yank the 4361 and 4381 out of the commercial DP market. However, looking at the issue of steering potential 4381 and 4361 users toward the System/38, Gruhn notes that the System/36 and 38 remain the key subjects of IBM's mid-range strategy.

See **RUMORS** page 40

Connolly is Computerworld's senior editor, systems & peripherals.

Motorola stresses diversity

Faster 68020 chip pushed for general systems use

By David Bright

While the first implementation of Motorola, Inc.'s 25-MHz MC68020 microprocessor is in a technical workstation, the high-performance 32-bit chip should soon be speeding up general-purpose systems as well, company and industry sources say.

Motorola recently boosted the top speed of the chip from 20 MHz to 25 MHz. The chip is also offered in 12.5-MHz and 16.67-MHz versions. In addition, Motorola raised the top speed of its 68881 floating-point processor from 16.67 MHz to 20 MHz. According to Jeff Nutt, manager of technical marketing for Motorola's 68000 family, the recently released 68020 offers seven times the performance of a basic 68000.

Both the faster 68020 and 68881 are used in Sun Microsystems, Inc.'s 4 million instructions per second (MIPS) 3/200 series workstations, introduced earlier this month [CW, Aug. 11].

Concerning the types of systems in which the MC68020 can be used, Nutt says the benefits of the faster chip will be across the board. In addition to technical workstations, systems incorporating the chip should include general-purpose systems accommodating more users, factory robots with faster-moving arms and telephone switching systems that need to handle more calls. "Each time we increase the performance, our customers find ways of using it," he says.

Until systems are able to provide an instantaneous response, there will always be a demand for more powerful chips and systems, according to Nutt. "When I'm sitting there and I call up a file or a screen and I have to wait five seconds, that's eternity. I want instantaneous response, and I think everybody else in the business wants instantaneous response."

Because of the constant demand for more power, Motorola is currently working on its next generation of microprocessors, Nutt says. However, he cannot yet reveal any performance estimates for those chips. Industry observers have called those chips the 68040 family, although

See **MOTOROLA** page 40

DATA VIEW

Report card

Users rate Prime Computer, Inc. and Hewlett-Packard Co. best of minicomputer maintenance.

Responsiveness:	Weighted Average	Users Answering
Prime	3.68	76
HP	3.58	291
Tandem Computers, Inc.	3.53	30
IBM	3.50	939
Effectiveness:		
HP	3.58	291
IBM	3.55	939

Ratings based on a February 1986 Datapro Research Corp. survey of 2,500 users asked to rate vendors on a 1-4 scale.

Larger sites favor uninterruptible power supplies

By Donna Raimondi

LA JOLLA, Calif. — Uninterruptible power supplies (UPS) are either planned or installed at 65% of all computer sites with 5,000 or more remote terminals, while only about 20% of sites with 100 to 250 terminals have or plan a UPS acquisition.

These UPS acquisition patterns were discovered in a recent study by Computer Intelligence Corp., a La Jolla market research company.

The survey examined 18,000 sites over a four-month period, said Thomas Young, market analyst at Computer Intelligence. Approximately 50% of the sites surveyed

See **LARGE** page 44

INSIDE

Charles River Data Systems announces supermicrocomputer additions to its Universe line/**44**

Intergraph releases dual-CPU configuration of its Microvax II-based graphics system/**44**

NEW THIS WEEK

- Toshiba introduces 24-pin, wide-carriage dot matrix printer

For more on this and other new products, see pp. 75-80.

INSTANT ANALYSIS

"The System/36 and the System/38 have become, in IBM parlance, the System/36-38 family, and that is significant for those product lines."

— **Per Flaatten, technology research manager for Arthur Andersen & Co.**

User firm's benchmarks support VLX performance claim

Tests confirm Tandem software compatibility

By Jeffry Beeler

CUPERTINO, Calif. — Benchmark tests by a Milwaukee-based user of Tandem Computers, Inc. systems recently corroborated the vendor's performance claims for its VLX high-end transaction processor.

In a test that A. O. Smith Data Systems, Inc. ran at Tandem's Cupertino headquarters in June, a VLX-based configuration reportedly provided twice the throughput per processor of the hardware supplier's next largest machine, the TXP.

"Our benchmark results put the VLX very much smack in the middle of the performance range that Tandem initially claimed for the machine," A. O. Smith's Vice-President of Product Development Walter Hadcock said during a recent telephone interview.

The tests also put to rest any doubts A. O. Smith had about whether its software written for other Tandem machines would run on the VLX, Hadcock said.

When Tandem introduced its latest top-of-the line system in April, it credited the VLX with processing on-line transactions 1.8 to 2.4 times faster than the nearly 3-year-old TXP.

A. O. Smith, a supplier of Tandem-compatible software for automated teller machine (ATM) applications and an ATM service bureau, furnished both the programs and raw data for its benchmark test, which was meant to simulate the workings of a shared ATM network.

In real life, a typical ATM transaction involves an intermediate processor that receives on-line traffic from a customer terminal and forwards the signal to a bank's host mainframe for authorization. After checking the user's account balance electronically, the host returns the transaction through the intermediate CPU to the originating ATM, which ends the process by sending a completion message to the middle machine.

In A. O. Smith's benchmark test, a four-processor VLX configuration played the role of the intermediate box, while an eight-CPU TXP system created the ATM work load and doubled as the authorizing host.

Roughly 10% to 15% of the ATM traffic was composed of simple inquiries about account balances. The rest of the work load, which was transmitted over a score of 9.6K bit/sec. lines, consisted of relatively resource-intensive transactions such as simulated funds transfers and cash withdrawals.

The mix of transaction types that A. O. Smith chose for its test is fairly representative of the kinds of traffic that typically occur over a commercial ATM network, Hadcock said.

After the VLX configuration had finished processing the work load it received from the TXPs, the test was repeated in reverse: A. O. Smith used the VLX system to simulate the ATM traffic and the TXP machines

See **USER** page 44

Rumors fly about 4300s

From page 39

"IBM's current thrust across its product lines is to focus its products in particular markets. It is positioning its products in those markets and trying to stop the confusion. The company really needs to clean up its act," Gruhn says, noting that some users remain unsure as to which mid-range products IBM is committed.

But Gruhn also reports that the idea of a new, powerful System/38 to serve the near-mainframe needs of 4381 users doesn't fit in with what her firm has learned about IBM's plans. She predicts that System/38 users, whose product line was revamped as recently as mid-June, won't see a super System/38 for two years.

One observer who says he hadn't heard the rumor but does not dismiss it out of hand is Svend Hartmann, president of Computer Merchants, Inc., a Chappaqua, N.Y., used-computer dealer and computer lessor.

"The rumor is very plausible and the kind of direction that IBM would take. If I had heard it, I would say that it fits in with the overall strategy that IBM has had for quite some time. In a way, I think it is already happening. You see relatively little commercial activity in the 4361 area in particular," which has been concentrated for a while in the computer-aided design and manufacturing market, Hartmann says.

An Infocorp analyst, Sandra Gant, says she would be surprised if IBM announced that the 4300s were being pulled from a particular market segment. But she, too, notes that the repositioning has been occurring for some time and recalls that during a presentation in West Germany more than a year ago, IBM positioned the 4361 as an engineering computer.

"I think IBM has been trying to position the 4300 as an engineering departmental system to compete with the Digital Equipment Corp. VAX line," Gant says.

"From a price/performance point of view it makes sense to position the 4300s as engineering machines. But it doesn't make sense to just kill them as commercial machines," Gant says, emphasizing that IBM "lets its customers vote with their money" before the company decides which machines to promote and enhance.

The basic reason so many observers say they would be surprised to see IBM pull the 4300s out of the commercial market is that the product family, with the possible exception of the 4361, has been a tremendous market success in the seven years since it was introduced. There are a lot of 4300s installed in American companies, with many of them being used to run payrolls and accounting packages in addition to doing engineering work.

> ***"If IBM does kill the 4381 and 4361 as commercial DP machines, it runs the risk of alienating a lot of people who could find themselves with no way to upgrade their machines."***

The market research firm Computer Intelligence Corp. earlier this year counted almost 16,000 4300s installed throughout the U.S. That number includes not only the 4361s and 4381s that remain in IBM's current new product offerings, but also more than 1,800 of the older 4331s and more than 5,000 of the various 4341s, the last of which were removed from the active marketing list in February.

If IBM does kill the 4381 and 4361 as commercial DP machines, or even if the high- and low-end replacements for the 4300s that are expected during the next few months prove to be too new and different, IBM runs the risk of alienating a lot of people who could find themselves with no way to upgrade their machines and no way to recoup their losses on the used market.

"What you have to remember is that there are thousands of 4300s out there. Even IBM can't move that many people. They can migrate some of those people over a period of a lot of years, but there is no way they can move that many people into another product line with one or two announcements," comments analyst Charles Greco of the International Data Corp. market research firm in Framingham, Mass.

Finally, Per Flaatten, a consultant with Arthur Andersen & Co. of Chicago, says he, too, heard the report about limiting 4300 sales to the engineering and scientific users.

"I heard that rumor myself, and I do not think it sounds plausible at all. The 4300 is making money for IBM, and so is the System/38. The way the 4300 is going, it is a pretty popular choice for people who are down low and expect to grow," Flaatten says. He maintains that the 4381 shouldn't be taken out of the commercial market until there is a replacement as an entry-level system to the IBM MVS world.

Flaatten also notes that what might be in the wind and serving to fan the rumors is IBM's long-running goal of driving IBM DOS users, most of whom are in the commercial DP area, toward MVS. He theorizes that IBM may be preparing to penalize users who want to stay with DOS, with those penalties being either financial or functional in nature. Another source of the rumors, he says, could be the withdrawal of support for IBM ECPS, a hardware assist found primarily in older 4300s.

But if one continues to look at the rumors and the events of the past few months, there are other questions that arise in connection with the 4300s. They are questions that 4300 customers have a right to have answered.

The 4381s received mid-life performance kickers and price cuts in February, which led to widespread speculation that a CMOS-based replacement is due this coming February. But the question of compatibility remains.

Similar compatibility questions may be on the minds of 4361 users who have heard IBM talk about its Micro370 microprocessor, which is expected to be at the heart of a 4361 replacement within a few months.

When it revamped the System/36 and System/38 lines in June, IBM announced its 9335 disk drive as a replacement for the 3370 that has been used with the System/38. But unlike the 3370, the 9335 is incompatible with the 4300s.

More typical of the confusion that continues to reign in the 4300 market is that surrounding the introduction of the 3174 controller as part of the June 16 announcements.

The 3174 was billed as a replacement for the 3274 controller, but while the 3274 supported the full 4300 family, users are questioning whether the new controller supports all 4300s or just the currently marketed 4361s and 4381s. The questions focus on the support for the older 4300s.

IBM spokesmen in the Information Systems Group report that the 3174 was designed to support all 4300s and that even the oldest models of the 4300 product line can be attached without major changes. That is what IBM's headquarters says. Users in the field are getting different answers.

More than a hundred 4300 users reportedly have tried to order 3174s only to be told that systems such as the 4341 aren't supported by the 3174. Therefore, those orders have been placed on hold. That type of discrepency is why rumors about IBM's doings and undoings are so easily picked up and given credence.

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Motorola stresses diversity of chip

From page 39

Motorola says it is not using that designation.

There is absolutely a need for more power in both individual and multiuser applications, agrees Richard Mikita, an analyst with International Data Corp., a market research firm based in Framingham, Mass. One of the next users of the 25-MHz 68020 could be Enmasse Computer Corp., a vendor of multiprocessor transaction processing systems, Mikita predicts.

But even the Apple Computer, Inc. Macintosh could be a candidate for the faster chip, especially in desktop publishing applications, Mikita adds.

Motorola rates the 25-MHz 68020 at 5 MIPS, with bursts reaching 12.5 MIPS. The 20-MHz 68881 floating-point processor performs more than 40 different floating-point functions.

Production shipments of the 25-MHz 68020 and the 20-MHz 68881 should begin in the fourth quarter of this year.

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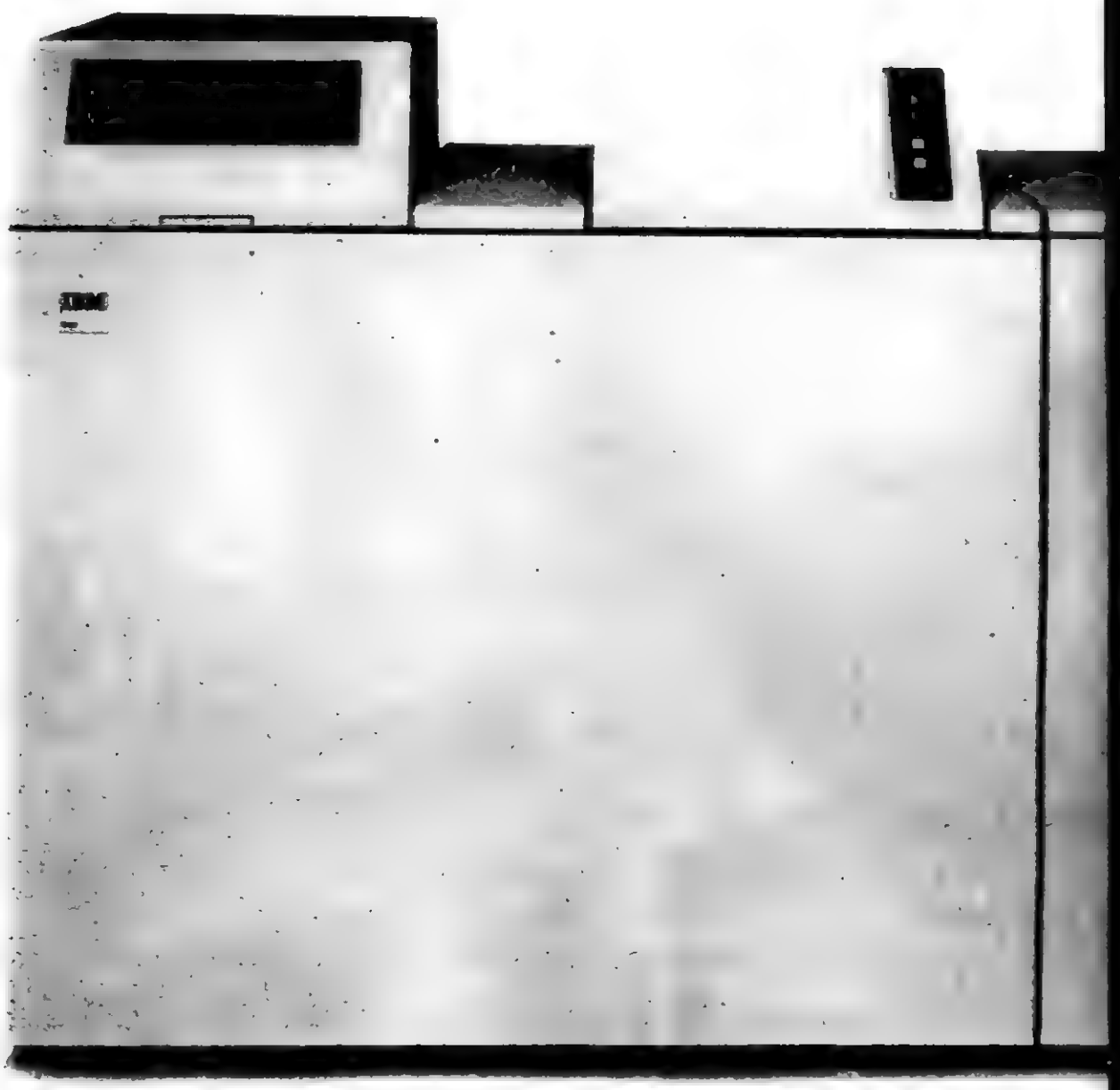
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IBM System/36

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IBM®

User tests support Tandem claim

From page 39

to process it.

"The reason we benchmarked the systems in both directions is that we were more interested in gauging the relative throughput of the VLX and the TXP than we were in getting some absolute measure of their performance," Hadcock said.

In the first half of the procedure, when ATM applications were being executed by the VLX, the testers achieved a top processing speed of 50 transaction/sec. and a sustained throughput of 40 transaction/sec., he said.

In the second half of the test, when responsibility for the processing moved to the TXP, the observed performance peaked at 29 transaction/sec. and averaged 20 transaction/sec.

As a Tandem software house, A. O. Smith sells products that run on the TXP and the hardware vendor's other existing processor models, including the Nonstop II.

But prior to the benchmark test, the user organization was uncertain as to whether the same programs would also operate — without revision — on the VLX.

Test proved compatibility

Hadcock said that, to A. O. Smith's relief, the benchmark test proved the VLX fully compatible with the rest of Tandem's processor line.

"The software we used in our tests was identical to the products we provide commercially," Hadcock said. "Within an hour of the moment we walked in and saw a VLX for the first time, we had our programs up and operating."

> ***'Within an hour of the moment we walked in and saw a VLX for the first time, we had our programs up and operating.'***
>
> — Walter Hadcock
> A. O. Smith Data Systems, Inc.

Although the test results were generally favorable, Smith has deferred thus far its decision on a VLX purchase.

"Right now, we still have some room to grow in the TXPs and Nonstop IIs we already have," Hadcock said.

"When our volume grows to the point where it begins to rub against our available capacity, we'll have to begin looking carefully at the VLX as our next possible acquisition," Haddock added.

A decision one way or the other on Smith's next CPU procurement will probably come during the fourth quarter, he said.

Universe 32-bit supermicros debut with denser hard drives

By James Connolly

FRAMINGHAM, Mass. — Charles River Data Systems, Inc. has announced two 32-bit supermicrocomputers for its Universe series that feature denser hard disk drives and the ability for users to add more I/O devices, communications controllers, memory and peripheral interfaces.

The Universe 32/117 and Universe 68/117 are largely comparable with Charles River Data's earlier Universe 32/137 and Universe 68/137 systems, except that the new systems use 5¼-in. disk drives rather than 8-in. drives, and they offer seven expansion slots rather than five slots, according to a company spokesman.

The 32-bit Unix systems are based on Motorola, Inc.'s Versabus. The Universe 32/117 uses a 12.5-MHz Motorola 68020 microprocessor and executes 2.7 million instructions per second (MIPS), according to Charles River Data.

The Universe 68/117 uses a 12.5-MHz Motorola 68000 processor and is rated at 1.25 MIPS, the company spokesman said.

The systems are targeted at the same markets as the earlier Universe systems, including telecommunications, image processing, advanced controls and nonfinancial transaction processing applications.

The systems are available now in the end-user and OEM markets, the vendor said.

The systems are available in 10½-in.-high, rack-mountable packages, and feature 140M bytes of unformatted disk storage and a ¼-in. streaming tape backup unit.

The Universe 32/117 costs $34,000 with 1M byte of memory.

The Universe 68/117 is priced at $27,500.

Dual-CPU graphics unit out

By James Connolly

HUNTSVILLE, Ala. — Intergraph Corp. recently introduced a dual-processor version of its Digital Equipment Corp. Microvax II-based Intergraph 250 graphics system.

Intergraph, which sells interactive graphics systems based on DEC VAX systems and plans to sell a graphics system based on the Fairchild Camera and Instrument Corp. Clipper microprocessor, said that the dual-processor Intergraph 252 provides twice the power of the single-processor 250.

According to Intergraph officials, additional benefits of the dual-processor system include the ability to access data on dual-ported disk drives from either CPU.

Cost-saving benefits

Another benefit is the ability to save money on some software license fees because the two CPUs are sold as a package.

The 252 consists of two Microvax II CPUs in a three-rack cabinet, 16M bytes of memory per CPU, a 337M-byte disk drive for each CPU and room for six rack-mounted disk drives within the cabinet.

Ethernet networking is provided through two Intergraph Communications Processors.

Standard software

Standard software includes DEC's MicroVMS and Intergraph's core drafting and data base management packages, Interactive Graphics Design Software and Data Management and Retrieval System.

The company said that a typical system costs $280,000 and that the 252 is scheduled for November delivery.

Intergraph also sells systems based upon DEC VAX/11-785 and VAX 8650 superminicomputers.

Large computer sites favor UPS

From page 39

had minicomputers, and 25% had either superminicomputers or mainframes.

"This is the first time we have done a UPS study, so we didn't know what to expect," Young said.

He is planning to conduct another survey on power conditioning units.

"I expect that many of the sites that don't have UPS have power conditioners," Young added.

Banking industry uses UPS

Another portion of the study, which was conducted a month earlier, showed that while 19% of the banking and savings-and-loan industries used UPS, that figure fell to 16% for transportation/utilities and government categories; 10% for finance/insurance, business services, electronic data processing services and process manufacturing; and only 7% for the wholesale/retail category.

While minicomputer and mainframe sites that consume less than 50 kVA are not likely candidates for UPS ownership, the likelihood of getting UPS increases quickly as the kVA consumption rate goes up, the study showed.

For instance, only 5% of sites in the 1- to 3-kVA range plan to acquire or already have an UPS, while in the 26- to 50-kVA range, 17% of all sites report UPS activity.

Beyond the 26- to 50-kVA range, the use of UPS increases significantly. Sites in the 51- to 100-kVA range show a 25% rate of activity, while UPS show up in 33% of sites in the 101- to 500-kVA range.

At sites exceeding 500-kVA consumption, there is a nearly 50% probability that a system is either planned for installation within 12 months or is already installed.

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Product Spotlight

Edited by Barbara Wierzbicki

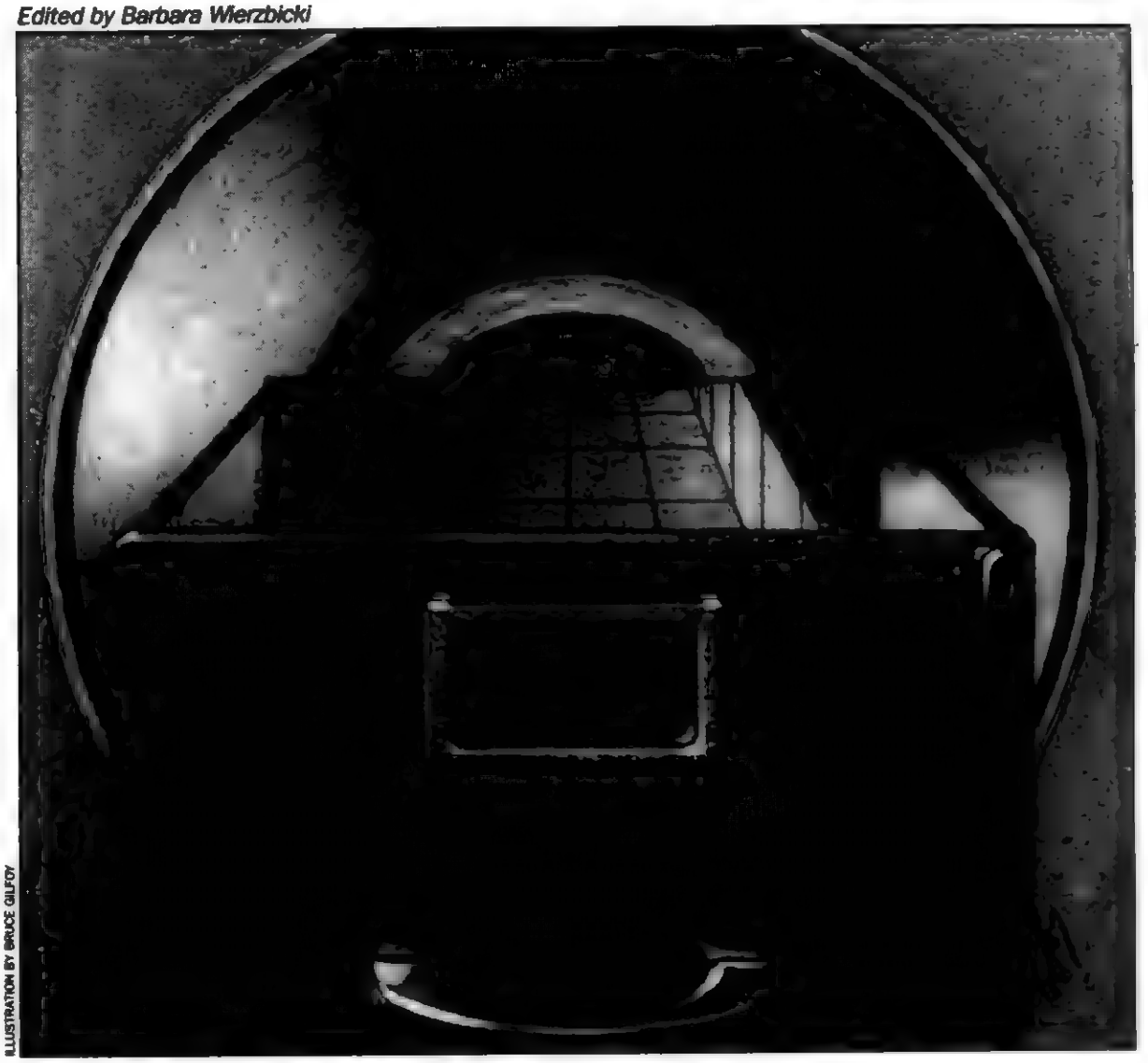


ILLUSTRATION BY BRUCE GILFOY

INSIDE

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Image/document processing

A risky replacement for paper-based systems

By SAMUEL P. LYLES and LILLIAN P. LYLES

For a relatively long time in the computer industry, it was tacitly understood that the fundamental units of data were numbers, alphabetical characters and a few special symbols. Stalwarts maintained this position, even when graphical characters and pictures were introduced, labeling them as information objects rather than real data. Such rigid interpretations, however, are changing as the evolving technology now forces us to regard digitized pictures, voices and so on as units of data — similar in many respects to numbers or alphabetical characters. Image and document processing is upon us.

Not only has image processing arrived, its continued development and eventual widespread use will be one of the milestones in the evolution of computer technology. Image processing will ultimately rank equally with word processing, spreadsheets and data base management systems in terms of its impact on the industry.

But regardless of the expected benefits of this rapidly progressing technology as promoted by its advocates, there is a very real need for industry professionals to exercise caution — to not be pushed by the excitement of new possibilities into spending resources on pipe dreams. DP managers must certainly stay abreast of new advances in hardware and software technology but should never lose sight of their ultimate responsibility for real-world performance.

With approximately 15 commercially available systems — and many more in the wings — corporate decision makers will soon be called upon to determine the feasibility of integrating image processing into their DP environments. It is time to set down ground rules for system evaluation and selection.

What exactly is meant by image processing? The basic idea is to capture a bit representation of a picture or image that can be stored, retrieved, manipulated, printed and so on by a computer. This technology appeals strongly to paper-intensive industries — financial institutions, insurance

Continued on next page

If image processing is to be a viable information handling method, we must evolve data/image base management techniques paralleling tools available for text and numbers.

Samuel Lyles is director of research and development at Business Records Corp., a Dallas-based firm specializing in legal records management. Lillian Lyles' career in DP spans 25 years, with extensive experience in banking and insurance operations.

Risky replacement of systems

Continued from previous page

companies, government agencies, engineering firms, banks — because it eliminates the need to use hard copies of paper documents. Moreover, image processing greatly reduces physical storage space requirements, and the nonerasable laser disk provides greater protection for valuable data.

The functional requirements of image processing should include the ability to do the following:

- Capture an image from a paper document through videoscanning.
- Compress and store the captured image on disk.
- Retrieve a desired image from the mass storage device.
- Display retrieved images on a screen.
- Edit, create and modify text.
- Print copies of images, text and data.

Capturing an image. Capturing may be accomplished by shining light on the image and measuring the reflected light at discrete intervals. For example, if a system of sensors is arranged to measure the reflected light at intervals of 1/200 inch, the image is said to have been scanned at 200 dots per inch, or 40,000 pixels.

The number of pixels included in a scanned image increases in direct proportion to the square of the scanning density (dots per inch). The appropriate scanning density for a given situation depends upon the resolution needed. Higher scanning densities are required for more detailed information.

Compressing and storing an image. This new image processing technology would not be possible without compression algorithms, techniques that allow you to shrink scanned images and store them on disk for subsequent processing.

Using compression algorithms, one side of a 12-in. laser disk can store the equivalent of 30,000 8½- by 11-in. sheets of paper — approximately the size of a four-drawer file cabinet. An office storing 1,000 images per day would require less than six inches of office shelf space per year at a cost in storage media of less than $2,000.

Assuming compression ratios of 20:1, storage requirements can range from roughly 6G byte/year (100 image/day) to 300G byte/year (5,000 image/day), depending upon application and level of activity.

Table 1 on page 48 illustrates the relationship of scanning density, image size and storage requirements. It should be apparent from the table that you need to determine the degree of resolution required with some care since the associated storage requirements increase in direct proportion to the square of the scanning density.

Document processing has also stimulated even greater interest in optical character recognition (OCR) processing. The potential for significant storage compression through OCR, offering effective reduction ratios of 200:1 and better, may very well be the difference that makes document processing feasible for certain applications.

Most "real" documents are a mixture of ASCII images and non-ASCII images like diagrams, pictures and signatures. OCR systems like Palantir Software Co.'s Compound Document Processor and the Kurzweil Computer Products, Inc. Model 4000 can convert text image data to ASCII representations, thus easily integrating word processing into the overall document processing function.

If OCR is to be incorporated into a document processing system in an effective manner, the system must be able to do the following:

- Discriminate between ASCII objects and non-ASCII objects.

> ***With approximately 15 commercially available systems, and many more in the wings, corporate decision makers will soon be called upon to determine the feasibility of integrating image processing into their DP environments.***

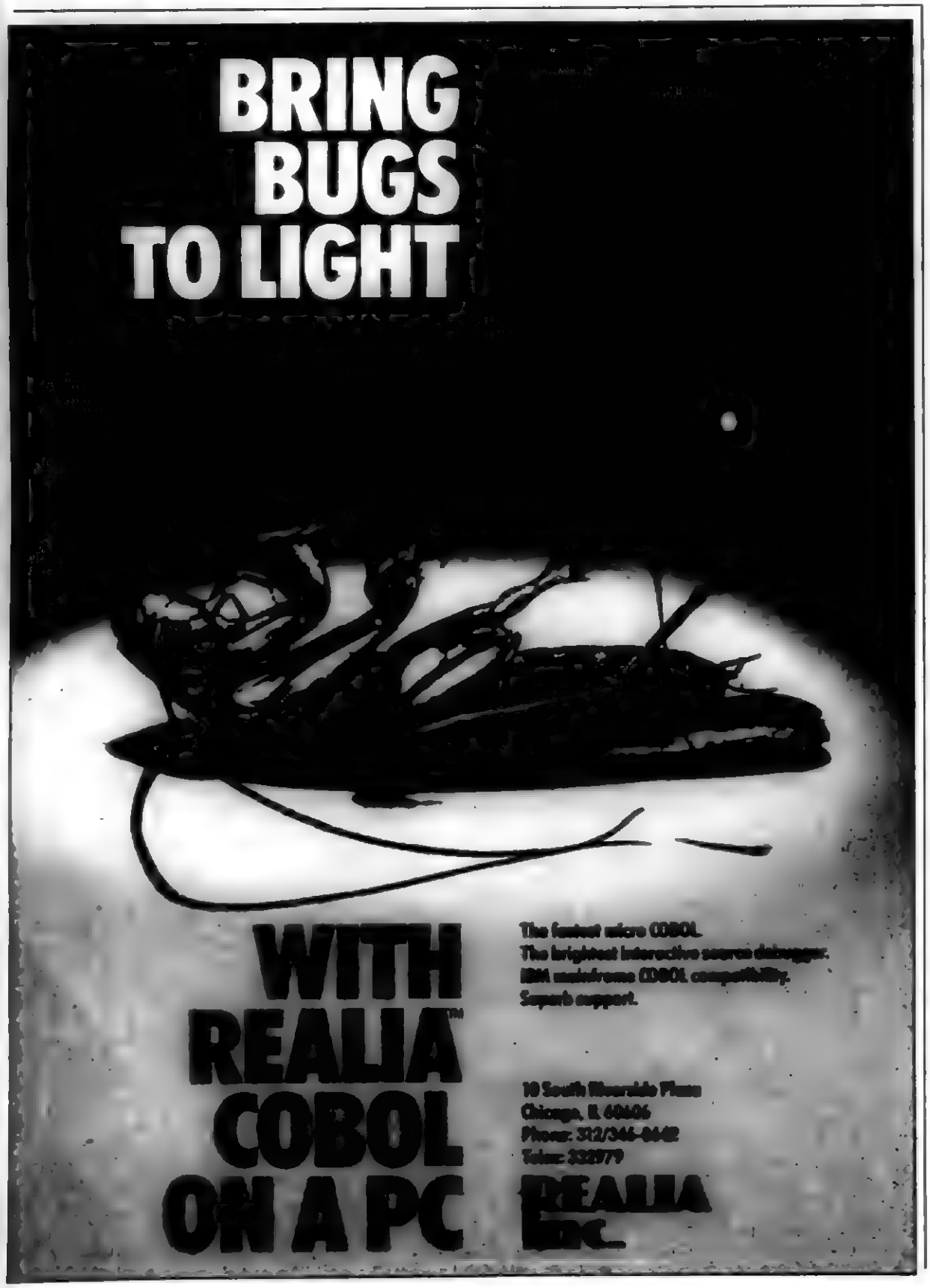
- Provide the user with the option of capturing ASCII objects as images and/or ASCII characters and storing non-ASCII objects like pictures and signatures as images.

Retrieving, displaying and editing an image. A captured and stored image may then be retrieved and, using the associated bit pattern, displayed on a CRT.

Standard display capabilities include multiple retrieved images on a screen, zoom, display front and back sides simultaneously, rotate the image and reverse video.

Now, imagine that you had scanned the image of the "Mona Lisa," stored it on disk and then retrieved and displayed that image in full color on your screen. In very important and fundamental ways the displayed image has already been processed, but at least two additional important types of editing are possible:

Continued on page 48



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Continued from page 48

• Spectral (frequency or color) analysis. Spectral analysis, which takes frequency or color measurements, provides a map of visible light intensities for the image as a function of the X-Y position. A technique called Fourier analysis lets you determine the contribution of each light frequency at each location. Such information allows you to go "inside" an image and modify the data in several ways, including identifying all regions of the image in which a given color is found, suppressing particular colors or ranges of colors, amplifying colors or ranges of colors and so on.

In essence, options like these let you conduct a detailed investigation of an image and then modify or edit the image's color spectrum.

• Geometric analysis. With knowledge of spectral intensity as a function of position, you may then identify and modify geometric patterns (circles, squares, ASCII characters). This capability allows you to search inside an image's bit pattern for all occurrences of the geometrical pattern according to a given word, like "Smith."

Computer analysis and editing of the spectrum and geometry of an image have been the subjects of many extensive texts, and the reader is referred to books such as *Digital Image Processing* by Gonzalez Wintz (Addison-Wesley Publishing Co.) for detailed discussions of these topics.

Printing an image. Any image processing system must allow you to print copies of images, data and text. The printing function is being increasingly done with laser printers, since these units most faithfully reproduce stored images.

If image and document processing is to become a viable information handling method, the computer industry must evolve data/image base management techniques paralleling tools now commonly available for text and numeric data.

Moreover, such systems must take every advantage of OCR, compression methods, inversion and so on in order to avoid a byte explosion that places undesirable limitations on the practical size of an image/data base.

Examining some basic parameters will help elucidate real-world limitations upon the successful implementation of any image or document processing system. To an overwhelming degree, the major practical areas of concern in evaluating these systems are rate of capture and storage.

Rate of capture. Office personnel handling claims forms at a large insurance company typically process at least 5,000 images each day. The staff requires the full-time use of four scanning machines, averaging

Table 1

IMAGE PROCESSING STORAGE REQUIREMENTS BASED ON SCANNING DENSITY AND IMAGE SIZE

Paper Size (inches)	Scanning Density (dot/in.)	Storage Required (bytes)	Produced Storage Requirements (bytes) Based on Compression Ratios		
			10:1	14.3:1	20:1
8½ by 11	100	116,875	11,688	8,173	5,844
	200	467,500	46,750	32,693	23,376
	300	1,051,875	105,188	73,558	52,596
	400	1,870,000	187,000	130,770	93,504
8½ by 14	100	148,750	14,875	10,402	7,438
	200	595,000	59,500	41,608	29,752
	300	1,338,750	133,875	93,619	66,942
	400	2,380,000	238,000	166,434	119,008

CW Chart

The degree of resolution needed must be determined carefully, since the associated storage requirements increase in direct proportion to the square of the scanning density.

Table 2

IMAGE PROCESSING RATES OF CAPTURE

Scanning Rates	Small Business: 100 Images Daily	Medium-Size Business: 1,000 Images Daily	Large Business: 5,000 Images Daily
1 sec./image	1.7 minutes	17.0 minutes	1.4 hours
10 sec./image	16.8 minutes	2.8 hours	1.8 days
20 sec./image	33.0 minutes	5.5 hours	3.5 days
30 sec./image	52.8 minutes	1.1 days	5.4 days
60 sec./image	1.7 hours	2.2 days	10.8 days

CW Chart

The time required to capture an image hinges on the rate of scanning. If document editing is needed during scanning, realistic rates of capture are between 20 and 30 sec./image.

Table 3

TIME REQUIREMENTS TO CAPTURE ARCHIVED BASES

Number of Images	1 Sec./Image	20 Sec./Image
260,000	8.68 machine-days	173.60 machine-days
1 million	34.70 machine-days	2.78 machine-years
1.25 million	43.00 machine-days	3.60 machine-years
2.5 million	86.75 machine-days	6.94 machine-years
5 million	173.60 machine-days	13.88 machine-years
12 million	1.74 machine-years	34.70 machine-years
25 million	3.48 machine-years	69.60 machine-years
768 million*	106.60 machine-years	2,132 machine-years

* An actual image base now residing on microfilm in Los Angeles.

CW Chart

scanning speeds of 20 sec./image, in order to capture the desired number of images each workday. At the low end of the spectrum, a small accounting firm needing to capture 100 images per day can do so in approximately 30 minutes with one scanning machine. Consider the requirements for offices having 100, 1,000 and 5,000 images to capture each work day (see Table 2, page 48).

You will note that the time required hinges on the rate of scanning. Equipment is available to scan either paper, microfilm or microfiche at rates of up to one image per second.

Whether this rate is achievable as practical throughput is an entirely different question, the answer to which depends almost entirely upon the nature of the application.

If any editing (key identification through OCR or manually, filtering of unwanted sections or colors and so on) is required as documents are scanned, rates between 20 and 30 seconds per document are more reasonable as a basis for determining the amount of time required.

The latter being the case, one machine should be barely adequate to maintain the pace of 1,000 images per day and at least four machines would be required for 5,000 images per day. In general, a minimal estimate would be one machine per thousand images per day.

With regard to concurrent operations, it is reasonable to assume that one must complete each day's work in one day. If the office in question generates 5,000 images to be indexed and captured each day, four capture stations working at no less than 20 sec./image will be required.

A separate yet related issue concerns the management of archived data bases. Projects to convert to image processing require plans not only for uninterrupted operations from the day of initiation forward but also for the management of historical or archived data.

Five hundred rolls of microfilm at 2,000 frames per roll — one million images — is a modest archived image base. The resources required to maintain current or date-forward operations may be considerably less than requirements to capture large archived image data bases.

For example, an office that has generated 100 images per day for 10 years now has an archived base of 250,000 images; an office generating 5,000 images per day could have an image base on the order of 12.5 million images in 10 years. The time required to capture archived bases of this size might therefore be estimated as in Table 3 on page 48.

This table should enable you to make a reasonable estimate of the minimal commitment of human and equipment resources that will be required to capture your company's historical data.

The table figures are meant to emphasize the importance of carefully evaluating the wisdom of launching into a project to convert an existing archived image data base to laser media.

In some cases, it may be that — irrespective of cost — too much time is required to capture the entire set of images. In this instance, one option is to prioritize your data and

Continued on page 54

Table 4

DAILY STORAGE REQUIREMENTS BASED ON NUMBER OF IMAGES AND COMPRESSION RATIOS

Number of Images	Compression Ratios				
	10:1	14.3:1	20:1	30:1	200:1
100	4.57M bytes	3.27M bytes	2.28M bytes	1.52M bytes	2.28K bytes
1,000	45.65M bytes	31.93M bytes	22.83M bytes	15.22M bytes	2.28M bytes
5,000	228.25M bytes	160.00M bytes	114.14M bytes	76.10M bytes	11.40M bytes
25,000	1.141G bytes	7.99G bytes	5.710 bytes	3.80G bytes	570.70M bytes
2.5 million	114.14G bytes	79.72G bytes	57.07G bytes	38.05G bytes	5.71G bytes
12.5 million	570.07G bytes	399.00G bytes	285.35G bytes	190.25G bytes	28.55G bytes

DW Chart

An 8½- by 11-in. sheet scanned at a density of 200 dot/in. requires 456.54K bytes of storage per gray scale without data compression. At a 20-1 compression ratio, it requires 22.83K bytes of storage.



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AD#PIC

Library, bank improve record management

By MICHAEL SULLIVAN-TRAINOR

For the Library of Congress, system speed and flexibility are fine, but the main reason image processing caught on is that it improves the quality of printed material.

On the other hand, officials at Los Angeles's Security Pacific National Bank are not concerned about the enhanced readability of their records. They are installing image processing systems hand over fist because they help control the bank's complex records system.

Each user relies on different vendors' products, but both operate image processing systems as input devices for extensive optical disk storage projects.

"We use image processing to enhance printed images, both text and photographs, such as those that appear in *Newsweek* or *Time* magazine," says Basil Manns, project engineer for the library's Optical Disk Project.

The system, made by Integrated Automation, Inc. of Alameda, Calif., reduces original printed halftone images to binary images and optimizes them through compression and other techniques. Manns' staff uses a custom algorithm to develop a pseudo halftone, which can be stored on optical disks and accessed by eight terminals.

Library staff members use the system's charge coupled device scanner to store between 1,000 and 2,000 pages of printed material daily.

Integrated Automation's system was selected by the library four years ago, because it was one of the more developed products on the market.

"Not too many people had a good grasp of image processing systems at that point in time," Manns says. "We chose the system because it provides continuous tone and allows us to define type sizes and resolution."

The only drawback with the system, according to Manns, is the preponderance of options that are operator-selectable.

"You have to have some manual commands, but it would be better if there were less. It's like any copy machine, the computer in the system needs to decide what the material is before it scans it," Manns says, "and it's up to the operator to determine the proper scanning procedures."

Security Pacific National Bank, also one of the early users of image processing, was a beta-test site for the first optical disk-based image processing system installed by Filenet Corp. of Costa Mesa, Calif., according to Robert Minnich, vice-president for the bank's image management unit.

"Filenet had a head start in terms of the other competing vendors, because its work control software and other features allow us to truncate the documents and then handle them electronically instead of doing all the paper shuffling we had been doing in the office," Minnich says.

The bank has one system operating in its international banking division, a second system being installed in personnel, and Minnich is conducting a study to justify implementing two additional systems, one in bank card operations and one in operations support, which handles individual retirement accounts.

Key to the effectiveness of the system is Workflo, Filenet's work control software, which facilitates access, storage and retrieval of the optical disk archives. The Workflo software takes over after the document has been written from the optical disk to the magnetic memory of a workstation.

It also enables operators to create new files for dispatching information to their supervisors, and it sequences investigative tasks.

Each of the division's 18 workstations contains Workflo routines to manipulate the images, with the supervisors having more advanced capabilities than the regular operators. Using a business forms page scanner, which handles 5½- to 14-in. documents, Minnich's staff can store between 2,500 and 3,000 documents a day in detailed indexes.

Other potential applications

While satisfied with the system, Minnich sees many other banking applications it could be used for in the transaction processing area, ranging from check processing to loan payments — if the scanner could operate at speeds as high as 100,000 documents per day.

"Speed is the limiting factor," he says. "The system was originally designed for records management document control, but we see a lot of other benefits for applications."

Such technological changes are beyond Filenet's capabilities, Minnich says, but the bank is reportedly negotiating with other vendors to develop compatible systems to upgrade the speed of the Filenet system.

Though they each use image processing for different reasons, managers at both the library and the bank are satisfied with the improvements in records management brought about by their image processing systems and look forward to more sophisticated, higher speed machines in the future. ■

Sullivan-Trainor is a Computerworld senior writer.

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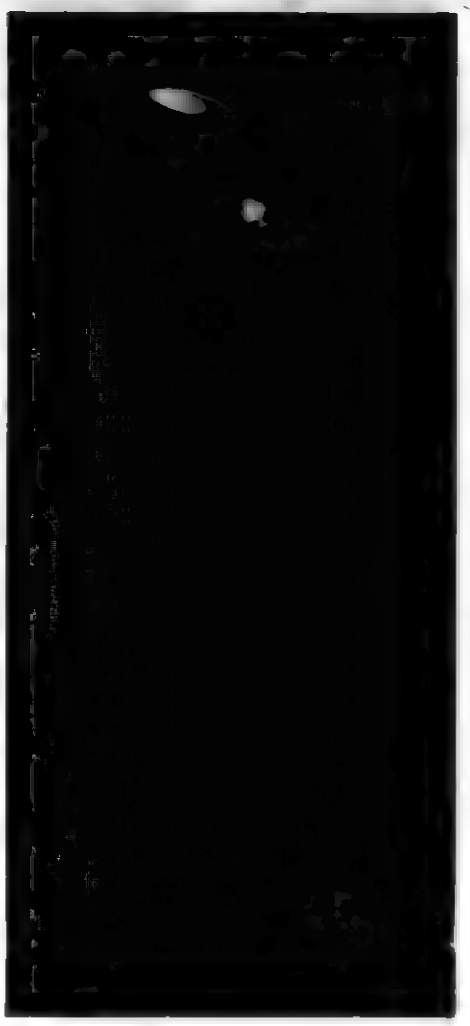
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									320K	$700	✓
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Exploring effects of optical disk imaging systems

By NANCY S. BRYAN

Optical disk-based imaging has received a lot of attention over the past 12 to 24 months. But how is it really affecting those pioneers who have actually implemented it, and in what kind of environment is this new technology appropriate?

Though optical disk-based systems are relatively new in production and commercial environments, users have experienced significant improvements in productivity. This article reviews the primary components of an optical disk-based imaging system and presents an overview of how the implementation of such a system has impacted a business function.

Imaging systems come in many different varieties to suit a range of applications. Some vendors provide all of the capabilities described below, and others provide only a subset.

Optical disk imaging system components. The document enters the system through the scanner. The scanner converts paper or microfilm documents directly into electronic images. The scanned images can be temporarily stored on a traditional magnetic disk, generally referred to as a magnetic cache. After the images have been scanned into the system, they are indexed. The index is a data base that contains the keys to retrieving the images in the system. This index may include the image number or name and other useful information for future retrieval.

The images, along with their associated indexes, are then transferred to an optical disk for permanent storage. The optical disk is a relatively inexpensive, high-capacity disk that is read or written by laser light. A 12-in. optical disk platter can store approximately 60,000 8½- by 11-in. images, or approximately 300 100-ft rolls of microfilm.

Many applications may require more than one optical disk to be online with active images. These applications may incorporate an optical disk "jukebox" or autoloader. The jukebox is a robotic mechanism that stores between 24 and 200 optical disks. It automates the retrieval of optical disks.

A jukebox with 200 12-in. optical disks has approximately the same storage capacity as 665 five-drawer file cabinets, and images can generally be accessed in fewer than 30 seconds.

Once images are loaded into the system, they are available for retrieval by an imaging workstation. The imaging workstation is a high-resolution display, generally 100 to 300 dot/in., used to view images. Software suporting the image retrieval process can have a variety of functions. These include the following:

- The ability to electronically route images to specific workstations or printers over a local-area network on demand.
- Electronic routing that allows images to be dispatched along predetermined document routes.
- The ability to hold incoming images until a predetermined packet of documents has been received (for example, all the loan application papers) and then distribute the complete set of images to the appropriate workstation.
- The ability to support multiple images such as the front and back of the same page through the use of windows.
- Zoom capability that allows the user to enlarge a portion of the screen for easier viewing.
- The ability to emulate IBM 3270 terminals, thus eliminating the need for multiple terminals.
- Editing software such as image edit, annotate and cut and paste.

> ***The optical disk imaging system is designed to minimize paper within an organization. However, there are times when producing paper output is necessary.***

The optical disk imaging system is designed to minimize paper within an organization. However, there are times when producing paper output is necessary. For this purpose, most systems include one or more high-speed laser printers. These printers can provide high-quality output in the range of 200 to 400 dot/in. resolution on a variety of paper sizes.

It is important to note that the hardware and software components can have a wide range of functions and that the selection of the appropriate vendor and system depends upon the requirements for the application.

There are two basic types of office environments that can be addressed

Bryan is a Los Angeles-based consultant in the Information Technology Group at Deloitte Haskins and Sells, a Big Eight accounting firm headquartered in New York.



by optical disk-based imaging systems: a project environment and a procedural environment.

A project environment is one in which work is done without a predefined series of steps. Work in a project environment is somewhat unpredictable.

A law office, a research department and a records or archive center can all be considered project environments.

A procedural environment is more structured, and work is done according to a defined series of steps. Accounts payable, mortgage loan processing and retirement trust account applications can be considered procedural work.

An optical disk-based imaging system can be designed to address either a project or a procedural environment.

An image processing application — before optical disk. An image-processing application usually involves active files in a procedural environment.

One such example is a retirement trust account department of a bank or savings and loan institution. The retirement trust account department is responsible for individual retirement accounts (IRA) as well as Keogh accounts. Such a department generally provides four key services — new accounts processing, transfers, distributions and customer service.

In such an environment, paperwork for each IRA averages seven pages, and up to 30 pages for a Keogh account. In the same application, the department receives 1,500 to 5,000 pages of incoming account information daily during the normal season and up to 8,000 to 10,000 pages per day during the busy pretax season.

In an actual case, the environment that existed before the introduction of optical disk imaging had the following characteristics:

- Documenters were microfilmed immediately after they were received and, for a significant period of time, were not available as originals or on film.
- New account processing took approximately two to three days.
- Multiple terminals were required for the transfer and distribution of funds units for data entry and microfilm viewing.
- Customer service requests for account status took longer than desired.

An image processing application — after optical disk. After the implementation of an optical disk-based image processing system, the retirement trust account department is able to operate much more efficiently.

New account processing is completed the same day, as opposed to the previous two- to three-day turnaround. The work load is electronically distributed among processors. Incomplete files are held in electronic pending files, and the processor is notified when all information is received.

Transfers and funds distribution processing can be performed with one workstation instead of with the multiple terminals that were required for viewing the microfilm index, viewing images and for creating textual account transfer confirmations as well as withdrawal documents.

> ***When, and if, it is determined that the application is best addressed by optical disk technology, the next step is selecting the most appropriate vendor and system.***

Also, all updates to a file generated during processing no longer need to be microfilmed, but instead they are immediately stored on optical disk.

Immediate availability of initial paperwork as well as updates on optical disks significantly improve customer service responsiveness. Productivity reports can be generated for each work group so that staff members can be moved from one section to another when work loads need to be balanced.

The example organizations cost justified their optical disk system based primarily on the labor and time involved in the processing of new accounts, transfers and funds distribution.

There is much forethought and preparation involved in determining that an optical disk-based system is the most appropriate solution to an application.

Each application must individually be evaluated based on the expected costs and benefits.

When, and if, it is determined that the application is best addressed by optical disk technology, the next step is selecting the most appropriate vendor and system. As the field of optical disk systems and vendors continues to expand, the selection process becomes increasingly complex.

The key to a successful system is in selecting the medium and overall system based upon the particular needs of the application and the organization as a whole, not based on what is the newest and most talked-about technology. ■

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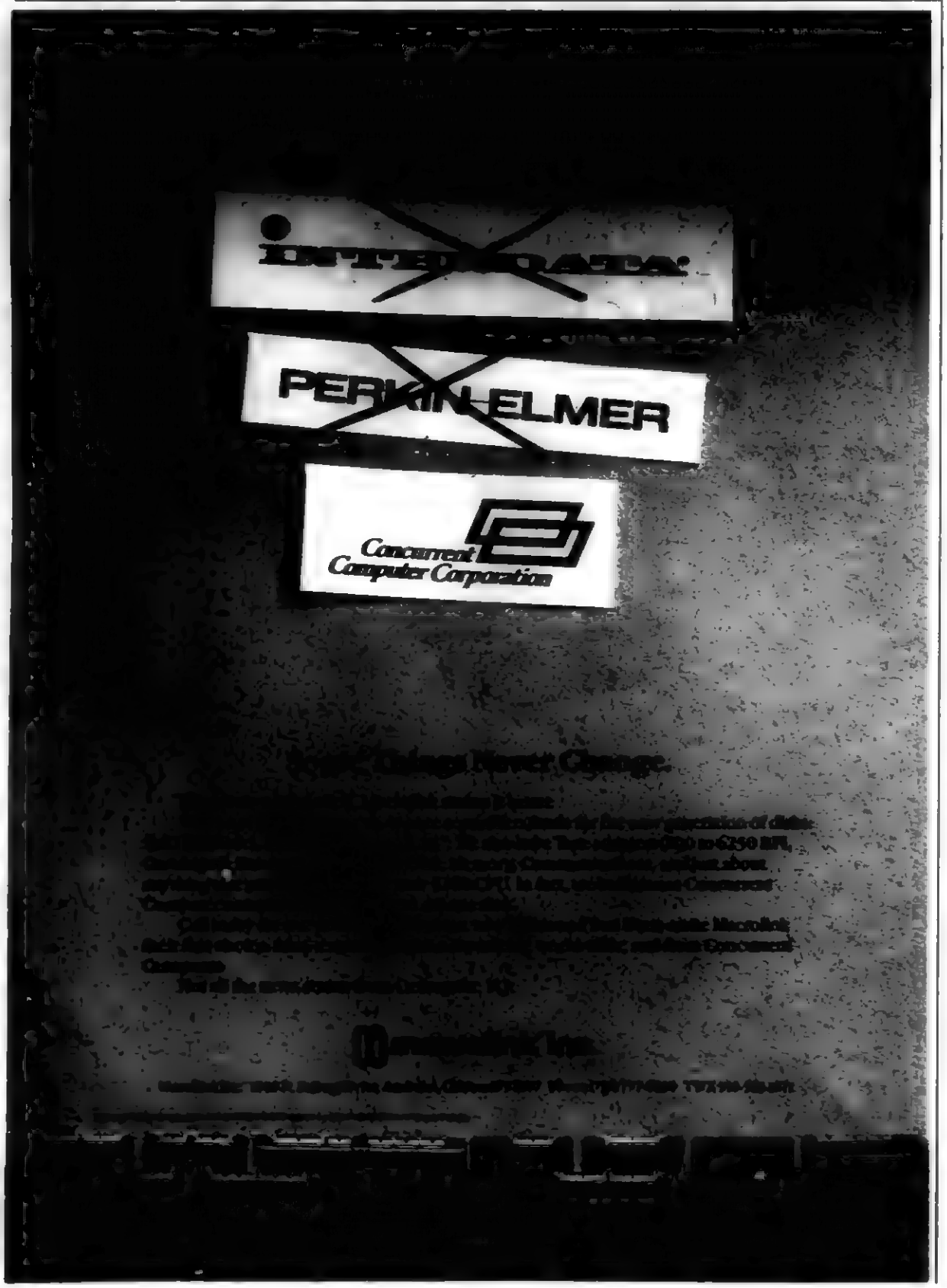
Table 5

ANNUAL STORAGE REQUIREMENTS BASED ON NUMBER OF IMAGES AND COMPRESSION RATIOS

Number of Images to Capture Daily	Compression Ratios 10:1	14.3:1	20:1	30:1	200:1
100	1.14G bytes	798.00M bytes	570.07M bytes	380.33M bytes	57.00M bytes
1,000	11.41G bytes	7.97G bytes	5.71G bytes	3.81G bytes	570.07M bytes
5,000	57.00G bytes	39.88G bytes	28.50G bytes	19.00G bytes	2.85G bytes

CW Chart

Comparing the capture rates in Table 2 (page 48) with the storage requirements in Table 4 (page 49) permits a comparison of daily work flow rates with annual storage requirements.



Continued from page 49

capture a smaller set of critical images.

Or it may be determined that the costs of capture are simply too large to justify relative to expected benefit.

In any event, for those projects that can be cost-justified, charts such as Table 3 on page 48 help to estimate the commitment of human and equipment resources required.

Storage. As stated earlier, an 8½-by 11-in. sheet scanned at a density of 200 dot/in. will require 23,376 bytes of storage with 20:1 compression. Roughly translated, this means a single 12-in. platter can store approximately 30,000 sheets of paper. It is instructive to see what these numbers imply about storage requirements (see Table 4 page 49).

The reader is urged not to take the storage quantities too casually — 1G byte is a very large quantity, almost too large to appreciate.

We now have the capability to store incredible amounts of data on a single disk — so much data, in fact, that we must be extraordinarily careful about how it is managed for retrieval.

Comparing capture rates with the storage requirements outlined in the table located on page 49, one may compare daily work flow rates with annual storage requirements (see Table 5).

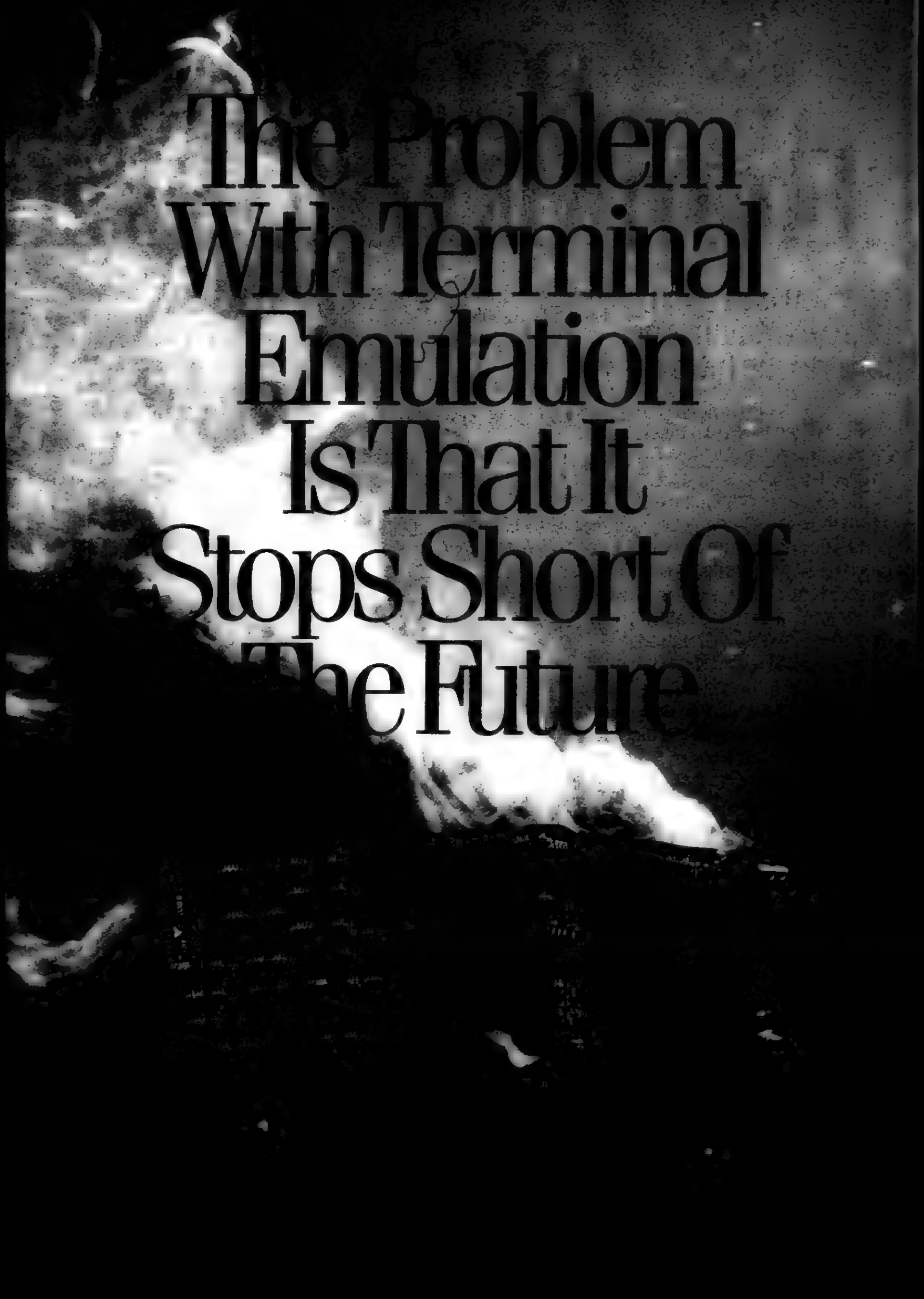
Our objective has been to clarify some fundamental parameters that govern the feasibility of implementing image processing systems. The requirement of a few tens of gigabytes of storage for even extremely large data bases of text and numeric data pales when compared with the storage requirements of even relatively small image data bases, measured in hundreds of gigabytes.

> ***A few tens of gigabytes of storage for extremely large data bases of text pales when compared with the hundreds of gigabytes needed for relatively small image data bases.***

Some image data bases will, in fact, require several terabytes of storage. The only currently practical solution to meet these huge storage requirements is laser storage technology.

Even after the resolution of the storage problems takes place, one must carefully consider the rate at which an image data base can be converted from paper or microfilm to laser media.

The job of capturing an archived set of images generally must be accomplished within a specified period of time. Given that period of time, the chart calculations included in this article will help you estimate the number of scanning devices, and hence the number of people, that will be required for an image capturing project. ■


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With Terminal
Emulation
Is That It
Stops Short Of
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ELECTRONIC IMAGING SYSTEMS

Company/ Model/ Price	Input: Original image size	Input: Scanner resolution	Input: Scanning speed	Input: Disk Capacity	Input: Document storage	Input: Number of Disk Drives On-Line	Input: Number of Document Pages Stored On-Line	Input: System Access Time	Input: CPU	Output: Display Resolution	Output: Type of Printer	Output: Speed	Output: Interfaces	Output: Special Features
Access Corp. 1811 Losantiville Ave. Cincinnati, Ohio 45237 **Model:** *Model 50* **Price:** *Less than $40,000*	35mm, A-E size	200 dot/ in.	8 to 10 sec./page	2G bytes	Auto-changer (jukebox)	Unlimited	770,000 (A-size), 192,500 (E-size)	10 to 15 sec.	Hewlett-Packard 1000 "A" 900 series	1,024 pixels by 800 pixels	Laser, electro-static plotter	Not available	RS-232, RS-422, Ethernet, small computer systems interface	Single-drive, 20-platter unit is field upgradable to dual-drive, 16-platter
Avalon Information Systems Corp. Suite 600 131 Stewart St. San Francisco, Calif. 94105 **Model:** *Pixel* **Price:** *$40,000*	8½- by 11-in. to 8½- by 17-in.	200 dot/ in.	8 to 12 sec./page	2,000 to 4,000 pages	Single disk drive	One to eight	Unlimited	5 to 10 sec.	Nestar, Novell or IBM local-area networks	100 dot/ in.	Laser	8 to 10 page/min	IBM's Systems Network Architecture; Ethernet, RS-232	IBM Personal Computer AT with LAN; DOS file image format
Alphanel 765 Flynn Road Camarillo, Calif. 93010 **Model:** *Digital Document Transmission System* **Price:** *$700,000 and up*	A-E size	200, 300 dot/in.	2 to 15 sec./page	1G byte/ side	Auto-changer (jukebox)	200	15 million	15 sec.	IBM 4381	200 dot/ in.	Laser, microfilm	20 page/ min	Ethernet, Nestar, compatible with most LANs, proprietary LAN (Alphanel 1720)	Satellite link, electronic revision of documentation, error-free transmission over LAN lines or satellite, IBM compatible, high-speed compression and expansion
Applitek Data Corp. 170 Enterprise Center Middletown, R.I. 02840 **Model:** *Image and Document Management System* **Price:** *$60,000 to $250,000*	Up to 40 in. by 100 ft.	100 to 400 dot/ in.	1 sec./ page	1,000M bytes	Optical disk drive	One (two to four drives; first quarter)	40,000 to 50,000/ side	2 sec.	Motorola 68010, Intel 8286, Intel 8088	100 dot/ in.	Dot matrix, thermal, laser	25 page/ min	RS-232, RS-242, IBM 3270, IBM 2480	Raster image editing, raster-to-vector conversion, computer-aided design software and file interchange with any IGES-compatible CAD software
Bell & Howell Co. **Image Product Dept.** 6800 McCormack Road Chicago, Ill. 60645 **Model:** *Filer 1000, Filer 2000* **Price:** *$65,000 to $150,000*	A and B	200, 300, 400 dot/ in.	3 sec./ page	1G byte/ side	Single-multiple disk drive, auto-changer (jukebox)	Up to eight	350,000	3 sec.	Proprietary	200 dot/ in.	Thermal transfer, laser	6, 12, 24 page/min	Standard serial and parallel	Full image editing capability, supports up to eight full-page displays, uses standard host data base for image search
CIE Systems, Inc. 2515 McCabe Way Irvine, Calif. 92713 **Model:** *Laser Optic Filing System* **Price:** *$120,000*	8½- by 11-in.; 8½- by 17-in.	200, 400 dot/in.	12 page/ min	2.6G bytes	Disk drive, auto-changer (jukebox)	32	60,000	5 to 25 sec.	Hitachi microprocessor	220 dot/ in.	Laser	12 page/ min	RS-232C	Facsimile capability, eight remote workstations, optical library
Distributed Image Systems Corp. Suite 8 9801 Reseda Blvd. Northridge, Calif. 91324 **Model:** *Digital document image file system* **Price:** *$35,000 and up*	A-E size	200, 240, 300, 400 dot/in.	3 to 15 sec./page	115M bytes to 2.4G bytes	Single disk drive, auto-changer (jukebox)	Unlimited	Unlimited	5 sec.	IBM PC AT, IBM mainframe	Four million pixels	Laser	8 to 25 page/min	Parallel, RS-422, RS-232	Can interface with any LAN, fax-compatible, compression expansion, pan and scroll up to E-size, zoom factors of 1, 2 and 4
Filenet Corp. 3530 Hyland Ave. Costa Mesa, Calif. 92626 **Model:** *Document-image processor* **Price:** *$328,000*	10- by 14-in.	200 or 400 dot/ in.	12 to 17 page/min.	2.5G bytes	Auto-changer (jukebox)	3,264	86 million	15 sec. (unmounted drive), 5 sec. (mounted drive), 3.5 sec. (magnetic disk)	68,000 server-based subsystems interconnected by a LAN	Two million pixels	Laser	8 page/ min	LAN	Works with company's Workflo management software, Interleaf text processor, forms generation, mainframe interface
Formative Technologies, Inc. 5001 Baum Blvd. Pittsburgh, Pa. 15213 **Model:** *First System* **Price:** *Available upon request*	A-E sizes	200 dot/ in.	Less than 4 min/ page (E-size)	105M bytes to 288M bytes	Single- or double-sided disk drive, mass storage devices	Not available	Not available	Not available	AM International, Sun	1,024 by 1,280 pixels	Electrostatic plotter	1 in./sec.	SNA, III from Triple-I	Software for scanning, calibrating and revising engineering drawings; integrated raster and vector editing

This chart includes information from vendors that responded to a survey conducted by the Association for Information and Image Management, based in Silver Spring, Md.

Chart compiled by Catherine Sakioka.

Product Spotlight /Image and Document Processing

	Input								Output			
	Document/page size	Resolution	Speed	Storage capacity	Storage device	Number of disks on-line	Number of documents on-line	Search time	Connectivity	Type of printer	Speed	Interfaces	Special features
Infodetics Corp. 1360 S. Anaheim Blvd. Anaheim, Calif. 92805 **Model:** *Cadmac* **Price:** *$300,000 to $15 million*	ANSI A-E and ISO A0-A4	200 to 400 dot/in.	Variable	1G byte/side	Single disk drive, auto-changer (jukebox)	Up to 400	20,000 to four million; up to 40 million	Less than 10 sec.	Data General, IBM or DEC	1,280 by 1,024 pixels	Electrostatic, laser, dot matrix	2 to 8 page/min	Manufacturing Automation Protocol, IEEE, Digital Data Network	Personal computer workstation, drawing management data base application, relational data base, system manages CAD files, scanned raster images, ASCII text
Integrated Automation, Inc. 1301 Harbor Bay Pkwy. Alameda, Calif. 94501 **Model:** *Docuvision* **Price:** *$300,000 and up*	Any size document	200, 300, 400 dot/in.	1 page/sec.	Unlimited	Auto-changer (jukebox)	100/jukebox	Three million/device	3 sec.	IBM, DEC, Data General	200, 300 dot/in.	Laser, electrostatic	12 to 40 copy/min	LAN, computer-aided design and manufacturing, satellite and microwave connection, RS-449, parallel	OCR, image enhancement, aperture card scanner, pan and zoom capabilities, full image editing capabilities, modular expansion, document security, relational data base for image management flexibility, raster-to-vector conversions
Integrated Software Systems, Inc. P.O. Box 27493 Denver, Colo. 80227 **Model:** *Digi-Store 500 System* **Price:** *$18,950*	8½- by 11-in.	200 dot/in.	30 sec./page	200M bytes	Optical disk drive	One to 50	5,000	2 sec.	Intel 8086	1,280 by 800 pixels	Fax machine	2 page/min	Can interface with most popular LANs	Not available
Integrated Software Systems **Model:** *Digi-Store 1000* **Price:** *$29,950*	8½- by 11-in.	300 dot/in.	4 to 6 page/min	400M bytes	Optical disk drive (jukebox first quarter)	One to 50	10,000	2 sec.	Intel 80286, 8086	1,280 by 1,650 pixels	Laser	6 to 8 page/min	Can interface with most popular LANs	Not available
Integrated Software Systems **Model:** *Digi-Store 2000* **Price:** *$68,950*	11- by 17-in.	400 dot/in.	2 sec./page	400M bytes to 3.2G bytes	Optical disk drive	One to 50	80,000	2 sec.	Intel 80286	1,280 by1,650 pixels	Laser	2 sec./page	Can interface with most popular LANs	Not available
Interlink Comp. 755 N. Mary Ave. Sunnyvale, Calif. 94086 **Model:** *3000 Systems* **Price:** *$139,800*	8½- by 11-in., legal, A4	200 dot/in.	2.5 sec./page	1,000M byte/side	Single disk drive	One to 16	50,000 to 800,000	2 sec.	Motorola 68010, 68000	100 to 200 dot/in.	Laser	8 and 15 page/min	Ethernet/SNA protocol	Interfaces to mainframe, one to 64 workstations, high-speed data base management system, banking and medical software applications
Laserdata, Inc. 10 Technology Drive Lowell, Mass. 01851 **Model:** *Laserview* **Price:** *$43,000*	8½- by 11-in., 8½- by 14-in., 11- by 17-in.	300 dot/in.	5 sec./page	1.6G bytes	Optical disk drive	16	800,000	1 sec.	PC-compatible	300 by 150 dot/in.	Laser	8 page/min	Can interface with most LANs	MS-DOS, gray scale, simultaneous viewing and printing, decompression speed under 1 sec.
3M Co. Bldg. 220-10W 3M Center St. Paul, Minn. 55144 **Model:** *Docutran 2000* **Price:** *$100,000 to $300,000*	11- by 17-in.	200, 400 dot/in.	3 sec./page	3.6G bytes	Drives; autochanger (jukebox)	Eight	Six million	1 to 15 sec.	Toshiba microprocessor	200 dot/in.	Laser	10 page/min	Ethernet	Remote communications to groups and fax; DBMS software interfaceable to system
3M **Model:** *Docutran 9000* **Price:** *$300,000 to $1 million*	E-size: 11- by 17-in.	200, 300 dot/in.	1 sec./page	2.4G bytes	Auto-changer (jukebox)	64/jukebox	30 million to 40 million	0.2 to 12 sec.	DEC Microvax II	Variable	Laser	10 to 30 page/min	Ethernet	Communications switch for access to packet networks
TAB Products Co. 1400 Page Mill Road Palo Alto, Calif. 94304 **Model:** *Laser-Optic filing system* **Price:** *$150,000*	10- by 14-in.	200, 400 dot/in.	12 document/min	2.6G bytes	Single disk drive; auto-changer (jukebox)	128	Four million with jukebox	3 to 5 sec.	Intel 16-bit microprocessor	1,728 by 2,368 pixels	Laser	10 page/min	RS-232, supports most popular LANs	Optional remote workstations, image edit, facsimile, mouse
Yutec Comp. 16780 Lark Ave. Los Gatos, Calif. 95030 **Model:** *Image Management System* **Price:** *$30,160*	5- by 3-in. to 10-in. by 30-ft	200 dot/in.	1 vertical in./sec.	200M bytes to 1G byte	Single disk drive	Two	4,000 (5¼-in.); 15,000 (12-in.)	5 to 15 sec.	IBM PC XT, IBM PC AT, AT&T Personal Computer 6300, IBM compatibles	1,000 by 1,000 pixels	Laser	30 sec./page	Nestar, Ethernet	Indexing and retrieval software

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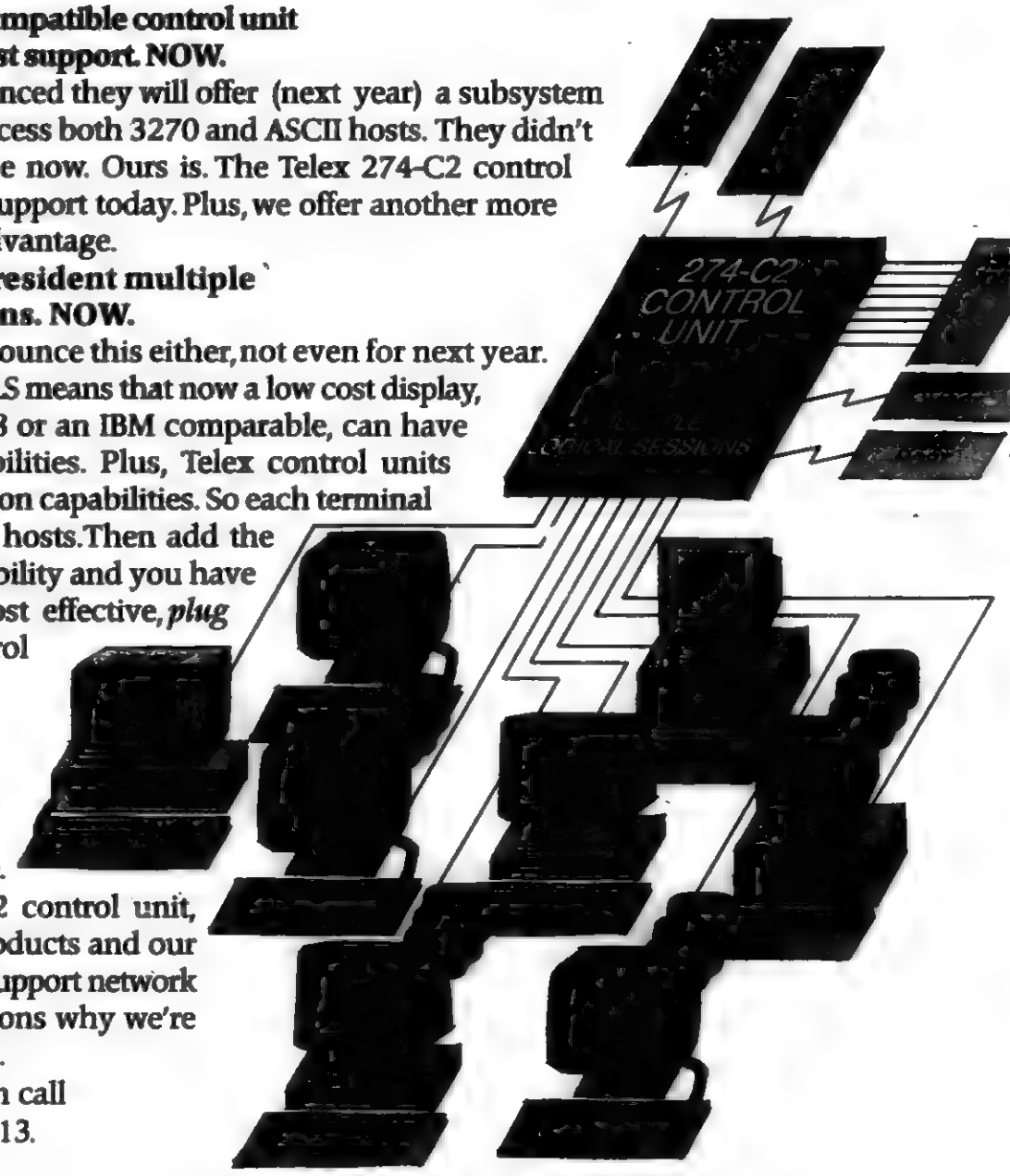
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In Depth

MIS can stimulate change in corporate view of AI

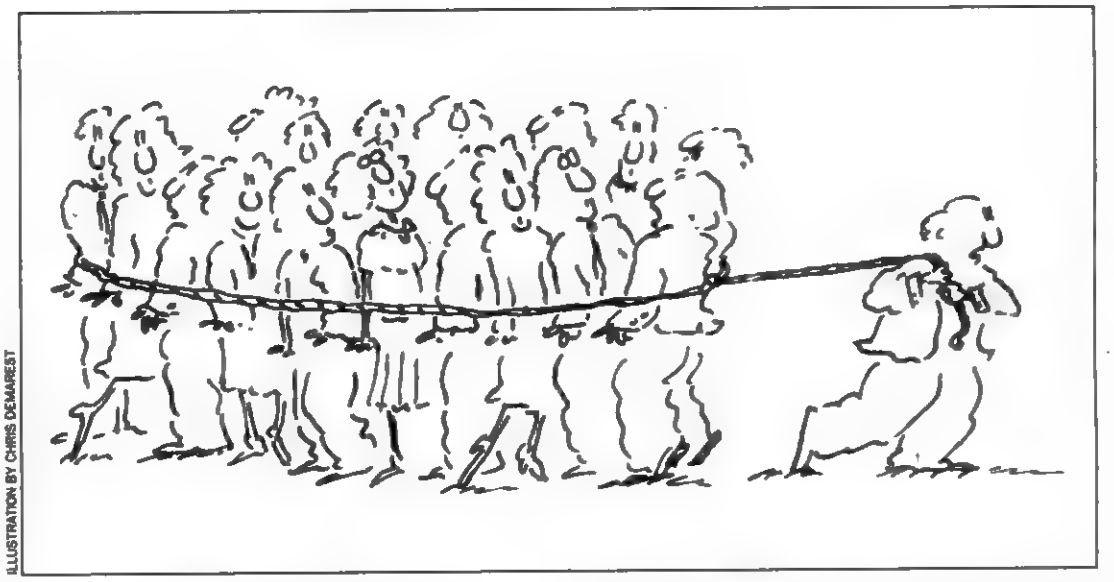


ILLUSTRATION BY CHRIS DEMAREST

Corporate budgets still snub AI development
• MIS should spearhead trend toward AI technology acceptance
• Curiosity breeds knowledge managers

By HENRY ERIC FIRDMAN

"Artificial Intelligence: It's Here!" So the cover of the July 9, 1984, issue of *Business Week* magazine proclaimed. Two years and dozens of similar overoptimistic media announcements later, AI is not here yet, in spite of an increasing number of successful applications and a growing consensus that AI has a tremendous long-term potential.

So what is happening? On the surface, everything is fine. AI research finds no shortage of funding: The Defense Advanced Research Projects Agency (DARPA), a research and development arm of the Pentagon, alone spends about $60 million annually on AI. Various market research firms predict that by 1990 the AI market will grow to between $1 billion and $10 billion. There are many — perhaps even too many — expert system development tools, and there is no shortage of education and training offerings. A few successful practical expert systems and other AI-based products have even been developed.

The problems become apparent when looking a little bit deeper at the same bright news. While the U.S. government (especially DARPA and the National Aeronautics and Space Administration) spends a lot of money on AI research and development, these funds go to a relatively small number of big defense contractors and start-up AI companies.

The fact is, too little AI development is funded from corporate budgets, implying that the average U.S. corporation does not believe in the commercial opportunities of AI technology or cannot afford launching an internal AI shop without a clearly visible and feasible cost-effective product in mind.

Industry of specific tools

A broad choice of AI hardware and software development tools provides further evidence that AI has been growing as an industry of specific tools and services rather than a variety of off-the-shelf commercial applications that appeal to corporations. The number of expert system development tools is so great and differences between them so elusive that prospective customers who have not done their homework have practically no chance of making the right choice.

Many customers understand that and solve the problem by ignoring it: They do not purchase AI development tools; instead they attend AI conferences to kick the tires of fancy LISP machines and knowledge representation environments presented at the exhibitions.

Most AI market forecasts are too optimistic and are based on a number of wrong assumptions. The most common one is that the AI market is demand-driven — so far, it is technology-driven.

Additionally, many market researchers overdefine AI, including with it fields that have nothing to do with artificial intelligence — like signal processing and industrial robotics — while others include machine vision and speech recognition systems as part of the market, even though

About the author

Firdman is president of Henry Firdman & Associates, a Lexington, Mass., consulting firm specializing in artificial intelligence and expert systems. He is also publisher of "AI Through the Looking Glass," a newsletter on the AI industry.

many of these systems utilize no AI.

It comes as no surprise, then, that successful practical applications are scarce and that most of them have been developed for in-house use by high-level AI professionals such as professors at Stanford and Carnegie-Mellon universities. The success of these academicians is hard to repeat, and, not surprisingly, the commercial market for AI applications almost does not exist.

There are two promising entrants to the commercial market: Planpower, a personal financial planner from Applied Expert Systems, Inc. in Cambridge, Mass., and Financial Advisor, a corporate financial planner from Palladian Software, Inc., also in Cambridge. Both products, very impressive technically, are said to be the first expert systems for the broad commercial market; however, their broad commercial acceptance still remains to be seen.

Corporate acceptance

The picture that I have just drawn seems gloomily pessimistic. However, as one who defines a pessimist as a well-informed optimist, I see the bright side: Things can be improved if one understands the reasons for a gloomy situation.

The major underlying reason for the current situation in AI is the lack of corporate acceptance of artificial intelligence technology. I see the acceptance and subsequent incorporation of AI technology not only by Fortune 500 organizations but also by the average American company as the key to healthy AI industry growth. Certainly, this process can take various shapes and can be done at different costs, depending on company size, available financial and human resources and general commitment to high technology.

The AI technology acceptance process can best be described in the context of a triangle, the nodes of which represent three categories of people participating in it: corporate management, MIS managers and users. I avoid the term "end users," because potential users of AI technology may be very far from the "end."

The MIS manager should play a key role in the AI technology acceptance process; MIS managers meeting the challenge of an upcoming AI revolution will eventually become knowledge managers in charge of acquiring, storing, maintaining and using corporate knowledge and data.

Corporate managers' wants

My understanding of what corporate management, MIS managers and users expect from AI comes mainly from executive briefings, seminars and training courses I conducted for two years.

These meetings are one of the best possible sources of information, because they allow me to talk, both publicly and privately, with many corporate and MIS managers and users who were, perhaps for different reasons, genuinely interested in AI.

Corporate managers pursuing AI and expert systems want to be able to make the right decisions concerning the allocation of resources for AI projects.

They often say, "Now I know my guys are after a pie in the sky. I believe that we have better applications that can be developed at a lower cost." Some go even further: "Now I can make all kinds of decisions about AI," they say.

In addition, these managers also want to see whether their MIS managers can lead the AI technology acceptance process. Unfortunately, they realize the answer is

> ***The number of expert system development tools is so great and differences between them so elusive that prospective customers who have not done their homework stand practically no chance of making the right choice.***

IBM ASCII terminals:

The case in black and white.

Introducing a somewhat more colorful member of the family.

Meet the IBM 3164 ASCII Color Display Station.

It gives you eight foreground and eight background colors. On a 14" screen.

And because of its 8 x 16 character matrix, the 3164 gives you clear, crisp characters in color.

But is color any reason to buy IBM's 3164? It is, according to studies that indicate the use of color increases productivity, decreases errors and promotes user satisfaction.

Color, of course, is far from the sole reason for choosing the 3164. To appreciate the others, you should get to know the rest of our ASCII family.

Emulation. Another side of the family.

Our ASCII terminals are designed to fit into existing systems. Even if the systems aren't ours.

Emulation Capability	
3161	IBM 3101 Model 10/11 ADDS Viewpoint* Hazeltine 1500* Lear Siegler ADM-3A* Lear Siegler ADM-5* TeleVideo 910*
3163	IBM 3101 Model 20/21 DEC VT 52* DEC VT 100* TeleVideo 950*
3164	IBM 3101 Model 20/21

For example, our basic ASCII Display Station, the IBM 3161, emulates up to six terminals. And the advanced-function 3163 emulates a number of higher level ASCII data streams.

Features	3161	3163	3164
Screen size	12"	12"	14"
Lines x characters	25x80	25x80	25x80
Character matrix	8x16	8x16	8x16
Double-sized characters	No	Yes	Yes
Line drawing characters	24	24	24
Vertical scroll	Jump	Jump/ Smooth	Jump/ Smooth
Definable function keys	24	24	24
Windowing	No	Yes	Yes
Partitioning	Horiz.	Vert./ Horiz.	Vert./ Horiz.
Characters in buffer	1920	7680	7680

What's more, every one of our ASCII terminals can operate in its own function-rich native mode.

Our family is flexible.

Our unique plug-in cartridges allow for considerable flexibility in your operation. For example, simply by switching cartridges you can shift a terminal from one data stream to another.

And, in many countries cartridges are also available that go beyond emulation to let you operate your ASCII terminals in several foreign languages. Appropriate foreign language keyboards are also offered.

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All our ASCII terminal keyboards have 102 keys. But that's not all they have in common. Every keyboard also has a low profile, gentle contour and typewriter touch.

And our keyboards have programmable function and editing keys so they can be custom-tailored to fit your application needs. The 3163 and 3164 models also have redefinable and recappable keys.

Superior ergonomic design isn't confined to the keyboard, however. All three displays tilt and swivel for maximum user satisfaction. And, of course, by making the display easy to read, we made it easier on the eyes. In addition to the 8 x 16 character matrix, we gave it an advanced non-glare etched screen, cursors, and character and field attributes like blink, reverse video, underscoring and dual intensity.

High standards. Competitive prices.

Quantity discounts are offered, too. And financing is available through the IBM Credit Corporation. Best of all, each terminal comes with the quality, service and support you'd expect from IBM.

Contact your IBM marketing representative, or call 1 800 IBM-2468, Ext. KC/90, for the IBM Authorized Distributor nearest you. And we'll present more evidence in the case for IBM's ASCII terminals.

It may be all you need to color your view.

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often no. Typically, corporate managers say, "My MIS manager has a lot of work to do. I need somebody else who is not so burdened and who has a fresh view."

Finally, corporate managers want to see whether AI can help solve their own strategic problems. Typically, even if these managers see an opportunity, they remain pessimistic because the technological problems that crop up on the way to solving their strategic problems seem to be overwhelming, and they do not have enough time or guts to face them. "Yes, it's a good opportunity — but maybe later," they say.

What users want

The users' objective is usually simpler. They have a problem in mind that they cannot solve using other approaches. They hope that AI can help.

They are typically interested in knowing more about available tools, because they are more technically oriented and because they know they are going to have to battle the company to get the hardware and software tools they need — or they think they need.

Users are often a little disappointed because the tools they like the most — for example, specialized workstations — are also the most expensive and they do not have much hope of getting them. Only a few users are happy to learn that they can get started on a basic personal-computer level.

What MIS managers want

It is much harder to present a typical MIS manager profile. I have observed at least three kinds of MIS managers, categorized according to their reasons for learning about AI.

Some want to gather enough knowledge to discuss AI fluently with corporate managers and users. These people are usually satisfied with whatever they get from the course.

Others have a specific bottleneck problem within their department that cannot be solved by conventional approaches. Typically, they behave like users, and their reaction to the course is the same, except that most of them are willing to use available hardware (especially IBM mainframes) rather than to purchase new systems.

The third group wants to understand their proper role in the artificial intelligence technology acceptance process. These people usually ask difficult questions concerning such controversial issues as the integration of expert systems into existing software, customization and maintenance of expert systems and the interrelations between experts, knowledge engineers and expert system designers.

> ***Users' objectives are usually simple. They have a problem in mind that they cannot solve using other approaches. They hope AI can help.***

MIS managers can become a proactive rather than a reactive corporate force if they can recognize the needs of corporate managers and users early and act appropriately.

At the same time, MIS managers can relieve corporate managers of the frustration mentioned earlier and significantly improve their own image-earning reputations as corporate problem solvers at the strategic level.

Problems and solutions

The following are a few examples of strategic problems — and corresponding corporate managers' needs — for which AI technologies can be used to find solutions:

- Preservation of retiring expertise.
- Turnover reduction.
- Scheduling and planning.
- Enterprise simulation.
- Decision making.

The case in color.



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AI: Extending technology

An artificial intelligence system comprises three major capabilities:

Knowledge acquisition. An AI system should be able to acquire new knowledge by communicating with the external world and by inferring from its own current knowledge. Inference methods can be general-purpose, like deduction, and domain-specific, like rules of thumb extracted from experts.

The acquired knowledge is stored in the medium called a knowledge base.

Goal-directed behavior. An AI system — given defined goals, adequate knowledge and a set of primitive goal achievement strategies — like actions or rules — should be able to achieve specific goals. To solve a problem, the system should build a plan as a configuration of primitive strategies and then execute this plan.

Skill acquisition. An AI system should be able to improve its performance in terms of scope, expertise and running time within the domain of its expertise, based on its knowledge and accumulated experience of goal-directed behavior. In a sense, an AI system should be able to learn from previous experience to improve its problem-solving performance.

Enhanced computing

Artificial intelligence, therefore, is not alien to conventional computer technology but rather is an extension of it.

In other words, the expression "to build AI into conventional software" is absolutely right, whereas the expression "to build AI *instead of* conventional software" is fundamentally wrong. AI is not replacing the existing technology — it is enhancing it.

Knowledge acquisition implies such constituent operations as knowledge entry; placing the knowledge chunk into the knowledge base; retrieving the knowledge chunk by querying the knowledge base; and keeping it consistent with regard to other related knowledge chunks, thus providing knowledge base integrity.

Just replace the word "knowledge" with "data," and you will see an analogy in today's data base management systems.

Goal-directed behavior is an extension of conventional programming. Generally, it includes planning and plan execution, with plans analogous to programs and their execution analogous to running the program.

Since AI systems search for solutions in order to build plans, each plan includes a number of alternative options. If an AI system has no idea which of several alternative plans is better, the plan is a result of an exhaustive search and generation of all possible ways to achieve the goal.

The greater the number of alternatives included, the more universal the plan. At the same time, the plan with more alternatives is harder — and more time-consuming — to build and execute. The exhaustive search causes a so-called "combinatorial explosion" and rapidly becomes impractical as the size of a problem grows.

Critical to AI is special knowledge, called heuristic or pragmatic knowledge, that directs plan generation to make that generation more efficient. Heuristic knowledge helps an AI system prune out the least promising options, thereby reducing planning to the choice of a few alternatives — ideally, to a choice of one.

A fundamental enhancement to conventional programming that can be provided by goal-directed behavior is plan repair, or runtime debugging of a plan, based on the results of plan execution. Obviously, conventional programs cannot be repaired in runtime.

More skills, better performance

Conventional programs cannot improve themselves. Since these programs are deterministic — having no alternative options to be reinforced or preferred — they can also hardly be improved by people, except for obvious things like loop cleanups.

On the contrary, the major function of skill acquisition in AI systems is to improve system performance in terms of the scope of problems the system is able to address, expertise measured as a percentage of the problem's particular cases solved successfully and running time required to solve the specific problem. In other words, an AI system will be able to solve a greater variety of problems and will solve each problem more effectively and efficiently as it acquires skills.

At this point, I am not aware of any commercial system that can automatically acquire skills, but the major methods for skill acquisition are fairly clear:

- Reduction of running time by eliminating or reducing the amount of search required to solve a specific problem. Reduction can be achieved through acquisition, reinforcement and adjustment of heuristic knowledge.
- Creation of new plans aimed at expanding the scope of problems solved, increasing the expertise in solving a problem or reducing the running time required to solve the problem.
- Addressing new problems based on the previous experience obtained from solving other problems, perhaps, in different problem domains. This kind of skill acquisition is called "inference by analogy."

Unfortunately, automated skill acquisition has not yet found its place in today's commercial systems. As a matter of fact, an important part of a knowledge engineer's job is to extract skills held by experts and incorporate these skills into an expert system. Expert systems that are capable of acquiring skills automatically will be able to evolve from novice through journeyman to expert. Today this capability is an exclusive privilege of human beings.

— HENRY ERIC FREIMAN

Here are a few examples of users' needs and how an MIS manager can help:

Develop qualified knowledge engineers and expert system designers. People in these professions are scarce, and in-house training may be one of the most cost-effective solutions to the problem. An MIS manager can help in arranging appropriate training.

> ***MIS managers can become a proactive corporate force if they can recognize the needs of corporate managers and users early and act appropriately.***

Initiate AI projects. Since artificial intelligence projects are relatively expensive so far, a careful feasibility study should be conducted before any high-cost commitments are made.

An MIS manager can help in starting and conducting the feasibility study.

Obtain tools for approved AI projects. In the course of the feasibility study, cost-effective development tools have to be selected. An MIS manager can help in selecting tools based on the user's requirements and corporate policies for tool acquisition, such as hardware unification or corporate licenses on expert system development tools.

These policies are developed by the MIS department.

The AI technology acceptance process cannot be successful without well-defined and focused training.

Corporate managers, MIS staff and users should go through training in AI and expert systems with different training objectives.

Corporate managers learn what can be done to incorporate AI technology in their organizations.

MIS staff members learn how to incorporate it and how to develop strategic corporate AI applications.

Users learn how to develop AI applications for their specific needs.

The MIS department can be a clearinghouse for comparative information about available hardware and software development tools.

The comparison should not be done solely on the basis of promotional literature. MIS people should see tools in action, perhaps even developing benchmarks and running them on different hardware and expert system development tools.

They can also get information from other companies about using these tools through information exchange and participation in users groups.

This activity is a prerequisite for formulating consistent policies concerning the use of development tools within the corporation.

The MIS staff can also collect



information about available commercial AI applications developed both for in-house use and as commercial products for the broad market.

As the AI market expands, MIS personnel will find more AI application packages that can be purchased and customized rather than completely developed in-house. Obviously, they can disseminate this information throughout the organization.

In addition, properly staffed and equipped MIS departments should be able to develop their own application packages if the need arises, instead of trying to take over users' applications.

> ***The name of the game is fostering AI technology, rather than pretending that it does not exist or avoiding any proactive steps to incorporate AI technology into the corporate culture.***

MIS can concentrate on strategically important applications fulfilling corporate managers' needs.

Another important responsibility of an MIS department is integrating expert systems developed by both users and the MIS department into existing conventional software.

Also important is providing communications between expert systems running on personal computers or workstations with departmental or corporate data bases and application packages running on mainframes and minicomputers.

As an MIS department develops the capabilities discussed earlier, it will inevitably function as a consulting firm within the corporation. MIS staff personnel will consult with and train users on applications and tool selection and expert system development, delivery, maintenance and support.

An MIS manager can also maintain a list of available outside consultants, with areas of expertise, to provide information or training on the issues currently beyond MIS department expertise. As time goes by, the MIS department will develop expertise in these areas, allowing it to take over the outside consultants' jobs.

Knowledge managers

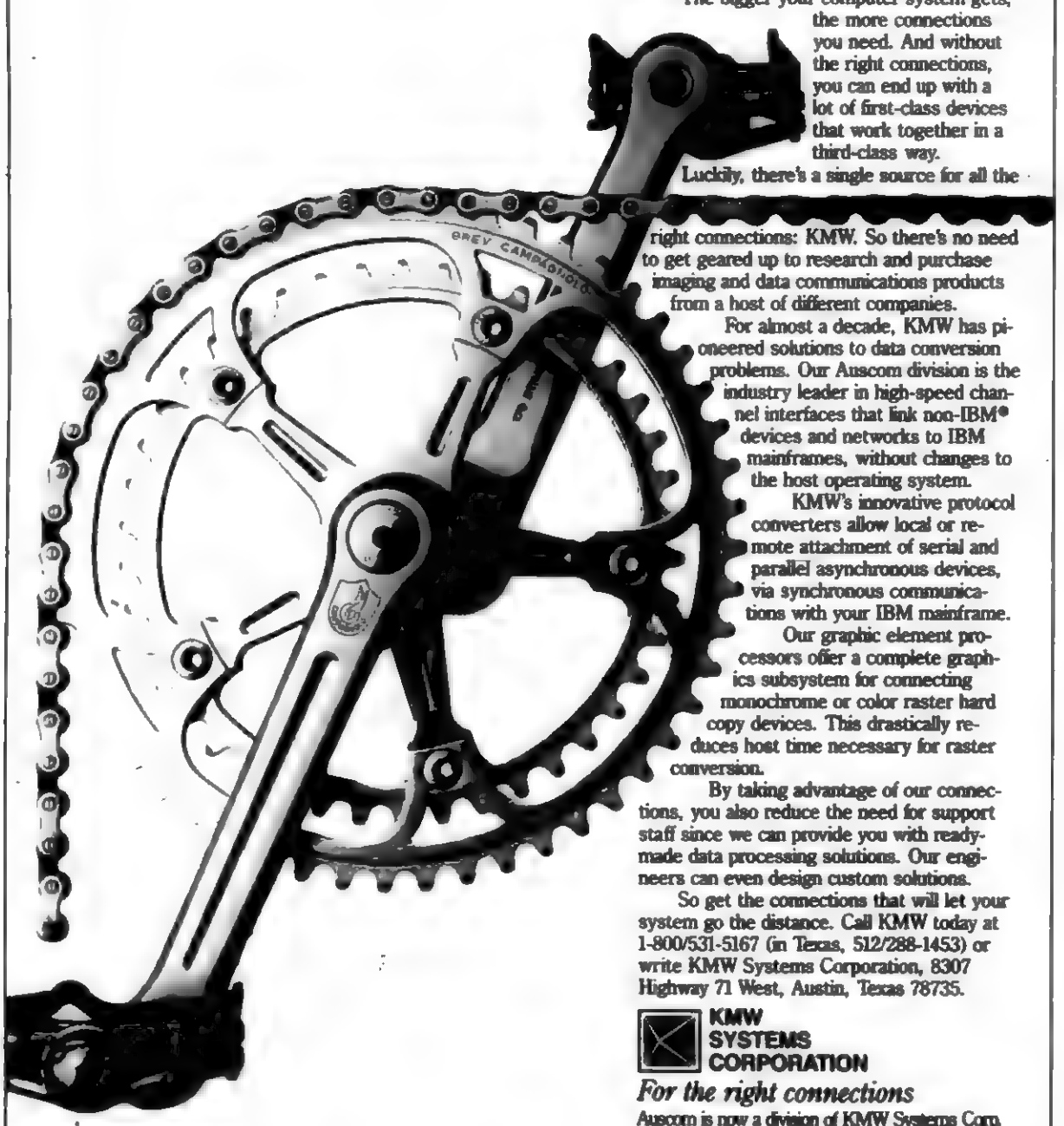
The name of the game is fostering AI technology, rather than pretending that it does not exist or avoiding any proactive steps to incorporate AI technology into the corporate culture.

I believe that those MIS managers who are curious about their role in the AI acceptance process will eventually make up a new breed of MIS managers.

These managers realize that data management as a corporate function becomes just a component of a new function: knowledge management. For this reason, I call them knowledge managers.

These MIS managers also realize that AI is, in fact, the third tide of the ongoing computer revolution — after personal computers and telecommunications — that can shake their current position in the corporation. They are eager to get adjusted to this revolution, to meet its challenges and eventually to become a part of it. They are not going to be just survivors of the revolution — they will be its winners. ■

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CORRECTION

A sidebar to the August 11 story on E. F. Hutton & Co. incorrectly implicated its Branch Information Processing System (BIPS) in the U.S. Department of Justice investigation of how the brokerage firm maintained its checking accounts.

The investigation focused on branch manager cash management practices, not on the operation of any automated system. BIPS was installed two years after the alleged improprieties took place and was designed to ensure such instances could not reoccur.

MANAGEMENT

TAKING CHARGE
Alan E. Brill

System bugs as time bombs

In previous columns, I have looked at the relationship between auditors and data processing managers. In this one, I would like to suggest a program to prevent some of the problems that an auditor might find.

Specifically, let us concentrate on the portion of the review that looks at application systems. When auditors review application systems, they look for what is called an internal control. This is a concept that says computer programs should be 100% predictable. That is, they should do what they are supposed to do, not do what they are not supposed to do, and provide the user with a way of positively verifying that they are working correctly.

In my experience, few installations have this principle built into their systems development standards. That is a pity, because a system without good internal controls is a time bomb. You do not really know if it has a bug that could cause your firm a problem, such as loss of money, loss of data or embarrassment. If the system does have a bug, you do not know when it will show up, and what's worse, without control reports, you may not even know it has failed.

Clearly, applications without proven internal controls have no place in a

See SYSTEM page 68

Brill is director of computer security services for the New York City Department of Investigation.

MIS exec turns mediator

'Diplomat' helps when MIS trouble stirs Quaker Oats

By Stanley Gibson

CHICAGO — Gary Reitz is one information executive who is finding it takes more than technical wizardry to get to the top. For Reitz, until last year a systems development manager, diplomatic savvy is more important now.


Quaker's Reitz

In his job as client services manager for Quaker Oats Co.'s Information Services department, Reitz acts as a go-between for the company's users and MIS, a role that requires the tact of a skilled negotiator.

"You have to ask a lot of questions and be diplomatic about how you ask them," says Reitz, who managed systems development at Quaker until 10 months ago. "I can be the eyes and ears of clients and the eyes and ears of the MIS department. It's a very difficult balance. It takes a certain personality and style."

Reitz is one of seven information services officers reporting to Ronald Brzezinski, vice-president of information systems for Quaker and the man who created Reitz's position.

"He's both the clients' 'man in Havana' and the MIS department's 'man in Havana,'" Brzezinski says. "His job is to keep dialogue going and foster a good teamwork approach. It takes a very polished and mature personality not to take sides."

Reitz's position was created after Quaker broke from its mold as a Burroughs Corp.-only user and became a multivendor shop. The company had two Burroughs B7900 systems, but it is now adding an IBM 3083 Model E. The plan is to run all the machines, but to do most new development on the IBM, Reitz says. Quaker drew up a three-year plan for the

See MIS page 69

Getting the specs on job seekers

By Peggy Watt

ANAHEIM, Calif. — Subjecting information center job applicants to the methodical sort of standards used to review equipment might cut down on employee turnover, according to one information center manager.

Skimping on the hiring process may require filling a job again sooner than an information center director wishes, according to Nancy Carole Grenard, manager of an information center at Purdue University and leader of an interviewing workshop at the Information Center Conference and Exposition held in Anaheim recently.

Before even posting the position, managers should be sure of what they want, Grenard suggested. They should review the job description and compare it with that of similar positions. It may be time to update responsibilities.

An information center director needs specific, obvious skills and experience, but some necessary attributes are less definable, Grenard said. She urged the interviewer to try anyway.

"How important is a DP background for the particular position?" Grenard asked. "I found some very good staff members from user areas, especially in positions in which they work with users," she added.

She usually specifies educational areas and degree requirements, though experi-

See GETTING page 72

INSIDE

Calendar: Shows, conferences, exhibits/73

INSTANT ANALYSIS

"The client wants solutions, not a spec sheet."
— Thersey R. Howard, executive vice-president, Datacom, Inc., Woodbury, N.J.

Companies put computers to work to spur sales, cut costs

Study notes advances in competitive edge

By David A. Ludlum

Sales representatives for the Wrangler clothing division of Blue Bell, Inc. enter orders with a portable computer that is on-line with a corporate mainframe, preventing the booking of orders for goods that are out of stock.

Using another on-line system tied to corporate mainframes, independent insurance agents representing The Travelers Cos. can send in policy specifications and then issue policies in their offices.

At Honeywell Information Systems, Inc., a corporate system used by sales representatives profiles prospective customers, providing leads such as the names of key executives and their participation in Honeywell seminars.

These are examples of the application of information systems to sales and marketing described in a study by The Conference Board, Inc. that found growing use of computers to spur sales and cut selling costs.

Several trends underlie the development, according to the study of 160 U.S. companies, including growing competitive pressures, customer demands, rising sales costs and advances in technology.

The sales systems are found in manufacturing and service industries and in consumer and industrial markets. They are used by field sales representatives and sales and marketing managers. Along with the tasks described above, they do jobs from analyzing customers and checking the status of orders to reporting selling expenses and making sales forecasts.

In addition to issuing policies, for example, the system Travelers sells to independent agents can rate and quote prices, find prospec for one type of coverage among customers already holding another type and communicate with Travelers by electronic mail.

The Conference Board estimated less than 10% of U.S. companies have computerized their sales efforts, but "leaders in this field may be gaining a significant competitive edge," said Louis A. Wallis, the researcher who authored the study.

Of 45 companies with active sales support systems, 60% reported "very favorable" or "favorable" results, and one-third said the systems have boosted sales representatives' earnings, according to the study.

Those conclusions, however, often were based on supposition rather than hard measures, such as a predicted return on investment, or on the assumption that increased sales or profitability resulted from the systems, Wallis noted.

Generally, Wallis said, companies that were surveyed judged systems on the basis of perceptions such as more professional behavior by sales representatives or positive feedback from customers.

One of the more detailed evaluations was from Honeywell, which found that after introducing its Focus 7 sales support system, shipments and sales force productivity rose by nearly one-third and sales force attrition fell by 40%.

The company attributed much of those gains to the system, which cost $2.5 million to develop and maintain for two years. It concluded that Focus 7 would pay for itself by reducing turnover by as few as 32 sales representatives.

The Wrangler Women's and Children's Apparel Division of Blue Bell, which must fill orders determined by changing fashions during brief selling seasons, launched its system chiefly to eliminate the taking of orders for goods that, unbeknownst to the sales force, were sold out. The division said its $400,000 system increased the number of deliverable orders by 10% and generated other

See COMPUTERS page 68

System bugs as time bombs

From page 67

commercial or governmental environment.

If you think about your training in systems development and the training of technical staff, you will likely find that nowhere in that training do data processing specialists receive a course on accounting principles.

Given that not everyone in your organization is trained in the principles of internal control, you can set standards that will go a long way toward the development of more effective systems.

Here are some specific suggestions:

• Every application consisting of multiple programs that sequentially process data should be written in such a way that the first program counts the records that it has successfully processed and forwarded for processing by another program. Other significant numbers (dollar amounts, for example) should also be counted.

Before finishing its work, the program should post its control totals to a file. The next program should read this file and recalculate the totals to ensure that the correct numbers of records and dollars were processed. This procedure should be continued for each program in the application system.

• Every system should produce a report that indicates it processed correctly — that all internal totals have balanced, for example — or that indicates the processing volumes for single-program applications.

• One of the most overlooked areas of systems development is error processing. Too often, in the press of deadlines, there is a feeling that it does not pay to spend toomuch time on areas of the program that will never be used. Of course when the program blows up at 3 a.m. on a Sunday, there are no instructions for operations. Can processing continue? If so, how? Who knows? Probably nobody, if the program did not have controls built into it that report the reason for failure.

• Require full documentation of internal controls. If the controls are not documented, they are not there. Require an explanation of how the program determines that everything is normal or, if an error is detected, how it is handled by the program.

• Test the controls. Plan a specific set of tests to check their operation. These tests should be planned and conducted by someone other than the programmer. Try to make it fail. Try hard.

• Do not accept, "But it is just a personal computer program" or "It is just a one-shot report" as an excuse to ignore controls. If you accept any excuses, soon everything will fall into an excuse category.

A personal computer program can fail as easily and as disastrously as a mainframe program. And the one-shot report that fails without letting anyone know will inevitably be the one that gives the chairman of the board embarrassingly wrong data.

• Provide training in internal control principles for your staff. There are short courses available through universities and seminar companies on internal control and electronic data processing auditing principles.

The more you and your staff know about internal control, the more it will become a natural part of your systems development life cycle.

If these suggestions sound like your company's standards, congratulations. You undoubtedly have few problems come audit time. If not, why not try adapting some of these ideas to your installation.

Beyond the payback of reduced aggravation at audit time, it is simply good business.

EXECUTIVE REPORTS

Special Editorial Features

Every issue of Computerworld presents either a Product Spotlight or Executive Report. For advertisers, it's still not too late to take advantage of the hot topics.

Financial Modeling Packages for Micros (Product Spotlight, September 15) Examines how standalone spreadsheets are fast disappearing and being replaced by integrated programs or financial modeling packages. The main article looks at what users can do after outgrowing their spreadsheets, and presents the use of a financial modeling package as one solution. Closing date August 29.

Communication Standards (Executive Report, September 22) Focuses on electronic data exchange protocol (EDI), which allows for the direct computer to computer exchange of standard business forms. This report studies the value of EDI in the transmission of purchase orders, invoices and other important documents in various industries. Also, a look at how EDI is strengthening the trade relationships between customers and suppliers. Closing date September 5.

On-line Computing (Executive Report, September 29) Explores the fact that although on-line transaction processing (OLTP) has been around since the 1960s, the market is now heating up with IBM and some BUNCH companies battling a group of young companies for the bulk of the market. This report examines on-line computing with a look at the major players, the current state of the art, and what users want. Closing date September 12.

Hardware Roundup (Product Spotlight, October 6) Covers large and medium-scale computer systems. Specifically looks at the past year's product innovations, significant revisions and enhancements, and what major players in the mainframe and supermini categories have been doing. A sidebar looks at what's going on with the BUNCH companies. Closing date September 19

And it doesn't stop there! Important and pertinent Executive Reports and Product Spotlights topics continue through October and November.

ISSUE	TOPIC	CLOSING DATE
October 13	Hardware Roundup/Small-scale Systems (Product Spotlight)	September 26
October 20	Hardware Roundup/Microcomputers (Product Spotlight)	October 3
October 27	Decision Support Systems (Executive Report)	October 10
November 3	"1000th Issue/40th Anniversary of the Computer"	October 10
November 10	PC Graphics Hardware (Product Spotlight)	October 24
November 12	"Computerworld Focus on Microcomputing"	October 3
November 17	Systems Integrators (Executive Report)	October 31
November 24	Vertical Markets (Executive Report)	November 7

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PRODUCT SPOTLIGHTS

Computers spur sales, cut costs

From page 67

additional revenue, paying for itself in one year.

The most commonly cited advantages of the sales support systems studied were providing information to the field (cited by 80% of the companies), time and territory management of the sales force (58%), cutting the time between orders and shipments (56%) and increased sales volume per sales representatives (51%).

Some of the systems were developed in-house, and some were purchased from turnkey vendors. Those installed by vendors were generally more sophisticated and tended to be up and running faster, according to Wallis.

He said that in developing the systems, companies tended to pay close attention to what users wanted. "They got a great deal of input about what the system should do. They did go out of their way to get people's opinions."

But changing users' attitudes still has been an obstacle, Wallis noted. Many sales representatives at Wrangler were skeptical of their new system, according to his study. But when they found it might increase their earnings, they were sold, the Conference Board reported.

Even then, however, the productivity of Wrangler sales force fell off, because the unfamiliarity with the system cut down on the number of sales calls they made in a day. But the division expects productivity to rebound as sales representatives get more comfortable with the computers and can work in front of customers with them, according to the study.

MIS exec turns mediator

From page 67

new IBM equipment that includes an order processing system, an accounts receivable package, distribution systems and financial accounting, including accounts payable and fixed assets.

"It requires a whole new mentality," Reitz says of the new system. A big part of his job is to see that clients are aware of the opportunities the new technology can offer and help them plan for them.

In addition to a new way of thinking, the change could bring a lot of headaches, he acknowledges.

As go-between, Reitz also runs the risk of being blamed by both sides when things do not go right. "In taking the job, he took a gamble," Brzezinski admits.

> ***'I have the invitation to talk to anyone within the organization I feel necessary.... It was a rare opportunity for personal development and the development of business skills.'***
>
> — Gary Reitz
> Quaker Oats Co.

But for Reitz, it is a gamble that may pay off in future corporate advancement.

"The reason I accepted it is because I have the ability to look into all aspects of Quaker's operations. I have the invitation to talk to anyone within the organization I feel necessary. I can learn more about the company and business plans. It was a rare opportunity for personal development and the development of business skills," he adds.

Broad exposure

Reitz says he would like to rise to chief information officer or a similarly high post and that to do so he must have broad exposure to the company.

It may become more common for managers to gain such exposure through the information systems department, he adds.

One of Reitz's duties is to help clients understand the costs of their information systems services.

With a chargeback system, a department that uses a service gets a bill from the information systems department, although no money is exchanged.

Reitz recalls one major client who was always quite vocal about the cost of computer chargebacks, claiming they were rising beyond his control every year.

In response, Reitz started itemizing chargeback bills that showed the user was spending more than necessary.

"It helps the manager understand the cost-benefit value of computer services," he says.

In another case, Reitz's communication skills were tested.

At a monthly discussion involving information systems personnel and a client group that had "always been a difficult group to work with," a heated discussion verged on direct confrontation.

But Reitz says he was able to defuse the situation by speaking to the participants individually after the meeting.

"In the past, you would have resorted to memo writing. Now, there is very little of that," Brzezinski claims. "It took six to nine months to build the confidence they had in Gary," he adds.

Reitz says he came to the job with no formal training in employee relations.

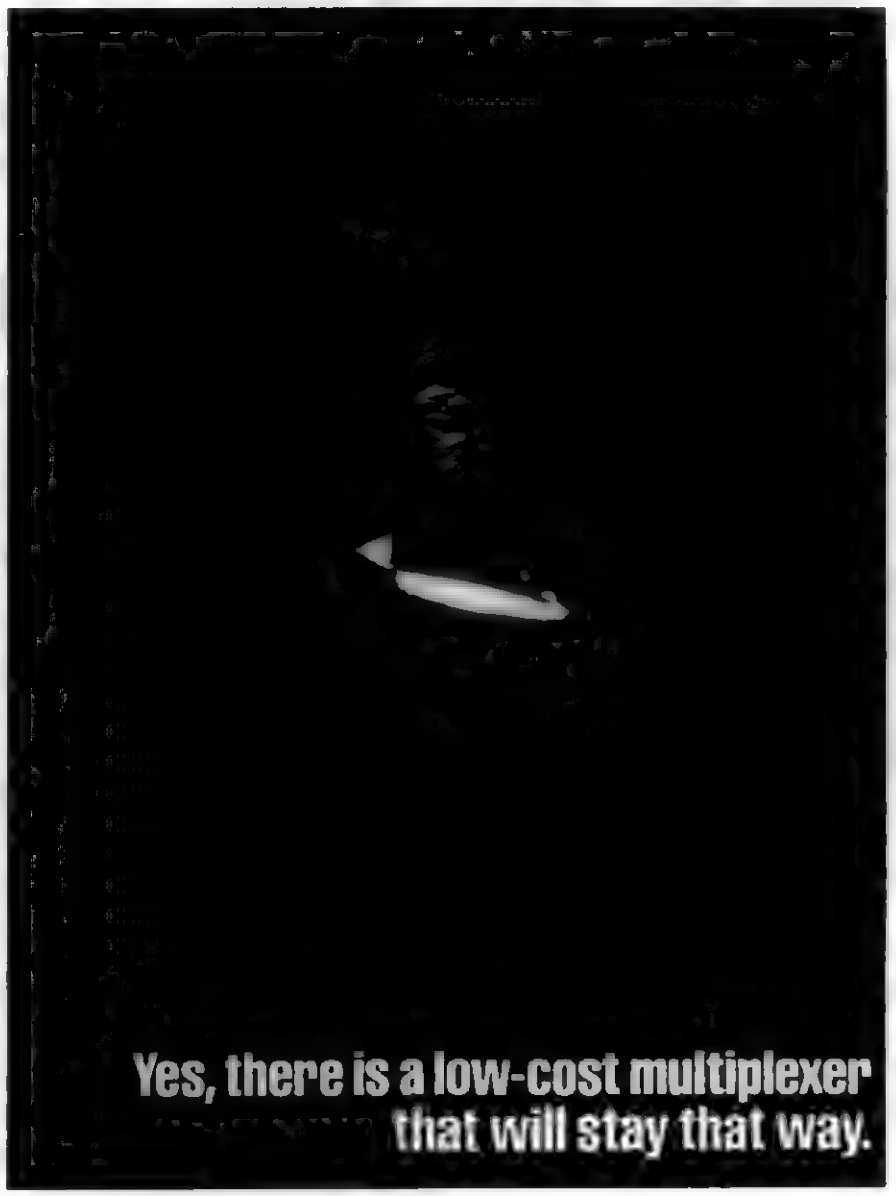
Formalizing responsibilities

"I was just given the job and told to develop some goals," he says, adding that he is still formalizing his responsibilities.

He aims to stay in the job for at least another year and, when he leaves, to offer a fully defined job for his replacement.

Although the position was created in response to the new IBM system, Reitz says it will be continued beyond the adjustment period and its focus may change.

Reitz says that whoever gets the job will have to have some of the communication skills that he possesses. "You just can't take a techie and put him in this job," he noted.



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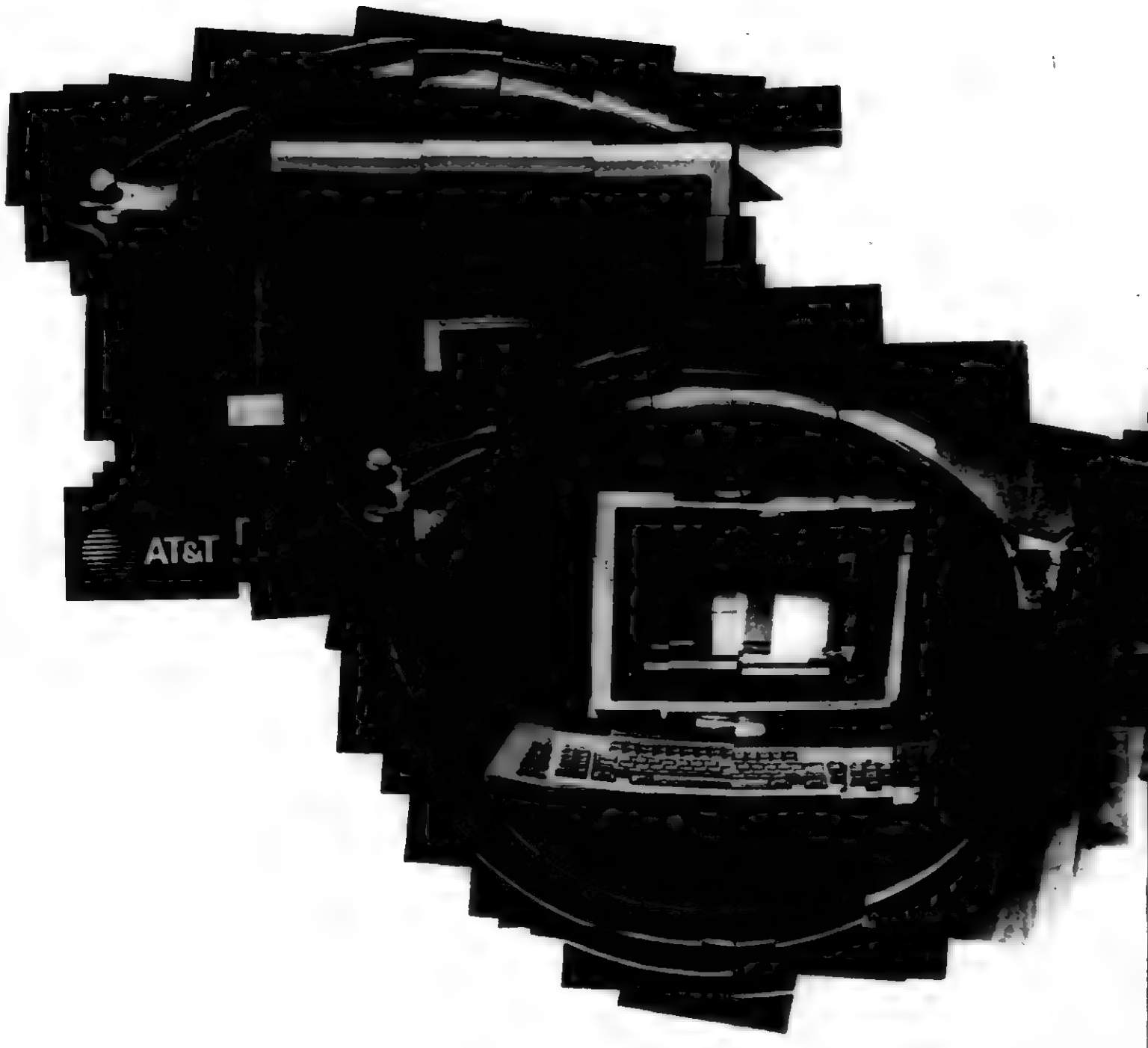
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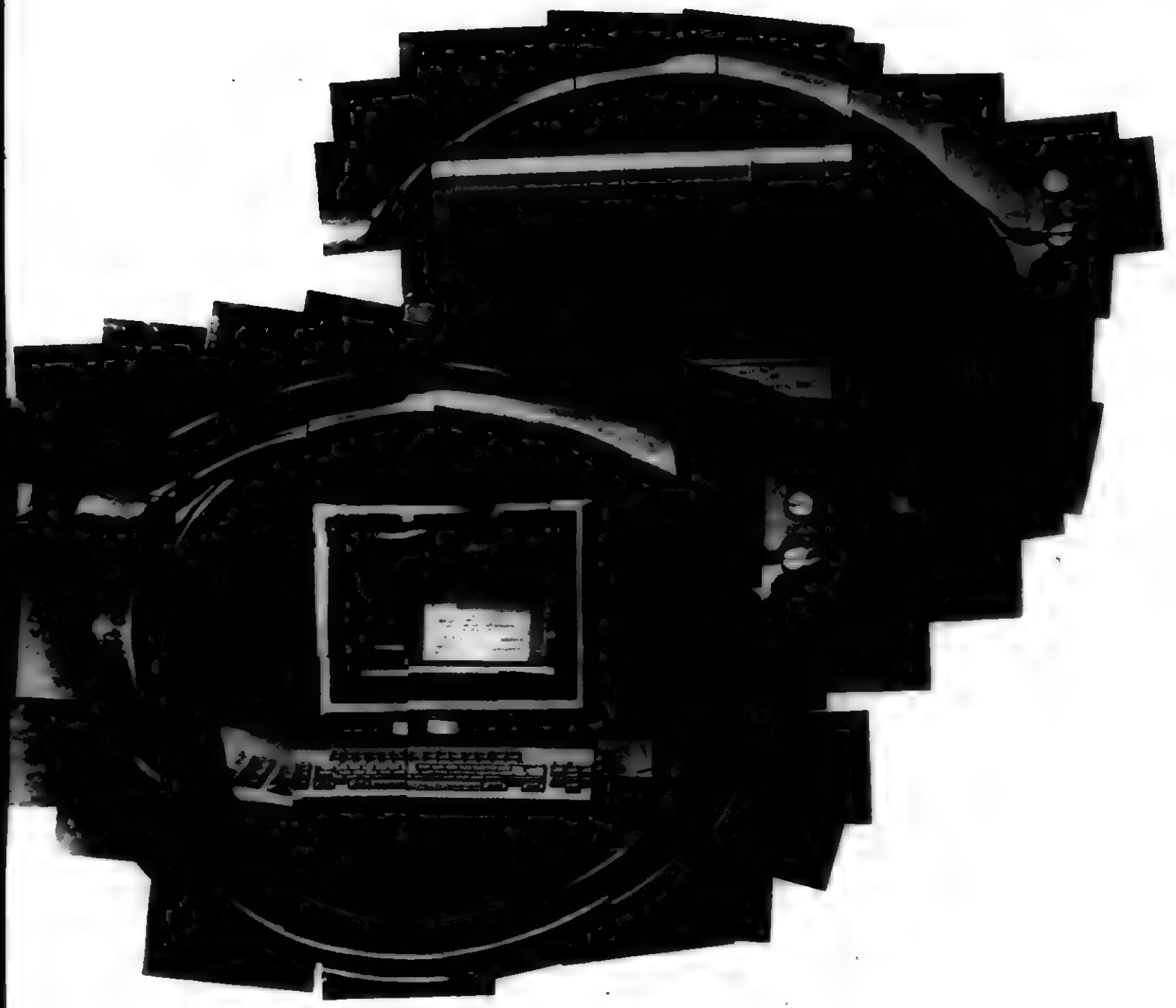
The 6500 lets you create up to four windows at the same time—into both synchronous and asynchronous hosts—and freely pass information among various databases.

For example, an inside salesperson taking an order could access: the customer's credit status in one host; relevant inventory information from another host at a completely different location; and the order form to fulfill the request from yet another host at another location.

All, on a single screen.

That kind of power means big productivity gains with no outlay for costly systems and applications development.

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HER THREE INITIALS IN THE 3270 WORLD.

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So before you decide on 3270 compatibles, call on your AT&T Account Executive, or simply dial 1 800 247-1212.

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The right choice.

Getting specs on job seekers

From page 67

ence alone is acceptable for some positions. Once she spells out the musts, Grenard said, she assigns numerical values to various qualifications. As the applications roll in, she rates each applicant according to the set values.

"Read the resume for content, not style," she said. "Don't judge an applicant by how much money was spent on a resume."

The key points she looks for are achievement, direction and how previous positions match or lead to the prospective one. She tries to identify a hard worker by noting those whose skills and experiences in a job go beyond what the title implies.

Grenard said to watch out for one who emphasizes education instead of experience and for too many qualifiers (such as "familiar with"), which might be signs of stretching to match the qualifications.

Whittling down applicants to interviewees is only the beginning. Grenard offered a lengthy list of questions from which she chooses 15 to 20 to ask the applicant. She said she saves a few toughies for follow-up interviews with the top contenders. As every job hopeful suspects, each question is aimed at prompting a specific, hidden or not-so-hidden message. Among the questions Grenard poses are the following:

- Can you describe for me a typical day in your present job? (A way of verifying information offered on the resume, Grenard said.)
- Describe a problem you faced in the past and how you solved it. (This is to examine the applicant's thought process.)
- What did you do differently from others in that position and why? (This tells about the applicant's willingness to conform to accepted procedures and about his initiative.)
- Describe your most satisfying or dissatisfying educational experience. (This is to provide clues about the individual's depth of experience; Grenard advised managers to be wary of one who says everything is easy.)
- What are some of the things that you found difficult to do in positions you have held? (This helps identify one unsuited to the tasks at hand. "Be very wary of anyone who considers users to be interlopers who are not to be trusted," Grenard warned.)
- What do you consider to be the best advice you could give to someone who is not computer literate but wishes to be? ("Try to find out how much sympathy they have for the novice user," Grenard advised.)
- Can you tell me a little bit about how you go about making important decisions? ("The ability to vary strategy is one of the most important in effectiveness," Grenard said.)
- What do you know about our company? (This may reveal an applicant's resourcefulness.)
- Describe the best supervisor you ever had. ("If they say 'none,' I'd be willing to bet they'd say that about you, too," Grenard said.)

Grenard suggested a one-to-one interview, calling sessions with multiple interviewers too stressful.

The interviewer must conscientiously avoid asking questions about categories banned by laws against discrimination, Grenard said. Among those are questions on race, national origin, marital and family status, age, handicaps and even some questions about residence.

"There is a catch-22 to the Equal Employment Opportunity Commission regulations," she noted. The corporate personnel department may be asked to prove it has considered and hired applicants of various races and creeds, as required by the commission, but the company is also prohibited from requesting information to categorize applicants as members of such groups. Her solution is to have the personnel department send a form asking for such information and stating that it is strictly for records to satisfy commission guidelines.

> ***"One study found that 24% of all job applicants give invalid job titles, 10% misrepresent their former job responsibilities and 22% list an inaccurate salary figure."***

Look beyond the canned references often handed over at the time of the interview, Grenard added. She suggested promptly calling interviewees' former supervisors, subordinates and coworkers. "Probe a while," she said. "Get beyond the surface comments. What were these person's frustrations? Achievements? And would the supervisor rehire him or her?"

Checking with former supervisors also identifies early any exaggerated or even fraudulent qualifications the applicant may claim. Grenard cited a study that found 24% of all job applicants give invalid job titles, 10% misrepresent their former job responsibilities and 22% list an inaccurate salary figure.

The wrap-up includes reviewing the documentation, interviewing the finalists, making the choice and extending the offer. But it does not end there — Grenard said the professional interviewer extends regrets to the runners-up promptly. She also suggested saving the documentation for at least three years.

"Don't say when you turn someone down that someone else was better qualified because that's hard to back up in court," she said. "Say someone else was a better match.

"Can you still get a dud? Of course," she added. "This isn't really so different than what we go through with hardware and software evaluation, and you still sometimes end up with a product that's not a good fit in your environment."

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF OHIO
WESTERN DIVISION

UNITED STATES OF AMERICA, Plaintiff,
v.
THE NATIONAL CASH REGISTER COMPANY, et al., Defendants.

In Equity No. 6965
NOTICE OF MOTION TO TERMINATE FINAL DECREE
Judge Walter H. Rice

TAKE NOTICE that NCR Corporation ("NCR"), formerly known as The National Cash Register Company, a defendant in the action, has filed a motion for an order terminating as to all defendants the "Final Decree" in this action, which was entered on February 1, 1916. The plaintiff, the United States of America, has consented to the entry of such an order, but has reserved the right to withdraw its consent for at least seventy (70) days after the publication of this notice.

The complaint in this action, which was filed in 1911, alleged that NCR and 28 individual defendants were engaged in a conspiracy to restrain trade, an attempt to monopolize and a successful monopolization of the cash register industry through a variety of anti-competitive practices, including corporate espionage and below-cost pricing. The Final Decree enjoins NCR and 17 individuals from, among other things:

(1) persuading a purchaser of a competitor's cash register to break his contract;

(2) espionage upon a competitor for the purpose of obtaining the names or addresses of purchasers or prospective purchasers or other information and using such information to dissuade any persons from purchasing a cash register from the competitor;

(3) inducing any employee of any competitor to disclose the business secrets of the competitor;

(4) inducing any employee of a competitor to leave the service of such competitor or inducing a dealer in competitive cash registers to cease to deal in such competitor's cash registers and to employ such employee or dealer;

(5) selling any cash register manufactured by a competitor or any cash register made to resemble a competing cash register when sold not for the purpose of earning profits therefrom but for the dominant purpose of preventing sales of such competing cash registers; or selling any cash register at a price fixed with reference not to the cost of manufacture but solely with reference to the price of said competing cash register, for the purpose of driving from business the manufacturer of the competing cash register;

(6) selling any secondhand cash register of NCR for the purpose not of realizing therefrom as much as practicable but for the dominant purpose of driving a competitor from business;

(7) having employees whose principal duty is to prevent competitors from selling cash registers or following the salesmen or dealers of a competitor for the purpose of interfering with the competitor's sales efforts or identifying its prospective customers;

(8) making any statement reflecting upon the solvency or responsibility of any competitor or upon the efficiency of any competing cash register which such statement is either a misrepresentation or is made for the mere purpose, not of directly promoting the sale of NCR cash registers, but of preventing the sale of competing cash registers;

(9) intimidating competitors or prospective investors in competitors with certain types of product comparisons or statements of purported losses suffered by the competitors in their efforts to compete with NCR;

(10) intimidating prospective purchasers of competing cash registers with suit for patent infringement;

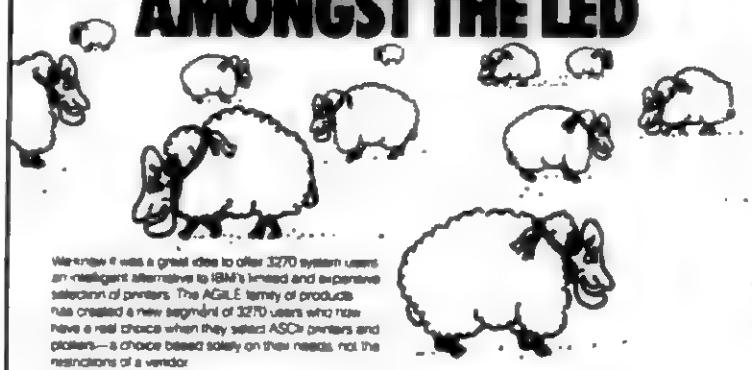
(11) maintaining an ostensible competitor corporation that is secretly controlled by the defendants;

(12) acquiring ownership of any part of the business of any competitor in cash registers; NCR may, however, petition the Court to permit such acquisition.

Interested persons may submit comments concerning this matter by sending them to John A. Weadon, Chief, Cleveland Field Office, Antitrust Division, United States Department of Justice, 995 Celebrezze Federal Building, Cleveland, Ohio 44199 (telephone: 216-522-4070). Such comments must be received by the Division within sixty (60) days.

Copies of the complaint, Final Decree, motion papers, all comments submitted and all further papers filed with the Court will be available for inspection at the Legal Procedure Unit of the Antitrust Division, Room 7233, United States Department of Justice, Tenth Street and Pennsylvania Avenue, N.W., Washington, D.C. 20530 (telephone: 202-633-2481), and at the Office of the Clerk of the United States District Court for the Southern District of Ohio, Western Division, 200 West Second Street, Dayton, Ohio 45402. Copies of any of these materials may be obtained from the Legal Procedure Unit upon request and payment of the copying fee set by Department of Justice regulations.

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We also knew our ideas were bound to create numerous competitors trying desperately to do what we do.

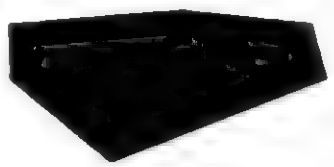
However, as a printer/plotter protocol converter, the engineering and design excellence of the AGILE 6287 is difficult to impersonate. The 6287 supports full-feature emulation of most IBM 3270 printer applications including APL. It provides built-in diagnostics, internal power supply, and fan cooling. The 6287 is backed by a full two-year warranty and AGILE's commitment to individual service and reliable customer support.

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Guide seeks CIM input

By Rosemary Hamilton

Guide International Corp., the association of IBM large system users, has begun recruiting computer-integrated manufacturing (CIM) professionals to help launch a CIM program for its members, according to the group's president.

"We want to bring in more people involved with CIM. We traditionally have not addressed this area," said John Nack, Guide's president. "It's one of the things that we've not done as well as we could have."

The association has received a high-level commitment from IBM to help develop a CIM program, Nack said.

The organization also has commitments from a few large manufacturing concerns that will send some of their people to Guide meetings to help with the effort, he said.

"Right now, it's the chicken-and-the-egg syndrome," Nack noted. "We don't have the program to attract CIM people, and we don't have the CIM people within Guide to develop a program."

CALENDAR

AUG. 31-SEPT. 6

Fourth Annual Office Automation Society International Conference. Chicago, Sept. 2-6 — Contact: OASI, Suite B, 15269 Mimosa Trail, Dumfries, Va. 22026.

Project Management Systems. Minneapolis, Sept. 3-5 — Contact: The American Institute, Carnegie Building, 55 Main St., Madison, N.J. 07940. Also being held Sept. 22-24 in Boston, Sept. 29 to Oct. 1 in Philadelphia and Oct. 22-24 in Cincinnati.

Federal Computer Conference. Washington, D.C., Sept. 3-5 — Contact: Federal Computer Conference, Box N, Wayland, Mass. 01778.

Telemarketing/West. Los Angeles, Sept. 3-5 — Contact: The Telemarketing Foundation, Inc., P.O. Box 829, Arnold, Md. 21012.

The Desktop Publishing Conference. San Francisco, Sept. 3-6 — Contact: Seybold Seminars, 6922 Wildfire Road, Malibu, Calif. 90265.

National Canadian Systems 3X Users Show. Toronto, Sept. 4-5 — Contact: The Producers, 360 Merrimack St., Lawrence, Mass. 01843.

SEPTEMBER 7-13

1986 Electronic Printer Conference. Boston, Sept. 7-10 — Contact: CAP International, Inc., One Snow Road, Marshfield, Mass. 02050.

System 1022/1032 Users Conference. Burlington, Mass., Sept. 7-10 — Contact: Software House, 1000 Massachusetts Ave., Cambridge, Mass. 02138.

Planning for Network Integration. Nashville, Sept. 7-10 — Contact: Southeastern Telecommunication Association, P.O. Box 901, Richmond, Va. 23207.

How to Design and Implement Bar Code Systems. Detroit, Sept. 8-9 — Contact: Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

Entity Modeling: Techniques and Application. Washington, D.C., Sept. 8-10 — Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

Technical Update Conference — 86. Anaheim, Calif., Sept. 8-10 — Contact: Security Pacific Audit Services, Suite 208, 11565 Laurel Canyon Blvd., San Fernando, Calif. 91340.

NCC-Telecommunications Conference. Philadelphia, Sept. 8-10 — Contact: American Federation of Information Processing Societies, 1899 Preston White Drive, Reston, Va. 22091.

Quality Assurance Institute's Seminars on Quality Data Processing. Toronto, Sept. 8-12 — Contact: QAI, 9222 Bay Point Drive, Orlando, Fla. 32819. Also being held Sept. 15-19 in Chicago.

Tutorial Week Boston '86. Cambridge, Mass., Sept. 8-12 — Contact: Director of Tutorials, IEEE Computer Society, 1730 Massachusetts Ave., Washington, D.C. 20036.

Writing Procedures, Policies and Documentation. Austin, Texas, Sept. 8-12 — Contact: Information Mapping, Inc., 275 Wyman St., Waltham, Mass. 02154.

43rd FID Conference and Congress. Montreal, Sept. 8-18 — Contact: Local Organizing Committee, FID Conference and Congress, C.P. 1144, Succursale Place Desjardins, Montreal, Que., Canada H5B 1B3.

National Capital Datapoint User Group Meeting. Arlington, Va., Sept. 9 — Contact: OSP/WHS/DCOAR, Room 1C730, The Pentagon, Washington, D.C. 20301.

Computing in the 21st Century. Bloomington, Minn., Sept. 9-10 — Contact: Charles Babbage Institute, University of Minnesota, 103 Walter Library, 117 Pleasant St. S.E., Minneapolis, Minn. 55455.

Satellite Communications Users Conference 86. Las Vegas, Sept. 9-11 — Contact: SCUC, 6530 S. Yosemite St., Englewood, Colo. 80111.

Midcon/86. Dallas, Sept. 9-11 — Contact: Midcon, 8110 Airport Blvd., Los Angeles, Calif. 90045.

1986 Intelligent Buildings Conference and Exposition. Atlanta, Sept. 9-11 — Contact: Bryson Associates, 162 Tower Place, 3340 Peachtree Road N.E., Atlanta, Ga. 30026.

Corporate Electronic Publishing Systems IV: A Conference and Show. Boston, Sept. 9-11 — Contact: Cahners Exposition Group, 999 Summer St., Stamford, Conn. 06905.

Real-Time Operating Systems: A Hands-On Workshop. San Diego, Sept. 9-12 — Contact: Integrated Computer Systems, P.O. Box 3614, 5800 Hannum Ave., Culver City, Calif. 90231. Also being held Oct. 28-31 in Boston and Nov. 11-14 in Palo Alto, Calif.

Southwest Idaho Chapter of the Data Processing Management Association's Annual Computer Show. Boise, Idaho, Sept. 10-11 — Contact: Publicity Chairman, Southwest ICDPMA, Boise State University, College of Business, 1910 University Drive, Boise, Idaho 83725.

Devlin Associates, Inc. Tenth Annual Disaster Recovery Planning Conference. Atlantic City, Sept. 10-12 — Contact: Devlin Associates, 430 Exton Commons, Exton, Pa. 19341.

Token-Ring Network & Application Program Interfaces. Palo Alto, Calif., Sept. 11-12 — Contact: Communications Solutions, Inc., 992 S. Saratoga-Sunnyvale Road, San Jose, Calif. 95129. Also being held Sept. 25-26 in New York.

Dataquest, Inc. Conference. San Diego, Sept. 11-12 — Contact: Computer Storage Industry Service, 1290 Ridder Park Drive, San Jose, Calif. 95131.

See CALENDAR page 74

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Nora Feldman Gildea
Director of Marketing
IDEAssociates, Inc.
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Optical Storage and Retrieval. Hyannis, Mass., Sept. 11-12 — Contact: International Optical Telecommunications, 720 Main St., Hyannis, Mass. 02601.

SEPTEMBER 14-20

CADRE — An Applied Data Research Users Conference. Nashville, Sept. 14-18 — Contact: Director of Client Relations, ADR, Rt. 206 and Orchard Road, CN-8, Princeton, N.J. 08540.

Bypass: The Second Wave. New York, Sept. 16 — Contact: Conference Registrar, The Eastern Management Group, Four Century Drive, Parsippany, N.J. 07054.

Comdex/Candex. Montreal, Sept. 18-19 — Contact: Candex Conference, Inc., 47 Lakeshore Road E., Mississauga, Ont., Canada L5G 4L7.

SEPTEMBER 21-27

National Retail Merchants Association's 28th Annual Retail Information Systems Conference. Anaheim, Calif., Sept. 21-24 — Contact: Director of Retail Standards and Technology, NRMA, 100 W. 31 St., New York, N.Y. 10001.

PSMJ CADD Managers Roundtable. Hyannis, Mass., Sept. 21-26 — Contact: PSMJ Roundtables, 10 Midland Ave., Newton, Mass. 02158.

Eighth Annual Lasers in Graphics/Electronic Publishing in the 80's Conference. Anaheim, Calif., Sept. 21-29 — Contact: Lasers in Graphics, Suite 1, 1855 E. Vista Way, Vista, Calif. 92084.

"C" Programming with Style and Discipline. Milwaukee, Sept. 22-24 — Contact: Center for Continuing Engineering Education, College of Engineering & Applied Science, University of Wisconsin — Milwaukee, 929 N. Sixth St., Milwaukee, Wis. 53203.

Space Tech '86. Orlando, Fla., Sept. 22-25 — Contact: Society of Manufacturing Engineers Public Relations, Box 930, One SME Drive, Dearborn, Mich. 48121.

Lasers in Automotive Manufacturing. Detroit, Sept. 23-24 — Contact: Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

International Videotex Industry Exposition and Conference. New York, Sept. 23-25 — Contact: Cahners Exposition Group, P.O. Box 3833, Cahners Plaza, 999 Summer St., Stamford, Conn. 06905.

Computer-Aided Publishing '86 Exposition and Conference. Washington, D.C., Sept. 23-25 — Contact: CAP Association, Suite 200, 90 W. Montgomery Ave., Rockville, Md. 20850.

EDI Training Session. Arlington, Va., Sept. 25-26 — Contact: TDCC, 1101 17th St. N.W., Washington, D.C. 20036.

The Fourth Annual NCR Users Eastern America Conference. Atlantic City, Sept. 25-26 — Contact: ECUO Treasurer/Convention Publicity Chairman, c/o AOR, Inc., P.O. Box 429, Willow Grove, Pa. 19090.

Robot Applications for Automotive Manufacturing. Detroit, Sept. 25-26 — Contact: Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

The Association for Women in Computing's Fifth Annual Conference. St. Louis, Sept. 26-28 — Contact: AWC Conference '86, 407 Hillmoor Drive, Silver Spring, Md. 20901.

SEPT. 28-OCT. 4

The Institute on Artificial Intelligence and Expert Systems. Chicago, Sept. 29 to Oct. 3 — Contact: Seminar Coordination Office, Suite 415, 850 Boylston St., Chestnut Hill, Mass. 02167.

Video Expo New York. New York, Sept. 29 to Oct. 4 — Contact: Knowledge Industry Publications, Inc., 701 Westchester Ave., White Plains, N.Y. 10604.

OCTOBER 5-11

Computer and Communications Security '86. New York, Oct. 7-9 — Contact: Show Manager, Cahners Exposition Group, Box 5060, 1350 E. Touhy Ave., Des Plaines, Ill. 60017.

OCTOBER 12-18

National Office Automation Conference. Washington, D.C., Oct. 14-16 — Contact: NOAC, P.O. Box N, Wayland, Mass. 01778.

OCTOBER 19-25

Infomatics '86. Toronto, Oct. 20-23 — Contact: International Information Management Congress, P.O. Box 34404, Bethesda, Md. 20817.

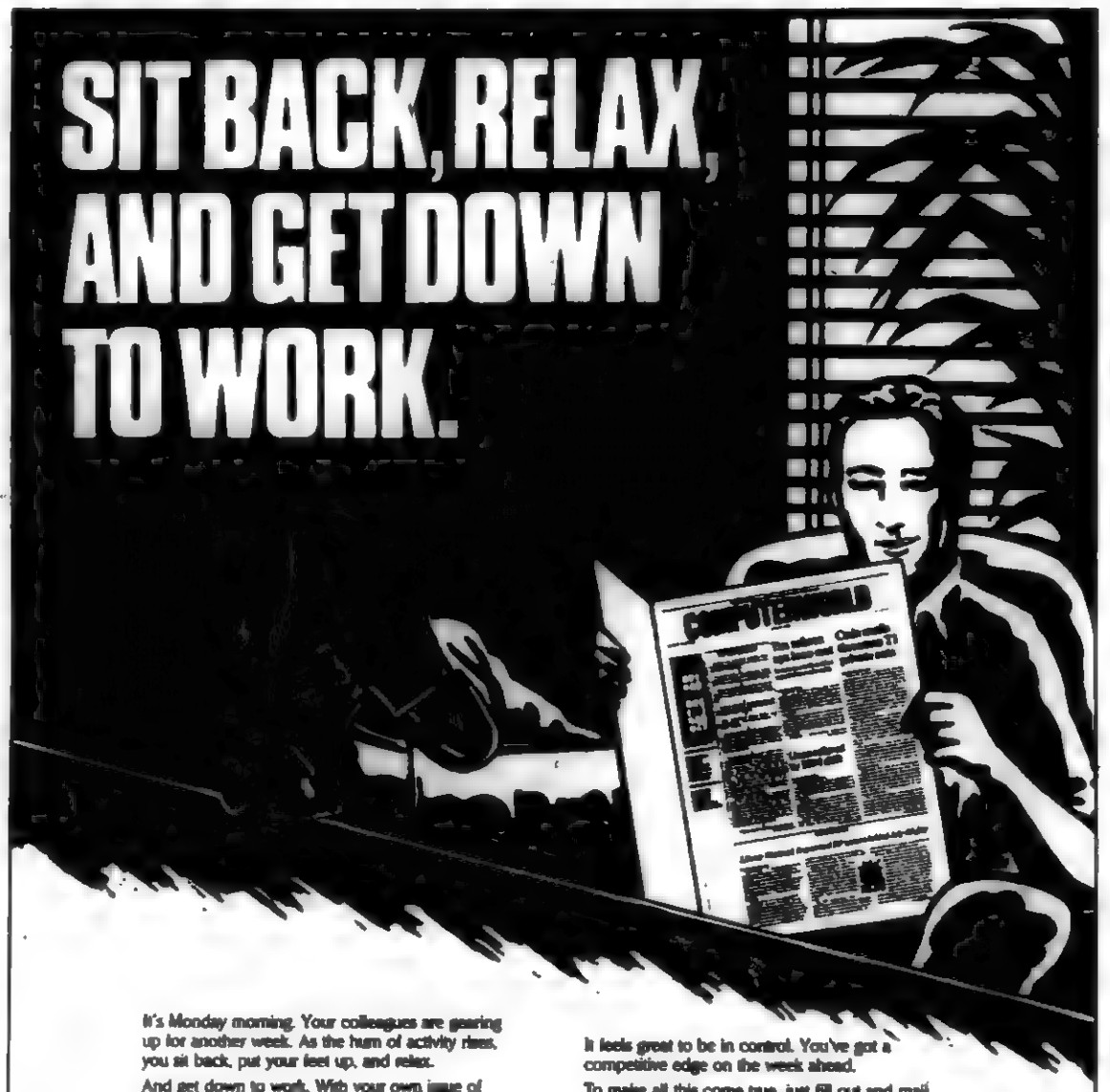
Software Configuration Management and Software Quality Assurance. Santa Maria, Calif., Oct. 22-24 — Contact: Software Certification Institute, P.O. Box 2328, Santa Maria, Calif. 93455.

Annual Human Resources Conference. New York, Oct. 23-24 — Contact: The Conference Board, Inc., P.O. Box 4026, Church Street Station, New York, N.Y. 10249.

OCT. 26-NOV. 1

IFMA '86. Chicago, Oct. 26-29 — Contact: International Facility Management Association, Suite 1410, Summit Tower, 11 Greenway Plaza, Houston, Texas 77046.

Computer Dealers and Lessors Association, Inc. Annual Meeting. Colorado Springs, Oct. 30 to Nov. 1 — Contact: CDLA, 1212 Potomac St. N.W., Washington, D.C. 20007.



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NEW PRODUCTS

Tool builds graphics on Microvax II

Sherill-Lubinski of Corte Madera, Calif., has ported its Object-Oriented Graphical Modeling System to Digital Equipment Corp.'s Microvax II.

The modeling system reportedly provides more than 40 different classes of objects for constructing graphics systems. The package allow users to create, modify, animate, store, retrieve and combine objects and pictures.

According to the vendor, a parametric instancing of models or submodels has been added. This feature preserves object-class control while allowing variation of parameters across objects in the class.

Four components

The Object-Oriented Graphical Modeling System consists of four components: a graphical modeling function, which is a system function library containing an extensive set of C language functions for hierarchical graphics modeling, display and interaction; a graphical modeling language interpreter for controlling and animating models created; an object-oriented environment that is a hierarchical framework said to organize functions and provide run-time support; and a graphics editor-builder called Draw, a high-level mouse- and icon-driven graphics editor/composer.

In addition to its ability to create complex pictures, Draw maintains a graphics data base of lines, rectangles, circles and other objects that can be organized as groups, symbols or projects and then associated with various types of viewing objects, the vendor stated. Draw can be invoked to redesign and reconfigure itself for any given application.

According to the vendor, the modeling system was designed specifically to embed in existing user applications. Its subassemblies and functions reportedly integrate easily into user code with minimal intrusion.

The price for the Draw binary module is $2,500; the complete system in binary version costs $4,500. According to the vendor, source code licenses are also available.

Stratus enhances VOS

Benchmarks reveal higher throughput, less waiting

Stratus Computer, Inc. of Marlboro, Mass., has announced Release 5.1 of the company's proprietary virtual operating system (VOS) for the Stratus FT250, XA400 and XA600 continuous processing systems.

Using the company's on-line transaction processing benchmark called TP-1, XA600 systems running Release 5.1 are said to show an increase in processing throughput while maintaining an average 2-sec. response time.

Enhancements to VOS in Release 5.1 are said to be in the areas of disk I/O management, such as increased disk cache manager capacity, which allows more disk I/O operation/sec.; improved locking algorithms, which speed cache management and cut application waiting time for locked files or records; increased disk cache size up to 60M bytes; and more available buffer resource space, which allows VOS to manage more processes, open files and attached devices.

VOS is said to be a virtual memory system designed for multiprogramming, multiple processors and networking in a fault-tolerant environment. VOS allocates system resources such as memory, CPUs and peripherals to each user as needed.

VOS Release 5.1 will be distributed Sept. 1 to Stratus customers with maintenance agreements at no cost, according to a company spokesman.

With Release 5.1, the company announced it is also providing results through the use of an on-line transaction processing benchmark called ET-1. ET-1 reportedly simulates a simple debit/credit transaction with minimal processing. A single-module XA600 system running Release 5.1 under ET-1 demonstrated 15 transaction/sec., the vendor stated.

Referee tends RAM programs

Referee, a utility program said to manage random-access memory (RAM)-resident software, has been introduced by Persoft, Inc. of Madison, Wis.

Referee is said to aid in preventing malfunctions and data loss that can occur when RAM-resident programs, such as desktop organizers, spelling checkers and keyboard enhancers compete with each other and with application programs for the computer's internal resources.

With Referee, users are reportedly able to activate or deactivate loaded memory-resident programs, either automatically or manually, to avoid combining programs that may vie for similar resources. Referee costs $69.95.

Referee also allows users to team up only those RAM-resident programs that are appropriate with a particular appplication program by establishing in advance which memory-resident programs should be activated with a particular program.

A user can also manually alter, either at the DOS prompt or with the memory-resident option of Referee, which RAM-resident programs are active. With this option, a user running an integrated program such as Lotus Development Corp.'s Symphony can manually activate a RAM-resident printing utility program in the spreadsheet portion of the program and have only a desktop organizer active in other portions of the program.

Referee can also unload RAM-resident programs from memory even if they do not have a specific unload feature. It shows the user which programs are active or inactive, as well as the amount of memory each program is using.

Referee can either be implemented as a stand-alone program or as a memory-resident program. In either case, a memory core must be loaded.

Referee runs under Version 2.0 or later of the IBM PC-DOS operating system. The central portion of the program is said to require about 25K bytes of memory and the additional memory-resident portion of the program requires another 12K bytes for nongraphics displays and 24K bytes for graphics displays.

INSIDE

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Systems & Peripherals/80

PCs develop object-based images with Smalltalk language

Digitalk, Inc. of Los Angeles has released Smalltalk/V, an implementation of the company's object-oriented programming language, said to transform an IBM Personal Computer or compatible into a graphical programming environment similar to that found on dedicated artificial intelligence workstations. Smalltalk/V costs $99.

Smalltalk/V reportedly features bit-mapped graphics, windows, mouse support, a built-in Prolog compiler, object-swapping virtual memory and a source-level debugger.

According to the vendor, the Smalltalk/V environment is modeless, allowing users access to all features at all times. Multiple windows can be open on the screen at one time, each with a different activity, giving programmers the ability to rapidly construct, test, debug and re-execute code without the need for time-consuming compile and link sessions.

Graphics capabilities

Smalltalk/V's graphics abilities include bit and forms editor for the creation of graphic icons and fonts, as well as Turtle graphics, which are said to simplify the manipulation and animation of graphic objects.

Each graphic object can be linked to other graphic objects through the Smalltalk message-passing paradigm, making possible the construction of complex simulations in which objects on the screen can modify each other's behavior. Smalltalk's built-in Prolog compiler is said to introduce users to logic programming and permits the integration of object-based and rule-based programming techniques.

According to Digitalk, the program's sophisticated source-level debugger greatly speeds program development. It includes the ability to examine and change local variables and then resume the program or restart the execution of a specific method. All Smalltalk source code is included, except compiler, with browser windows said to promote easy access and modification.

Other features of Smalltalk/V include an automatic change log that records every modification of the environment and permits its reconstruction in case of error; a directory-and-file browser system that gives a graphic representation of the organization of IBM PC-DOS files and directories, enabling them to be easily modified and organized; access to other languages and DOS functions; and a DOS command shell.

An optional communications interface permits communication with AT&T Unix System V and University of California at Berkley Unix 4.2 and other systems via RS-232 for $49.

Smalltalk/V is not copy protected and requires 512K bytes of random-access memory on the IBM PC, Personal Computer AT and compatibles. It also requires a Microsoft Corp. or compatible mouse and IBM Enhanced Graphics Adapter, Hercules Computer Technology or AT&T graphics controller. Digitalk's original, nongraphic Smalltalk implementation, Methods, has been reduced in price from $250 to $79.

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NEW PRODUCTS/SOFTWARE & SERVICES

SOFTWARE & SERVICES

Systems software

C.D.S. Computer Corp. has announced its **User Security Authorization System** to provide an added level of security for users of Digital Equipment Corp.'s VAX computers with the VMS operating environment.

Features of the User Security Authorization System include issuance of an additional password, elimination of the VMS prompt and the ability to restrict users to a specific terminal.

For dial-up users, the system reportedly provides an optional disconnect and dial-back to predetermined numbers and verification of answerbacks from terminals or personal computer-based emulators.

The User Security Authorization System costs $4,500.

C.D.S. Computer, Suite 205, 21243 Ventura Blvd., Woodland Hills, Calif. 91364.

Applications packages

Britz Publishing, Inc. has announced **Art System Release 2.0** of its accounts receivable software for the IBM System/34 and System/36 family of computers.

Art System Release 2.0 is said to be an open item, batch method, accounts receivable system that includes such functions as data entry, invoice printing, accounts receivable ledger, aging reports and transaction history.

Art System Release 2.0 has a one-time charge of $99.

Britz Publishing, 1814 Capital Towers, Jackson, Miss. 39201.

■

Daly & Wolcott, Inc. has introduced the **Shipped Order History** system, an enhancement of its Mapics II Order Entry & Invoicing for the IBM System/38.

The Shipped Order History system reportedly saves a shipment history for each order and sequences it by customer and item, a feature not available to Mapics II users. The package also features alpha-search to help users find customer numbers and provides the following inquiry screens: open order summary, open orders by item, customer open order detail and shipment history.

The Shipped Order History system costs $1,200 on the System/38.

Daly & Wolcott, P.O. Box 1509, East Greenwich, R.I. 02818.

■

Target Systems Corp. has announced its **Target-Sales** software for all Digital Equipment Corp. VAX VMS computers.

Target-Sales reportedly can be used to facilitate account management, lead tracking and follow-up scheduling.

According to the vendor, account profiles, call sheets, letters, labels, aged reports and Rolodex cards can be created based on several demographic selections.

Unlimited ongoing dialogue can be captured with Target-Sales, allowing large sales departments to maintain a close relationship with current customers.

Target-Sales is priced at $995.

Target Systems, 33 Boston Post Road W., Marlboro, Mass. 01752.

Utilities

Corinthian Software Sales, Inc. has released **Sourceplus**, a VM source library system.

Sourceplus reportedly controls source, job control language and other data, provides security and flexibility and condenses direct-access storage device (DASD) by 70%. According to the vendor, Sourceplus also handles standard and user-defined "Includes" and operates with DOS and/or OS guests or in pure VM.

Sourceplus is priced at $4,500.

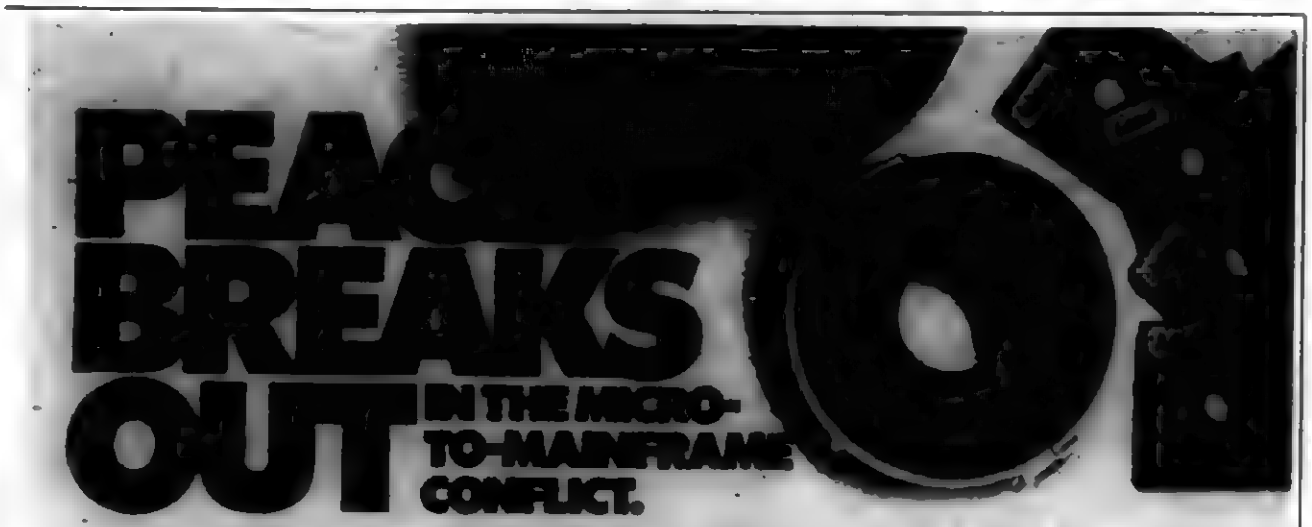
Corinthian Software Sales, Suite C-250, 3260 Powers Ferry Road, Marietta, Ga. 30067.

MICROS

Software applications packages

Southern Computer Systems, Inc. has released **Keyentry III Plus**, an extension to its Keyentry III data entry system for the IBM Personal Computer.

Keyentry III Plus provides the following additions to Keyentry III: a data entry language that can be com-



bined with Keyentry III's parameter-based job definitions to provide almost unlimited entry, processing and verification flexibility; and the screen painter for Keyentry III applications that require custom screens.

Keyentry III Plus carries a price of $895.

Southern Computer Systems, 2732 Seventh Ave. S., Birmingham, Ala. 35233.

Software enhancements

Software Studios, Inc. has enhanced its **PC-Desk** personal productivity program for IBM Personal Computers and compatibles.

The new version features a to-do list; a client billing log, telephone log and expense log; a telephone directory; a word processor featuring automatic right margin justification, boldface, underlining and color support; and an installation program.

Other new features include printed documentation.

PC-Desk costs $125.

Software Studios, Suite 104, 8516 Sugarbush, Annandale, Va. 22003.

■

Excalibur Sources, Inc. has released **Version 2.0** of its **Exsell** automated sales prospecting system.

Exsell Version 2.0 includes features such as call activity reporting, simultaneous updating of multiple prospect records, advanced search capabilites using key words or phrases, search-and-phone functions and a counter that shows how many prospects meet the same criteria.

The system works on IBM Personal Computers or compatibles with 128K bytes of random-access memory, two disk drives or a hard disk and a modem for autodialing.

Exsell Version 2.0 costs $395.

Excalibur Sources, P.O. Box 467220, Atlanta, Ga. 30346.

Communications

Elgar Corp. has introduced **Failsafe LAN**, a software program said to allow communication between local-area network (LAN) systems and Elgar's standby battery power systems.

According to the vendor, in the event of a power failure, Failsafe LAN is automatically activated to close application programs, secure system files, initialize printers and execute external processes such as parking hard disks. Failsafe LAN is random-access memory-resident.

Failsafe LAN is bundled with Elgar's battery backup system and ranges in price from $765 to $1,295.

Elgar, 9250 Brown Deer Road, San Diego, Calif. 92121.

■

Computer Peripherals, Inc. has introduced the **Little Dictator**, an enhancement board said to allow IBM Personal Computers and compatibles to be controlled by voice commands.

According to the vendor, the board can be programmed to respond to as many as 500 commands and to recognize up to 64 voice patterns. The user can store menus, submenus and menu extensions of up to 50 commands per menu.

The Little Dictator is priced at $599, including a microphone.

Computer Peripherals, 2635 Lavery Court, Newbury Park, Calif. 91320.

Printers/ Plotters/Peripherals

Advanced Matrix Technology has enhanced its all-in-one line of Office Printers and introduced a **triple-bin cut-sheet feeder** for stationery, forms and envelopes.

The enhancement allows first-line printing, permitting return addresses to be printed in the upper left corner of envelopes and on the first line of forms or other formatted documents.

The sheet feeder's three bins are said to accommodate up to 220 sheets of 20-lb paper plus 50 standard envelopes.

Prices for the all-in-one Office Printers start at $1,645, and the triple-bin cut-sheet feeder costs $710.

Advanced Matrix Technology, 1157 Tourmaline Drive, Newbury Park, Calif. 91320.

COMMUNICATIONS

Controllers

Xylogics, Inc. has introduced the **Xylogics 780**, a VME communications controller said to feature a full 32-bit, instead of a 16-bit, data path.

The Xylogics 780 is said to be able to connect 16 ports to a multiuser Motorola, Inc. VMEbus-based host computer. It supports 16 full-duplex asynchronous ports at 9.6K bit/sec. or eight ports at 19.2K bit/sec. on a single board, according to the vendor. The controller features a real-time multitasking executive and includes a comprehensive set of self-test and in-service diagnostics.

The Xylogics 780 costs $2,495.

Xylogics, 144 Middlesex Tnpk., Burlington, Mass. 01803.

Multiplexers/Modems

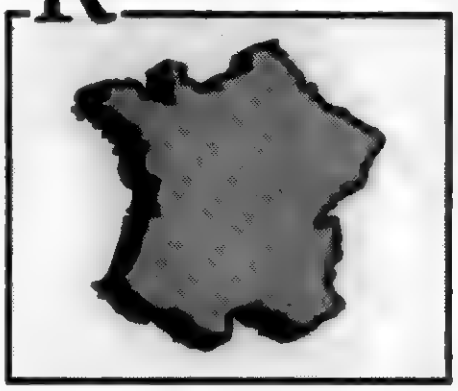
Fibermux Corp. has announced the **FX6401**, a 48-channel multiplexer for use with both single and multimode fiber-optic cables.

The FX6401 reportedly supports user speeds from 300 bit/sec. to 2M bit/sec. and supports all commonly used interfaces, including RS-232, RS-449 and V.35. There are three models available: for single-mode fiber, the FX6401/SM; for multimode fiber, the FX6401/H; and the FX6401/L. Integrated test sets are said to continually monitor end-to-end system performance and initiate switch-over to standby common logic and module and standby fiber.

The prices for the FX6401 range from $3,500 to $20,000 per unit.

Fibermux, 21630 Lassen St., Chatsworth, Calif. 91311.

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NEW PRODUCTS/COMMUNICATIONS

Leemah Datacom Security Corp. has added the **Traqnet 1032 B** and the **Traqnet 2128 B** access control systems for modems to its Traqnet B series.

The Traqnet 1032 B 32-port model is priced at $275 per line card. It comes in a rack-mount unit, which is priced at $1,500, and an expansion unit, which is priced at $750.

As many as 16 line cards can be installed in the rack-mount version, according to a Leeman Datacom Security spokesman.

The Traqnet 2128 B is priced at $375 per line card. The rack-mount unit is priced at $2,890 and is said to be capable of protecting up to 32 lines.

The 32-line expansion unit costs from $785.

Leemah Datacom Security, 3948 Trust Way, Hayward, Calif. 94545.

Data Race, Inc. has announced **Race-AF**, an enhancement to its Race full-duplex, dial-up modem.

Added features include alternate AT&T Bell Laboratories 212A or 103/113-compatible originate and answer modes and an expanded IBM Personal Computer AT-compatible dial-up command set. Race-AF also has the following features: automatic hang-up after a preset duration of no activity, such as breaks, meetings or interruptions; automatic redial of the last number dialed; and automatic speed translation of received characters to the terminal.

Race-AF is available in two versions: Race-AF I, a single-channel full-duplex modem, and Race-AF II, a full-duplex modem with a second independent printer channel that grants remote users both terminal interaction and printer output simultaneously over one dial-up connection.

Race-AF I costs $1,645, and Race-AF II costs $1,845.

Data Race, 5839 Sebastian Place, San Antonio, Texas 78249.

Test equipment

Telecommunications Techniques Corp. has introduced the **Fireberd 6000 communications analyzer.**

The Fireberd 6000, said to aid in evaluating digital networks, operates from 50 bit/sec. to 15M bit/sec.

Fireberd 6000 includes analysis features such as a clock slip detector, frequency counters and an inverted clock detector, according to the vendor.

Utilizing a frequency synthesizer, the Fireberd 6000 is said to operate at programmable rates for synchronous, asynchronous and recovered clock applications.

According to the vendor, the 6000 offers advanced jitter generation and measurement capabilities including spectral analysis with multiple jitter masks and automatic frequency sweeps.

The Fireberd 6000 costs $7,995.

Telecommunications Techniques, P.O. Box 6027, 444 N. Frederick Ave., Gaithersburg, Md. 20877.

SYSTEMS & PERIPHERALS

Processors

HVE Engineering, Inc. has released the **Synergist Multibus/VMEbus** real-time translator.

The Synergist Multibus/VMEbus permits resource sharing between two computer systems having different bus architectures without incurring power or speed penalties or requiring additional software, hardware or intermediate controllers, the vendor said.

The Synergist Multibus/VMEbus is reportedly able to support 20- or 24-bit Intel Corp. Multibus addressing and 24-bit Motorola, Inc. VMEbus addressing.

Full-parallel, four-level, user-selectable VMEbus priority is possible with two modes of operation, according to the vendor.

Other features include user-defeatable automatic byte swapping and buffered address.

Synergist Multibus/VMEbus costs $1,495.

HVE Engineering, 1684 Dell Ave., Campbell, Calif. 95008.

Data storage

Interphase Corp. has introduced its **V/SMD 4200 Cheetah** storage module drive disk controller.

The V/SMD 4200 Cheetah reportedly boosts direct memory access throughput to 30M bit/sec. and above.

The increased bus throughput is said to be made possible by the Interphase BUSpacket Interface, which features virtual buffer architecture and zero-latency reads and writes.

The BUSpacket Interface also features AT&T System V Unix-optimized intelligent caching with 128K bytes of multitrack cache memory, according to the vendor.

The V/SMD 4200 Cheetah costs $3,350.

Interphase, 2925 Merrell Road, Dallas, Texas 75229.

Printers/Plotters

Toshiba America, Inc. has released its **P341E** dot matrix printer.

The P341E is a 24-pin wide-carriage printer said to operate at 216 char./sec. It is capable of producing correspondence-quality printing at 72 char./sec.

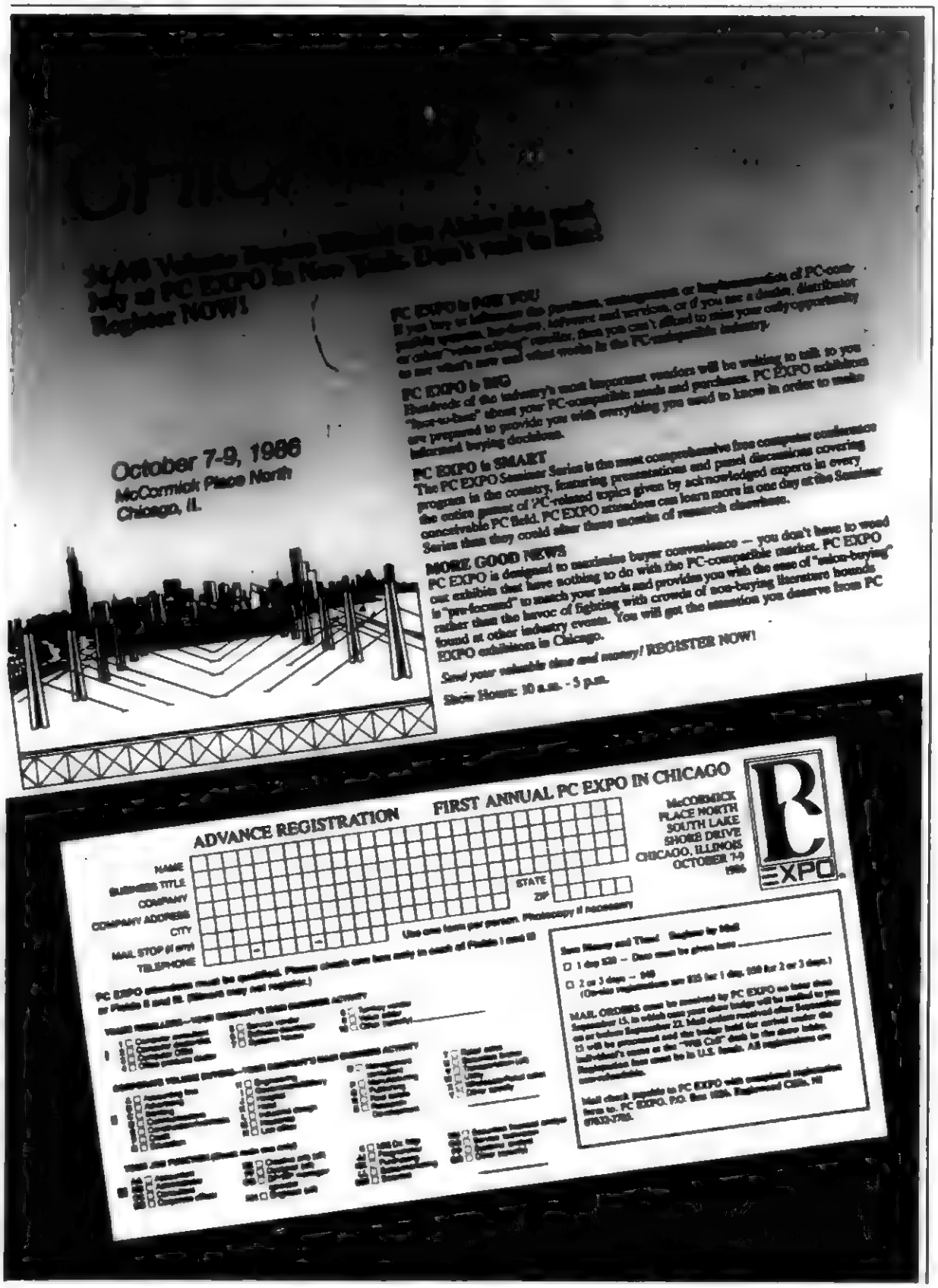
The printer is sold with a serial and parallel interface and is designed to use Toshiba's mechanical sheet feeder as well as its unidirectional tractor.

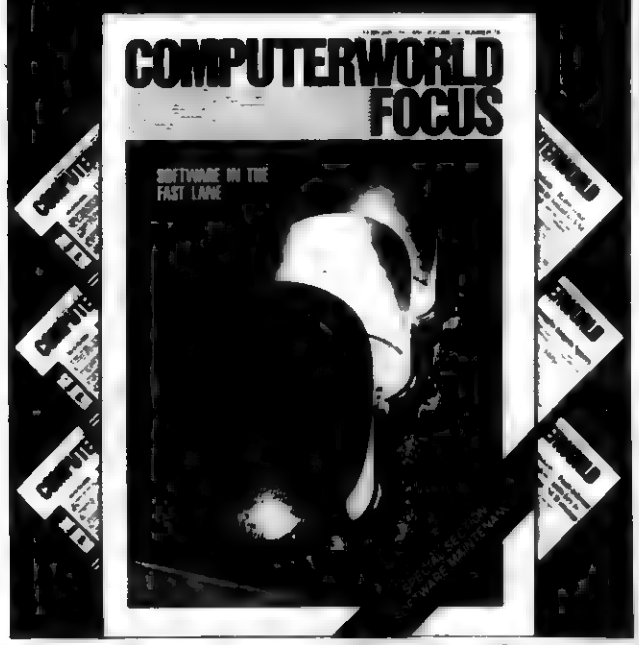
The P341E printer is similar to the P341 except for paper handling accessories, according to the vendor.

The P341E is priced at $999.

The unidirectional tractor costs $95.

Toshiba America, Information Systems Division, 2441 Michelle Drive, Tustin, Calif. 92680.




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COMPUTER INDUSTRY

Section begins on page 110

Merger activity to reconfigure European telecom market

Rising R&D costs spur consolidation

By Alan Alper

NEW YORK — The proposed combination of ITT's telecommunications business with a consortium of European companies is the first in what analysts expect to be a wave of merger activity that will restructure Europe's telecom market.

Last month, ITT proposed to sell its telecommunications and office automation equipment unit for $1.8 billion to the European consortium led by France's state-owned Compagnie Generale d'Electricite (CGE) [CW, July 7]. The French government recently said it would not oppose the merger, which will form the world's second largest telecom equipment vendor after AT&T.

The ITT-CGE marriage reflects the chaotic state of the telecommunications business, an industry beset by escalating development costs, confusion over industry standards such as Integrated Services Digital Network and decelerating growth rates. Such problems have created an environment conducive to consolidation, analysts have suggested.

The dozen or so companies currently locking horns in European telecommunications may be reformed into two or three competing consortia, according to Fritz Ringling, director of communications research at the Gartner Group, Inc. in Stamford, Conn.

"What you have now is companies jockeying for position to join alternate groups," Ringling says. "It's necessary since no one company besides AT&T or Siemens AG can afford to develop the next-generation product."

> ***'No one company besides AT&T or Siemens AG can afford to develop the next-generation product.'***
>
> — Fritz Ringling, Gartner Group, Inc.

Opposing the ITT-CGE group, Ringling says, will be a second European consortium, possibly headed by Siemens AG of West Germany, and an existing joint venture between AT&T and N. V. Philips of the Netherlands.

Siemens is rumored to be the leading candidate to acquire Compagnie Generale des Constructions Telephonique (CGCT), the central office switch operation said to be offered for sale by the French government. If Siemens successfully takes over CGCT, Ringling suggests, Siemens would be joined by at least one UK company, probably Plessey PLC, or Italtel, the Italian telephone company.

"The governments recognized some time ago, and now the professionals are beginning to understand, that there has to be a reduction in the number of companies in the marketplace," Ringling says. "Companies can't develop products only for the national market but must export to recoup their investment."

Because it is dominated by a non-European interest, the AT&T-Philips venture will not be a significant factor in the European telecommunications market, according to Ringling. "AT&T-Philips will probably get some business in Britain and parts of Holland and Belgium but will be strongest in Philips' traditional markets in the Middle East, South America and Africa," he notes.

Meanwhile, the CGE alliance may prove to be the only way ITT can continue to participate in the telecommunications industry.

ITT's decision indicated the firm was no longer willing to make the heavy investment required to stay competitive in a very capital-intensive business, analysts said at the time the deal with CGE was disclosed. The announcement followed ITT's development difficulties and escalating costs associated with its System 12 telephone switch.

ITT will retain a 30% stake in the joint venture, enabling it to reduce mounting internal debt by transferring approximately $1 billion of its $2.6 billion in debt to the new entity.

"ITT management felt that to retain a substantial part of a big telecommunications company was the way to go," says Kenneth Bosomworth of market researcher International Resource Development, Inc. in Norwalk, Conn.

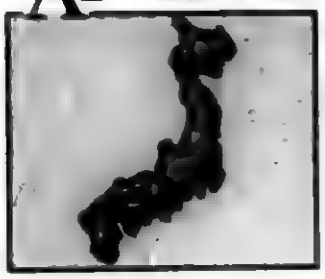
"This way, if things go well, it will get to share in the profits, but if things don't, it won't be a big deal at the bottom line," Bosomworth adds.

The same rationalization very likely is being considered at most of the leading European telecommunications firms as well, analysts conclude.

West German electronics and computer groups Bosch AG and Nixdorf AG, however, recently said they are unlikely to participate in the new ITT-CGE joint venture.

Claudia Marwede-Dengg of the Computerworld International News Service contributed to this report.

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IBM Europe strategy praised

By Amiel Kornel
Computerworld International News Service

PARIS — IBM Europe's reorganization [CW, Aug. 4] will seek to place greater emphasis on vertical markets and emerging opportunities in telecommunications in order to enhance revenue.

Units in each country will acquire greater responsibility for mapping out local strategies, and the Paris-based European headquarters will provide horizontal support through four newly created services.

The reorganization will officially take place Sept. 1.

Initial user response to the restructuring plans appears to be favorable.

Pierre Amy, head of the IBM users group at the French banking giant Credit Agricole, says he applauds the move to delegate greater authority to Big Blue's French subsidiary.

"My IBM contacts were quite quickly powerless when faced with the big structures of IBM Europe," Amy says. "As a client, this reorganization should bring me something because the administrative yoke of IBM Europe was too heavy."

The moves, not unlike restructuring efforts carried out at other multinational companies operating in Europe, come as increasingly demanding overseas clients command an ever greater share of U.S. firms' corporate revenue.

While IBM revenue grew only 9% worldwide to $50 billion in 1985, European revenue climbed 17% to about $13 billion.

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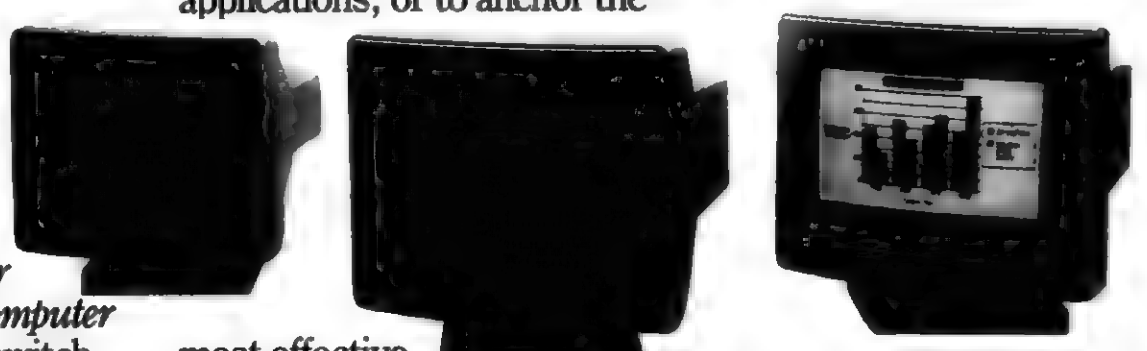
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Combine the WYSEpc 286 with the WY-530 monochrome or WY-630 color monitor and get outstanding performance. For enhanced color graphics, move up to the WY-640 EGA monitor. Or, bring CAD and desktop publishing applications into better focus, price-Wyse and pixel-Wyse, with the WY-700 high resolution graphics display (as shown with the WYSEpc 286 at left).

With the new WYSEpc 286, you can also choose the keyboard that's the best fit: either the standard AT-style, or the IBM Enhanced PC keyboard. And you get the complete compatibility you should expect in every other way, including more than 350 tested off-the-shelf software packages.

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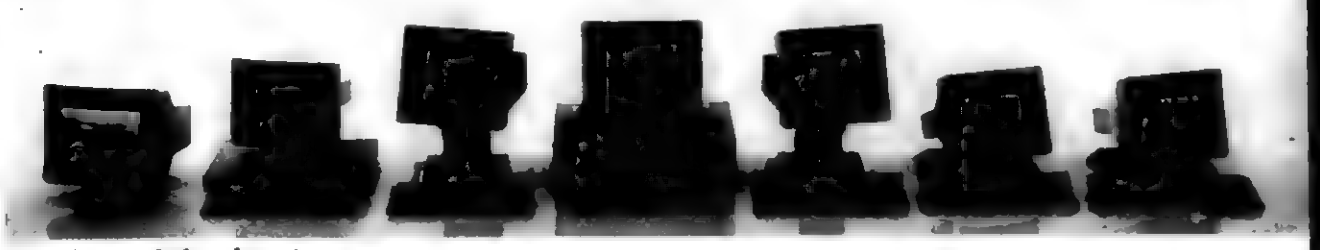


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COMPUTER INDUSTRY

Speculation over Micropro resignations points to finances

Successors seek to reverse losses

By Maura McEnaney

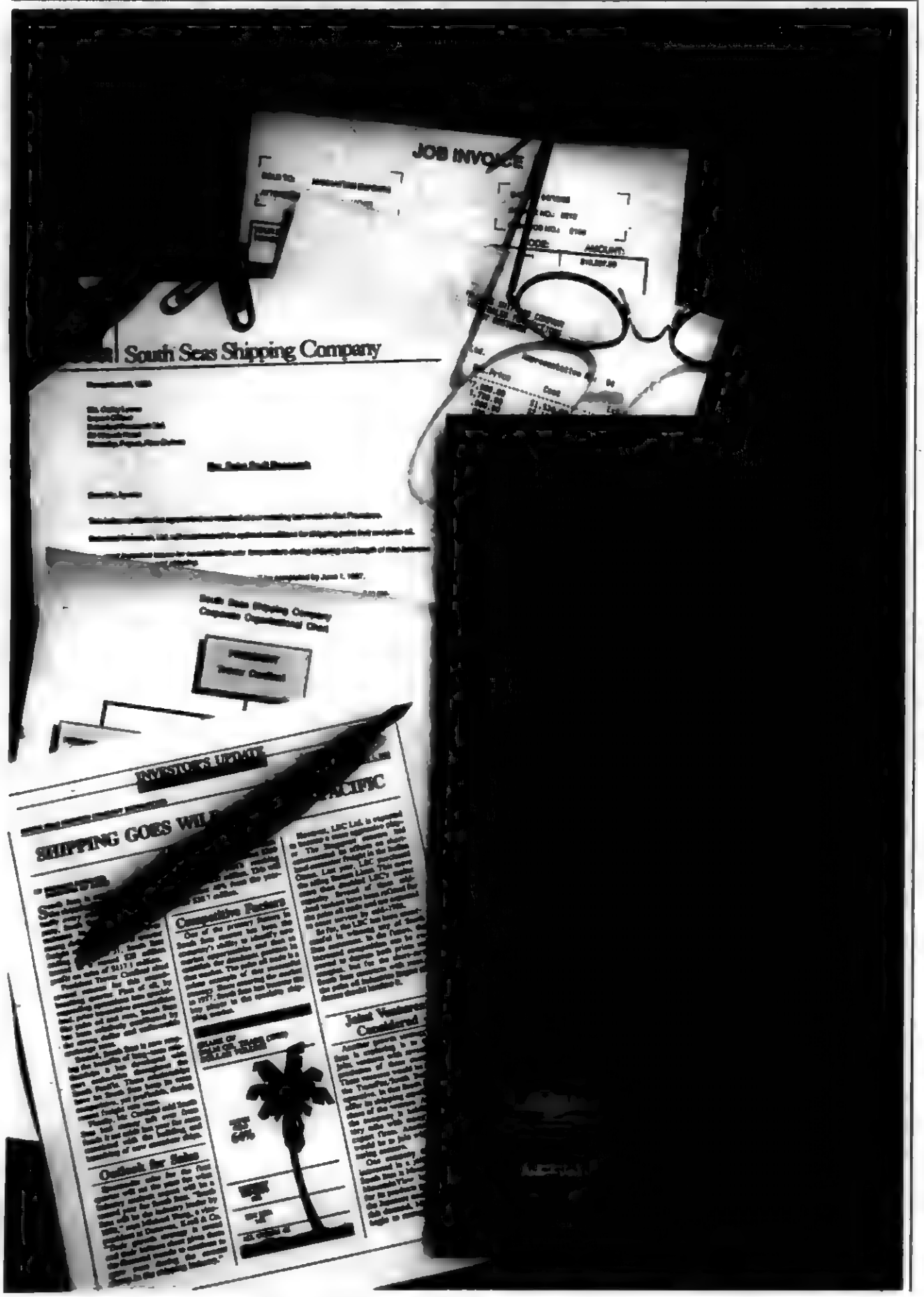
SAN RAFAEL, Calif. — Turmoil at Micropro International Corp. moved from the bottom line into the board room recently when the company announced the resignations of President and Chief Executive Officer H. Glen Haney and two key vice-presidents.

Last week, Micropro appointed Leon Williams, 41, to succeed Haney as president and CEO Sept. 15. Williams had been senior vice-president of systems planning and technology at McGraw-Hill's Business and Financial Information Cos.

Haney had been with Micropro for three years, succeeding Micropro founder Seymour Rubenstein. Observers speculated that the resignation may have been forced by the firm's financial backers, who were unhappy over Micropro's poor earnings results. Included among the financiers was venture capitalist Frederick Adler.

Haney will be a consultant to Adler's venture capital firm, Adler & Co. Current Adler & Co. member Gari Grimm has been named Micropro general manager.

Resigning from Micropro were Peter S. Kent, vice-president of finance and administration, and Frank Frost, vice-president of world sales.



While the resignations indicate significant changes at Micropro, analysts are not convinced that the move will help the fortunes of the microcomputer word processing software company, which has recently been plagued by declining sales and climbing losses [CW, June 30].

"It's like rearranging the deck chairs on the Titanic," said Harvey H. Bundy III, an analyst with William Blair & Co. in Chicago.

Once the leader in word processing with its Wordstar program, Micropro began losing market share about two years ago. In the third quarter ended May 31, Micropro lost $2.4 million.

The company attributed much of the loss to the bankruptcy of distributor First Software Corp., which owed Micropro $1.4 million. So far this year, Micropro has lost $900,000 on $27.7 million in revenue.

"I'm not sure Haney wasn't a scapegoat for problems beyond his control," said analyst Robert Lefkowits of Infocorp in Cupertino, Calif.

Just as the company began concentrating on improving its word processing packages, the market shifted and now requires diversity in the product line, Lefkowits said.

Despite the declining sales, Micropro is far from sinking, Lefkowits added. He noted that a new version of Wordstar, anticipated in September, could continue to beef up revenue at Micropro.

"They're still a $30 million company," he said. "With 1.5 million users, they should be able to get at least 10% to upgrade. I'd love to run a little company that can make $10 million just by sneezing."

NET buys Comdesign

REDWOOD CITY, Calif. — Reflecting the continued consolidation of the T-1 multiplexer market, T-1 vendor Network Equipment Technologies Co. (NET) recently agreed to acquire Comdesign, Inc.

Comdesign, based in Santa Barbara, Calif., manufactures products for the low-speed data communications market. NET will acquire Comdesign in a stock transaction of undisclosed value.

NET is expected to integrate some Comdesign products with its network management system and resell them, and Comdesign will remarket T-1 products jointly developed with NET.

EXECUTIVE CORNER

Frank L. Chisholm, 38, has joined Soft-Switch, Inc. as the new president and chief operating officer, replacing **N. D'Arcy Roche**, who has left the company. Chisholm, formerly executive vice-president at Cullinet Software, Inc., will be responsible for Soft-Switch's day-to-day operations. He will report to **Michael D. Zisman**, founder, chairman and chief executive officer.

■

Edward M. Esber Jr. has been elected chairman of Ashton-Tate. He will continue as president and chief executive officer. The company's shareholders also elected three new members to the board: **James Castle**, 49; **F. William Graham**, 48; and **Henry Alan Sweetbaum**, 48. These additions bring the total membership of the board to eight.

■

On-Line Software International, Inc. has announced the appointment of **Howard P. Sorgen** to both president and the newly created position of chief operating officer. **Jack M. Berdy**, company founder, will remain chairman and chief executive officer. Previously, Sorgen was executive vice-president at Manufacturers Hanover Trust Co.

■

Delbert W. Yocam has been appointed to the position of executive vice-president and chief operating officer at Apple Computer, Inc. Yocam joined Apple in 1979. Most recently, he was executive vice-president and group executive of product operations. Previously, he held the position of executive vice-president and general manager of the Apple II group, which developed, engineered, manufactured and marketed all Apple II products.

■

Bob Obuch has been named executive vice-president and chief operating officer in charge of North American operations at Digital Research, Inc.

In this newly created position, Obuch will oversee the departments of engineering, marketing and sales.

■

ITT Corp. has announced the appointment of **D. Mark Fowler** as president and general manager of ITT's Business Systems Group. Fowler was most recently senior vice-president of product management and development for the Information Systems Division. In 1983, Fowler founded and became chairman and president of Zaisan, Inc., a manufacturer of integrated voice/data workstations.

■

Jerome L. Dreyer, president of ADAPSO, the computer software and services industry association, has resigned from the association's staff. Dreyer, who has served as ADAPSO's chief staff officer since 1967, will act as a consultant in the transition of staff management. The ADAPSO executive committee has named **Luanne James**, chairman of Argonaut Information Systems, to act as ADAPSO's interim executive director.

■

Thomas H. O'Donnell has been appointed to the newly created position of chief operating officer at General Computer Corp. O'Donnell, who spent 17 years with IBM, joined General Computer in February as vice-president of marketing.

■

Gigabit Logic, Inc. has announced the appointment of **John D. Heightley** as the company's new president and chief executive officer. **Heinrich Krabbe**, former president, will remain chairman of the board.

■

Robert A. DiNanno has been appointed to the new position of vice-president of operations at Encore Computer Corp. DiNanno will be responsible for the company's manufacturing and new product programs. Previously, DiNanno served as vice-president of manufacturing at Adage, Inc.

■

Andrew C. Knowles III has been promoted to chairman of Prime Computer, Inc.'s computer-aided design and manufacturing (CAD/CAM) and workstations group, as the company restructures its executive positions in CAD/CAM. **Robert A. Fischer**, formerly chairman of McDonnell Douglas Information Systems Group, will serve as group president and chief executive officer.

■

Two veteran aerospace executives have been promoted at Martin Marietta Corp.: **Dan A. Peterson** to senior vice-president for information systems and **Gareth D. Flora** to succeed Peterson as vice-president for business development.

■

Businessland, Inc. has announced the appointments of two senior vice-presidents to its corporate and field operations. **James A. Heisch** has been promoted to senior vice-president of finance and will remain the company's chief financial officer. **Lather J. Nussbaum** has been promoted to senior vice-president of marketing and operations.

■

Egil Juliussen, formerly president and chairman of Future Computing, Inc., has joined Isaacson, Inc. as chairman and chief executive officer.

Isaacson was formed in December 1985 by **Portia Isaacson**, who is president, and **Dale Dukes**, vice-president.

■

Robert P. Gardner has been promoted to president and chief executive officer of Enmasse Computer Corp. Most recently, Gardner was executive vice-president at Enmasse; prior to that, he served as a managing partner of Bedminister Capital Group, a high-technology venture group.

■

David Larson has been named vice-president and chief financial officer at Baron Data Systems Co., which is a leading supplier of computer systems for the legal and medical markets.

IBM lets its defenses down

From page 110

architecture in the world. But we also intend to focus on linking the SNA networks with others."

What other networks? Lautenbach said that IBM will support Integrated Services Digital Network and provide links between SNA and Telenet from GTE Telenet Communications Corp., Tymnet from McDonnell Douglas Network Systems, Inc. and other similar networks.

What is the reason that IBM may be opening up to the world? In a word, it is its growth — or lack thereof if the firm does not open up.

The recent comments by the senior IBM executives suggest that they are finally coming around to correcting the flaws in some of their product strategies from the early 1980s. One of these was the assumption of a continuous 50% or more growth in million instructions per second (MIPS) demand, fueled by high Personal Computer shipment volumes.

"The PCs will help drive up the MIPS demand," predicted "Buck" Rodgers, then IBM's senior vice-president of marketing, at a March 1984 meeting for financial analysts in Boca Raton, Fla. He predicted the 50% MIPS growth rates would continue in 1984 and 1985.

As we know now, that didn't happen. Where did Rodgers and IBM go wrong? They failed to realize that, without the communications networks and software in place, all those millions of PCs were like telephone sets with only the intercom and calculator features on them.

In other words, as hard as the corporate PC users tried, they could not easily talk to each other. Such an environment was more likely to reduce the demand for switching equipment, or mainframes in IBM's case, rather than add to it.

Lautenbach said at the San Jose meeting that IBM is opening up its communications strategy because the company thinks such a move would help the growth of MIPS demand. Later, Akers expanded on this by saying, "The more devices, ours and theirs [IBM competitors], that we can have connected to our systems, the better it is for our business."

Complementing IBM's recent openness is its new systems integration marketing strategy. To the customer, IBM presents itself as a consultant that understands the customer's business and can "put it all together."

The effort seems to be paying off. At General Motors Corp.'s Buick Division, IBM and GM have jointly developed the software to computerize the dealer's service departments — based on IBM equipment, of course.

American Airlines and IBM have joined up to develop a new system for American's travel agents. And the beat goes on.

Interestingly, there is not much new to IBM's "new" marketing strategy. IBM is still the same old friendly supplier that was selling solutions while its competition was selling products. The result was a level of account control that often left IBM competitors baffled. The only difference from the past is that IBM is now including communications products among its solutions.

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Software developers must take steps to protect own secrets



OUTSIDE LINES
L. J. Kutten

It is generally accepted under U.S. law that anyone can examine and analyze any product obtained without restriction on the open market in order to discover how it works. This is known as reverse engineering, and it is a practice approved by the U.S. Supreme Court.

With software, this right to reverse-engineer means there is very little or no trade secret protection in software unless the software is sold with restrictions. Accordingly, a developer that wants to retain a trade secret in commercially distributed software must take steps to protect it. Typical protective steps include the following:

- Use of a license agreement under which the licensee obtains only a limited right to use the software and no rights to disassemble or decompile the software.
- Contractually prohibiting the making of archival copies, prohibiting further resale or distribution of the software and requiring disposal of all copies.
- Distributing the software in object code only, with a contractual provision saying the user will not attempt to reverse-engineer the software.
- Placing proprietary notices on the software media and on the opening screen of the software.
- Using coded software that disappears or becomes nonfunctional if not updated.
- Limiting the amount of documentation transferred with the package.
- Requiring the licensee to notify the licensor of any circumstances that would indicate an unauthorized disclosure or use.

If the trade secret software involves patentable subject matter, the owner has the option of using either trade secrecy or patent law to protect the software, but not both.

If patent protection is sought, then trade secret protection is lost to the extent the secret is revealed in the patent. That portion not disclosed can retain its trade secret status.

If patent protection is chosen, the applicant must disclose "the best mode" of working the patent. This does not mean that the actual computer program or trade secret must be revealed, but that sufficient information must be presented to allow the invention to be worked by others at the end of the patent monopoly.

Unlike most license agreements, a contract between a software developer and the U.S. government or a government agency is controlled by federal procurement regulations, not the terms of the contract.

It is very possible that an unknowing trade secret owner could sign a government contract containing a "Rights in Technical Data and Computer Software" clause that grants the government unlimited rights to the software.

Kutten is a member of the Missouri and Illinois bars. His book, Protecting Computer Software: Law and Forms, *will be published later this year by Kluwer Law Book Co.*

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Used computer mart sees growth

From page 110

Inc., a Fairfield, Conn., broker of used Sperry Corp. and Hewlett-Packard Co. hardware. "We had an instance recently where a Fortune 500 company in our area laid off 200 people and at the same time was purchasing an awful lot of equipment from us," he recalls.

Beyond saving money, corporations are increasingly attracted to used equipment because they are assured of compatibility with existing products or networks, vendors say.

"Most people have a significant investment in software and consequently don't want to risk having any problems when they bring in new equipment," says Sonny Monosson, president of American Used Computer Co., a supplier of Digital Equipment Corp. and AT&T systems and peripherals in Boston. "Sure, there are people who want to be on the leading edge, but there are many who don't care and accept used computers."

A recent study commissioned by Monosson estimated the domestic market for used computers at about $4.5 billion. Unlike other suppliers, Monosson says he believes that regardless of economic conditions, market opportunities for used equipment are omnipresent.

One thing that has changed over the years is that customers have become more sophisticated when it comes to buying used computer equipment. "Large corporations and government institutions are finally realizing that 'used' doesn't mean anything more than the equipment is broken in," Monosson explains.

ON OCTOBER 8, WE FOCUS ON OFFICE AUTOMATION

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But hurry, closing is August 29.

For more information, contact Ed Marecki, Vice President/Sales, Computerworld Focus, 375 Cochituate Rd., Framingham, MA 01701-9171, (617) 879-0700. Or call your local Computerworld sales representative.

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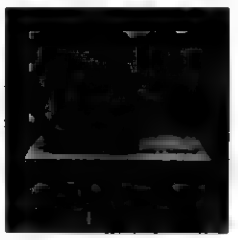
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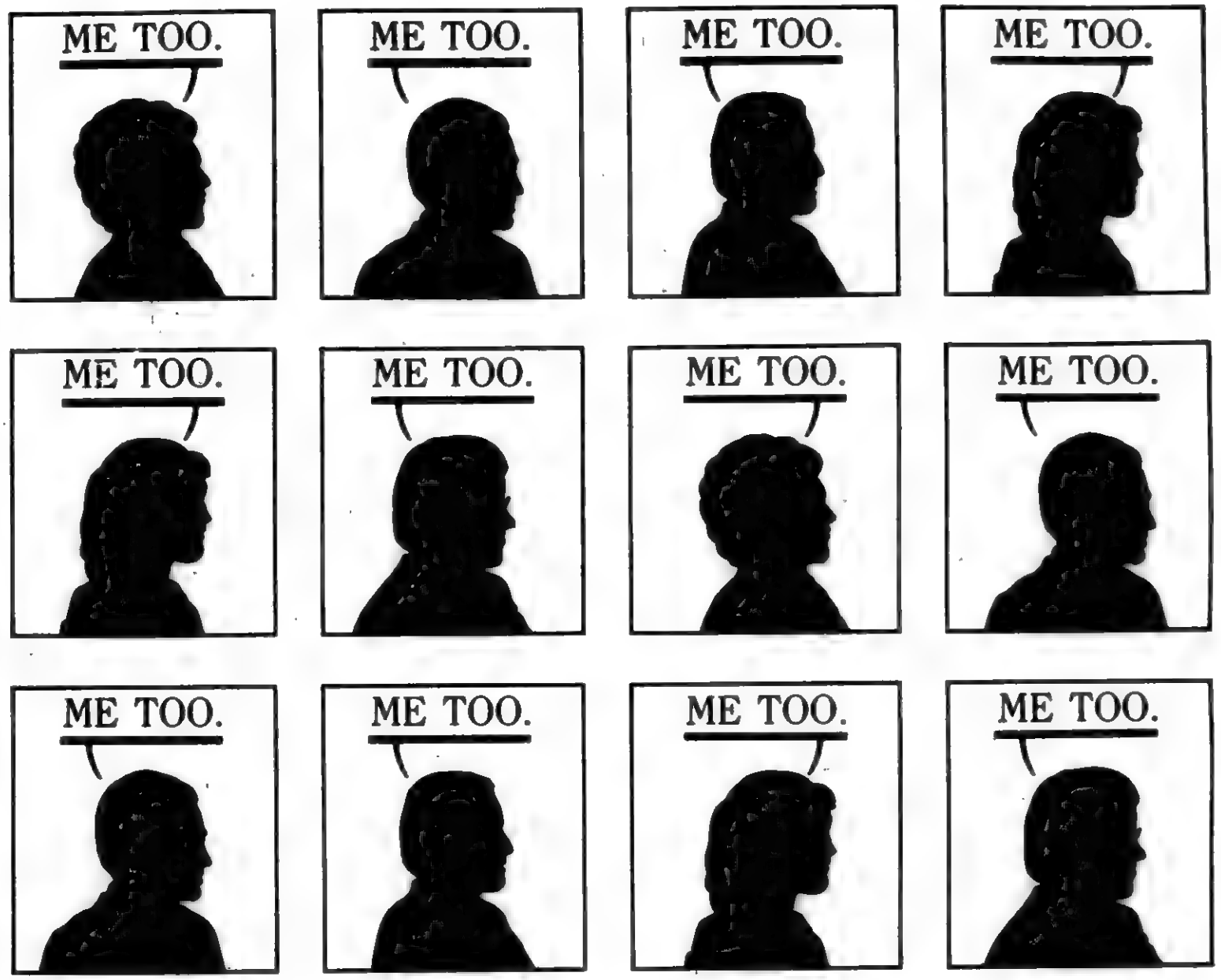
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You will participate in the design and development of spacecraft, earth stations, and network control; and provide technical liaison with manufacturing contractors. A Bachelor's degree or equivalent in Engineering and four years experience in design and development of space-based communication systems which includes working on a program of space-based system from design to operation required. Experience with communication systems, link budgets/simulations, satellite communications, voice/data communications, and in aerospace industry manufacturing and contracting is required. (Job Code 638-1).

PROJECT ENGINEER-SATELLITE SYSTEMS

You will participate at an accomplished level in the design and development of spacecraft, earth stations, and network control; and provide technical liaison with manufacturing contractors. A Bachelor's degree or equivalent in Engineering and six years experience in the design and development of communication systems, including at least four years with space-based system from design to operations required; Master's degree preferred. Experience with voice/data communications, communication systems engineering, link budgets/simulations, satellite communications, project engineer, and in aerospace industry manufacturing and contracting is required. (Job Code 638-2).

CHIEF ENGINEER-TELEHUB SYSTEMS DEVELOPMENT

You will ensure timely and cost-effective design and development of all telehub stations, control centers and related programs as part of the space-based communication system for traffic voice, data, video and image. A Master's degree or equivalent in Engineering and ten years experience in the design and development of space-based communication systems and software which includes serving as a program manager/equivalent of space-based system from design to operation. Experience with satellite communications, networks/switching, digital communications and baseband equipment is required. (Job Code 638-3).

CHIEF ENGINEER-GROUND SEGMENT ENGINEERING

You will ensure the design and development of all earth stations, control centers, and related programs as part of the space-based communication system for operational traffic voice, data, video and image. A Master's degree or equivalent in Electrical Engineering, Telecommunications Engineering or related field and seven years engineering experience including design and development and space-based communication systems required. Experience in program management/leadership of space-based system from design to operation, satellite communications, earth station design/development, program management and project engineering is required. (Job Code 638-4).

SR. TELECOMMUNICATION ENGINEER — Data

You will forecast future requirements, optimize use of existing capacity and implement system expansions with regard to data systems. A Bachelor's degree in Electrical Engineering is required along with four years professional experience in communications or computer systems engineering and data network design and implementation. You must have knowledge of various communications protocols and standards including, but not limited to, SDLC/SNA, HDLC, X.25 and IEEE 802; knowledge of electronic systems and data network theory; and experience with fiber optics, systems performance evaluation and network modeling and design. Experience in computer programming is preferred. (Job Code 638-5)

SR. SYSTEMS PROGRAMMER

You will be responsible for performance and analysis of each major system's DASD configuration and improvement recommendations using MICS, SMF/RMF, OMEGAMON, RESOLVE, TES DATA response time monitor, BEST1, MAP and CMS models. You must have five years data processing experience, including three years in systems programming for large IBM mainframes and demonstrated technical skills in implementing major IBM systems software. A Bachelor's degree or equivalent in a computer related field and experience with the above mentioned tools are preferred. (Job Code 638-6).

SR. DEVELOPMENT ANALYST

You will design and implement systems development standards, procedures, structured development methodologies and productivity tools to aid the development process. You must have five years data processing experience which includes three years in systems development and two years in one or more of the following data processing functional areas: structured development methodologies, technical training, productivity aid development, project management control, or documentation/procedures development. Strong human relations skills are required. (Job Code 638-7).

DEVELOPMENT ANALYST

You will design and implement systems development standards, procedures, structured development methodologies and productivity tools to aid the development process. You must have three years data processing experience which includes two years in systems development and one year in one or more of the following data processing functional areas: structured development methodologies, technical training, productivity aid development, project management control, or documentation/procedures development. Good human relations skills are required. (Job Code 638-8).

INFORMATION CENTER ANALYST

Three years experience in data processing required along with training experience and strong communication and interpersonal skills, systems design and analysis and user needs analysis; and knowledge of: FCS-EPS (or other similar multi-dimensional modeling software), FOCUS, SAS, TELL-A-GRAF, MVS/TSO and VM/CMS. Bachelor's Degree in Math, Business or Computer Science preferred. (Job Code 638-9).

INFORMATION CENTER ASSOCIATE ANALYST

One year experience in data processing required along with training experience and strong communication and interpersonal skills; knowledge of MVS/TSO, VM/CMS, PROFS, Display Write 370, Display Write 3; and some PC experience. Position is for a PROFS Administrator. Bachelor's Degree in Business, Math or Computer Science preferred. (Job Code 638-10).

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You will design and install IMS data bases for large-scale IBM systems. You must have a minimum of three years experience with two years in systems development and IMS DB/DC experience. Experience preferred in: Monitoring data bases for performance; logical and physical data base design, data base reorganization and recovery procedures and utilities; PSB and DBD creation. **Positions available in Memphis and Colorado Springs.** (Job Code 638-11).

QUALITY ASSURANCE ANALYST

You will participate in the development of a quality assurance function to include such areas as: Change control, system test, monitoring of standards and procedures, implementation of a structured methodology and system design reviews. You must have a minimum of three years data processing experience with two years in systems development using COBOL and strong interpersonal skills. IMS knowledge and experience with systems test, design reviews, change control or structured methodology preferred (Yourdon). **Positions available in Memphis and Colorado Springs.** (Job Code 638-12).

IMS DB/DC PROGRAMMER ANALYSTS

You must have a solid working knowledge and experience in COBOL, IMS DB/DC, and OS JCL in a large-scale IBM environment. A Bachelor's degree or equivalent in Computer Science, Math, or Business and a minimum of three years experience in actual programming, documentation, and implementation of general business systems required. (Job Code 638-13).

SR. TECHNICAL ADVISOR - VIDEO SYSTEMS

You will act as senior technical authority in video special projects research, analysis, design and implementation of advanced systems. A Bachelor's degree or equivalent in Electrical Engineering, Computer Science, Physics, Math or Telecommunications required along with eight years experience in system design, development, and operation of advanced special technologies. Must have knowledge of research and development methods, IC design and development, or machine/chip level programming (Job Code 638-14).

SR. TECHNICAL ADVISOR - VIDEO NETWORK

You will act as senior technical authority in video special projects research, analysis, design and implementation of advanced systems. A Bachelor's degree or equivalent in Electrical Engineering, Computer Science, Physics, Math or Telecommunications required along with eight years experience in system design, development, and operation of advanced special technologies. Must have knowledge of research and development methods, digital compression and transmission media. (Job Code 638-15).

PROJECT ENGINEER - VIDEO DEVELOPMENT

You will act as technical authority in video systems performing research, analysis, design and implementation of advanced systems. A Bachelor's degree or equivalent in Electrical Engineering, Computer Science, Physics, or Math required along with six years experience in design, development and operation of telecommunications networks. Must have knowledge of compressed full broadcast video systems, transmission media and networking switching (Job Code 638-16).

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DATA PROCESSING

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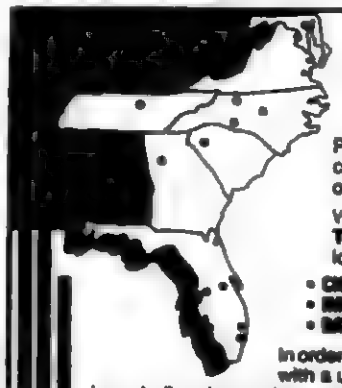
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VP/Sales/Edward P. Marecki
Manager/Marketing & Sales Operations/Kathy Doyle
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(617) 879-0700

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SALES: Vice President, Edward P. Marecki. Manager/Marketing & Sales Operations, Kathy Doyle. National Recruitment Sales Manager, Al DeMille. Display Advertising Manager, Carolyn Novack. Display Advertising, Maureen Carter, George W. Griffin, Mary Campo. Classified Operations Manager, Cynthia Delany.

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Foreign Editorial/ Sales Offices

Argentina: Ruben Argento, Computerworld Argentina, Av. Belgrano 406-Piso 9, CP 1092 Buenos Aires. Phone: 34-5583/5584. Telex: 22644.

Asia: Euan Barty, Asia Computerworld Communications Ltd., 701-4 Kam Chung Bldg., 54 Jaffe Road, Wanchai, Hong Kong. Phone: (05) 8L63238. Telex: 72827 (COMWR HX)

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (02) 4395133. Telex: AA74752 COMWOR.

Austria: Dr. Manfred Weiss, CW Publikationen, Verlagsgesellschaft m.b.H., Josefstaedter Strasse 74, A-1080 Wein, Austria. Telex: 115 542 (sch/a).

Brazil: Eric Hippeau, Computerworld do Brazil, Rua Pedroso de Morais 1553, 05419 Sao Paulo, SP Brazil. Phone: 814-9658-212-8750. Telex: 11 32017 (WORD).

Denmark: Preben Engell, Computerworld/Danmark A/S, Torvegade 52, 1400 Copenhagen K, Denmark. Phone: (01) 955 695. Telex: 31566.

France: Axel LeBlois, Computerworld Communications S.A., 185 Avenue Charles De Gaulle, 92200 Neuilly Sur Seine, France. Phone: 747 1272. Telex: 613234 F.

Hungary: Dezso Futasz, SZT Computerworld, P.O. Box 386, Budapest, 1536, Hungary.

Italy: Daniele Comboni, Computer Publishing Group S.R.L., Viale Restelli 5, 20124 Milano. Phone: (2) 688 9773. Telex: 333436 (GEJIT).

Japan: Mr. Shuji Mizuguchi, Computerworld Japan, 7-4 Shintomi 1-Chome, Chuo-ku, Tokyo 104. Phone: (03) 551-3882, Telex: 252-4217 (Computerworld Japan only).

Steven Yamada, Tokyo Representative Corp., Sanshin Kogyo Bldg., 2-10 Kando Jimbocho 3F, Chiyoda-ku, Tokyo 101, Japan. Phone: 230-4117, Telex: J26860 (reps for all CWCI publications except Computerworld Japan).

Mexico: Henry Morales, Computerworld Mexico S.A. de C.V., Oaxaca 21-2, Mexico City 7 D.F. Colonia Roma, 06700 Mexico. Phone: (05) 514-4218. Telex: 177 1300 (ACHAME).

The Netherlands: Wout Berends, CW Communications B.V., van Eeghenstraat 84, 1071 GK Amsterdam, The Netherlands. Phone: (020) 64 1 6651. Telex: 18242 (CWCOM NL).

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Sweden: CW Communications AB, Sodra Hammvagen 22, S-115 41 Stockholm, Sweden. Phone: 46 8 67 91 80. Telex: 14904 9 (NOVACW).

Switzerland: Gebhard Osterwalder, CW Publikationen AG, Witikonerstrasse no. 15, CH - 8032 Zurich, Switzerland. Phone: (01) 55 10 77. Telex: 816710.

Taiwan: Grace Tang, ACE Media Agency Ltd., Room 503, 1, Fu Hsin S. Road, Sec. 1, Taipei, 10587, Taiwan, R.O.C. Phone: 751 3636. Telex: 14142 (ACE GROUP). (Representative for all CWCI publications).

United Kingdom: Martin Durham, CW Communications Ltd., 99 Grays Inn Rd., London, WC1 8UT, United Kingdom. Phone: (01) 831-9252. Telex: 262346.

Euan Rose, Bill Dunlop, Barbara Levy, Christine Taylor, Beere Hobson Assoc., 345 Goswell Rd., Islington, London EC1, United Kingdom. Phone: (01) 278 3415. Telex: 311951. (Representatives for CWCI publications).

Venezuela: Kalman von Vajna Nagy, CW Comunicaciones, C.R.L. Torre Maracaibo, Piso 10, Oficina H, Av. Libertador, Caracas, Venezuela. Phone: 72-76-30.

West Germany: Eckhard Utpadel, CW Publikationens GMBH, Friedrichstrasse 31, 8000 Munchen 40, West Germany. Phone: (089) 38172-0. Telex: 5215350.

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Javelin lays off domestic sales reps

Firm says direct costs expanded too quickly

By David Bright

CAMBRIDGE, Mass. — Saying that it had expanded direct sales costs too quickly, Javelin Software Corp. last week laid off an undisclosed portion of its domestic sales force.

In the reshuffling, Javelin's total work force was reduced from a number in the high 30s to just under 30, according to Robert Firmin, Javelin's chairman.

Firmin said the action would "bring expenses in line with domestic revenue," which had not grown as fast as expected.

Sales reps have become contractors

Some of the laid-off sales representatives have become independent contractors for Javelin, according to Firmin.

While the field sales force has been reduced, the total number of sales, presale and postsale support people will remain the same or increase slightly, he added.

"Some faces will change, but our presence in the field is not going to be diminished at all," Firmin said.

International sales growing

International sales through a distribution agreement with Ashton-Tate are growing faster than domestic sales and currently account for about half of Javelin's income, Firmin said.

However, he claimed that overall revenues were on target. He also said that the company would become profitable in the fourth quarter of this year.

Backed by more than $4 million in private funding, the 3½-year-old company has been shipping its Javelin business analysis package for the IBM Personal Computer since October.

Cullinet suffers first loss ever

From page 110

a major product announcement on Sept. 9, one, he hinted, that will put Cullinet in the software development marketplace.

Chapman also emphasized that Cullinet is positioning itself to become a player in the minicomputer or departmental processor market, one that it believes will grow faster than mainframe software.

In addition to its recent acquisition of Esvel Co., a San Jose, Calif.-based developer of DBMS software for the Digital Equipment Corp. VAX line, Cullinet has purchased a VAX applications vendor.

Cullinet acquired Computer Strategies, Inc. of Grand Rapids, Mich., which produces manufacturing software for the automotive and related industries.

The movement into the VAX market follows earlier moves by such mainframe software vendors as Cincom Systems, Inc. and Software AG.

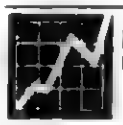
"It looks to us like an important strategic move. VAX software could be a third of our revenue by fiscal 1988," Chapman said, citing the installed base of 20,000 VAXs and the fact that 50% of Cullinet's mainframe software customers are also users of the VAX.

Wall Street analysts have frowned on Cullinet's initial reluctance to commit itself to interfacing its products with IBM's DB2 relational data base management system and its data access command set, SQL. Cullinet allowed its hands-off stand to gradually erode into a commitment to provide support for SQL, and the vendor says its Online Query product will offer an SQL option this fall.

"Cullinet's current poor results are caused by a number of factors, including the re-emergence of IBM as a major participant in the data base management systems market via DB2," said Christopher Mortenson of Alex Brown & Sons. "We expect DB2 SQL to be successful as the market looks for standards upon which to build its mission-critical systems and believe this will continue to make life difficult for Cullinet."

Although Cullinet has announced it will provide support for SQL, Chapman was not specific about when that support would materialize for two products cited in addition to Online Query — the fourth-generation language Application Development System and Cullinet's version of Cobol.

Strong earnings, market savvy make Cray a favorite



ACTIVE ISSUES
Kathy Portaus

At a time when uncertainty prevails among technology stocks, Cray Research, Inc. (CYR — 82) is considered a sure bet.

What separates Cray from other computer firms is the predictability of its stunning year-to-year earnings increases. Its financial visibility is clear, owing to bookings that typically occur a year in advance.

Rich Edwards, analyst with Robertson, Colman & Stephens, expects Cray to ship 51 systems next year and estimates the company will earn $5.10 to $5.20 per share in fiscal 1987, which assumes the existing 46% tax rate.

Investors remain confident of Cray because the supercomputer market is largely immune to economic conditions. According to Edwards, what fuels demand for supercomputers is the basic replacement of physical experimentation with computer simulation and modeling.

In addition to clear earnings visibility, Cray benefits from strong fundamentals that will likely support its future growth. According to Rick Martin, analyst with Sanford C. Bernstein & Co., not only is the number of units shipped each year growing, but the number of processors in each new installation is also increasing. Such a trend raises the average price per system.

Furthermore, Cray tends to sell more equipment than it leases. In its June 1986 quarter, Cray's shipments were 100% purchased, Martin says.

Because of the high cost of market entry, analysts foresee limited competition for Cray. Control Data Corp.; ETA Systems, Inc.; NEC Corp.; and Fujitsu Ltd./Amdahl Corp. are still newcomers to the U.S. supercomputer market.

Even as competition intensifies, Cray should not lose market share, says Jeffrey Canin, senior technology analyst with Hambrecht & Quist. Canin says Cray is responding to competition with continued funding of major research and development programs, including the development of three additional processor families. The first of these, an eight-processor series known as YMP, is due in 1988.

Canin says Cray is positioning its customer base for upgrades to these future products by standardizing all new systems and migrating some existing systems to Unicos, Cray's Unix implementation.

To determine the upgrade potential of Cray's installed base, Sanford's Martin conducted a survey last year in which the average Cray customer projected the useful life of its supercomputer at just three years.

"Although everyone focuses on its technology," Martin observes, "Cray has superb marketing." According to Martin, Cray's service and support build tremendous customer loyalty. Cray is also expanding the range of potential applications for its systems, Edwards of Robertson, Colman adds.

Since Cray's stock reflects all of these positive factors and sells at roughly a 100% premium to the market multiple, is this still a good time to invest in Cray?

"The easiest money has been made in Cray," Hambrecht & Quist's Canin says, "but over the next 12 to 24 months, the stock is likely to still out-perform computer issues."

Traditionally, Cray has traded between 20 and 30 times calendar earnings, Edwards says. Based on his 1986 estimate of $4.00 per share, Edwards says, "At 120, the stock is approaching full valuation on an historical basis."

Considering tax reform will likely add 50 to 75 cents to Cray's 1987 street estimate of $5.00 per share, "the stock doesn't seem so very expensive," Martin says, "when trading on 1987 expectations."

Portaus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

HP announces earnings increase

From page 110

orders accounted for most of the increase, rising 51% to a total of $863 million.

U.S. orders increased 9% from $990 million a year ago.

'Only surprise'

"The only surprise in these numbers is the order increase," said Tim McCollum of Dean Witter Reynolds, Inc. "I was thinking along the lines of 15% to 20%."

For the nine months ended July, HP recorded revenue of $5.1 billion, up 7% from a year ago.

Net earnings of $1.40 per share were down 1% from $362 million, or $1.41 per share, in the first nine months of 1985.

Moderate growth seen

HP Chief Executive Officer John Young said in a prepared statement that despite the improvement in international orders in the third quarter, the company anticipates moderate growth for the year.

"While business has improved, we remain cautious," he said.

"Capital spending by our customers is still sluggish, and we see no indication of a significant turnaround," Young added.

Ashton-Tate gets revenue boost

From page 110

While Ashton-Tate enjoys strong sales of its industry standard applications, it sacrifices more advanced, innovative capabilities, according to Goulde. "Although it's not technically innovative, people feel secure buying Multimate, for example," he said.

Other data base products have more functionality than Dbase III Plus, Goulde said, citing Microrim, Inc.'s Rbase series and Paradox from Ansa Software. "Both have the ability to read and write a much larger variety of files from other products."

During the second quarter, Ashton-Tate reported an increase in overseas sales, partly due to an international distribution deal with Javelin Software Corp., said Edward M. Esber Jr., Ashton-Tate's chairman, president and chief executive officer.

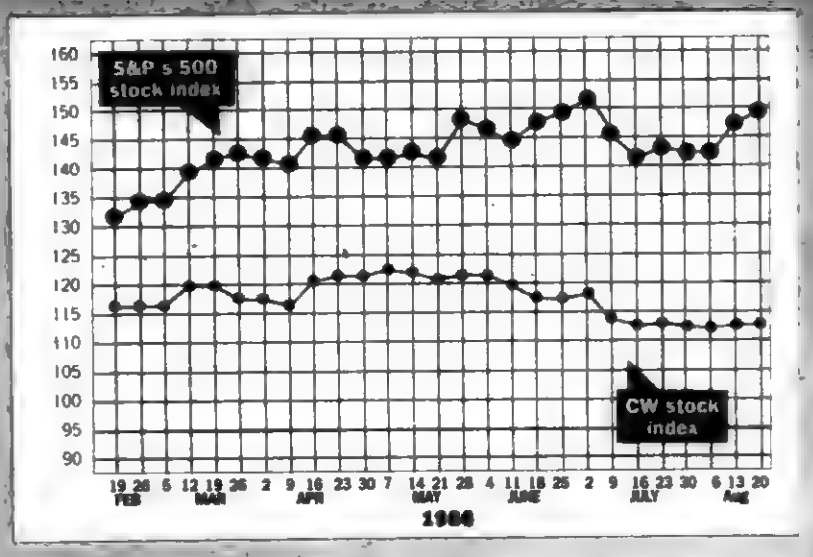
The firm also formed its fifth and sixth micro-to-mainframe link agreements, announcing deals with Cincom Systems, Inc. and Comshare, Inc.

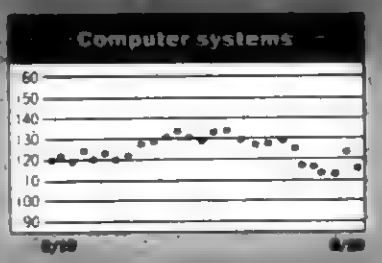
Second-quarter activity included the debut of Dbrun III Plus, an execute-only version of Dbase III Plus. Ashton-Tate has entered the Apple Computer, Inc. Macintosh market with Dbase Mac. The firm also recently entered a pending acquisition with Decision Resources, Inc.

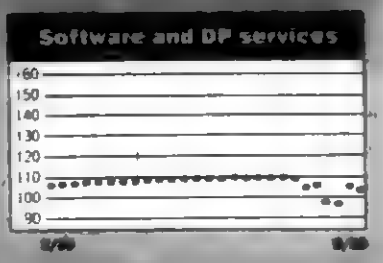
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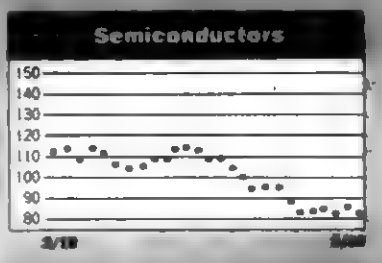
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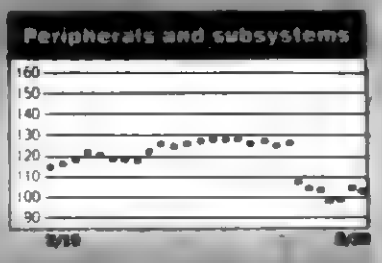
Computerworld stock trading index















All indexes reflect a historical base of 100 on Dec. 31, 1985, and track stock market performance in relation to that base. The CW stock index represents the unweighted average performance of the six categories of computer industry stocks.

	8/13/86	8/20/86
Computer systems	122.0	**118.9**
Software and DP services	105.1	**102.9**
Peripherals and subsystems	104.6	**103.2**
Supplies and accessories	145.5	**145.2**
Semiconductors	85.6	**81.8**
Leasing companies	102.0	**100.6**
CW stock index	113.4	**112.9**
Standard and Poor's 500 stock index	146.9	**149.3**

Computerworld stock trading summary

CLOSING PRICES WEDNESDAY, AUGUST 20, 1986

COMPUTER SYSTEMS

EXCH		52-WEEK RANGE (1)		PRICE CLOSE AUGUST 20 1986	WEEK NET CHNGE	WEEK PCT CHNGE
O	ALPHA MICROSYSTEMS	8	4	4.38	+0.1	+2.9
O	ALTOS COMPUTER SYS	19	10	12.75	+1.4	+12.1
A	AMDAHL CORP	19	10	17.88	+0.1	+0.7
O	APOLLO COMPUTER INC	19	9	11.75	-0.3	-2.1
O	APPLE COMPUTER INC	39	15	36.25	+0.3	+0.7
N	AT&T	26	20	23.63	+0.1	+0.5
N	BURROUGHS CORP	73	52	71.13	-0.1	-0.2
O	C P T CORP	7	4	4.38	+0.1	+2.9
N	COMPAQ COMPUTER CORP	18	8	14.50	-0.3	-1.7
A	COMPUTER CONSOLES INC	12	6	8.25	-0.4	-4.3
O	CONCURRENT COMP CORP	25	1	12.75	-0.5	-3.8
N	CONTROL DATA CORP DEL	27	15	23.38	+2.3	+10.7
O	CONVERGENT TECH	14	6	6.63	+0.5	+8.2
N	CRAY RESH INC	100	44	82.00	-3.8	-4.4
O	DAISY SYS CORP	32	8	10.13	+0.4	+3.8
N	DATA GEN CORP	50	30	34.75	-0.1	-0.4
N	DATAPOINT CORP	9	5	7.38	-0.1	-1.7
N	DIGITAL EQUIP CORP	99	50	98.13	+1.8	+1.8
N	ELECTRONIC ASSOC INC	7	4	4.25	-0.3	-5.6
N	FLOATING POINT SYS INC	46	14	14.88	-0.8	-4.8
N	GOULD INC	38	15	18.38	+0.5	+2.8
N	HARRIS CORP DEL	36	22	30.25	+2.4	+8.5
N	HEWLETT PACKARD CO	48	29	43.00	+0.9	+2.1
N	HONEYWELL INC	87	59	71.50	+5.1	+7.7
N	IBM	162	122	139.25	+5.3	+3.9
O	IPL SYS INC	4	1	2.75	-0.3	-8.3
N	ITT CORP	60	32	53.50	+0.0	+0.0
N	M A COM INC	20	13	15.75	+1.0	+6.8
N	MATSUSHITA ELEC INDL LTD	100	49	89.75	+6.3	+7.5
O	MENTOR GRAPHICS CORP	21	11	14.50	+0.4	+2.7
N	MOHAWK DATA SCI CORP	4	1	2.63	+0.1	+5.0
N	NBI INC	16	9	10.13	+0.1	+1.3
N	NCR CORP	57	31	53.13	-1.1	-2.1
N	PRIME COMPUTER INC	28	15	20.88	+1.0	+5.0
N	SPERRY CORP	76	46	76.00	+0.4	+0.5
O	STRATUS COMPUTER	26	15	22.00	+0.8	+3.5
O	SYMBOLICS INC	16	7	7.00	-0.1	-1.8
O	TANDEM COMPUTERS INC	39	13	37.88	-0.5	-1.3
N	TANDY CORP	45	32	36.25	-0.9	-2.4
N	TEXAS INSTRS INC	148	88	117.50	+1.9	+1.6
A	ULTIMATE CORP	35	11	19.13	+1.6	+9.3
A	WANG LABS INC	23	12	13.88	+0.1	+0.9
A	WANG LABS INC	23	11	13.75	+0.3	+1.9
N	XEROX CORP	72	46	57.25	+0.6	+1.1

SUPPLIES & ACCESSORIES

EXCH		52-WEEK RANGE (1)		PRICE CLOSE AUGUST 20 1986	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMER BUSINESS PRODS	37	25	28.88	-1.1	-3.8
N	BARRY WRIGHT CORP	25	17	18.63	-0.9	-4.5
A	DUPLER IN[illegible]VIC	23	17	21.50	+1.4	+6.8
N	EVANS SU[illegible], FORMS INC	28	15	24.75	+1.0	+4.2
N	3M CO	115	74	111.50	-0.5	-0.4
N	MOORE LTD	28	18	23.63	-1.0	-4.1
O	STANDARD REGISTER CO	50	30	37.50	+0.3	+0.7
N	WALLACE COMPUTER SVCS	50	23	46.63	+0.4	+0.8

SOFTWARE & DP SERVICES

EXCH		52-WEEK RANGE (1)		PRICE CLOSE AUGUST 20 1986	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	7	3	5.25	+0.1	+2.4
N	ADVANCED SYS INC	20	11	15.13	+0.1	+0.8
N	AGS COMPUTERS INC	25	14	19.50	+1.4	+7.6
O	AMERICAN MGMT SYS INC	20	8	17.25	+0.0	+0.0
O	AMERICAN SOFTWARE INC	15	9	13.50	+1.1	+9.1
N	ANACOMP INC	7	3	4.13	+0.1	+3.1
O	ANALYSTS INTL CORP	10	4	4.50	-0.1	-2.7
O	ASHTON TATE	34	10	27.13	+0.6	+2.4
O	ASK COMPUTER SYS INC	15	7	11.50	+0.5	+4.5
O	ASTRADYNE COMP IND	3	1	2.63	+0.7	+37.7
N	AUTOMATIC DATA PROC	39	18	33.50	+0.3	+0.8
O	COMPUTER ASSOC INTL INC	25	10	23.75	-0.5	-2.1
O	COMPUTER HORIZONS CORP	15	10	11.00	-0.1	-1.1
O	COMPUTER NETWORK TECH	10	2	6.81	+0.0	+0.0
N	COMPUTER SCIENCES CORP	40	22	37.75	+1.8	+4.9
O	COMPUTER TASK GROUP INC	19	11	11.75	+0.0	+0.0
O	COMPUTONE SYS INC	6	1	1.75	-0.1	-5.7
O	COMSHARE INC	13	9	12.25	+0.1	+1.0
W	CULLINET SOFTWARE INC	20	8	8.25	-0.5	-5.7
O	CYCARE SYS INC	17	10	12.00	+0.0	+0.0
O	DUQUESNE SYS INC	46	11	29.50	+0.5	+1.7
N	GENERAL ELEC CO	83	56	76.13	-0.8	-1.0
N	GENERAL MTRS CORP	50	33	40.00	1.3	3.0
N	GTE CORP	58	38	57.88	+2.3	+4.0
O	HOGAN SYS INC	12	4	10.75	+0.4	+3.6
O	INFORMATION SCIENCES INC	4	1	2.00	-0.1	-5.9
O	INFOTRON SYS CORP	23	12	12.00	-0.5	-4.0
O	KEANE INC	17	7	7.38	-0.1	1.7
N	LOGICON INC	43	27	28.13	+0.4	+1.4
O	LOTUS DEV CORP	39	15	37.75	+2.8	+7.9
O	MANAGEMENT SCI AMER	16	8	14.75	+0.3	+1.7
O	MCI COMM CORP	13	8	8.00	+0.3	+3.2
O	MICOM SYS INC	23	10	11.25	+0.3	+2.3
O	MICRO PRO INTL CORP	4	2	2.25	-0.2	-7.7
O	MICROSOFT CORP	36	26	30.00	+0.3	+0.8
O	NATIONAL DATA CORP	26	11	18.38	-1.1	-5.8
O	ON LINE SOFTWARE INT	16	6	11.75	-0.5	-4.1
O	ORACLE SYS CORP	29	14	15.25	-0.6	-3.9
N	RAMSOFT INC SYS INC	26	18	29.75	+1.6	+5.8
N	PLANNING RESH CORP	24	14	20.50	+0.3	+1.2
O	POLICY MGMT SYS CORP	24	15	17.50	+0.0	+0.0
O	PROGRAMMING & SYS INC	11	5	9.00	+0.0	+0.0
O	REYNOLDS & REYNOLDS CO	41	18	41.00	+4.5	+12.3
O	SCIENTIFIC COMPUTERS INC	6	4	4.25	+0.0	+0.0
O	SEI CORP	28	15	18.25	+2.0	+12.3
O	SHARED MED SYS CORP	41	29	35.25	+1.1	+3.3
O	SOFTWARE AG SYSTEMS INC	22	13	18.75	-0.3	-1.5
O	SOFTWARE PUBG CORP	10	5	5.63	+0.1	+2.3
A	STERLING SOFTWARE INC	21	7	17.25	-0.6	-3.5
N	UCCEL CORP	23	13	20.88	+0.9	+4.4
N	URS CORP	18	10	16.25	+0.8	+4.8
O	VM SOFTWARE INC	32	17	28.50	+1.3	+4.6

SEMICONDUCTORS

EXCH		52-WEEK RANGE (1)		PRICE CLOSE AUGUST 20 1986	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADVANCED MICRO DEV	34	14	16.63	+0.3	+1.5
N	ANALOG DEVICES INC	25	14	17.63	+0.8	+3.7
O	ANALOGIC CORP	16	10	12.00	+0.5	+4.3
N	APPLIED MAGNETICS CORP	20	12	15.50	+0.0	+0.0
O	AVANTEK INC	24	16	17.88	+0.5	+2.9
O	HADCO CORP	7	4	4.63	+0.0	+0.0
O	INTEL CORP	32	16	21.25	+1.3	+6.3
O	MICRO MASK INC	8	2	2.63	-0.4	-12.5
N	MOTOROLA INC	50	29	40.38	+1.5	+3.9
N	NATIONAL SEMICONDUCTOR	18	9	9.63	+0.4	+4.1
N	TERADYNE INC	30	17	20.00	+0.9	+4.6

PERIPHERALS & SUBSYSTEMS

EXCH		52 WEEK RANGE (1)		PRICE CLOSE AUGUST 20 1986	WEEK NET CHNGE	WEEK PCT CHNGE
A	AM INTL INC	9	3	6.13	-0.1	2.0
A	ANDERSON JACOBSON INC	3	2	2.25	-0.0	+0.0
O	AST RESH INC	33	11	13.25	+2.4	+21.8
O	AUTOTROL CORP	10	6	7.00	+0.0	+0.0
O	AVANT GRADE COMPUTING	9	3	3.50	+0.3	+7.7
O	BANCTEC INC	13	7	7.00	-0.1	1.8
N	BOLT BERANEK & NEWMAN	48	28	41.75	-0.1	-0.3
N	CENTRONICS DATA COMP	8	4	7.63	-0.3	3.2
A	CETEC CORP	9	6	6.38	+0.1	+2.0
A	COGNITRONICS CORP	6	3	3.13	-0.3	7.4
N	COMPUGRAPHIC CORP	29	16	16.25	1.0	5.8
N	COMPUTERVISION CORP	19	9	12.63	-0.1	1.0
N	CONRAC CORP	18	11	15.63	+0.4	+2.5
A	DATAPRODUCTS CORP	18	11	13.13	-0.5	3.7
A	DATARAM CORP	18	5	9.25	+0.1	+1.4
O	DATA SWITCH CORP	9	5	6.25	+0.1	+2.0
O	DATUM INC	7	5	5.63	+0.0	+0.0
N	DECISION INDS CORP	15	9	10.00	+1.1	+12.7
O	ENDATA INC	8	3	5.25	-0.5	-8.7
O	EVANS & SUTHERLAND	27	17	22.38	+1.0	+4.7
N	FLOATING POINT SYS INC	46	14	14.88	-0.8	4.8
O	GANDALF TECHNOLOGIES	8	5	6.13	-0.1	2.0
N	GENERAL DATACOMM IND	15	8	9.63	-0.6	6.1
N	HAZELTINE CORP	28	16	19.13	+1.3	+7.0
O	ICOT CORP	13	6	10.00	+1.0	+11.1
O	INFORMATION INTL INC	16	10	15.31	-0.2	1.2
O	INTECOM INC	7	3	5.06	-0.1	+2.5
O	INTERLEAF INC	15	8	7.75	-0.4	4.6
O	MEGADATA CORP	5	3	3.13	-0.3	+8.7
A	MSI DATA CORP	14	8	10.25	-0.1	1.2
N	NASHUA CORP	28	12	27.63	+0.5	+1.8
O	NETWORK SYS CORP	26	10	12.50	+0.0	+0.0
N	NORTH AMERN PHILIPS CORP	48	32	39.25	-0.5	1.3
N	NORTHERN TELECOM LTD	38	25	29.38	-0.1	0.4
O	NOVELL INC	21	10	20.25	+1.4	+7.3
O	OMEX	1	0	0.38	+0.0	+0.0
N	PARADYNE CORP	13	6	6.25	-0.4	-5.7
A	PENRIL CORP	9	5	5.00	+0.1	+2.6
N	PLESSEY PLC	38	19	28.38	-0.6	2.2
O	PRINTRONIX INC	15	11	13.63	+1.5	+12.4
O	QMS INC	16	6	13.63	-0.9	6.0
O	RAMTEK CORP	7	2	6.00	+0.0	+0.0
N	RECOGNITION EQUIP INC	17	9	11.50	+0.3	+2.2
N	SANDERS ASSOC INC	63	29	59.88	+0.0	+0.0
O	SCAN TRON CORP	24	12	18.75	+0.3	+1.4
N	SCIENTIFIC ATLANTA INC	15	9	8.88	+0.3	+2.9
O	SEAGATE TECHNOLOGY	14	5	12.88	+0.9	+7.3
N	STORAGE TECHNOLOGY	7	1	2.63	+0.0	+0.0
O	SUN MICROSYSTEM INC	20	11	15.13	+0.6	+4.3
A	T-BAR INC	7	5	6.25	+0.1	+2.0
A	TAB PRODS CO	15	10	14.13	-0.4	2.6
O	TANDON CORP	8	3	3.75	+0.3	+7.1
A	TEC INC	9	4	4.88	-0.6	11.4
N	TEKTRONIX INC	65	47	61.00	+2.1	+3.6
O	TELEVIDEO SYS INC	4	2	3.00	+0.5	+20.0
N	TELEX CORP	69	41	58.38	+2.9	+5.2
N	TIMEPLEX INC	24	14	15.13	-0.5	3.2
N	TITAN CORP	12	5	9.38	-0.3	2.6
O	VISUAL TECHNOLOGY INC	2	0	0.63	+0.1	+24.8
O	WYSE TECH	19	7	10.63	+1.0	+6.4

LEASING COMPANIES

EXCH		52-WEEK RANGE (1)		PRICE CLOSE AUGUST 20 1986	WEEK NET CHNGE	WEEK PCT CHNGE
N	COMDISCO INC	25	12	19.13	-0.9	-4.4
N	CONTINENTAL INFO SYS	12	8	10.50	+0.4	+3.7
O	FINALCO GROUP INC	5	3	3.50	+0.4	+12.0
O	PHOENIX AMERN INC	8	2	3.88	+0.1	+3.3
O	SELECTERM INC	12	5	6.00	+0.3	+4.3
N	U.S. LEASING	46	32	42.00	+0.5	+1.2

EXCH: N—NEW YORK; A—AMERICAN; P—PACIFIC; B—BOSTON; L—NATIONAL; M—MIDWEST; O—OVER-THE-COUNTER; S—SPLIT

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(1) TO NEAREST DOLLAR

COMPUTER INDUSTRY

INSIDE

The recent divestiture of ITT's telecommunications business may spur a major restructuring of Europe's telecom industry/**81**

Micropro replaces its CEO in a major management reshuffling/**84**

Javelin lays off part of its sales force/**108**

Stock watchers are bullish on Cray Research/**108**

INSTANT ANALYSIS

"Not since the introduction of the IBM Personal Computer and the jump from eight to 16 bits has this kind of opportunity been available."

— John Gribi, chief financial officer, Compaq Computer Corp., on the forthcoming generation of Intel Corp. 80386-based microcomputers

Cullinet suffers first loss

But Chapman sees growth in VAX software offerings

By Charles Babcock

WESTWOOD, Mass. — Despite his company's first-ever quarterly loss, announced last week, Cullinet Software, Inc. Vice-Chairman and Chief Executive Officer David L. Chapman claims the firm is developing technologies that will allow it to resume its usual pattern of growth.



Cullinet's Chapman

For the first fiscal quarter ended July 31, Cullinet lost $10.6 million, or 35 cents per share, on revenue that plunged 25% from year-earlier levels to $31.8 million. The results included a write-off of $7 million for the remaining assets of Computer Pictures Corp., acquired by Cullinet in 1982. The after-tax impact of the write-off was 12 cents per share. In the year-earlier quarter, Cullinet earned $4.2 million, or 14 cents per share, on sales of $42.3 million.

Chapman said the company saw no immediate relief from the current market slowdown. But in an interview at the Westwood, Mass., company headquarters, shortly before the results were announced, Chapman ticked off a series of reasons why he thinks the losses will be short-lived.

While sales of Cullinet's flagship IDMS/R data base management system are obviously down, Chapman claimed the product fares well in face-offs with its competition. "We're seeing the first glimmer of increased market demand," he claimed.

In Cullinet's fledgling application business, Chapman acknowledged that competition was keen for financial application packages, but, he said, "Manufacturing software for the DOS marketplace is beginning to pick up."

None of these developments, however, was able to offset the final write-off of Computer Pictures, a $14 million cash acquisition in 1982 of a microcomputer graphics and analytical software firm.

Chapman, nevertheless, said Cullinet was continuing to invest heavily in new technologies and will make

See **CULLINET** page 108

Used computer mart heats up

By Alan Alper

While declining capital expenditures at corporations nationwide are causing many computer manufacturers to sing the financial blues, the computer industry slump is creating sundry opportunities for peddlers of used equipment.

In contrast to firms such as IBM, Honeywell, Inc. and Data General Corp., used computer suppliers say the business environment for their wares is as good as it has ever been. Some vendors stress that tighter budgets at many corporations and educational institutions has purchasing agents turning toward used gear to help stretch limited financial resources.

"Certainly, lower cost is a primary incentive to buy used equipment," notes Michael Wolfe, president of Century Computer Brokers, Inc. of Culver City, Calif., a supplier of used peripherals and data communications products.

Wolfe points out that while a new 900 line/min Dataproducts Corp. printer lists for $10,000, a used one sells for $2,500.

Some companies also purchase used equipment and cannibalize it for spare parts. "If a company needs a logic board repaired in a terminal, it can cost $200," Wolfe explains. "You can get a new terminal for $250, put the logic board in yourself and get other spare parts you might need later."

Many companies are embracing used computer equipment at a time when budgetary retrenching abounds, notes Bob Weissblatt, president of Computer Resale,

See **USED** page 86

INDUSTRY INSIGHT
Bob Djurdjevic

IBM lets its defenses down

Why is IBM opening up?

After decades of almost airtight control of its captive markets, there is a breath of fresh air in IBM's strategies. IBM seems to be opening up to the world in more ways than one.

First, the company's senior executives, led by its new chairman, John Akers, exhibited an unusual air of openness at the June meeting for financial analysts in San Jose, Calif. Second, IBM is also opening up its Systems Network Architecture (SNA) communications strategy.

In an unusual departure from the behavior of his predecessors, Akers stayed on the podium well past his planned time; IBM chairmen have traditionally tried to limit their exposure to the outside world to a minimum. He tackled most of the analysts' questions head-on.

In the end, his openness and courage earned him genuinely enthusiastic applause from the nonpartisan group, which contrasted with the reactions to the usually bland speeches by IBM chairmen in the past.

IBM's new president of the Communications Product Division, Terry Lautenbach, also talked of opening up the gates to the jewel of IBM's communications strategy, SNA, with some 23,000 licenses installed worldwide.

"We have a clear direction in our communications strategy," he asserted. "We think that SNA is the best network

See **IBM** page 85

Djurdjevic is a computer industry analyst and president of Annex Research, a Phoenix-based computer research and consulting firm.

HP announces earnings rise, printer OEM deal with Zenith

By Maura McEnaney

PALO ALTO, Calif. — Hewlett-Packard Co. stayed closed to Wall Street predictions and posted a 6% earnings increase for the third quarter ended July 31.

Separately, HP announced an OEM agreement to sell its Thinkjet portable printer to Zenith Data Systems as part of Zenith's $30 million Internal Revenue Service contract for portable computers.

HP will supply up to 18,000 printers, which will retain the HP label, to be bundled with Zenith's Z-171 portable.

HP's third-quarter earnings increased to $123 million, or 48 cents a share, compared with $117 million, or 45 cents a share, for the third quarter of last year.

HP sales increased 11% to $1.8 billion, compared with $1.6 billion for the same quarter a year ago.

Orders for the quarter increased 25% over a year ago, a gain that surprised several analysts. "I thought they'd do about 18%," said John Geraghty at First Boston Corp. "All of a sudden, their orders are up. That's not bad in an environment where orders have been sluggish."

Incoming orders were $1.8 billion, compared with $1.4 billion in the third quarter of 1985. International

See **HP** page 108

Diversification, Dbase III Plus boost Ashton-Tate quarterly revenue 87%

By Ninamary Maginnis

TORRANCE, Calif. — Ashton-Tate last week reported second-quarter earnings of $6.5 million, an 87% increase over the $3.5 million reported for the like quarter last year.

In part, the boost was due to Ashton-Tate's acquisition of Multimate International Corp. late last year, an expanded product line and continued strong sales of its Dbase III Plus data base management application, according to industry analysts.

The company reported earnings of 53 cents per share, compared with 37 cents per share in the second quarter of fiscal 1986. Second-quarter revenue was $49 million, a 78% increase over revenue of $27.5 million in the year-earlier quarter.

"The dramatic increase in revenue reflects the acquisition of Multimate and some new products they are promoting that weren't there in last year's April and July quarters," said Edward Cotter, an analyst with Philadelphia-based W.H. Newbold's Son & Co. "The quarters we are now comparing didn't have Multimate, Framework II and Dbase III Plus."

Michael Goulde of Boston-based market research firm the Yankee Group agreed. "Ashton-Tate has become more diversified and less dependent on revenue from any one product," he said. "They made some very smart acquisitions."

See **ASHTON-TATE** page 108

Look out for the Best

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L.A.

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